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[+ Section 1](#)[+ Section 2](#)**Document overview**

In order to achieve and maintain a high standard for content presentation and a consistent user experience on NASA.gov, the following guidelines have been established in accordance with the portal strategy, information architecture, UI design, and HTML template development. These standards should be incorporated when updating and maintaining the NASA.gov portal.

**This document is divided into two parts:**

**1.0 INFORMATION ARCHITECTURE AND USER INTERFACE DESIGN**

This section is intended to explain the structure of information on the NASA.gov portal, as well as assist in graphics production, explain the user interface and templates in detail, and to standardize editing graphics, page elements, and promotional content.

[+ View section 1.0](#)**2.0 EDITORIAL GUIDELINES**

A handbook to help ensure that the most compelling NASA content is showcased on NASA.gov, and that a consistent voice and textual and grammar style is used throughout the portal.

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[+ Graphics Standards](#)[+ Animation Standards](#)[+ Actionscript Details](#)**Introduction to the Information Architecture**

The new NASA portal promotes the best content from the NASA network of web sites, and has been carefully structured to organize and position that content in order for it to be engaging and relevant to the various audiences that it is intended for.

The structure and design of the content is referred to as the Information Architecture. The Information Architecture, also commonly referred to as the "IA", relies on a series of organizing principles that need to be respected and maintained, in order to ensure the integrity of the presentation of content on [NASA.gov](#).

**Key Organizing Principles**

Organizing principles are the categorization schemes that are used to "bucket" content. Flow principles refer to the general path that users employ to navigate through content.

The new NASA portal is structured around the following organizational principles:

**Persistent Items:**

- Text Only Version
- en Espanol
- Contact NASA
- Find it @ NASA
- Footer Navigation

**Audience Segments:**

- For Kids
- For Students
- Grades K-4
- Grades 5-8
- Grades 9-12
- Post Secondary
- For Educators
- Grades K-4
- Grades 5-8
- Grades 9-12
- Post Secondary
- Informal Educators
- For Media and Press

**Content Type:**

- About NASA
- News and Events
- Multimedia
- Missions
- Popular Topics
- MyNASA
- Promotional Banners

**Vision Segments:**

- Life on Earth
- Humans in Space
- Exploring the Universe

**Content Type**

The NASA portal contains some content of interest to all audiences. This content is housed in a series of landing pages categorized by broad types of content. It also includes the rotating banner and other promotions on the home page.

Navigation, referred to as the "global navigation" is contained in the gray bar at the top of the page and in the footer:

- About NASA
- News and Events
- Multimedia
- Missions
- Popular Topics
- MyNASA
- Footer navigation and site credits

MyNASA allows users to build their own custom category containing content of the greatest value and interest to them within available channels.

## Audience segmentation

There is content on the NASA portal that is selected and published for specific audiences.

These audiences include:

- Kids (for children)
- Students K-4 (learning for children)
- Students (grouped by grade levels, 5-8, 9-12, Post Secondary)
- Educators (grouped by grade levels K-4, 5-8, 9-12, Post Secondary)
- Media & Press

Content that is identified as being of special interest to these groups is placed in the areas referred to as "segments". Navigation for these areas, referred to as "segment navigation", is located on the left hand side of the home page. Navigation within segments varies according to the segment's needs and is reflected in the contents of the left navigation.

**General Public:** "Popular Topics" is a section in the main navigation where content that is intended for the general public will be placed. As opposed to the content found in the Audience Segmentation, "Popular Topics" is an area that is intended to hold content that is identified as having a broad appeal.

The "Popular Topics" section is comprised of a landing page that allows users to select from 8 more specific sub-categories:

- Looking At Earth
- Aeronautics
- Our Solar System
- The Space Shuttle
- International Space Station
- NASA in the Lab
- NASA Technology
- Stars and Galaxies

More categories may be added over time.

**Vision:** To help create understanding about NASA's mandate, the home page promotes a number of feature stories that help to illustrate NASA's vision statement. These stories are physically grouped in one of three columns, according to which part of the vision statement they support. Each vision ("Life On Earth", "Humans In Space", "Exploring The Universe") also supports a landing page that houses additional vision-related stories. The collective navigation is referred to as the "vision navigation".

**NASA Search:** Much of NASA's content is not directly accessible through the primary organizing principles as identified above. This is because they are either contained in the Content Management System or contained elsewhere in the NASA network of sites.

Search must be considered as a type of organizing principle, given that it is the single access point to these types of content. As a result, search is persistent on every page of the NASA.gov interface.

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**"Wide" as opposed to "Deep":** The intention of the portal is to provide the audiences meaningful access to the huge range of content that NASA offers. To accomplish this, the home page and major landing pages offer many access points to content.

Ease of use is also a priority. Assuming that the user's destination or "terminus page" is a feature article page, the inherent structural approach limits the typical flow to a click path of approximately three to four clicks. For example, a typical click path may include clicks from:

[Flash Introduction](#) to the [Home page](#) to the [About NASA Landing page](#) to a left navigation element like [Visiting NASA](#) to the [Ames Research Site](#).

This "wide" rather than "deep" approach means that users can select from a wide range of content, but are guaranteed to find specific content quickly.

**Lateral Navigation at All Points**

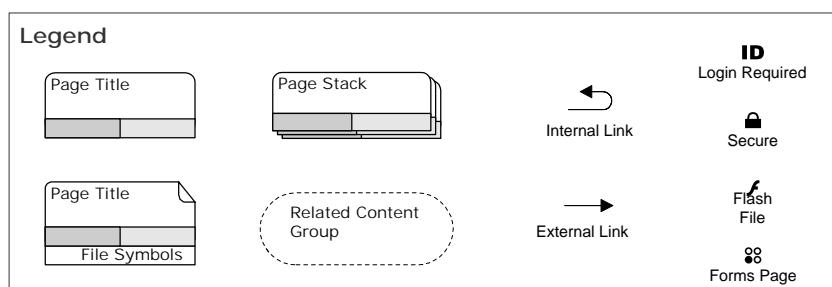
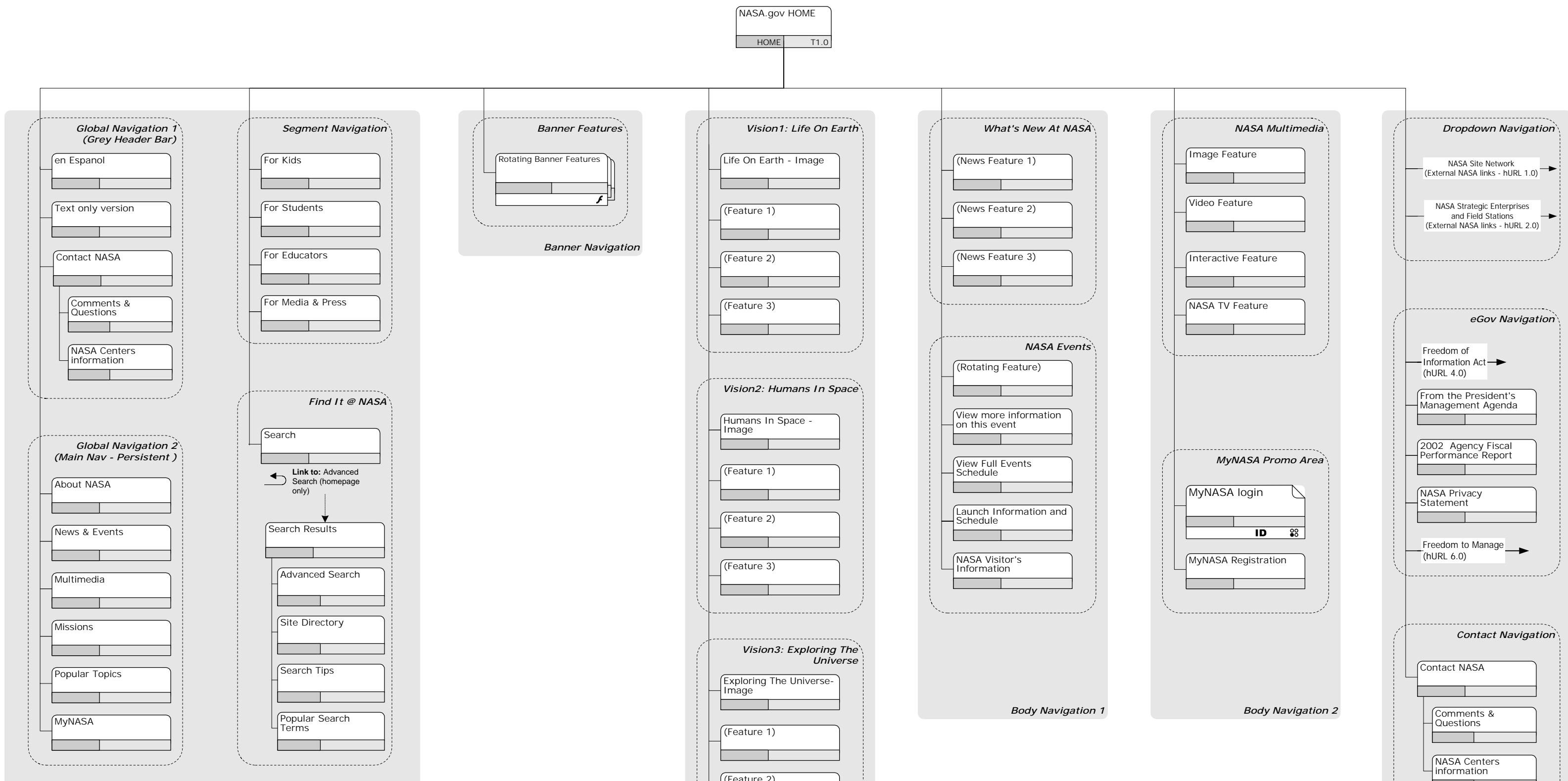
As a user travels along a typical path, they may not find the information they want, or they may come to a terminus page and decide to change their navigation path. This is typical of most users' "browsing/searching" behavior. To facilitate this, all pages (excluding the home page) make use of "lateral navigation" - navigation that facilitates quick changes in user path decisions. This strategy is supported by use of:

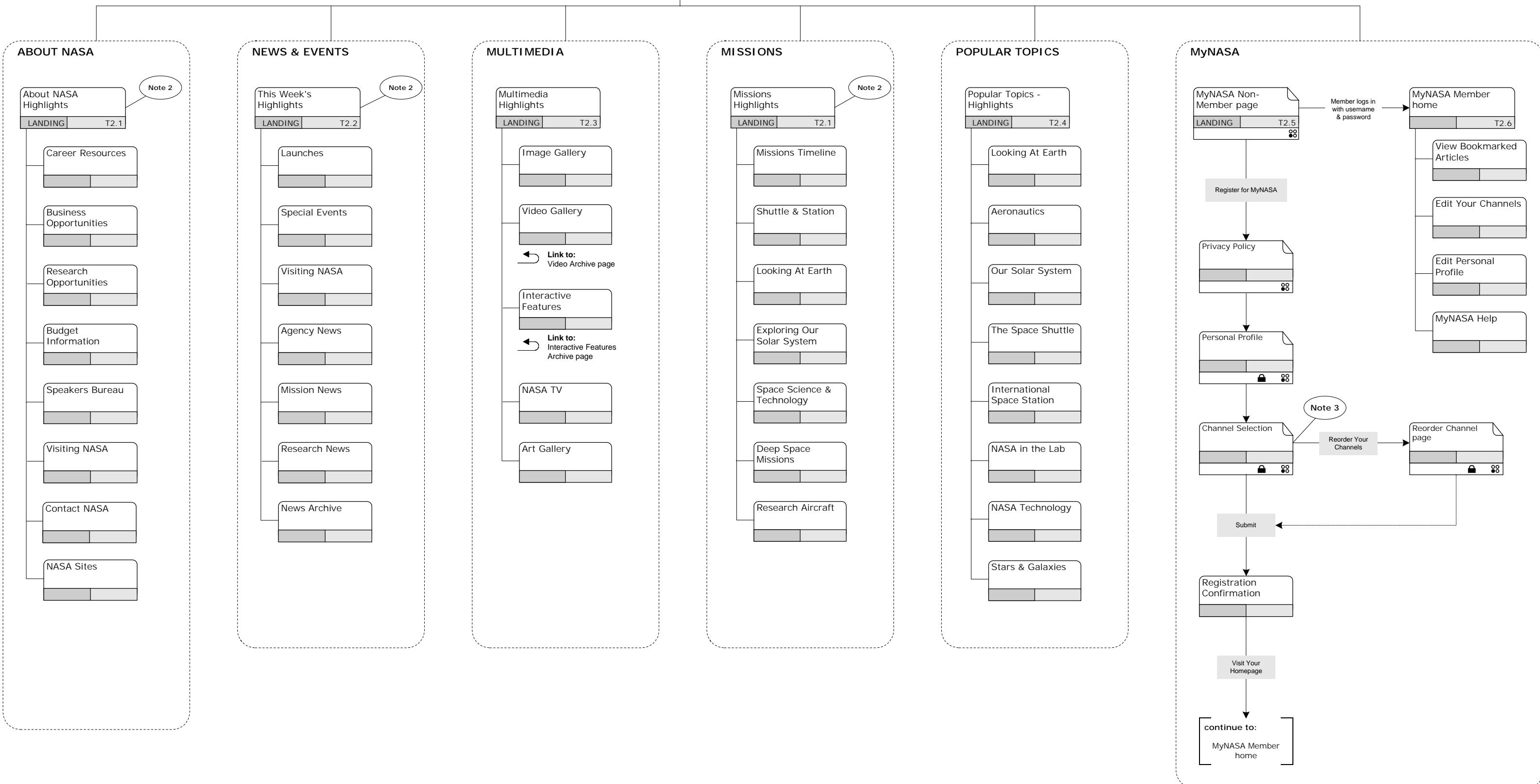
Related Links - Links to content related to the main content body of a given page (i.e. Related Multimedia)

Global Navigation - Links to "Home", and to the content types housed in the Global Navigation

Persistent Search - Search is on all pages

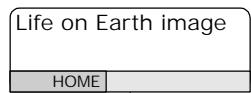
**Related documentation**[+ Link to High level IA \(PDF files\)](#)





**VISION NAVIGATION**

**VISION1: LIFE ON EARTH**



Life On Earth Main Features  
LANDING T2.0

In Everyday Life

Looking At Earth

The Environment

New Technologies

Living Things

Improving Flight

**VISION2: HUMANS IN SPACE**



Humans In Space Main Features  
LANDING T2.0

Preparing For Space Travel

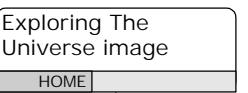
Getting To Space

Living In Space

Working In Space

Traveling In Space

**VISION3: EXPLORING THE UNIVERSE**



Exploring The Universe Main Features  
LANDING T2.0

Our Solar System

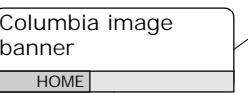
Stars & Galaxies

Watch The Skies

New Worlds

Robotic Explorers

**COLUMBIA SECTION**



Columbia home  
LANDING

Media Resources

Freedom of Information Act Records

Help The Board

Crew Profiles

Mission Overview

Memorials

**NASA FACTS SECTION**



Life On Earth Facts  
LANDING

Humans In Space Facts

Exploring The Universe Facts

**MEDIA & PRESS SECTION**



Press Release Archive

Press Kits

Fact Sheet

Images

Multimedia Resources

Speeches

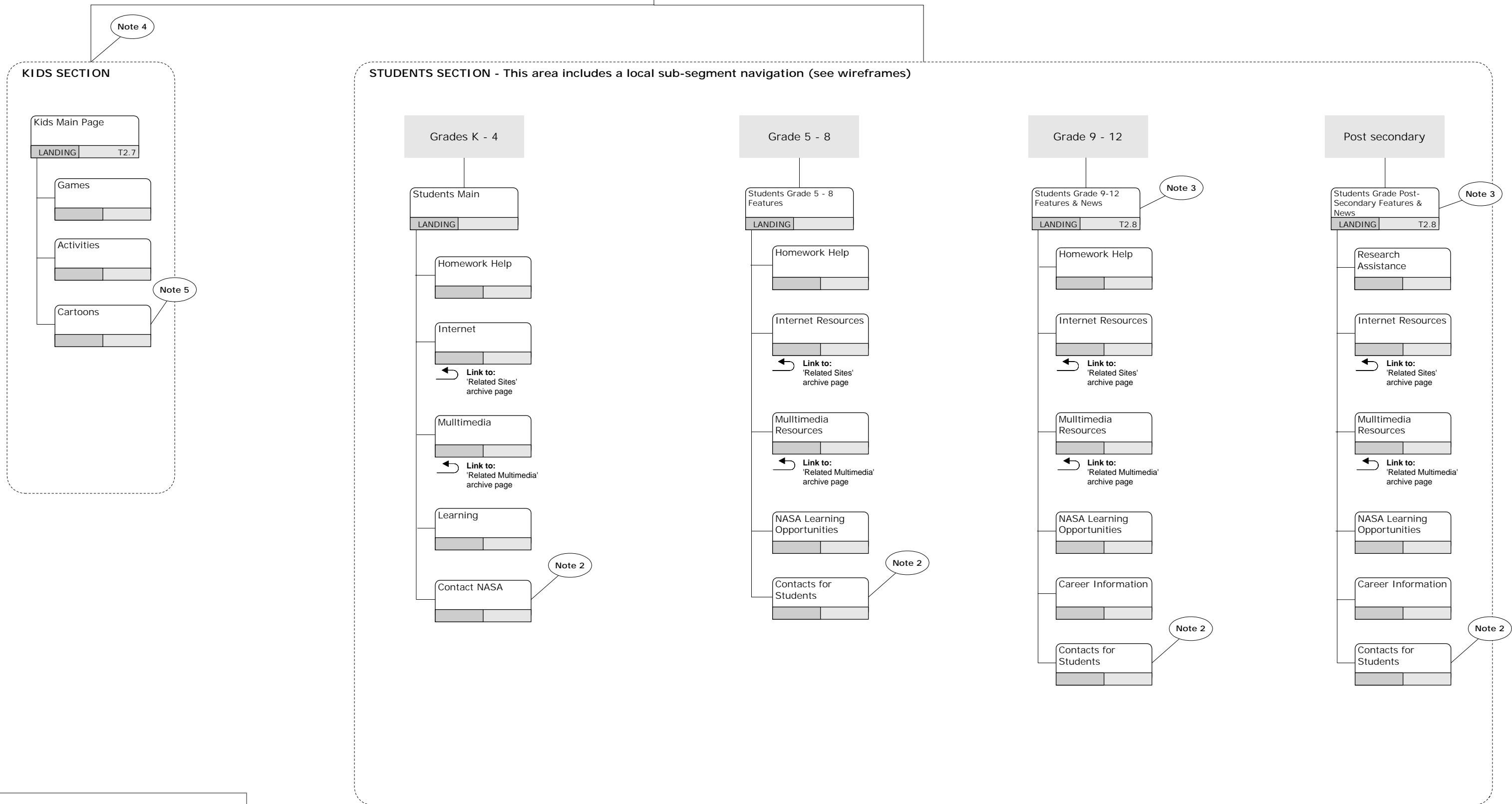
Press Contacts

**Notes**

Note 1: News on landing page

Note 2: This is a text link that is spawned from the NASA Facts that are located on different pages throughout the site





Notes

Note 2: This page will share content with "Contacts For Educators"

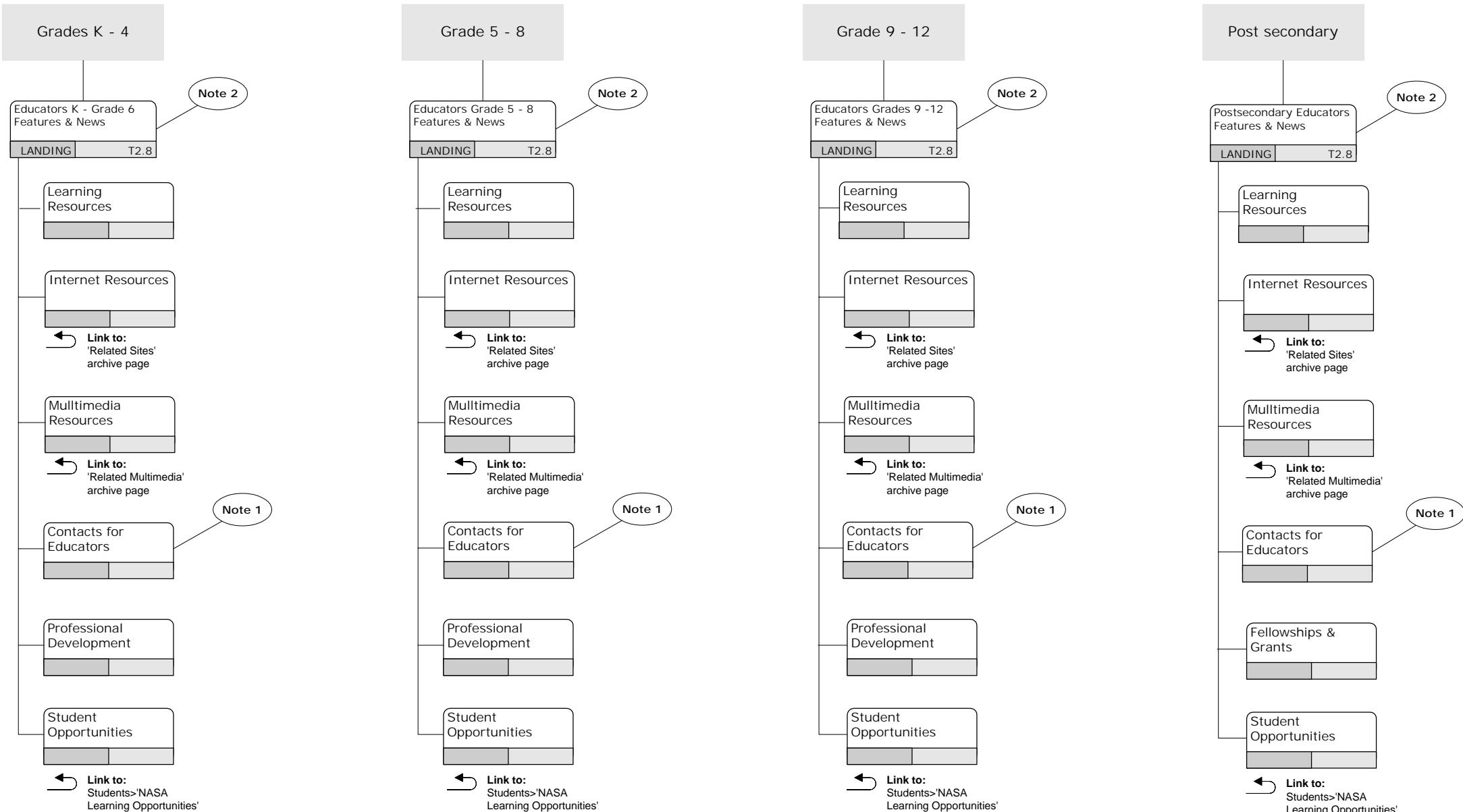
Note 3: News on landing page

Note 4: Alt tag to reflect "Fun, Games & Activities..."-type copy to distinguish from Students Section

Note 5: Will remain "Cartoons" for May 1 launch. Desire expressed by Nitin to see this more closely reflect "Arts & Stories"



**EDUCATORS SECTION - This area includes a local sub-segment navigation (see wireframes)**



Notes

Note 1: This page will share content with "Contacts For Students"

Note 2: News on landing page



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The NASA.gov portal solution is built upon the following key considerations:

**Branding**

NASA is a brand that comes with high expectations. The NASA.gov portal must drive and enhance the NASA identity. Consistency should be attained in reference to visual identity, content selection, copy tonality, usability and technical functionality.

**Inspire, Inform, and Involve**

Inspire with an engaging experience. Inform with great content and information. Involve users to build a stronger relationship.

**Build upon and prove NASA's Vision and Mission**

Deliver the vision and mission through the experience, content and design.

**Recognize the need (and challenge) to balance a functional portal with a strong brand experience**

The NASA.gov portal site solution delivers an exceptional user experience along with the functional elements and categories required from a strong portal concept. In other words, engage and excite the user while still providing essential content & functional needs.

**Identify and address unique individual tasks and user needs**

The NASA.gov portal provides easy access to the experience and content required and expected by the audience segments, it facilitates user tasks (search, navigate, and explore), and lets users engage in rich media experiences when possible, but does not exclude users who cannot view rich media based content.

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The following examples can be used as visual reference for UI design and/or graphics production.

The pages shown correspond to the high level IA. The content used in the examples is for position only.

[Home page](#)[Home page \(non flash / no script\)](#)**Global Navigation:**[About NASA](#), [News and Events](#), [Multimedia](#), [Missions](#), [Popular Topics](#), [MyNASA](#)**Search (Find it @ NASA):**[Simple search](#), [Advanced search](#), [Category search](#), [Popular search terms](#), [Search tips](#)

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For Kids Main, Kids Article, Games, Did you know, What does it mean, Info for parents, Popup1, Popup2

**For Students:**

Grades K-4, Students Landing (other grades)

**For Educators:**

For Educators Main

**For Media & Press:**

Main page, News archive



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## NASA's Vision

[Life on Earth](#), [Humans in Space](#), [Exploring the Universe](#), [Detail Page 1](#), [Detail Page 2](#), [Features Archive](#)



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Multimedia highlights, Multimedia archive, Video archive, Interactive features archive, Image of the day gallery, Image of the day (larger view), Image of the day archive



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## MyNASA

[Nonmember, Register, MyNASA home, Bookmarks, Edit, Help, Edit Image](#)

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## Popular Topics

[Popular topics main, Topic page](#)

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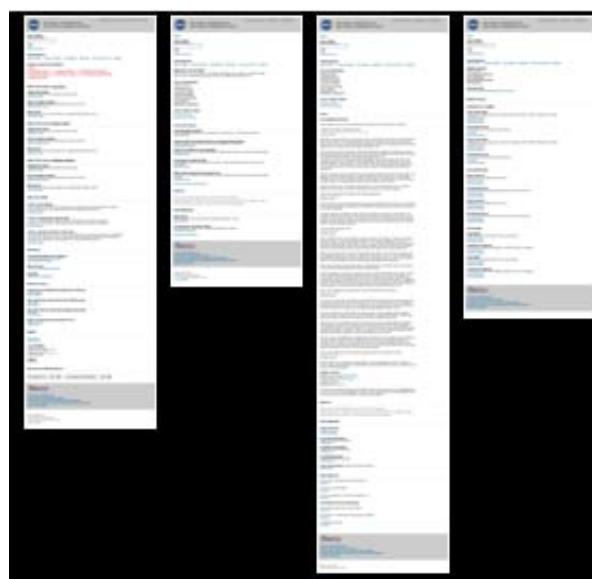
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The text only version of NASA.gov is designed with special consideration for user viewing the site with screen readers, very slow connections, limited functionality or with a preference for viewing text only content. Although the regular portal meets strict section 508 compliance standards and provides a relatively low bandwidth experience, text only is optimal for this select group of users. In this version of the site, the text size of the body copy and headlines is resizable by the user in accordance with accessibility guidelines.

[Text only home page](#), [Text only landing page](#), [Text only article](#), [Text only MyNASA](#),



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## Visual Affinity

**Overview of banners**

NASA's challenge lies in unifying a disparate network of sites to achieve a more consistent look and feel throughout the NASA network. The affinity top banners and footer have been provided to allow both content (rich media) and sites on the NASA network to adopt an affinity with the [NASA.gov](#) look and feel.



Additionally source code and detailed specifications have been created for use by webmasters able to adopt a higher level of visual affinity. This creates resizable pages on a black background with a centered white area that is 750 pixels wide.

**Sample Pages**[Banner 1](#), [Banner 2](#), [Banner 3](#), [Banner 4 \(multimedia pop up\)](#),**More complete levels of affinity:**

Sites on the NASA network wishing to adopt a more complete or stronger visual affinity should utilize the underlying principles that govern the NASA.gov portal in addition to specific graphic standards and page layout.

The font usage can easily be adopted from the style sheets used on the main portal (css), images should be treated in a similar manner, colors can be referenced according to the guidelines devised by the portal IA and UI. Specific consideration should be given on a case by case basis to navigation, content, and/or rich media creation.

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NASA.gov is made up of a predetermined set of templates. Standard templates help to maintain a consistent and optimal user experience throughout the site. This consistency enhances usability and provides an ease of maintenance. While there are overall design, specification and template consistencies throughout the entire portal, some specifications apply only to certain sections.

It is important that pages which serve a similar purpose, for example, article pages, have a consistent layout. A consistent page layout not only helps the user understand navigation and site architecture, but more importantly, it makes the customer feel comfortable within the site.

Users who are able to understand the UI will be able to direct their attention more easily towards the content and functionality provided on specific pages.

**Index of templates**

Before choosing a template it is imperative to understand the editorial focus of the section of the site the page is being added to, as well as how it fits into the site IA.

Below is an index of page templates used throughout NASA.gov. These examples list and explain the function of each type of page element (collection), providing details regarding the graphic standards and specifications. This includes font usage, colors, sizes, and any other considerations.

**Examples of templates:**[Home template A](#), [Home template B](#)

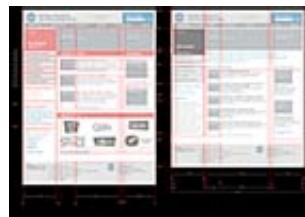
[Landing Template](#), [Detail Template \(Article 1 Column\)](#) [Detail Template \(Article 2 Column\)](#) [Archive Template](#)



[Multimedia Template](#), [Large Image Template](#), [Image Archive](#), [Multimedia Archive](#), [News Archive](#), [More NASA Facts](#)



Students K-4 Template, Students Template (same as Landing Template)



Kids Landing, Kids Popup (Did you know)



MyNASA NonMember, MyNASA Member



Popular Topics Landing



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The NASA logo should be presented in a clear and consistent way throughout the portal and the network of sites (through visual affinity)

- Display against a white, black, or gray (#CCCCCC) background only
- The insignia should never appear against a full color photograph
- A white line should never appear around the insignia
- Never modify or distort the insignia in any way, whether by adding, eliminating or otherwise changing design elements
- Because of the detail contained in the NASA insignia, avoid reducing it to small sizes when possible. 50 x 50 pixels is the minimum (approx) size that the insignia can be reduced to for use in the UI. (see example in the footer on NASA.gov)
- The text should never be illegible

[+ Download NASA logo ESP \(188 KB\)](#)

Recommended usage as demonstrated on NASA.gov:



Not recommended usage demonstrating manipulation:



Not recommended usage showing a white outline and an improper background color:



Not recommended usage showing manipulation with a glow and an improper background:



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Images should be used in reference to a specific piece of content or as a promotional thumbnail. Images will have the greatest impact if they are simple, direct and focused. This is especially true when creating thumbnail images for promotional features, but it is also an important consideration for images in detail page articles. Multiple images or montages create visual clutter and make the call to action less apparent. Promotional banners should be designed after billboards, the concept should be clear to a user who glances at it quickly. A good banner will contain a simple image that allows type to be placed over it in a way that is easy to read. Darker images should be used with white type when possible. Use the arrow graphic to designate an external link (new window) at the end of the call to action.

When possible provide options to view a larger image and a hi resolution image.

**Image compression**

The goal of image compression is to format to the smallest-possible image size, with the least degradation in quality.

Use either Image Ready or the "Save for Web" feature in Photoshop 7, and ensure the jpeg format is used for all photos. The optimal quality setting is 50-60.

Use gif format for all graphics and thumbnails with large areas of solid color. Format using either 256 or 128 colors depending on the detail contained in the image. Ensure "Dither" is turned off, and use the "Adaptive" setting.

Consult your software user manual with any further concerns.

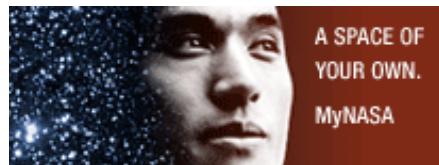
**Types of images include:** thumbnail images, promotional banner images, and images used in galleries or article pages.

**Promotional snippet (64 x 48 pixels - jpeg quality 60, 1-2k)**

Used in promotional 'snippets' on home page, landing pages and feature archives.

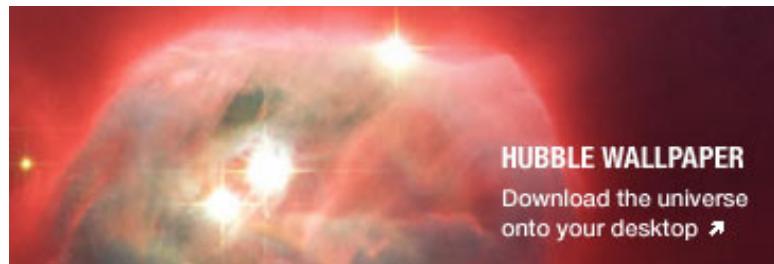
**Related multimedia (100 x 75 pixels - jpeg quality 60, 4-5k)**

Used in right hand column of landing pages and throughout detail article pages, featured multimedia, on home page, multimedia landing page, and archives.



**Promotional thumbnail larger (205 x 75 pixels - jpeg quality 60, 7-8k)**

Used on home page to promote current events like launches or visit NASA.



**Promotional banner 1 (363 x 123 pixels - jpeg quality 60, 10-12k)**

Used on landing pages and in rotating banner on home page.

NOTE: Keep images simple and direct. Multiple images or montages create visual clutter and make the call to action less apparent. Promotional banners should be designed after billboards, the concept should be clear to a user who glances at it quickly. A good banner will contain a simple image that allows type to be placed over it in a way that is easy to read. Darker images should be used with white type when possible. Use the arrow graphic to designate an external link (new window) at the end of the call to action.

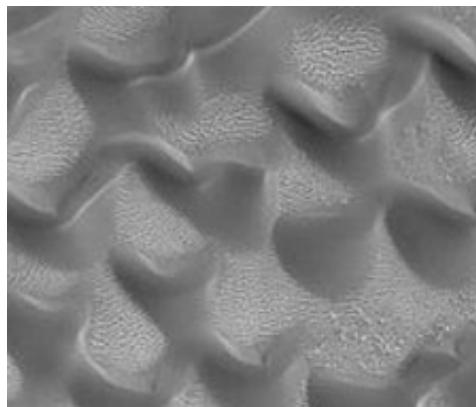


**Promotional banner 2 (179 x 123 pixels - jpeg quality 60, 7-8k)**

Used on landing pages.

**Images used in detail page articles**

Images placed within the article body should be cropped to fit a maximum horizontal size of 330 pixels, this allows for the related column to fit beside articles as necessary. They should also be cropped in a horizontal format to reduce file size and page scrolling. Minimum height for horizontal images is 125 pixels. Minimum size for square images is 225 pixels by 225 pixels. Text should never wrap an image in an article. (please refer to Template Specifications)



## Sample article pages



### Avoid

Avoid reusing images or graphics with identities that conflict with the NASA.gov identity whenever possible. Discard all shadows, borders, and/or effects. Avoid using images that are smaller than 200 x 175 pixels except as thumbnails.

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All graphic text on the site is Helvetica Neue.

**Helvetica Neue 57 Condensed** is used on intro text

abcdefghijklmnopqrstuvwxyz

ABCDEFGHIJKLMNP

QRSTUVWXYZ0123456789

(.,!/?&\$%£€)äçéîöùßå

**Helvetica Neue 65 Medium** is used for the call to action on promo banners and flash banners

abcdefghijklmnopqrstuvwxyz

ABCDEFGHIJKLMNP

QRSTUVWXYZ0123456789

(.,!/?&\$%£€)äçéîöùßå

**Helvetica Neue 67 Medium Condensed** is used on navigation and section headers

abcdefghijklmnopqrstuvwxyz

ABCDEFGHIJKLMNP

QRSTUVWXYZ0123456789

(.,!/?&\$%£€)äçéîöùßå

**Helvetica Neue 77 Bold Condensed** is used for titles on promo banners and flash banners

abcdefghijklmnopqrstuvwxyz

ABCDEFGHIJKLMNP

QRSTUVWXYZ0123456789

(.,!/?&\$%£€)äçéîöùßå

Detailed font specifications are given in the diagrams below:

[Home page](#), [Vision landing](#), [Feature detail](#), [Students K-4](#), [Kids main](#), [Popular topics](#), [Site intro](#)



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All HTML text is Arial or Arial Bold. Arial has been widely recognized as a standard online font supported by most platforms.

The CSS styles referenced are from the NASA global style sheet (currently, [http://www.nasa.gov/css/1955main\\_common.css](http://www.nasa.gov/css/1955main_common.css)).

**Promotional Feature Titles / Dates**

Arial 11pt bold, black

CSS class: bold

Maximum 50 characters (limit is determined by the CMS)

Avoid the use of all caps. Refer to Editorial Guidelines for proper use of title case.

Titles are separated from content with a line break

SAMPLE:

**Saving Cajun Country**

If the date is necessary, it should be included before the Feature Title.

NOTE: Dates are not always needed if the Feature is not an article.

i.e. an external site or multimedia feature.

Use the format mm.dd.yy

SAMPLE:

**03.13.03 - Saving Cajun Country**

**Promotional Leader Sentences**

Arial 11pt regular, black

CSS class: None needed (inherits from global style)

Maximum 110 characters (limit is determined by the CMS)

This equals two lines or less.

SAMPLE:

Satellite imaging to help save...

**Promotional Link Labels**

11pt Arial regular, blue, #006699

CSS class: None needed (inherits from global style)

Links should describe the content type that is being referenced. Use capitals for the first word only, unless it is a formal name.

i.e. Visit site, Read article, Watch video, Go to Mars

SAMPLE:

[+ Read this article](#)

**Article Dates**

Arial 11pt regular, black

CSS class: None needed (inherits from global style)

Dates appear on the same line as the article title but are right justified.

Use the format mm.dd.yy

SAMPLE:

03.13.03

**Body Copy**

Arial 11pt regular, black

CSS class: None needed (inherits from global style)

This format is the default standard for all text on the site.

Copy is always left justified and should avoid using other formatting conventions whenever possible in order to provide a clean and consistent presentation.

NOTE: All html-based formatting should be stripped out from the content.

e.g. <font>, <center> tags and style and class attributes.

SAMPLE:

Scientists, engineers and educators at...

### **Numbered and Bulleted Lists**

Arial 11pt regular, black

CSS class: None needed (inherits from global style)

Avoid using bullets or numbered lists if possible.

Bullets are always left justified with minimal indentation

SAMPLE:

- Physics of Free Falling Objects

### **Sub Headings** Arial 11pt bold, black

CSS class: bold

In order to break article body into sub sections. There should be no line break following a sub heading - breaks fall before the heading.

SAMPLE:

### **Defying Gravity: NASA Helps Students**

#### **Image Captions**

Arial 11pt regular, black

CSS class: None needed (inherits from global style)

Image captions describe the subject of the image and should contain similar information to the alt tag. Captions appear immediately below the image.

NOTE: Importing image credits from an existing HTML page may have to have formatting tags removed from the source code to ensure it is displayed properly.

SAMPLE:

"Singing sand dunes" of the Gobi Desert

#### **Image Credits**

11pt Arial Regular, gray / #484848

CSS class: detailImageDesc

Credit the source of the image or illustration immediately below the Image Caption.

SAMPLE:

Image credit: A royalty-free image from corbis.com

#### **Page Breaks**

11pt Arial regular, black / links: blue, #006699

CSS class: None needed (inherits from global style)

Individual pages should not require extensive user scrolling. Breaks are determined based on length of article copy, the amount and size of images, and number of total pages. NOTE: This is not done automatically by the CMS and needs to be considered as part of the publishing process.

SAMPLE:

Page [1](#), [2](#), [3](#), [4](#)

#### **Article Credits and Contacts**

Subheading, 11pt Arial bold, black / Authors, 11pt Arial regular, gray / #484848

CSS class: bold / detailImageDesc

Credits and Contacts should be listed after the last page of the article, not at the top of the first page. This information would fall at the end the last page of a multiple page article.

SAMPLE:

#### **Credits and Contacts**

Authors: Mark Abernethy, Chris Leduc

#### **Related Information / Links (right hand column)**

Subheading, 11pt Arial bold, black / Links, 11pt Arial regular, blue, #006699  
CSS class: bold / None needed (inherits from global style)  
Provides links to related multimedia, web sites on the NASA Network or other portal pages, and/or glossary terms if available.  
SAMPLE:  
**Listen to this article**  
[+ Streaming audio](#)  
[+ Downloadable file](#)

[+ Main Page](#)**SECTION 1****1.1 Information Architecture**[+ Introduction /](#)[Key Organizing Principles](#)[+ Flow Principles](#)[+ High Level IA \(PDF\)](#)**1.2 The User Interface**[+ Guiding Principles](#)**1.3 Index of pages:**[+ Home page/ Global nav / Find it](#)[+ Audience Segmentation](#)[+ NASA's Vision](#)[+ Multimedia Section](#)[+ MyNASA](#)[+ Popular Topics](#)[+ Other Pages](#)[+ Text Only](#)[+ Visual Affinity](#)**1.4 Production guidelines:**[+ Template Specifications](#)[+ NASA Logo](#)[+ Image Usage](#)[+ Font Overview](#)[+ Font CSS Specs](#)[- Colors](#)[+ Promotional Banners](#)

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The following colors are used on NASA.gov to differentiate sections of the portal, color graphics appropriately, and influence the font style sheets. Please refer to details in either index of pages, template specifications or fonts for specific color attributes.

006699  
R 0  
G 101  
B 103

DC282F  
R 220  
G 40  
B 47

000000  
R 0  
G 0  
B 0

CCCCCC  
R 204  
G 204  
B 204

666666  
R 102  
G 102  
B 102

484848  
R 72  
G 72  
B 72

FFFFFF  
R 255  
G 255  
B 255

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Images must help to communicate the concept of the promotion and have enough neutral space for the title and call to action to reside in and be readable. In most cases the image should be dark enough to allow white type to be readable over top of it.

Keep images simple and direct. Multiple images or montages create visual clutter and make the call to action less apparent. Promotional banners should be designed after billboards, the concept should be clear to a user who glances at it quickly. A good banner will contain a simple image that allows type to be placed over it in a way that is easy to read. Darker images should be used with white type when possible. Use the arrow graphic to designate an external link (new window) at the end of the call to action.

**Font usage and specifications**

All font specifications and grid measurements can be found in the sample below:

**Promotional banner specs****Promotional banner sample**[+ Banner 1 \(363 x 123\), download editable psd file \(mac photoshop 6\)](#)[+ Banner 2 \(178 x 123\), download editable psd file \(mac photoshop 6\)](#)**Related documentation**[View editorial guidelines for promotional banners \(available in Section 2\)](#)

[+ Main Page](#)**SECTION 1****1.1 Information Architecture**[+ Introduction /](#)[Key Organizing Principles](#)[+ Flow Principles](#)[+ High Level IA \(PDF\)](#)**1.2 The User Interface**[+ Guiding Principles](#)**1.3 Index of pages:**[+ Home page/ Global nav / Find it](#)[+ Audience Segmentation](#)[+ NASA's Vision](#)[+ Multimedia Section](#)[+ MyNASA](#)[+ Popular Topics](#)[+ Other Pages](#)[+ Text Only](#)[+ Visual Affinity](#)**1.4 Production guidelines:**[+ Template Specifications](#)[+ NASA Logo](#)[+ Image Usage](#)[+ Font Overview](#)[+ Font CSS Specs](#)[+ Colors](#)[+ Promotional Banners](#)

Creating flash banners

[- Graphics Standards](#)[+ Animation Standards](#)[+ Actionscript Details](#)**Creating flash banners****Home page rotating banner**

Home Page Banner

Flash Document settings

Size: 363 x 123

File Size: 40 kilobytes

Background Color: Black

FPS: 21

Flash Player Version: 5

[+ Download editable flash file \(flash\\_standards.zip\)](#)**Graphic Standards**

Refer to the image and typographic standards for static banners.

**Bitmap Standards**

All bitmap images imported into Flash should be PNG format.

Compression should be set for each bitmap image individually through the bitmap properties palette to assure quality.

**Text Standards**

Flash uses its own style of type settings. The same typographic standards used in static banners should be followed, however, some of the setting will differ from Photoshop but achieve the same effect. The Flash type settings are as follows:

**Titles**

Helvetica Neue Condensed Bold 14pt (kerning 0, line spacing 2)

Titles should be limited to 1 line when possible

**Call to Action**

Helvetica Neue Medium 65 11pt (kerning 0, line spacing 2)

Call to action should be limited to 4 lines when possible

The Text and arrow or plus icon should be White on top of a contrasting color whenever possible. On light backgrounds one alternative is Grey (#484848).

**Creating New Features**

New features can be added by duplicating and adjusting the existing feature clips. All new features must have a top left center point and be positioned at 0x-0y.

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Star Transition Reference

The transition used in the home page revolving banner is the Star Transition (see: Star Transition Reference). The transition is triggered at the beginning of the banner launch and in between revolving features. The transition is triggered through the timer clip inside of each feature clip. The star transition must be used between all revolving features.

**Feature Image Transition**

Image Transition Reference

The feature images have In and Out transitions that work in conjunction with the Star Transition. The In transition consists of the bitmap image fading in while a feathered black mask fades out over top of it. This creates a subtle tunnel effect.

The Out transition consists of a black block fading in over the feature image, making it appear to fade out.

**Feature Text Transition**

Text Transition

Text Masking

**Titles**

All title symbols must have a lower left positioned center point. The center point is crucial for creating the proper animation.

The In animation consists of a size and alpha tween (see: Text Masking). The tween begins at 85% Size and 0% Alpha. The tween ends on 100% Size and 100% Alpha. The lower left center point facilitates the left to right motion of the tween. The tween

can span 10 - 12 frames and must be set to 100% Ease Out. This transition must be used for all titles inside of the home page Revolving Banner.

The Out animation consists of a 1 frame white block flash. The title remains on the stage for 1 frame after the white block flash and then is removed by a blank keyframe.

### **Call to Action**

The In animation consists of a masking technique (see: Text Masking). A multi frame Graphic Symbol is masked by a Type Graphic Symbol. The multi frame Graphic Symbol (anm\_text wipe in) consists of 4 stacked white blocks that move from left to right in succession. The Symbol 'anm\_text wipe in' is set to 100% width and 96% height to accommodate the spacing on the call to action. When this Symbol is masked by a type Symbol it appears as if the type is being written in. This transition must be used for all calls to action inside of a NASA banner.

The Out animation consists of a 1 frame white block flash. The title remains on the stage for 1 frame after the white block flash and then is removed by a blank keyframe.

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```

1 // ::::::: Timer :::::::
2 // the timer is used by a clip inside of the features
3
4 // set start time and limit
5 Movieclip.prototype.initTimer = function(myLimit) {
6     init = Math.floor(getTimer()/1000);
7     limit = myLimit;
8 }
9
10 // function to time the interval to next frame
11 Movieclip.prototype.playTimer = function() {
12     now = Math.floor(getTimer()/1000);
13     time = now-init;
14     if (time>limit) {
15         // play Star Transition on time limit
16         _parent._parent.stars.gotoAndPlay(2);
17         _parent.gotoAndPlay("out");
18     }
19 }
20 // ::::::::::::::::::::

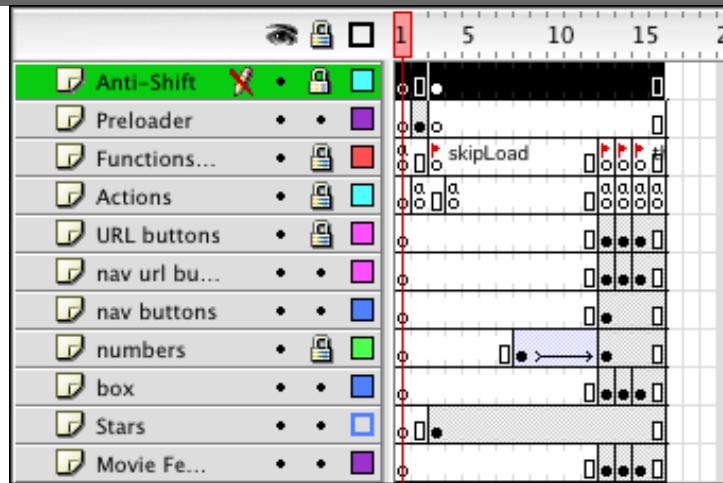
```

Line 25 of 25, Col 2

**Timer Function**

The Timer is used to eliminate long spans of blank keyframes where the feature remains static (see: Timer Function). Using the getTimer function calculations are made to track the time the feature is static. By comparing that to a dynamically set time limit an enterFrame loop will know when to transition the feature out. The Timer function is attached to the MovieClip Object to make it readily available and local to any clip that needs to use it. The Timer function can be found in the first frame of the Function/Labels layer.

**Layer Details****Anti-Shift**



Anti-Shift Layer

The top layer is a hack fix used to stop the Bitmap images from shifting (see: Anti-Shift Layer). This layer contains a box covering the entire document with an alpha setting of 0%.

The screenshot shows the NASA website's header and a news banner. The header includes links for About NASA, News & Events, Multimedia, Missions, Popular Topics, and My NASA. A red grid overlay highlights specific elements: a 15px gap between the top of the header and the start of the banner, and a 15px gap between the end of the banner and the bottom of the page. The news banner features a large image of a meteorite and the headline "KEEPING AN EYE ON SPACE ROCKS". Below the banner is a sidebar with "News and Events" and a list of news categories. To the right is a "RELATED MULTIMEDIA" section with a thumbnail for "Interactive View of STS-113 Mission". Notes on the right side provide styling guidelines for headlines and banners.

+ ABOUT NASA    + NEWS & EVENTS    + MULTIMEDIA    + MISSIONS    + POPULAR TOPICS    + MYNASA

+ Home

**News and Events**

- THIS WEEKS HIGHLIGHTS

+ LAUNCHES AND DOCKINGS

+ SPECIAL EVENTS

+ VISITING NASA

+ AGENCY NEWS

+ MISSION NEWS

+ RESEARCH NEWS

+ NEWS ARCHIVE

**KEEPING AN EYE ON SPACE ROCKS**  
Is one on its way? What if it is? ↗

**HEADLINE:**  
**HELVETICA NEUE 77 BOLD CONDENSED 14 PT (ALL CAPS)**

**CALL TO ACTION:**  
NEWS & EVENTS FEATURES  
**Helvetica Neue 65 Medium 11pt ↗**

**BANNER 01 SIZE:**  
May 01: **363 x 123 pixels**  
+ View feature

**NOTES:**

- Keep images simple and direct / emphasis is on the type
- Darker images should be used with white type when possible
- Use the arrow graphic to designate an external link at the end of the call to action

**BANNER 02 SIZE:**  
May 01: **178 x 123 pixels**

**NASA FACT**

NASA Sponsors Student Robotics Competition

 NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION

+ Low Bandwidth  
+ Contact NASA

FIND IT @ NASA :  
 + GO

+ ABOUT NASA    + NEWS & EVENTS    + MULTIMEDIA    + MISSIONS    + POPULAR TOPICS    + MyNASA

+ Home

## Exploring the Universe

- MAIN FEATURES

+ OUR SOLAR SYSTEM  
+ STARS AND GALAXIES  
+ WATCH THE SKIES  
+ NEW WORLDS  
+ ROBOTIC EXPLORERS

+ Humans in Space  
+ Exploring the Universe

NASA FACT

[EXPLORE THE UNIVERSE](#)

  
**HUBBLE WALLPAPER**  
Download the universe onto your desktop ↗

  
**SATURN**  
Join the observation campaign ↗

Welcome to Exploring the Universe. NASA has a mandate to inform you about the vast universe we live in... to show you things that have never been seen before. We are striving to answer the eternal question: Is there life beyond?

**EXPLORING THE UNIVERSE FEATURES**

  
**City-Swallowing Sand Dunes**  
NASA supported researchers are studying the complex physics of menacing sand dunes.  
[+ View feature](#)

  
**SC2002 (Conference of High Performance Computing and Networking)**  
NASA computing research to be showcased at conference in Baltimore.  
[+ Read more about this event](#)

**RELATED MULTIMEDIA**

  
**Black Carbon**  
NASA finds how carbon particles are changing the weather in China.





.....

























(b) Pre-hypothetical state:  $\text{Hypothesis} \rightarrow \text{Hypothesis}$   
(c) Hypothesized state:  $\text{Hypothesis} \rightarrow \text{Hypothesis}$   
(d) Hypothesis:  $\text{Hypothesis} \rightarrow \text{Hypothesis}$

http://bulletin.oxfordjournals.org/content/40/1/406.full.html#supplementary-figures



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## 2.0 Editorial Guidelines

### NASA / NASA.gov

#### **NASA's Vision for the Future**

To improve life here

To extend life to there

To find life beyond

#### **NASA's Mission**

To understand and protect our home planet

To explore the Universe and search for life

To inspire the next generation of explorers...as *only NASA can*

#### **NASA.gov - Inspire, Inform and Involve**

In order to promote NASA's relevance in the lives of everyday Americans, it is essential to engage them via a visitor-centric, streamlined portal that showcases the best content NASA has to offer. In the portal's development, three key objectives (**inspire, inform and involve**) have formed the centerpiece of the NASA.gov vision, as it supports the Agency's mandate:

#### **Inspire**

Transport visitors into a rich, engaging environment where they can experience the emotion, vision and imagination of NASA through interactive presentations and multimedia.

Encourage wonder about the vastness of the universe and awe about our ability to explore it.

Communicate NASA's vision of the future dramatically.

#### **Inform**

Encourage a journey of personal discovery and learning for all who come to NASA.gov through educational content, tools and information.

Effectively convey NASA's mission and what NASA is

[+ For Educators](#)

[+ For Media and Press](#)

today.

Present timely, relevant and engaging content.

### **Involve**

Ultimately, reach out to enthusiasts, cultivate their interest in NASA and encourage them to become involved advocates.

Create a sense of ownership with users through personalization.

## 2.0 Editorial Guidelines

### NASA / NASA.gov

#### NASA's Vision for the Future

To improve life here  
To extend life to there  
To find life beyond

#### NASA's Mission

To understand and protect our home planet  
To explore the Universe and search for life  
To inspire the next generation of explorers...as *only NASA can*

#### NASA.gov - Inspire, Inform and Involve

In order to promote NASA's relevance in the lives of everyday Americans, it is essential to engage them via a visitor-centric, streamlined portal that showcases the best content NASA has to offer. In the portal's development, three key objectives (**inspire**, **inform** and **involve**) have formed the centerpiece of the NASA.gov vision, as it supports the Agency's mandate:

##### **Inspire**

Transport visitors into a rich, engaging environment where they can experience the emotion, vision and imagination of NASA through interactive presentations and multimedia.  
Encourage wonder about the vastness of the universe and awe about our ability to explore it.  
Communicate NASA's vision of the future dramatically.

##### **Inform**

Encourage a journey of personal discovery and learning for all who come to NASA.gov through educational content, tools and information.  
Effectively convey NASA's mission and what NASA is today.  
Present timely, relevant and engaging content.

##### **Involve**

Ultimately, reach out to enthusiasts, cultivate their interest in NASA and encourage them to become involved advocates.  
Create a sense of ownership with users through personalization.

## Audience Overview

NASA has identified the following key target audiences for NASA.gov:

The **general public** looking for general information on NASA subjects; seeking information on visiting NASA facilities or seeing a launch; or following up on NASA stories they have heard about in the news.

**Teachers** looking for resource materials (lesson plans and curricula).

**Students** looking for "homework help" on NASA-specific or general science and engineering topics, as well as for opportunities to become involved with the Agency.

**Kids**, generally elementary school or younger, who are looking for inspiration and engagement, as much as for information.

**Media and Press** seeking information on a specific topic, in advance of and/or following up on a NASA story. Their greatest concerns are clear information organization, effective search/browse capability, and fast, assured access.

For the purpose of these Editorial Guidelines, results from the following sources have been used to provide a preliminary determination of target audience needs:

**Critical Mass User Research** conducted in November/2002 in response to the NASA.gov RFP

NASA.gov **Website Effectiveness Testing** conducted by the Usability Sciences Corporation in February/2003

NASA.gov most **popular search terms**

## Requirements, goals, and desired content

Identification of target audiences is an ongoing process. While these target audiences have been identified by NASA, continuous effort is needed to foster understanding of evolving requirements. In better understanding specific user needs, further target audiences will also evolve.

### General Public

Key goals:

Catching up on NASA current affairs and projects

Being entertained by interactivity, visuals and interesting and unbiased content

Feeding curiosity

Passing time

Locating important public information quickly and easily

Requirements:

Interface must be easy to navigate and intuitive

Content should be organized by subject and overall principles

Desired content:

News and events

General Agency information

General interest in specific topics (for example space exploration or satellite imaging)

Rich media and engaging visuals

### Kids

Key goals:

Have fun individually or with family

Learn more about personal interests

To be engaged, without necessarily realizing it

Spend time on familiar web sites

Requirements:

To find rich media or visually engaging content quickly and easily

To find content with or without the assistance of a parent

Desired content:

Educational games

Engaging multimedia and visuals

Educational activities

Uninterested in numerous and/or technical links, or content that needs to be "applied for"

Turned off by multiple open windows

Need to be spoken to in voice/vocabulary that is understandable

## **Students**

Key goals:

Be entertained by interactivity, visuals and grade-level focused content that speaks with an intelligent voice

Conduct research in the context of both schoolwork and personal interests

Find career preparation and development information

Requirements:

Perform topic specific searches for the purpose of research

Browse informally

Discover new and interesting subjects

Find career-related information

Desired content:

Student-focused pages for homework assistance

General interest content pertaining to specific topics

Career information

Rich media and engaging visuals

Focused on an audience of their specific age group/grade level

## **Educators**

Key goals:

Provide a fun educational atmosphere for students

Provide information to support theme-based education in the classroom

Satisfy student curiosity and questions

Find curriculum and activities suitable for specific grade levels

Requirements:

Age appropriate classroom materials

Visually rich resources

Desired content:

Curricula and lesson plans developed for specific student grade levels

Specific curricula and lesson plans which include feedback from educators who have already used them in the classroom

Engaging features which allow students to interact, speak with and ask questions of "experts"

Simple, navigable and engaging rich media and visual-oriented content for use in the classroom

High resolution imagery for reproduction in the classroom

## **Media and Press**

## Key goals:

To present facts in an article, and not just be the voice for a particular organization or initiative  
Need human beings to talk to in order to carry out professional tasks  
To properly research, need proper background information before commencing to write, and access to information when fact-checking work  
Information must be accurate and timely

## Requirements:

To identify timely and topical stories  
Contact NASA media officials  
Locate common media resources  
Locate background information

## Desired content:

Press releases  
Backgrounders  
Fact sheets  
Public affairs contact lists  
Dynamic search  
Press kits  
Image galleries

# Textual Style and Voice

## Introduction

Why use Editorial Guidelines for NASA.gov? In a word, consistency.

NASA.gov is our organization's best channel for communicating with the public. Through the portal we have the opportunity to not only share information, but to convey the inspirational qualities of NASA and connect with people-American and international-on a whole new level.

NASA.gov is a dynamic extension of the Agency and should provide a NASA experience that is both satisfying and rewarding to its users. As we streamline our Web content into this unified portal it is essential that we use this guide as a point of reference to ensure a consistent voice and style across the entire NASA online network.

## NASA Editorial Style

### Spelling, Grammar, Style and Usage

Editorial style for all NASA communications is based on Associated Press style. For any concerns regarding spelling, grammar, style or usage consult the following publications. In some cases these guides may disagree with one another. The *AP Stylebook* should be regarded as the overriding authority on anything not established in this document.

*The Associated Press Stylebook and Briefing on Media Law*. Perseus Publishing, Cambridge, MA.

*Webster's New World Dictionary*, Fourth Edition, Hungry Minds, Inc., New York, NY.

*The Chicago Manual of Style*, 14<sup>th</sup> Edition. University of Chicago Press, Chicago, IL.

### Headlines and Subheads

Headlines and subheads can afford to be witty in print, but with online readers preferring to scan text rather than read it entirely, it is important that your headers are clear and accurate.

In articles, capitalize only the first word of the headline and subheads except for proper names and acronyms.

### Spelling and Usage Exceptions and Common Mistakes

NASA copy generally follows Associated Press style. The following list contains exceptions and commonly misused words and terms:

**Administrator** (not administrator when referring to the head of NASA, even when not using his/

her name after)

### **bullets/lists**

Do not use final punctuation in bulleted lists. Try and keep each bullet to only one sentence in length.

### **dashes**

For Web text: Don't use em dashes online; substitute en dashes with spaces around them instead. Use en dashes and hyphens the same as you would in for-print text.

**e-mail** (not Email, E-mail or email)

For e-mail text: Substitute a hyphen with spaces around it for both the em dash and en dash.

**home page** (two words, no caps)

**International Space Station** (capitalized as a proper noun)

**Internet** (not internet)

**log in, log-in**

Not login. As a verb, two words. As an adjective, hyphenated.

*Please log in to your account.*

*Welcome to the log-in page.*

**Space Shuttle** (not space shuttle)

**Web site** (not website or web site)

## **Calls to Action**

Calls to action are text links that invite a user to carry out an action, or 'snippets'. They should be specific, direct and active. Use the same casing as you would for headlines and subheads (first word, proper nouns and acronyms).

Suggested calls to action:

- + Read more
- + View image
- + Learn more
- + View more videos...
- + Watch video
- + Visit Web site
- + Go to Mars (for kids)
- + Play game (for kids)

Poor calls to action

- + Click here
- + View feature
- + Information here
- + More

# The Voice of NASA

NASA is unique. Our organization has built its reputation on awe-inspiring events, discoveries and technological advancements.

The key messages for NASA's Web initiatives center on innovation, movement towards the future, science and technology, and empowering humanity. NASA's Vision-improve life here, extend life to there and find life beyond-as well as the objectives of the NASA.gov portal—inspire, inform and involve-support these messages, as should the copy tone, voice and style.

## Tone and Style Summary

### Tone

direct

trustworthy

knowledgeable

innovative

inspirational

### Style

use the active voice

opt for verbs over noun phrases (e.g., "consider," not "take into consideration")

avoid industry-specific jargon where possible

clear, specific and strong calls to action (e.g., "Read more," "Visit site," "Watch video")

# Writing to NASA's Audiences

## General Public

Profile:

Looking for information on NASA current affairs

Want to be entertained by interactivity, visuals and interesting content

Copy objectives:

To inform

Deliver clear, accurate and up-to-date NASA news and features

Show NASA.gov as the authority for finding information on the agency, as well as space and space-related information

Copy guidelines:

8<sup>th</sup>-9<sup>th</sup> grade reading level

Simple and straightforward, not overly technical

## Kids

Profile:

Young and curious

Want to play games and be entertained

Copy objectives:

To inspire

Educate while entertaining

Copy guidelines:

No higher than a 3<sup>rd</sup> grade reading level

Light, fun and exciting

Calls to action: "Go to Mars!," "Play game," "Learn more"

## Students

Profile:

Want to be entertained by interactivity, visuals and interesting, youth-focused content

Want to research for school and personal interests

May be looking for career and development information

Copy objectives:

To educate

Deliver interesting and useful information on a wide variety of NASA, Earth, space and technology related topics

Copy guidelines:

Grade-level specific reading level depending on audience sub-section

Specific and accurate

## **Students (Post Graduate)**

Profile:

Want to be entertained by interactivity, visuals and interesting, research-focused content

Want to research for school and personal interests

May be looking for career and development information

Copy objectives:

To educate

Deliver interesting and useful information on a wide variety of NASA, Earth, space and technology-related topics

Copy guidelines:

8<sup>th</sup>-10<sup>th</sup> grade reading level

Specific and accurate

## **Educators**

Profile:

Want to find information and activities that can be transferred to a classroom environment (for their specific level)

Looking to satisfy student questions and curiosity and stay educated on current space-related happenings

Copy objectives:

To educate

Deliver interesting and useful information on a wide variety of NASA, Earth, space and technology-related topics

Copy guidelines:

8<sup>th</sup>-9<sup>th</sup> grade reading level

Specific and accurate

Conversational and helpful

## **Media and Press**

Profile:

Want information to produce articles or reports

Looking to conduct research and fact-checking

Copy objectives:

To inform

Deliver clear and accurate information on NASA and NASA-related news and events

**Copy guidelines:**

8<sup>th</sup>-9<sup>th</sup> grade reading level

Specific and accurate

Clear and detailed

# Writing for the Web

## Why Writing for Online Audiences Differs From Other Mediums

When writing for an online audience you are doing more than just delivering content to the user, you are impacting their experience with NASA.gov and NASA in general. It is important that you write in a way that draws users into the content and conveys an accurate and consistent NASA message, while still providing needed information.

The Web medium is very different from print. At the very least, reading text from a screen is far more difficult than reading from paper. More than that, the very nature of the Web-active clicking and moving around from page to page and site to site-fosters an environment of impatience; users want information quickly and easily or they will simply go to another source to get it.

Jakob Nielsen, a leading authority on Web usability, says users read 25 percent slower from a computer monitor and 79 percent of Web users have a tendency to scan Web pages as opposed to reading text word-by-word. "Skimming instead of reading is a fact of the Web," writes Nielsen, "it's been confirmed by countless usability studies."

## Best Practices of Web Writing

### Clarity

Clear writing makes for easier reading and reduces the possibility of miscommunication. When writing your copy two things you should avoid are confusion and wasted time for your readers. Make certain all ambiguities, no matter how insignificant they may seem, are eliminated from your text.

### Accuracy

Given the complex nature of much of what NASA does, it is important to keep all of your content accurate. Even the smallest typo or factual error can create confusion for your readers.

### Relevance

Does everything in your article need to be there? Irrelevant information just adds to the length of your copy without making any contribution to the information your reader is looking for. When writing, speak directly to your audience and give them information that is both useful and informative. These are real people with specific needs and uses for NASA.gov. One way to get a clear indication of whether or not you are effectively writing to your audience is to pay close attention to any feedback e-mail generated through the site.

### Concision

Given the extra strain of reading text from a computer monitor you should always aim to write about 50 percent less than you would for a print piece. Delete any and all unnecessary words from your copy, then go back and see if you can cut any more. Eliminate anything that doesn't need to be there. This will reduce the size of your text and the amount of user scrolling. Overall,

the information will be easier for users to scan and digest leading to a better online experience.

## How to Write Concise Copy

Avoid buzzwords and industry-specific jargon.

Don't use a long word when a short word will do:

Instead of **utilize**, use **use**.

Instead of **terminate**, use **end**.

Use compact substitutes for wordy phrases:

Instead of **in a timely manner**, use **promptly**.

Instead of **in view of the fact that**, use **because**.

Instead of **is equipped with**, use **has**.

Omit needless words:

Instead of **the question as to whether**, use **whether**.

Instead of **he is a man who**, use **he**.

Avoid redundant expressions:

Instead of **red in color**, use **red**.

Instead of **the exact same**, use **the same**.

Instead of **end result**, use **result**.

Instead of **preexisting**, use **existing**.

## Intuitive Organization and Scannability

Present essential information first. Put your "who," "what," "when," "where," "why" and "how" in the first paragraph. Present the key points of an article first and get into specific details later.

Also, keep your sentences and paragraphs short and try and stick to one idea per paragraph. As users scan they will miss a lot of information if it is buried deep in the text.

How to write scannable copy:

Use subheads to give users a quick overview of what's on the page.

Use bullet points for parallel words, phrases and clauses.

Keep your sentences short (this doesn't mean you can't use complex or compound sentences, just make sure your longer sentences are justifiable).

Use transition words, especially coordinating conjunctions (yes, it is okay to start a sentence with "and" or "but"), but use conjunctive adverbs (i.e., "however," "nevertheless") sparingly.

Always include captions for images, even if the text on the page already explains them.

# Page-by-Page Editorial Strategy

## Introduction

NASA's online content is as rich, compelling and informative as that of any online publication or federal agency. The Agency's missions and projects capture the imaginations of us all, and content exists across the NASA network that does the same. It's a question of bringing that content directly to the general public and target audiences via NASA.gov, having clearly defined audience requirements in mind, as well as defined subject matter expertise on what NASA content is, in fact, the most compelling to those audiences.

The spectrum of content available across the NASA network of over 3,000 web sites is both vast and varied. Some, while technically important to a small and focused audience, is of little use to a broader public. Some, while perhaps important to multiple internal stakeholders at NASA, should not be disseminated to broader target audience segments. Some, while of interest to one target audience, would be of little use to another.

It is crucial to remember that the vision of NASA.gov is to **inspire, inform and involve** the greater public, and to reinforce the status of the Agency in their eyes. To do so, subject matter and editorial sense need to be taken into account at every point of the content lifecycle. NASA.gov, in many ways, is like the Agency's online magazine, and if visitors aren't immediately inspired, informed or involved, subscriptions will be canceled.

The following pages outline each landing page and specific content fields therein, and speak to the ideal content types we feel best address audience needs, and best represent NASA.

# Home Page Editorial Strategy



## Promotional Banners

### Objective

Effectively showcase the most relevant and timely initiatives and breaking news from NASA.

### Description

Three esthetically-designed, revolving Flash banners.

### Content Examples

Link to the Educator Astronaut Web site, Link to the Columbia Disaster microsite, Multimedia piece outlining NASA's mission.

### Update Frequency

Will vary depending on initiative/program length and ongoing relevance of content. Due to the important nature of the content being provided, banners should be available for a minimum of two weeks.



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+ ABOUT NASA

+ NEWS & EVENTS

+ MULTIMEDIA

+ MISSIONS

+ POPULAR TOPICS

+ MyNASA

+ For Kids

+ For Students

+ For Educators

+ For Media & Press



### LIVING IN SPACE

A look into the day-to-day life of astronauts. ↗

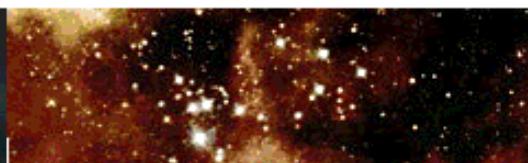
VIEW [1] 2 3

### FIND IT @ NASA:

Enter Search Term

+ GO

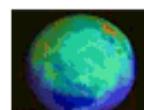
+ ADVANCED SEARCH



### + LIFE ON EARTH



**Saving Cajun Country**  
Satellite imaging to help save Native American sites  
+ Read this article



**SOLVE Campaign Launches**  
Measuring ozone and other atmospheric gases in the Arctic  
+ Read about this event



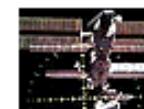
**Black Carbon**  
NASA discovers how carbon particles are changing the weather in China  
↗ View this animation



**Space Station Supernova**  
Learn how to spot the ISS in the dawn sky  
+ Read this article



**Behind the Scenes of Human Space Flight**  
Meet the people who make it all happen and visit their facilities  
+ Read this article



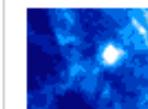
**Tracking the ISS**  
When will the International Space Station pass over you?  
↗ Visit this site



**Neutron Star Revealed**  
Scientists reveal the nature of matter inside neutron stars  
+ Read this article



**Final Galileo Flyby**  
Monday morning begins a sprint into the inner reaches of the Jupiter system  
↗ Learn about this event



**Shocking Secrets of the Crab Pulsar**  
Chandra X-Ray Observatory and Hubble Space Telescope capture the Crab Pulsar  
↗ See the Crab Pulsar

### NEWS AND EVENTS FEATURES

#### 06.19.03 - South America Shines In NASA's Latest Space Radar Map Release

Thanks to cloud-penetrating radar flown on NASA's Shuttle Radar Topography Mission (SRTM), more than 340 million residents of the fourth largest continent have access to high resolution terrain-shape data.

### FEATURED NASA SITES

#### COMING UP ON NASA TV:

Monday - Friday

+ High-resolution topographic data.  
[+ Read More](#)

#### **06.19.03 - Reviewing Educator Astronaut Applications**

NASA will use criteria developed by a Blue Ribbon Panel to identify the final candidates for the Astronaut Corps.

[+ Read More](#)

#### **06.19.03 - The Secret Lives Of Galaxies Unveiled In Deep Survey**

Two of NASA's Great Observatories are beginning to harvest new clues to the origin and evolution of galaxies.

[+ Read More](#)

#### **06.19.03 - Nighttime Clouds Shed Light On Space Weather.**

Three of the four rocket experiments, launched from WFF, will include the formation of milky, white clouds.

[+ Read More](#)

#### **06.19.03 - Research Helps Highlight Lightning Safety Awareness Week**

Summer brings increased chances of thunderstorms and dangerous lightning. NASA marks National Lightning Safety Awareness Week, June 22-29.

[+ Read More](#)

#### **06.18.03 - Keys To International Space Station Module Received**

Two cornerstone components for future research and operations aboard the International Space Station are ready to begin integrated testing at the Kennedy Space Center.

[+ Read More](#)

[+ View Archives](#)

### MULTIMEDIA FEATURES



**Image Feature**  
Cone Nebula from  
Hubble Space  
Telescope.  
[+ View this image](#)  
[+ More images...](#)



**Video Feature**  
Nose camera view  
of Space Shuttle  
Launch.  
[+ View Video](#)  
[+ More Videos...](#)



**Interactive Feature**  
The Virtual Astronaut  
Interactive feature.  
[+ Visit site](#)  
[+ More features...](#)



**NASA TV**  
10.20.02  
Live interview with  
ISS Crew.  
[+ Watch this show](#)  
[+ NASATV Info](#)

### My NASA



[+ Take the tour](#)   [+ Register now](#)

#### Login to My NASA

Enter your user name

Enter password

[+ SIGN IN](#)

NASA SITES:

Ciencia@NASA



[GO](#)

NASA RESOURCES:

Aerospace Technology



[GO](#)



+ Freedom of Information Act  
+ The President's Management Agenda  
+ FY 2002 Agency Performance and Accountability Report



Author: Beth Beck  
NASA Official: Brian Dunbar  
Last Updated: November 20, 2002

11:00 a.m. - 12:00 p.m. - Expedition/ISS Commentary - JSC

#### **June 25, Wednesday**

Mars Exploration Rover "Opportunity" MER-B Launch Coverage - KSC

[+ View NASA TV Schedule](#)

[+ Watch NASA TV Now!](#)

#### COLUMBIA HOME PAGE:

[+ View FOIA Records](#)

[+ View Investigation Site](#)

#### OTHER NASA LINKS:

[+ Return to Flight Task Force](#)

[+ Want to Work at NASA?](#)

+ NASA Privacy Statement, Disclaimer,  
and Accessibility Certification  
+ Freedom to Manage

+ Contact NASA

# NASA's Vision Features



## Objective

To educate, promote, inform and inspire with NASA's best feature content, divided by Vision-related themes: Life on Earth, Humans in Space and Exploring the Universe.

## Description

Nine revolving Features (most recent at the top of each column) showcasing timely and in-depth and important initiatives/accomplishments of NASA. Content should be either a detailed article with multiple high quality visuals or accompanying multimedia, an engaging multimedia feature, an interactive tool or a recent image release. Content should not be limited to press releases or news. Topics will be diverse, ranging from earth science to International Space Station research to Hubble telescope image releases. When a new feature is added, the most dated item will move to the Features bucket of its respective Vision Segment landing page: Life on Earth, Humans in Space or Exploring the Universe.

## Content Examples

Shuttle Endeavour animated video, Multimedia Schematics of Future Scramjet, Neutron Star Revealed feature article

## Update Frequency

Features are fed by deeper-level NASA.gov pages. As such, they will be updated regularly. A feature should still be available on the home page for a minimum of three days before returning to its Vision Segment landing page, and then its Vision Segment Feature Archive.



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+ ABOUT NASA

+ NEWS & EVENTS

+ MULTIMEDIA

+ MISSIONS

+ POPULAR TOPICS

+ MyNASA

+ Home

### Life on Earth

- MAIN FEATURES

+ IN EVERYDAY LIFE

+ LOOKING AT EARTH

+ THE ENVIRONMENT

+ NEW TECHNOLOGIES

+ LIFE SCIENCE

+ MANAGING COMPLEXITY

#### Choose another category:

+ Humans in Space

+ Exploring the Universe

#### NASA FACT

Did you know that astronauts on the ISS don't do laundry? After wearing their clothes for two to three days, they put them in a progress cargo vehicle that burns up upon re-entry into the Earth's atmosphere.



Welcome to Here on Earth. NASA has a mission to help us all better understand and protect our planet. Learn how we are contributing to make our home a better place for all of us.

#### HERE ON EARTH FEATURES



##### City-Swallowing Sand Dunes

NASA supported researchers are studying the complex physics of menacing sand dunes.

[+ View feature](#)



##### SC2002 (Conference of High Performance Computing and Networking)

NASA computing research to be showcased at conference in Baltimore.

[+ Read more about this event](#)



##### Surfers Use Satellites to Chase Big Waves

Surf forecasters are now using near real-time meteorological data from satellites to find big waves.

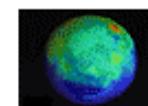
[+ View feature](#)



##### Learning How to Explain the Rain

Recent efforts by NASA have begun to reveal some of the subtleties that drive various forms of precipitation.

[+ View feature](#)



##### NASA Joins International Ozone Study in Arctic

NASA will join more than 350 scientists this winter to measure ozone and other atmospheric gases up north.

[+View feature](#)

#### RELATED MULTIMEDIA



##### Black Carbon

NASA finds how carbon particles are changing the weather in China.

[+ View animation](#)



##### The Adventures of Amelia the Pigeon

New educational earth science multimedia adventure for children.

[+ View adventure](#)

[+ View more related](#)

VIEW MORE FEATURES  
multimedia

+ View more Here on Earth features



- + Freedom of Information Act
- + The President's Management Agenda
- + FY 2002 Agency Performance and Accountability Report
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- + Freedom to Manage



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## Humans in Space

### - MAIN FEATURES

+ PREPARING FOR SPACE TRAVEL

+ GETTING TO SPACE

+ LIVING IN SPACE

+ WORKING IN SPACE

+ TRAVELING IN SPACE

+ Humans in Space

+ Exploring the Universe

### NASA FACT

Did you know that astronauts on the ISS don't do laundry?

After wearing their clothes for two to three days, they put them in a progress cargo vehicle that burns up upon re-entry into the Earth's atmosphere.



LIVING IN SPACE  
A look into the day-to-day life of astronauts ↗



SPACE SHUTTLE  
COUNTDOWN  
The 16th flight to the ISS ↗

Welcome to Humans in Space. NASA has a mandate to pioneer the future... to do what has never been done before. Learn how we are venturing to regions unexplored and unknown, and helping to foster the next generation of explorers.

### HUMANS IN SPACE FEATURES



#### City-Swallowing Sand Dunes

NASA supported researchers are studying the complex physics of menacing sand dunes.

[+ View feature](#)



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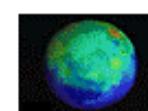
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[+ View feature](#)

### RELATED MULTIMEDIA



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[↗ View animation](#)



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[↗ View adventure](#)

[↗ View more related](#)

[View more features](#)  
[multimedia](#)

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### Exploring the Universe

#### - MAIN FEATURES

+ OUR SOLAR SYSTEM

+ STARS AND GALAXIES

+ WATCH THE SKIES

+ NEW WORLDS

+ ROBOTIC EXPLORERS

+ Humans in Space

+ Exploring the Universe

#### NASA FACT

Did you know that radio telescopes are used to measure the materials ejected from blackholes?

For a radio telescope to be able to observe details as fine as those observed by the Hubble Space Telescope, it would have to be 100,000 times larger



#### RXTE AT THE MOVIES

The Rossi X-ray Timing Explorer (RXTE) observes the worlds of black holes, neutron stars and X-ray pulsars ➤



Welcome to Exploring the Universe. NASA has a mandate to inform you about the vast universe we live in... to show you things that have never been seen before. We are striving to answer the eternal question: Is there life beyond?

#### EXPLORING THE UNIVERSE FEATURES



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[+ View feature](#)



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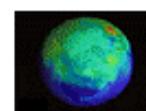
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VIEW MORE  
multimedia

than Hubble, or about  
160 km (100 miles)  
in diameter.

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Author: Beth Beck  
NASA Official: Brian Dunbar  
Last Updated: November 20, 2002  
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## What's New at NASA

### Objective

Provision of important 'quick-hit' news items.

### Description

Four revolving text-heavy news items or press releases (most recent at the top). Content must be of prime importance and timely. When a new news item is added, the most dated will move to the News Archive.

### Content Examples

Scientists test rover at Mars camp, NASA 2003 budget announced

### Update Frequency

As needed: Possibly several times a day.

# NASA Events Promotion

## Objective

To clearly communicate to NASA's audiences about upcoming events of importance.

## Description

Revolving and timely currently occurring or upcoming events...often related to NASA missions. Upcoming shuttle/mission launches etc. will often be featured and promoted here.

## Content Examples

19<sup>th</sup> Endeavour Mission (Live on NASA TV)

## Update Frequency

Event promotion should be available for a minimum of one week, and no longer than one month before being replaced.

# Multimedia Features

## Objective

To inspire NASA's audiences with the most compelling multimedia pieces from across NASA's spectrum of Web sites.

## Description

Revolving and timely image, video and interactive features. The bottom right-hand content field will be a constant link to an upcoming NASA TV broadcast.

## Content Examples

Cone Nebula image from the Hubble Space Telescope, Nose view of Shuttle launch video feature, The Virtual Astronaut interactive feature, Live interview with the ISS crew on NASA TV.

## Update Frequency

Image features will be the most frequently updated, but should be available at a minimum for one day, and at a maximum for one week.

Video features should remain on the home page for a minimum of three days and a maximum of two weeks.

Interactive features should be available for a minimum of one week, and a maximum of one month.

NASA TV must be updated as soon as the particular broadcast being promoted has expired.

# Global Navigation Editorial Strategy

## About NASA



### About NASA section pages (from left navigation):

Career Resources, Business Opportunities, Research Opportunities, Budget Information, Speakers Bureau, Visiting NASAS, Contact NASA, NASA Sites

## About NASA Highlights (Landing Page)

### Objective

To outline NASA's organizational goals and detail Agency activities. To provide the latest news about NASA Headquarters initiatives.

### Description

Two Promotional Banners will highlight timely Agency news or initiatives.

Five static Features will reinforce and educate about NASA's leadership, vision, structure and history.

Three Headquarters News items (press releases) will detail the latest news from NASA Headquarters.

Two Related Multimedia features will directly correspond to Promotional Banners, Features or News items.

Two Related NASA Sites will provide supplemental information to Banners, Features or News items.

### Content Examples

Banners: Space Shuttle Columbia - The latest on the investigation

Five static Features address NASA's leadership (bios of the Administrator and Deputy Administrator), vision (Administrator O'Keefe's vision for NASA), structure (NASA's structure) and history (The history of NASA).

Headquarters News: "Small business awarded multi-million dollar contract" press release

Related Multimedia: NASA mission video

Related NASA Sites: Welcome to NASA.gov

### **Update Frequency**

Promotional Banners should be available for a minimum of two weeks.

The five Features are standing content items that will only change with major organizational changes/initiatives.

Related Multimedia and Related NASA Sites should be available on the page for a minimum of one week, and no longer than five weeks before being archived.

NASA Fact should be updated on a monthly basis.

## **About NASA - Career Resources (left navigation)**

### **Objective**

To provide the information needed to inspire and involve NASA's next generation of explorers.

### **Description**

Single detail page providing descriptive text and links to sources of NASA career information.

### **Content Examples**

Detail page with text and hyperlinks: to the NASA Jobs page for example.

NASA Fact: Trivia or fact pertaining to NASA careers and employment.

### **Update Frequency**

As needed. When any new online career resources are developed they should be made available on this page.

NASA Fact should be updated on a monthly basis.

## **About NASA - Business Opportunities (left navigation)**

### **Objective**

To provide detailed information on how businesses can work with NASA.

## Description

Single detail page providing descriptive text and links to sources of information on how businesses can work with NASA, from bidding on contracts to stimulating investment in new markets and technologies.

## Content Examples

Detail page with text and hyperlinks: to the NASA Commercial Technology Program page for example.

NASA Fact: Trivia or fact pertaining to doing business with NASA.

## Update Frequency

As needed. When any new online business opportunity content is produced, it should be made available from this page.

NASA Fact should be updated on a monthly basis.

# About NASA - Research Opportunities (left navigation)

## Objective

To provide detailed information on how researchers can become involved with NASA.

## Description

Single detail page providing descriptive text and links to sources of information on how researchers can work with NASA, from specific research opportunities currently available to how researchers can submit unsolicited proposals.

## Content Examples

Detail page with text and hyperlinks: to the NASA Headquarters Research Opportunities page for example.

NASA Fact: Trivia or fact pertaining to NASA research.

## Update Frequency

As needed. When any new online business opportunity content is produced, it should be made available from this page.

NASA Fact should be updated on a monthly basis.

# About NASA - Budget Information (left navigation)

## **Objective**

To provide information on past, present and future NASA budgets.

## **Description**

Single detail page providing descriptive text and links to specific NASA budget documentation.

## **Content Examples**

Introductory text and hyperlinks: to NASA's FY 2004 Budget for example.

NASA Fact: Trivia or fact pertaining to NASA's budget.

## **Update Frequency**

As needed. When any new budget documentation or information is produced, it should be made available from this page.

NASA Fact should be updated on a monthly basis.

## **About NASA - Speakers Bureau (left navigation)**

### **Objective**

To promote the program that supplies NASA speakers to conferences and events.

### **Description**

Single detail page providing introductory text and nationwide contact information for requesting speakers.

### **Content Examples**

Detail page with informative text, contact information and e-mail links.

NASA Fact: Trivia or fact pertaining to NASA speakers or employees.

### **Update Frequency**

As needed. When any new Speakers Bureau contact information is produced, it should be made available from this page.

NASA Fact should be updated on a monthly basis.

## **About NASA - Visiting NASA (left navigation)**

### **Objective**

To provide the general public with the information they need to personally visit one of the NASA centers or Headquarters.

## Description

Single detail page providing general visiting information, as well as descriptions, contacts and hyperlinks for each center that offers tours to visitors.

## Content Examples

Detail page with informative text, contact information and hyperlinks to center Web site visitor information.

NASA Fact: Trivia or fact pertaining to NASA Headquarters, centers, tours or visitors. For example, "XX number of visitors toured the Johnson Space Center in 2002."

## Update Frequency

As needed. When any new contact information is produced, it should be made available from this page.

NASA Fact should be updated on a monthly basis.

# NASA Sites (left navigation)

## Objective

To provide one-stop content for finding an individual enterprise or center home page, or further NASA content that exists outside of the NASA.gov portal.

## Description

Single detail page with descriptive text and hyperlinks to NASA enterprise, center and specific subject matter Web sites.

## Content Examples

Detail page with informative text, contact information and hyperlinks to center Web sites and sites with specific subject matter: Ames Research Center home page, Space Shuttle Columbia home page, etc.

NASA Fact: Trivia or fact pertaining to the NASA Web. For example, "On Feb. 1 NASA.gov received XX hits."

## Update Frequency

As needed. When published information changes or new Web sites are launched, they should be made available from this page.

NASA Fact should be updated on a monthly basis.





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- ABOUT NASA HIGHLIGHTS

+ CAREER RESOURCES

+ BUSINESS OPPORTUNITIES

+ RESEARCH OPPORTUNITIES

+ BUDGET INFORMATION

+ SPEAKERS BUREAU

+ VISITING NASA

+ CONTACT NASA

+ NASA SITES

### NASA FACT

Did you know that NASA is also working to improve life on earth? From medical devices to better tires, from satellite imaging to remote sensing, NASA is helping make our home a better place to live.



This section offers information about NASA as an agency. It explains the history, mission, leadership, vision and organization of the National Aeronautic and Space Administration in a down-to-earth way.

### ABOUT NASA FEATURES



#### Who Leads NASA ?

Sean O'Keefe was appointed by the President as the 10th Administrator of NASA in December of 2001

[+ View the Administrator's page](#)



#### Administrator O'Keefe's Vision for NASA

"In broad terms, our mandate is to pioneer the future . . . to do what has never been done before."

[+ View feature](#)



#### NASA Deputy Administrator Frederick D. Gregory

Frederick D. Gregory assumed the role of Deputy Administrator of NASA in August of 2002

[+ View feature](#)



#### The History of NASA

Since its inception in 1958, NASA has achieved many great scientific and technological feats

[+ View feature](#)



#### NASA's Structure

NASA is a large organization with operations throughout the U.S.A.

[+ View feature](#)

### RELATED MULTIMEDIA



#### NASA's Mission Video

To understand and protect our home planet...

[+ Watch this video](#)

### RELATED NASA SITES

#### Columbia Investigation

The latest news on the Columbia investigation

[+ View the Columbia main page](#)

[+ Visit Investigation Board site](#)

#### STS-107 Memorial Funds

Contributions are being accepted

[+ Visit site](#)

(This link is for information only.  
The Agency does not endorse  
or encourage such donations.)

#### Condolences

Read condolence messages.

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ONE NASA is an effort to foster greater collaboration across the Agency  
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**NASA Headquarters**  
As the nexus of NASA's major aeronautical and space programs, NASA Headquarters is the voice of the Agency  
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Author: Beth Beck  
NASA Official: Brian Dunbar  
Last Updated: November 20, 2002  
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## News and Events



### News and Events section pages (left navigation):

[Launches and Dockings](#), [Special Events](#), [Visiting NASA](#), [Agency News](#), [Mission News](#), [Research News](#), [News Archives](#)

### This Week's Highlights (Landing Page)

#### Objective

Highlight NASA's latest news and accomplishments, as well as important upcoming/ongoing events and activities.

#### Description

Two Promotional Banners highlight the latest and greatest events/news/accomplishments at NASA.

Seven revolving Features (most recent at the top) showcase timely (recent newsworthy content) and in-depth and important initiatives/accomplishments or ongoing/upcoming events. Content must be a press release, detailed article with multiple high quality visuals or accompanying multimedia or a recent image release. When a new feature is added, the most dated item will move to a News and Events Feature Archive.

Two Related Multimedia items (most recent at the top) will directly relate to one of the published features or banners. When a new multimedia item is added, the most dated multimedia piece will move to a News and Events Related Multimedia Archive.

Three Related NASA Sites (most recent at the top) will provide hyperlinks to NASA Web sites that directly relate to one of the published features or banners. When a new Related Site is added, the most dated will move to a News and Events Related Sites Archive.

NASA Fact will highlight a little-known piece of trivia or fact about recent NASA news/events.

#### Content Examples

Promotional Banners: The 19<sup>th</sup> Space Shuttle Endeavour mission

Features: "NASA sponsors student robotics competition" feature article

Related Multimedia: Interactive view of the upcoming Endeavour mission

Related NASA Sites: Space Shuttle Endeavour photo gallery

NASA Fact: "Since its first launch, the Space Shuttle Endeavour has traveled XX kilometers (XX miles)"

### **Update Frequency**

Promotional Banners should be available for a minimum of two weeks.

Features, Related Multimedia and Related NASA Sites should be available on the page for a minimum of one week, and no longer than five weeks before being archived.

NASA Fact should be updated on a monthly basis.

## **News and Events - Launches and Dockings (left navigation)**

### **Objective**

Detail upcoming NASA launches.

### **Description**

Five revolving Features (most recent at the top) showcase timely (recent newsworthy content) and important launches and dockings. Content must be a press release, detailed article with multiple high quality visuals or accompanying multimedia or a recent image release. When a new feature is added, the most dated item will move to a Launches and Dockings Feature Archive.

Two Related Multimedia items (most recent at the top) will directly relate to one of the published features. When a new multimedia item is added, the most dated multimedia piece will move to a Launches and Dockings Related Multimedia Archive.

Three Related NASA Sites (most recent at the top) will provide hyperlinks to NASA Web sites that directly relate to one of the published features. When a new Related Site is added, the most dated will move to a Launches and Dockings Related Sites Archive.

NASA Fact will highlight a little-known piece of trivia or fact about NASA launches.

### **Content Examples**

Features: "Soyuz launch: a new crew for the ISS" feature article

Related Multimedia: Soyuz launch Webcast: Live on NASA TV

Related NASA Sites: Space Shuttle Endeavour photo gallery

NASA Fact: "Since its inception, NASA has launched XX missions."

### **Update Frequency**

Features, Related Multimedia and Related NASA Sites should be available on the page for a minimum of one week, and no longer than eight weeks before being archived.

NASA Fact should be updated on a monthly basis.

## **News and Events - Special Events (left navigation)**

### **Objective**

Detail upcoming and ongoing NASA special events of importance.

### **Description**

Five revolving Features (most recent at the top) showcase timely (recent newsworthy content) and important events. Content must be a press release, detailed article with multiple high quality visuals or accompanying multimedia or a recent image release. When a new feature is added, the most dated item will move to a Special Events Feature Archive.

Two Related Multimedia items (most recent at the top) will directly relate to one of the published features. When a new multimedia item is added, the most dated multimedia piece will move to a Special Events Related Multimedia Archive.

Three Related NASA Sites (most recent at the top) will provide hyperlinks to NASA Web sites that directly relate to one of the published features. When a new Related Site is added, the most dated will move to a Special Events Related NASA Sites Archive.

NASA Fact will highlight a little-known piece of trivia or fact about one of the published Special Events specifically, or NASA events in general.

### **Content Examples**

Features: "Pioneer NASA spacecraft celebrates 20 years of service" feature article

Related Multimedia: Pioneer video

Related NASA Sites: Pioneer Mission home page

NASA Fact: "Pioneer 4 was tracked to a distance of 655,000 kilometers (407,000 miles) from Earth, a record at that time."

## **Update Frequency**

Features, Related Multimedia and Related NASA Sites should be available on the page for a minimum of one week, and no longer than eight weeks before being archived.

NASA Fact should be updated on a monthly basis.

## **News and Events - Visiting NASA (left navigation)**

### **Objective**

To provide the general public with the information they need to personally visit one of the NASA centers or Headquarters.

### **Description**

Single detail page providing general visitors information, as well as descriptions, contacts and hyperlinks for each center that offers tours to visitors.

### **Content Examples**

Detail page with informative text, contact information and hyperlinks to center Web site visitor information.

NASA Fact: Trivia or fact pertaining to NASA Headquarters, centers, tours or visitors. For example, "XX number of visitors toured the Johnson Space Center in 2002."

### **Update Frequency**

As needed. When any new contact information is produced, it should be made available from this page.

NASA Fact should be updated on a monthly basis.

## **News and Events - Agency News (left navigation)**

### **Objective**

To outline NASA's organizational goals and detail Agency activities. To provide the latest news about NASA Headquarters initiatives.

### **Description**

Five revolving Features (most recent at the top) showcase timely Agency news (recent newsworthy content). Content must be a press release, detailed article with multiple high quality visuals or accompanying multimedia or a recent image release. When a new feature is added,

the most dated item will move to an Agency News Feature Archive.

Two Related Multimedia items (most recent at the top) will directly relate to one of the published features. When a new multimedia item is added, the most dated multimedia piece will move to an Agency News Related Multimedia Archive.

Three Related NASA Sites (most recent at the top) will provide hyperlinks to NASA Web sites that directly relate to one of the published features, or NASA news in general. When a new Related NASA Site is added, the most dated will move to an Agency News Archive.

NASA Fact will highlight a little-known piece of trivia or fact about NASA or one of the published features.

### **Content Examples**

Features: "Columbia sensor diagrams presented to Columbia Accident Investigation Board" feature article

Related Multimedia: NASA mission video

Related NASA Sites: Welcome to NASA.gov

### **Update Frequency**

Features, Related Multimedia and Related NASA Sites should be available on the page for a minimum of one week, and no longer than six weeks before being archived.

NASA Fact should be updated on a monthly basis.

## **News and Events - Mission News (left navigation)**

*(Note: content for this page will be fed by NASA.gov's Missions section)*

### **Objective**

To highlight and publish the latest NASA mission news.

### **Description**

Five revolving Features (most recent at the top) showcase timely mission news (recent newsworthy content). Content must be a press release, detailed article with multiple high quality visuals or accompanying multimedia or a recent image release. When a new feature is added, the most dated item will move to a Mission News Feature Archive.

Two Related Multimedia (most recent at the top) items will directly relate to one of the published features. When a new multimedia item is added, the most dated multimedia piece will move to a Mission News Related Multimedia Archive.

Three Related NASA Sites (most recent at the top) will provide hyperlinks to NASA Web sites that directly relate to one of the published features or banners or NASA missions in general. When a new Related NASA Site is added, the most dated will move to a Mission News Related NASA Sites Archive.

NASA Fact will highlight a little-known piece of trivia or fact about a NASA mission.

### **Content Examples**

Features: "Milky Way stars in cosmic reality show" feature article

Related Multimedia: Virtual Mars

Related NASA Sites: Mars Exploration Web site

NASA Fact: "Over the two years of the continual habitation of the ISS, its size has increased by more than 90,718 kilograms (200,000 pounds)."

### **Update Frequency**

Features, Related Multimedia and Related NASA Sites should be available on the page for a minimum of three days, and no longer than five weeks before being archived.

NASA Fact should be updated on a monthly basis.

## **News and Events - Research News (left navigation)**

### **Objective**

To highlight and publish the latest NASA news pertaining to research.

### **Description**

Five revolving Features (most recent at the top) showcase research news (recent newsworthy content). Content must be a press release, detailed article with multiple high quality visuals or accompanying multimedia or a recent image release. When a new feature is added, the most dated item will move to a Research News Feature Archive.

Two Related Multimedia (most recent at the top) items will directly relate to one of the published features. When a new multimedia item is added, the most dated multimedia piece will move to a Research News Related Multimedia Archive.

Three Related NASA Sites (most recent at the top) will provide hyperlinks to NASA Web sites that directly relate to one of the published features, or NASA research in general. When a new Related Site is added, the most dated will move to a Research News Related Sites Archive.

NASA Fact will highlight a little-known piece of trivia or fact about NASA research.

## **Content Examples**

Features: "Hubble watches light from erupting star" feature article

Related Multimedia: Star V838 Mon expands video

Related NASA Sites: Hubble Space Telescope home page

NASA Fact: "There are 80-plus research experiments planned for the STS-107 mission."

## **Update Frequency**

Features, Related Multimedia and Related NASA Sites should be available on the page for a minimum of one week, and no longer than eight weeks before being archived.

NASA Fact should be updated on a monthly basis.

## **News and Events - News Archive (left navigation)**

### **Objective**

To provide access to NASA's wealth of news releases and information.

### **Description**

Detail page providing access to NASA's news archive, with news organized by year and month of release.



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## News and Events

- THIS WEEKS HIGHLIGHTS

+ LAUNCHES AND DOCKINGS

+ SPECIAL EVENTS

+ VISITING NASA

+ AGENCY NEWS

+ MISSION NEWS

+ RESEARCH NEWS

+ NEWS ARCHIVE

### NASA FACT

Did you know that NASA is also working to improve life on earth? From medical devices to better tires, from satellite imaging to remote sensing, NASA is helping make our home a better place to live.



### THE 19TH SPACE SHUTTLE ENDEAVOUR MISSION

Watch it live on NASA TV →



Welcome to NASA news and features. Stay up to date with NASA by exploring our latest agency, mission, and research highlights.

### NEWS & EVENTS FEATURES



#### Webchat With Astronaut William Pogue

Thursday, November 14 offers two webcasts and one chat opportunity to meet and ask questions of retired astronaut William Pogue.

[+ View feature](#)



#### Last Chance to See Meteor Shower until 2099

Sky watchers will have an opportunity to see the most dramatic light show of the past several decades.

[+ View feature](#)



#### NASA Sponsors Student Robotics Competition

Heavy metal will rock-and-roll at seven different locations across the country early next year.

[+ View feature](#)



#### SeaWINDS Instrument Ready for Flight

At Japan's Tanegashima Space Center, preparations continue for the Dec. 14 launch of Japan's Advanced Earth Observation Satellite II.

[+ View feature](#)

[+ More News and Events...](#)

### RELATED MULTIMEDIA



#### Interactive View of STS-113 Mission

Take a virtual tour of the next shuttle mission

[+ View mission](#)

### RELATED NASA SITES

#### NASA's Education Calendar

Monthly calendar of education-related events

[+ View site](#)

#### Mars Exploration Events

Touring Mars-related events around the country and information for museums

[+ View site](#)

#### Jet Propulsion Laboratory Events

Upcoming and past JPL events

[+ View site](#)

+ More related NASA sites...



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Author: Beth Beck  
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Last Updated: November 20, 2002  
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# Multimedia

## Multimedia section pages (left navigation):

[Image Gallery](#), [Video Gallery](#), [Interactive Features](#), [NASA TV](#), [Art Gallery](#)

## Multimedia Highlights (Landing Page)



### Objective

Transport visitors into a rich, engaging environment where they can experience the emotion, vision and imagination of NASA through interactive presentations and multimedia.

### Description

Two Promotional Banners highlight the latest and greatest multimedia content being produced by NASA.

The Features content bucket highlights single features for Image Feature, Video Feature and Interactive Feature. When updated, these features will move to the Image, Video and Interactive Galleries respectively.

The NASA TV content field is a standing link to NASA TV, with a specific upcoming broadcast detailed.

Related NASA Sites provides links to three NASA Sites (most recent at the top) with compelling images or multimedia content. When updated the most dated will move to a Multimedia Related NASA Sites archive.

NASA Fact will highlight a little-known piece of trivia or fact about NASA Multimedia production or imaging.

### Content Examples

Promotional Banners: Living in Space interactive feature.

Image Feature: "Saharan dust off of West Africa" image

Video Feature: "Video footage of Iraqi oil fires from space"

Interactive Feature: "Interactive Columbia Image Gallery"

NASA TV: "Live interview with the ISS crew" broadcast

Related NASA Sites: The NASA Image Exchange

NASA Fact: "Every day the Hubble Space Telescope archives 3 to 5 gigabytes of data and delivers between 10 to 15 gigabytes to astronomers all over the world."

### **Update Frequency**

Promotional Banners should be available for a minimum of two weeks.

The Image Feature should be updated daily.

Video and Interactive Features should be available for a minimum of one week and no longer than four weeks.

Related NASA Sites should be available on the page for a minimum of one week, and no longer than five weeks before being archived.

NASA Fact should be updated on a monthly basis.

### **Multimedia section pages (left navigation):**

Image Gallery, [Video Gallery](#), [Interactive Features](#), [NASA TV](#), [Art Gallery](#)

## **Multimedia - Image Gallery (left navigation)**



### **Description**

Standing gallery of archived image features from the Multimedia Landing Page.

NASA Fact will highlight a little-known piece of trivia or fact about NASA Multimedia production or imaging.

## Multimedia - Video Gallery (left navigation)



### Description

Standing gallery of archived video features from the Multimedia Landing Page.

NASA Fact will highlight a little-known piece of trivia or fact about NASA Multimedia production or imaging.

## Multimedia - Interactive Features (left navigation)

### Description

Standing gallery of archived interactive features from the Multimedia Landing Page.

NASA Fact will highlight a little-known piece of trivia or fact about NASA Multimedia production or imaging.

## Multimedia - NASA TV (left navigation)

### Objective

To provide immediate access to NASA TV programming.

### Description

Detail page containing introductory text for NASA TV, as well as descriptions of programming of interest, and hyperlinks for further information.

NASA Fact will highlight a little-known piece of trivia or fact about NASA Multimedia production or imaging.

### Update Frequency

As needed, depending on NASA TV programming and schedule changes.

## Multimedia - Art Gallery (left navigation)

### Objective

To showcase the most compelling work being completed by the NASA Art Program and other artists capturing NASA's work in paintings, drawings and other media.

### Description

Archive style gallery of art-related images.

NASA Fact will highlight a little-known piece of trivia or fact about NASA Multimedia production or imaging.

### Content Examples

"SIRTF and the Milky Way: an artist's concept"

### Update Frequency

A new image should be added at least every two weeks.

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**Multimedia**

+ MULTIMEDIA HIGHLIGHTS  
+ IMAGE GALLERY  
+ VIDEO GALLERY  
+ INTERACTIVE FEATURES  
+ NASA TV

**NASA FACT**

Did you know that every day, the Hubble Space Telescope archives 3 to 5 gigabytes of data and delivers between 10 and 15 gigabytes to astronomers all over the world?

+ More NASA Facts...

**LIVING IN SPACE**  
A look into the day-to-day life of astronauts ↗

**NEXUS**  
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Welcome to the NASA Multimedia Gallery. Experience NASA through our great selection of images, video, and interactive features.

**IMAGE FEATURE**



**NASA image of the day**  
+ View more information on this image  
+ More NASA images...

**VIDEO FEATURES**



**STS-107 Crew Cabin Video**  
Video footage taken by the crew during re-entry on Feb. 1. The video lasts approximately 13 minutes and is introduced by Astronaut Scott Altman.  
↗ View the video (RealMedia)  
↗ View (RealMedia Mirror 1)  
↗ View (RealMedia Mirror 2)  
+ More videos...

**NASA TV**



**NASA TV**  
10.20.02 Live interview with the ISS Crew  
↗ Watch this show  
+ NASA TV Info

**RELATED NASA SITES**

**Copernica Arts Program**  
Interact with original artwork commissioned to chronicle the wonders, risks and triumphs of space exploration  
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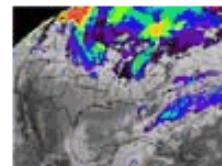
**Astronomy Picture of the Day**  
Each day a different image or photograph of our fascinating universe is featured, along with a brief explanation written by a professional astronomer  
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## INTERACTIVE FEATURES



### Interactive Columbia image gallery

See an interactive tribute to the Columbia crew and the events from February 1, 2003  
[» View this interactive feature](#)



### Interactive weather satellite imagery

See your weather coming from miles away! This interactive viewer allows you view the latest images from global weather satellites  
[» View this interactive feature](#)

[+ More interactive features...](#)

## NASA Image Exchange

Entry point for performing searches for NASA photographs and images at multiple NASA Centers

[» Visit site](#)

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- + The President's Management Agenda
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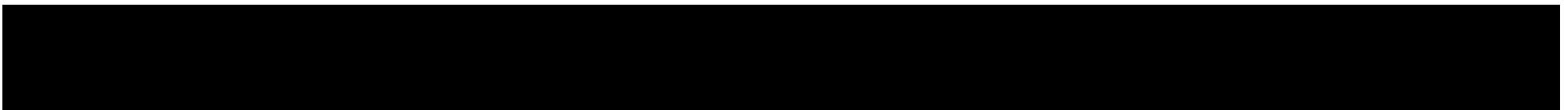


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Last Updated: November 20, 2002

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## Multimedia

+ MULTIMEDIA HIGHLIGHTS

- IMAGE GALLERY

+ VIDEO GALLERY

+ INTERACTIVE FEATURES

+ NASA TV

## NASA FACT

Did you know that every day, the Hubble Space Telescope archives 3 to 5 gigabytes of data and delivers between 10 and 15 gigabytes to astronomers all over the world?

+ More NASA Facts...

## IMAGE OF THE DAY GALLERY

### Cone Nebula



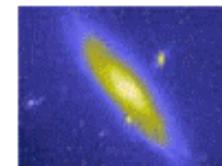
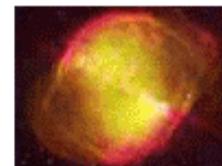
"Cone Nebula" from Hubble Telescope

Image Credit: NASA

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+ View high res (5 mb)

### Previous Images of the Day...



## RELATED NASA SITES

### Astronomy Picture of the Day

Each day a different image or photograph of our fascinating universe is featured, along with a brief explanation written by a professional astronomer

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Author: Beth Beck  
NASA Official: Brian Dunbar  
Last Updated: November 20, 2002  
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## Multimedia

+ MULTIMEDIA HIGHLIGHTS

+ IMAGE GALLERY

+ VIDEO GALLERY

+ INTERACTIVE FEATURES

+ NASA TV

### NASA FACT

Did you know that every day, the Hubble Space Telescope archives 3 to 5 gigabytes of data and delivers between 10 and 15 gigabytes to astronomers all over the world?

+ More NASA Facts...

### VIDEO ARCHIVE



#### Video 1

10.20.02 Text description of multimedia item fills this space here

- + Link to quick time version
- + Link to real media version
- + Link to windows media version



#### Video 2

10.20.02 Text description of multimedia item fills this space here

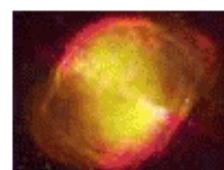
- + Link to quick time version



#### Video 3

10.20.02 Text description of multimedia item fills this space here

- + Link to quick time version
- + Link to real media version



#### Video 4

10.20.02 Text description of multimedia item fills this space here

- + Link to quick time version
- + Link to windows media version



#### Video 5

10.20.02 Text description of multimedia item fills this space here

- + Link to windows media version



#### Video 6

10.20.02 Text description of multimedia item fills this space here

- + Link to windows media version



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# Missions

## Missions section pages (left navigation):

[Shuttle and Station](#), [Looking at Earth](#), [Exploring Our Solar System](#), [Space Science and Technology](#), [Deep Space Missions](#), [Research Aircraft](#)

## Missions Highlights (Landing Page)



### Objective

To capture the depth and breadth of NASA's many missions for users.

### Description

Two Promotional Banners highlight the biggest events/news/accomplishments related to NASA missions.

Five revolving Features (most recent at the top) showcase timely (recent newsworthy content) and in-depth and important initiatives/accomplishments as related to NASA missions. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an interactive tool, or a recent image release. When a new feature is added, the most dated item will move to a NASA Missions Feature Archive.

Three Missions News items (press releases, most recent at the top) will detail the latest news about NASA Missions.

Two Related Multimedia items (most recent at the top) will showcase the most engaging Missions multimedia content available. When a new multimedia item is added, the most dated multimedia piece will move to a Missions Related Multimedia Archive.

Three Related NASA Sites (most recent at the top) will provide links to NASA sites directly pertaining to NASA missions. When a new related site is added, the most dated item will move to a Missions Related NASA Sites Archive.

NASA Fact will highlight a little-known piece of trivia or fact about NASA missions.

## **Content Examples**

Promotional Banners: "Mars Rovers take baby steps" link to Mars Exploration

Features: "Looking at Earth: The Terra Satellite is helping us to understand how our planet is changing" feature article

Missions News: "Techs search for oxygen leak source in Endeavour" press release

Related Multimedia: Solar System Simulator

Related NASA Sites: Columbia home page

NASA Fact: "With over 100 launches, space shuttle missions have now carried over 300 passengers and 1.36 million kg (3 million pounds) of cargo into orbit."

### **Update Frequency**

Promotional Banners should be available for a minimum of two weeks.

Features, Related Multimedia and Related NASA Sites should be available on the page for a minimum of one week, and no longer than six weeks before being archived.

NASA Missions News will be updated frequently, possibly daily.

NASA Fact should be updated on a monthly basis.

## **Missions - NASA Missions Timeline (left navigation)**

### **Objective**

To provide an historical, current and future timeline of NASA's important missions to users.

### **Description**

Graphical detail page providing a timeline of NASA missions.

NASA Fact will highlight a little-known piece of trivia or fact about NASA missions.

### **Update Frequency**

As needed, when new relevant missions are launched, or timelines/schedules are adjusted.

NASA Fact should be updated on a monthly basis.

## Missions - Shuttle and Station (left navigation)

### Objective

To highlight the most compelling NASA content in relation to Space Shuttle and ISS missions.

### Description

Five revolving Features (most recent at the top) showcase timely (recent newsworthy content) and in-depth and important initiatives/accomplishments as related to NASA Shuttle and ISS missions. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an interactive tool, or a recent image release. When a new feature is added, the most dated item will move to a Shuttle and Station Feature Archive.

Two Related Multimedia (most recent at the top) items will showcase the most engaging Shuttle and Station multimedia content available. They will preferably directly relate to one of the published features. When a new multimedia item is added, the most dated multimedia piece will move to a Shuttle and Station Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about Shuttle missions or the ISS.

### Content Examples

Features: "Tracking the ISS: When will the station pass over you?" interactive tool

Related Multimedia: STS-107 Videos

NASA Fact: "With over 100 launches, space shuttle missions have now carried over 300 passengers and 1.36 million kg (3 million pounds) of cargo into orbit."

### Update Frequency

Promotional Banners should be available for a minimum of two weeks.

Features and Related Multimedia should be available on this page for a minimum of one week, and no longer than eight weeks before being archived.

NASA Fact should be updated on a monthly basis.

## Missions - Looking at Earth (left navigation)

### Objective

To showcase NASA's remote sensing and satellite imaging missions.

### Description

Five revolving Features (most recent at the top) will provide content publicizing NASA's missions that strive to better understand our home planet. When a new feature is added, the most dated item will move to the Missions Looking at Earth Feature Archive.

Two Related Multimedia items (most recent at the top) will directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to the Missions Looking at Earth Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about NASA remote sensing and satellite imaging work, or about our planet in general.

### **Content Examples**

Features: "Black carbon: NASA discovers how carbon particles are changing the weather in China" feature article

Related Multimedia: "The Adventures of Echo the Bat" remote sensing multimedia

NASA Fact: "Without a protective upper-level ozone layer, there would be no life on Earth."

### **Update Frequency**

A new Feature and Related Multimedia piece should be added at least every two weeks. Features should be available on this page for a minimum of one week.

NASA Fact should be updated on a monthly basis.

## **Missions - Exploring our Solar System (left navigation)**

### **Objective**

To showcase NASA missions that strive to better understand our solar system.

### **Description**

Five revolving Features (most recent at the top) will provide content publicizing NASA's missions that strive to better understand our solar system. When a new feature is added, the most dated item will move to the Missions Exploring Our Solar System Feature Archive.

Two Related Multimedia items (most recent at the top) will directly relate to one of the published features, or to the solar system in general. When a new multimedia piece is added, the most dated item will move to the Missions Exploring Our Solar System Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about NASA missions that explore our solar system.

### **Content Examples**

Features: "Exploring Jupiter's great dark spot" feature article

Related Multimedia: "Mars Exploration Rover videos"

NASA Fact: "Our sun is almost XX times larger than Earth."

### **Update Frequency**

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of one week.

NASA Fact should be updated on a monthly basis.

## **Missions - Space Science and Technology (left navigation)**

### **Objective**

To showcase the technology that makes NASA missions possible.

### **Description**

Five revolving Features (most recent at the top) will provide content that educates about the technology behind NASA missions. When a new feature is added, the most dated item will move to the Space Science and Technology Feature Archive.

Two Related Multimedia items (most recent at the top) will directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to the Missions Space Science and Technology Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about the technology behind NASA missions.

### **Content Examples**

Features: "A search for habitable planets: Technology behind the Kepler mission" feature article

Related Multimedia: "Seeing the early solar system: Images from the Dawn mission will use new technology to look back in time" gallery

NASA Fact: "By using infrared technology, the Space Infrared Telescope Facility will help us better understand how planets are formed."

### **Update Frequency**

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of one week.

NASA Fact should be updated on a monthly basis.

## Missions - Deep Space Missions (left navigation)

### Objective

To highlight and inform users about NASA's missions that study our universe.

### Description

Five revolving Features (most recent at the top) will provide content that about NASA's deep space missions. When a new feature is added, the most dated item will move to the Deep Space Missions Feature Archive.

Two Related Multimedia items (most recent at the top) will directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to the Deep Space Missions Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about NASA's deep space missions.

### Content Examples

Features: "Gamma ray burst reveals explosive activity" feature article

Related Multimedia: Hubble Space Telescope image gallery

NASA Fact: "By using infrared technology, the Space Infrared Telescope Facility will help us better understand how planets are formed."

### Update Frequency

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of one week.

NASA Fact should be updated on a monthly basis.

## Missions - Research Aircraft (left navigation)

### Objective

To highlight and inform users about NASA's aeronautics and research aircraft missions.

### Description

Five revolving Features (most recent at the top) will provide content about NASA's research aircraft missions. When a new feature is added, the most dated item will move to the Missions Research Aircraft Feature Archive.

Two Related Multimedia items will directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to the Missions Research Aircraft Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about NASA Research Aircraft.

### **Content Examples**

Features: "NASA research aircraft searches Columbia's path for debris" feature article

Related Multimedia: "Eagle morphs into advanced concept vehicle" video

NASA Fact: "In 1957 the Short SC.1 VTOL Research Aircraft made its first flight powered by five Rolls Royce RB.108 turbojets."

### **Update Frequency**

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of one week.

NASA Fact should be updated on a monthly basis.

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## Missions

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+ LOOKING AT EARTH

+ EXPLORING OUR SOLAR SYSTEM

+ SPACE SCIENCE & TECHNOLOGY

+ DEEP SPACE MISSIONS

+ RESEARCH AIRCRAFT

**MARS ROVERS TAKE BABY STEPS**  
The twin rovers face a daunting 460 million kilometer (286 million mile) voyage to Mars ↗



**FEATURE IMAGES**  
Photos from the Cassini-Huygens mission ↗



NASA missions are as varied as the mandate of the agency. From using satellites imaging to study climate change to the Hubble Space Telescope scanning deep space, NASA's goal is to further mankind's knowledge of our universe.

### MISSIONS FEATURES

**Webchat With Astronaut William Pogue**  
Thursday, November 14 offers two webcasts and one chat opportunity to meet and ask questions of retired astronaut William Pogue.  
[+ View feature](#)

**Last Chance to See Meteor Shower until 2099**  
Sky watchers will have an opportunity to see the most dramatic light show of the past several decades.  
[+ View feature](#)

**NASA Sponsors Student Robotics Competition**  
Heavy metal will rock-and-roll at seven different locations across the country early next year.  
[+ View feature](#)

**SeaWINDS Instrument Ready for Flight**  
At Japan's Tanegashima Space Center, preparations continue for the Dec. 14 launch of Japan's Advanced Earth Observation Satellite II.  
[+ View feature](#)

+ More News and Events...

### RELATED MULTIMEDIA

**Interactive View of STS-113 Mission**  
Take a virtual tour of the next shuttle mission  
[+ View mission](#)

### RELATED NASA SITES

**NASA's Education Calendar**  
Monthly calendar of education-related events  
[+ View site](#)

**Mars Exploration Events**  
Touring Mars-related events around the country and information for museums  
[+ View site](#)

**Jet Propulsion Laboratory Events**

Upcoming and past JPL events

[+ View site](#)

+ More related NASA sites...

## NASA HEADQUARTERS NEWS

### **03.20.03 - Increasing Solar Trend Can Change Climate**

Historical records of solar activity indicate an increase in solar radiation since the late 1970s, which could affect climate change.

[+ Read more](#)

### **03.19.03 - Gamma-Ray Burst Reveals Explosive Activity**

Scientists witnessed the death of a gigantic star and possibly the birth of a brand new, spinning black hole.

[+ Read more](#)

### **03.19.03 - Surprise! Lightning Affects Regional Pollution**

Summer lightning over the U.S. significantly increases regional ozone and other gases that affect air chemistry.

[+ Read more](#)

### **03.18.03 - Fun Science Emphasizes Space Based Research**

While some Station crew members read books during free time, Don Petit prefers 'Saturday Morning Science.'

[+ Read more](#)

### **03.14.03 - Plans for Return to Space Flight**

As the Columbia accident investigation proceeds, NASA outlines activities necessary to return the Space Shuttle to flight. Associate Administrator for Space Flight provides internal planning letter and organization chart.

[+ View transcript in Acrobat PDF \(306 Kb\)](#)

[+ View letter in Acrobat PDF \(306 Kb\)](#)

[+ View chart in Acrobat PDF \(306 Kb\)](#)

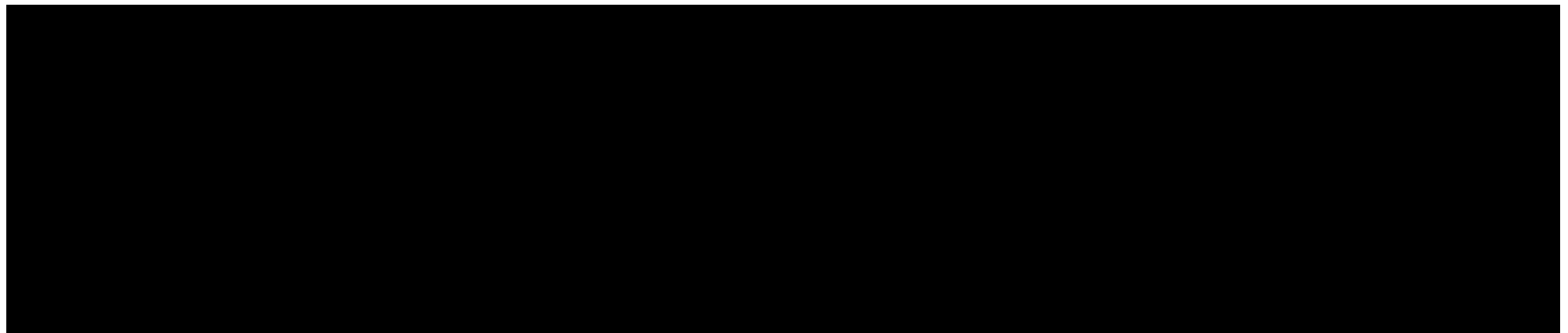


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## Popular Topics / MyNASA



### Objective

To allow users to customize their access to NASA online content.

### Description

Powered by the Content Management System, Popular Topics and MyNASA have direct correlations content-wise, with topics, or channels, being linked across the two sections. The CMS will feed content to the channels and topics chosen for representation.



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+ NASA IN THE LAB

+ THE SPACE SHUTTLE

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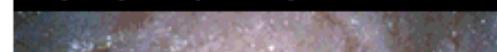
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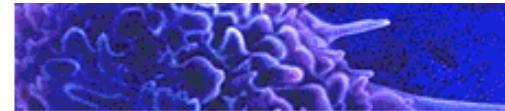


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Author: Beth Beck  
NASA Official: Brian Dunbar  
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# NASA's Vision: Life on Earth

## Life on Earth section pages (left navigation):

[In Everyday Life](#), [Looking at Earth](#), [The Environment](#), [New Technologies](#), [Living Things](#), [Improving Flight](#)

## Life on Earth Main Features (Landing Page)



### Objective

To capture the depth and breadth of NASA's earth-based and earth-focused activities.

### Description

Two Promotional Banners highlight the biggest events/news/accomplishments related to NASA's earth-based and earth-focused programs.

Five revolving Features (most recent at the top) showcase timely (recent newsworthy content) and in-depth and important initiatives/accomplishments as related to the "Improve Life Here" component of NASA's vision. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an interactive tool, or a recent image release. When a new feature is added, the most dated item will move to a Life on Earth Feature Archive.

Two Related Multimedia items (most recent at the top) will showcase the most engaging earth-focused multimedia content available, and can directly relate to one of the published banners or features. When a new multimedia item is added, the most dated multimedia piece will move to a Life on Earth Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia about our planet or NASA's work under the "Improve Life Here" vision.

## Content Examples

Promotional Banners: Satellite image release of volcanic eruption in Ecuador

Features: "NASA joins international ozone study in the Arctic" feature article

Related Multimedia: Multimedia schematics of future scramjet

NASA Fact: "Without an upper-level protective ozone layer, there would be no life on Earth."

## Update Frequency

Promotional Banners should be available for a minimum of two weeks.

Features and Related Multimedia should be available on the page for a minimum of one week, and no longer than five weeks before being archived.

NASA Fact should be updated on a monthly basis.

## Life on Earth - In Everyday Life (left navigation)

### Life on Earth section pages (left navigation):

In Everyday Life, [Looking at Earth](#), [The Environment](#), [New Technologies](#), [Living Things](#), [Improving Flight](#)

### Objective

To highlight content that educates users about the impact NASA has had, and is having, on our day-to-day lives.

### Description

Five revolving Features (most recent at the top) with content that showcases NASA's impact on our lives (inventions for example). Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an image release or an interactive tool. When a new feature is added, the most dated item will move to the In Everyday Life Feature Archive.

Two Related Multimedia items (most recent at the top) will showcase the most engaging work NASA is doing, or has done, in terms of inventions and technologies being used around the world. Multimedia will directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to an In Everyday Life Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about NASA's accomplishments in making our lives easier.

## Content Examples

Feature: "NASA scientists have invented new video technology" feature article

Related Multimedia: "Focus on this!: Video stabilization technology" video release

NASA Fact: "The smoke detector was invented by NASA scientists."

## Update Frequency

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

# Life on Earth - Looking at Earth (left navigation)

## Life on Earth section pages (left navigation):

[In Everyday Life](#), [Looking at Earth](#), [The Environment](#), [New Technologies](#), [Living Things](#), [Improving Flight](#)

## Objective

To showcase research efforts and results in remote sensing and satellite imaging.

## Description

Five revolving Features (most recent at the top) with content publicizing NASA's efforts to look at and better understand our home planet. When a new feature is added, the most dated item will move to the Looking at Earth Feature Archive.

Two Related Multimedia (most recent at the top) items will directly relate to one of the published features or satellite imaging and remote sensing in general. When a new multimedia piece is added, the most dated item will move to the Looking at Earth Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about NASA remote sensing and satellite imaging work, or about our planet in general.

## Content Examples

Feature: "Finding fossils from space" feature article

Related Multimedia: "Visible Earth" gallery

## Update Frequency

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

## Life on Earth - The Environment (left navigation)

### Life on Earth section pages (left navigation):

[In Everyday Life](#), [Looking at Earth](#), [The Environment](#), [New Technologies](#), [Living Things](#), [Improving Flight](#)

### Objective

To showcase NASA's research efforts to better understand our environment and to educate users about how Earth is being affected by human habitation.

### Description

Five revolving Features (most recent at the top) about NASA's efforts to look at and better understand our environment. When a new feature is added, the most dated item will move to The Environment Feature Archive.

Two Related Multimedia items (most recent at the top) will directly relate to one of the published features or the Environment in general. When a new multimedia piece is added, the most dated item will move to The Environment Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about Earth's environment and NASA's efforts to better understand it.

### Content Examples

Feature: "Black carbon: NASA discovers how carbon particles are changing the weather in China" feature article

Related Multimedia: Visible Earth gallery

NASA Fact: "Without a protective upper-level ozone layer, there would be no life on Earth."

### Update Frequency

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

## Life on Earth - New Technologies (left navigation)

## **Life on Earth section pages (left navigation):**

[In Everyday Life](#), [Looking at Earth](#), [The Environment](#), [New Technologies](#), [Living Things](#), [Improving Flight](#)

### **Objective**

To showcase and educate users about NASA's work on new technology development.

### **Description**

Five revolving Features (most recent at the top) about NASA's research and development of new technologies. When a new feature is added, the most dated item will move to a New Technologies Feature Archive.

Two Related Multimedia items (most recent at the top) will directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to a New Technologies Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about NASA technology development.

### **Content Examples**

Feature: "Students and robots converge on Cleveland to compete" feature article about the Buckeye Regional FIRST Robotics competition

Related Multimedia: "Robot of the week" image

### **Update Frequency**

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

## **Life on Earth - Living Things (left navigation)**

### **Life on Earth section pages (left navigation):**

[In Everyday Life](#), [Looking at Earth](#), [The Environment](#), [New Technologies](#), [Living Things](#), [Improving Flight](#)

### **Objective**

To highlight and educate users about NASA's physical and biological sciences research.

### **Description**

Five revolving Features (most recent at the top) about NASA's physical and biological sciences

research. When a new feature is added, the most dated item will move to a Living Things Feature Archive.

Two Related Multimedia items will directly relate to one of the published features, or to Living Things in general. When a new multimedia piece is added, the most dated item will move to a Living Things Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about Living Things, or NASA's work to better understand them.

## **Content Examples**

Feature: "Better bone implants" feature article

Related Multimedia: "Fetal heart monitor" video

NASA Fact: "Adults have 160,000 kilometers (100,000 miles) of blood vessels, children have 96,000 kilometers (60,000 miles)."

## **Update Frequency**

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

## **Life on Earth - Improving Flight (left navigation)**

### **Life on Earth section pages (left navigation):**

[In Everyday Life](#), [Looking at Earth](#), [The Environment](#), [New Technologies](#), [Living Things](#), [Improving Flight](#)

## **Objective**

To highlight and educate users about NASA's aeronautics research and projects and the Agency's efforts to improve flight safety worldwide.

## **Description**

Five revolving Features (most recent at the top) about aeronautics and flight research. When a new feature is added, the most dated item will move to an Improving Flight Feature Archive.

Two Related Multimedia items (most recent at the top) will directly relate to one of the published features, or to aeronautics in general. When a new multimedia piece is added, the most dated item will move to an Improving Flight Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about flight in general, or NASA's

work more specifically.

## **Content Examples**

Feature: "Active Aerelastic Wing project team explores new technologies" feature article

Related Multimedia: "Eagle morphs into advanced concept vehicle" video

NASA Fact: "In 1957 the Short SC.1 VTOL Research Aircraft made its first flight powered by five Rolls Royce RB.108 turbojets."

## **Update Frequency**

A new Feature and Related Multimedia piece should be added at least every three weeks.

Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

# Humans in Space

## Humans in Space section pages (left navigation):

Preparing for Space Travel, Getting to Space, Living in Space, Working in Space, Traveling in Space

## Humans in Space Main Features (Landing Page)



### Objective

To capture the depth and breadth of NASA's human-driven space exploration activities.

### Description

Two Promotional Banners highlight the biggest events/news/accomplishments related to NASA's space exploration programs involving humans.

Five revolving Features (most recent at the top) showcase timely (recent newsworthy content) and in-depth and important initiatives/accomplishments as related to the "Extend Life to There" component of NASA's vision. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an interactive tool, or a recent image release. When a new feature is added, the most dated item will move to a Humans in Space Feature Archive.

Two Related Multimedia items (most recent at the top) will showcase the most engaging space exploration multimedia content available, and can directly relate to one of the published banners or features. When a new multimedia item is added, the most dated multimedia piece will move to a Humans in Space Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about NASA's work under the "Extend Life to There" vision.

### Content Examples

Promotional Banners: "Track the ISS in the night sky" interactive tool

Features: "How astronauts get along" feature article

Related Multimedia: STS-113 gallery of pre-flight animated videos

NASA Fact: "Astronauts on the ISS don't do laundry..."

### **Update Frequency**

Promotional Banners should be available for a minimum of two weeks.

Features and Related Multimedia should be available on the page for a minimum of one week, and no longer than five weeks before being archived.

NASA Fact should be updated on a monthly basis.

## **Humans in Space - Preparing for Space Travel (left navigation)**

### **Humans in Space section pages (left navigation):**

Preparing for Space Travel, [Getting to Space](#), [Living in Space](#), [Working in Space](#), [Traveling in Space](#)

### **Objective**

To highlight content that educates users about the research and preparations that are needed prior to liftoff.

### **Description**

Five revolving Features (most recent at the top) with content about earth-based preparations needed for space travel. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an image release or an interactive tool. When a new feature is added, the most dated item will move to the Preparing for Space Travel Feature Archive.

Two Related Multimedia items (most recent at the top) will highlight interactive or visual content about earth-based preparations needed for space travel, and can directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to a Preparing for Space Travel Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about preparing for space travel.

### **Content Examples**

Feature: "Baseline Data Collection Facility" feature article

Related Multimedia: "STS-101 crew trains with new 'glass cockpit'" video release

NASA Fact: "In 1959 the first astronauts were selected from 500 applicants."

### **Update Frequency**

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

## **Humans in Space - Getting to Space (left navigation)**

### **Humans in Space section pages (left navigation):**

[Preparing for Space Travel](#), [Getting to Space](#), [Living in Space](#), [Working in Space](#), [Traveling in Space](#)

### **Objective**

To highlight content that educates users about expendable launch vehicles launched by NASA, and their role in getting humans to space.

### **Description**

Five revolving Features (most recent at the top) with content about non-human launches to space that support NASA's "Extend Life to There" vision. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an image release or an interactive tool. When a new feature is added, the most dated item will move to the Getting to Space Feature Archive.

Two Related Multimedia items (most recent at the top) will highlight interactive or visual content about non-human launches, and can directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to a Getting to Space Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about getting to space.

### **Content Examples**

Feature: "Final ISS truss shipment to launch" feature article

Related Multimedia: "The Zvezda Service Module launch" video release

### **Update Frequency**

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

## Humans in Space - Living in Space (left navigation)

### Humans in Space section pages (left navigation):

[Preparing for Space Travel](#), [Getting to Space](#), [Living in Space](#), [Working in Space](#), [Traveling in Space](#)

### Objective

To highlight content that educates users about life aboard the International Space Station, and future efforts to live in space.

### Description

Five revolving Features (most recent at the top) with content about life aboard the ISS and directly related to the "Extend Life to There" vision. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an image release or an interactive tool. When a new feature is added, the most dated item will move to the Living in Space Feature Archive.

Two Related Multimedia items (most recent at the top) will highlight interactive or visual content about life aboard the ISS or future life in space, and can directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to a Living in Space Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about living in space.

### Content Examples

Feature: "ISS crewmembers use Ham radio to talk with people on earth" feature article

Related Multimedia: "See how astronauts eat in space" video

NASA Fact: "Astronauts on the ISS don't do laundry..."

### Update Frequency

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

## Humans in Space - Working in Space (left navigation)

## **Humans in Space section pages (left navigation):**

[Preparing for Space Travel](#), [Getting to Space](#), [Living in Space](#), [Working in Space](#), [Traveling in Space](#)

### **Objective**

To highlight content that educates users about working in space, from research conducted on the Shuttle to operations at the International Space Station.

### **Description**

Five revolving Features (most recent at the top) with content about working in space and directly related to the "Extend Life to There" vision. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an image release or an interactive tool. When a new feature is added, the most dated item will move to the Working in Space Feature Archive.

Two Related Multimedia items (most recent at the top) will highlight interactive or visual content about the work being conducted on board the ISS or Shuttle, and can directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to a Working in Space Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about working in space.

### **Content Examples**

Feature: "Expedition Six crew to conduct space walk" feature article

Related Multimedia: "Space Station Science Image of the Day" video

NASA Fact: "Astronauts on the ISS don't do laundry..."

### **Update Frequency**

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

## **Humans in Space - Traveling in Space (left navigation)**

### **Humans in Space section pages (left navigation):**

[Preparing for Space Travel](#), [Getting to Space](#), [Living in Space](#), [Working in Space](#), [Traveling in Space](#)

## Objective

To highlight content that educates users about space travel, with a primary focus on shuttle missions.

## Description

Five revolving Features (most recent at the top) with content about traveling in space, as directly related to the "Extend Life to There" vision. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an image release or an interactive tool. When a new feature is added, the most dated item will move to the Traveling in Space Feature Archive.

Two Related Multimedia items (most recent at the top) will highlight interactive or visual content about traveling in space and shuttle missions, and can directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to a Traveling in Space Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about traveling in space.

## Content Examples

Feature: "19<sup>th</sup> Shuttle Endeavour mission set to launch" feature article

Related Multimedia: "Shuttle Endeavour launch: Live on NASA TV" Webcast

NASA Fact: "With over 100 launches, space shuttle missions have now carried over 300 passengers and 1.36 million kg (3 million pounds) of cargo into orbit."

## Update Frequency

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

# NASA's Vision: Exploring the Universe

**Exploring the Universe section pages (left navigation):** Our Solar System, Stars and Galaxies, Watch the Skies, New Worlds, Robotic Explorers

## Exploring the Universe Main Features (Landing Page)



### Objective

To capture the depth and breadth of NASA's space exploration programs and activities.

### Description

Two Promotional Banners highlight the biggest events/news/accomplishments related to NASA's space exploration programs.

Five revolving Features (most recent at the top) showcase timely (recent newsworthy content) and in-depth and important initiatives/accomplishments as related to the "Find Life Beyond" component of NASA's vision. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an interactive tool, or a recent image release. When a new feature is added, the most dated item will move to an Exploring the Universe Feature Archive.

Two Related Multimedia items (most recent at the top) will showcase the most engaging space exploration multimedia content available, and can directly relate to one of the published banners or features. When a new multimedia item is added, the most dated multimedia piece will move to an Exploring the Universe Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about space exploration.

### Content Examples

Promotional Banners: "Mars Rovers take baby steps" feature

Features: "Neutron star revealed" feature article

Related Multimedia: Solar System Simulator

NASA Fact: "Radio telescopes can be used to measure the materials ejected from black holes..."

### **Update Frequency**

Promotional Banners should be available for a minimum of two weeks.

Features and Related Multimedia should be available on the page for a minimum of one week, and no longer than five weeks before being archived.

NASA Fact should be updated on a monthly basis.

## **Exploring the Universe - Our Solar System (left navigation)**

**Exploring the Universe section pages (left navigation):** [Our Solar System](#), [Stars and Galaxies](#), [Watch the Skies](#), [New Worlds](#), [Robotic Explorers](#)

### **Objective**

To highlight NASA content about our solar system, and the Agency's efforts to better understand our own neighborhood.

### **Description**

Five revolving Features (most recent at the top) about our solar system. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an image release or an interactive tool. When a new feature is added, the most dated item will move to the Our Solar System Feature Archive.

Two Related Multimedia items (most recent at the top) will highlight interactive or visual content about our solar system, and can directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to an Our Solar System Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about our solar system.

### **Content Examples**

Feature: "Mars Rovers take baby steps" feature article

Related Multimedia: Solar System Simulator

NASA Fact: "It takes 12 Earth years for Mars to make one orbit around the sun."

## **Update Frequency**

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

## **Exploring the Universe - Stars and Galaxies (left navigation)**

**Exploring the Universe section pages (left navigation):** [Our Solar System](#), [Stars and Galaxies](#), [Watch the Skies](#), [New Worlds](#), [Robotic Explorers](#)

### **Objective**

To highlight NASA content about stars and galaxies, and the Agency's deep space research programs.

### **Description**

Five revolving Features (most recent at the top) about stars and galaxies. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an image release or an interactive tool. When a new feature is added, the most dated item will move to the Stars and Galaxies Feature Archive.

Two Related Multimedia items (most recent at the top) will highlight interactive or visual content about stars and galaxies, and can directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to a Stars and Galaxies Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about stars and galaxies.

### **Content Examples**

Feature: "Neutron star revealed" feature article

Related Multimedia: Animation of a star expanding into a red super giant

### **Update Frequency**

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

## **Exploring the Universe - Watch the Skies (left navigation)**

## **Exploring the Universe section pages (left navigation): Our Solar System, Stars and Galaxies, Watch the Skies, New Worlds, Robotic Explorers**

### **Objective**

To highlight NASA astronomy content, and aspects of our universe that can be seen just by looking up.

### **Description**

Five revolving Features (most recent at the top) about astronomy. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an image release or an interactive tool. When a new feature is added, the most dated item will move to the Watch the Skies Feature Archive.

Two Related Multimedia items (most recent at the top) will highlight interactive or visual content about exploration of the universe from Earth, and can directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to a Watch the Skies Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about astronomy.

### **Content Examples**

Feature: "Jaw-dropping Leonids" feature article

Related Multimedia: "Track the ISS in the night sky" interactive tool

NASA Fact: "During an official 'meteor storm' an observer can view 1,000 or more meteors in one hour."

### **Update Frequency**

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

## **Exploring the Universe - New Worlds (left navigation)**

## **Exploring the Universe section pages (left navigation): Our Solar System, Stars and Galaxies, Watch the Skies, New Worlds, Robotic Explorers**

### **Objective**

To publicize NASA's efforts and research behind the search for Earth-like, or possibly life-supporting, planets in the universe.

## Description

Five revolving Features (most recent at the top) about the search for new worlds in the universe. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an image release or an interactive tool. When a new feature is added, the most dated item will move to the New Worlds Feature Archive.

Two Related Multimedia items (most recent at the top) will highlight interactive or visual content about the search for new worlds, and can directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to a New Worlds Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about Earth and possible life-supporting planets in the universe.

## Content Examples

Feature: "Building planets in cyberspace" feature article

Related Multimedia: "Planet Quest" interactive gallery

NASA Fact: "Over the next 15 years NASA is embarking on a bold series of missions to find and characterize new worlds."

## Update Frequency

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

## Exploring the Universe - Robotic Explorers (left navigation)

**Exploring the Universe section pages (left navigation):** Our Solar System, Stars and Galaxies, Watch the Skies, New Worlds, Robotic Explorers

## Objective

To provide content and insight into how robots are helping us to explore the universe, and how far they might take us in the future.

## Description

Five revolving Features (most recent at the top) about the role of robotics in helping us to explore the universe. Content must be either a detailed article with multiple high quality visuals or accompanying multimedia (not just a press release), an image release or an interactive tool. When a new feature is added, the most dated item will move to the Robotic Explorers Feature

## Archive.

Two Related Multimedia items (most recent at the top) will highlight interactive or visual content about NASA's robotic explorers, and can directly relate to one of the published features. When a new multimedia piece is added, the most dated item will move to a Robotic Explorers Related Multimedia Archive.

NASA Fact will highlight a little-known piece of trivia or fact about NASA robotics, and the use of robots for exploration.

### **Content Examples**

Feature: "Mars Rovers take baby steps" feature article

Related Multimedia: "3D Mars Rover Game" interactive game

### **Update Frequency**

A new Feature and Related Multimedia piece should be added at least every three weeks. Features should be available on this page for a minimum of two weeks.

NASA Fact should be updated on a monthly basis.

# For Kids

**For Kids section pages (left navigation):**

[Games, Activities, Cartoons](#)

## For Kids Main (Landing Page)



### Objective

Inspire and engage kids, generally elementary school or younger, as well as older audiences, with content that is both informative and fun.

### Description

Two Promotional Banners highlight major NASA initiatives in a manner that is accessible by children, as well as the most compelling and fun NASA content.

New for Kids has four revolving Features (most recent at the top) showcasing fun and engaging child-focused content. Content must be written in a manner accessible by young children and include colorful visuals or accompanying multimedia or games. When a new feature is added, the most dated item will move to a For Kids Feature Archive.

More Cool Stuff will highlight the most engaging multimedia content available for kids, and can directly relate to one of the published banners or features. When a new multimedia item is added, the most dated multimedia piece will move to More Cool Stuff Archive.

Cool NASA Sites will provide links to other NASA sites just for kids.

NASA Fact will highlight a little-known piece of trivia or fact about our universe or NASA's activities, and will be written in a manner comprehensible by young children.

### Content Examples

Promotional Banners: "Nominate your teacher to be an Educator Astronaut!"

New for Kids: "How a space toilet is different" video feature

More Cool Stuff: "The Adventures of Amelia the Pigeon" interactive story

Cool NASA Sites: Amazing Space Galaxy Trading Cards

NASA Fact: "On the moon you can jump 20 feet in the air...."

### **Update Frequency**

Promotional Banners should be available for a minimum of two weeks.

New for Kids Features, More Cool Stuff and Cool NASA Sites should be available on the page for a minimum of one week, and no longer than five weeks before being archived.

NASA Fact should be updated on a monthly basis.

## **For Kids - Games (left navigation)**

### **For Kids section pages (left navigation):**

[Games](#), [Activities](#), [Cartoons](#)

### **Objective**

Compel children with interactive games that educate as much as they engage.

### **Description**

Five featured games. When a new game is added, the most dated game will move to a Games Archive.

### **Content Examples**

Mars 3D Rover Game

### **Update Frequency**

Dependent on the production and availability of game content. One new game a month should be added here. When added, the most dated game will move to a Games Archive.

## **For Kids - Activities (left navigation)**

### **For Kids section pages (left navigation):**

[Games](#), [Activities](#), [Cartoons](#)

### **Objective**

Promote interactivity with children through educational activities.

## Description

Five featured activities. When a new activity is added, the most dated activity will move to an Activities Archive.

## Content Examples

"Launch a rocket from a spinning planet" activity

## Update Frequency

A new activity should be added at least every three weeks. Activities should be available on this page for a minimum of one week.

# For Kids - Cartoons (left navigation)

## For Kids section pages (left navigation):

[Games](#), [Activities](#), [Cartoons](#)

## Objective

Compel children with through colorful visuals, animated stories and video.

## Description

Five featured art-focused activities, illustrated/narrated stories and videos. When a new feature is added, the most dated will move to an Art and Stories Archive.

## Content Examples

Robin Whirlybird's Rotorcraft Adventures animated story.

## Update Frequency

Dependent on the production and availability of Art and Stories content. One new feature should be added every three weeks here. When added, the most dated item will move to an Art and Stories Archive.



## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

+ Low Bandwidth  
+ Contact NASA

FIND IT @ NASA :

Enter Search Term

+ GO

+ INFO FOR MOM & DAD

+ INFO FOR TEACHERS

+ CHILDREN'S PROTECTION ACT

+ Home

Greetings  
Kid Earthlings!

+ KIDS MAIN PAGE

**GAMES**  
**CARTOONS**  
**ACTIVITIES**

### did you know?

That on the moon you can jump 20 feet in the air? Way more than you can on Earth...

+ Click here to find out why

### what does it mean?

(Click on a word below to find out what it means)

+ Black Hole

+ Comet

+ Gravity

+ Meteor

+ Nebulae



### TURN YOUR TEACHER INTO AN ASTRONAUT

Nominate them today! ↗

### NEW FOR KIDS!



#### In Search of Moon Trees

Said the little acorn to the new maple, "My father was a mighty oak." Said the maple back, "My father was a Moon tree!"

+ Find out what a Moon Tree is



#### Put Your Name On Mars

Send your name in to NASA and have it added to a DVD that will be sent to Mars!

+ Send your name to Mars!



#### Meet Me at the Space Station

Hello everybody! I'm MC the robot. Join me and i will take you on a tour of the Space Station travelling around Earth.

+ Come on, let's go check it out

+ CHECK OUT MORE NASA STUFF...



### NASA's MISSION

Check out the Flash video ↗



MORE COOL STUFF...



Earth & Sun by Tuska

+ Look at this image

+ View more images...

+ Join the Space Club

### NASA EMAIL CREW



Title title title...

+ Look at this image

+ Get Email updates here!

COOL NASA SITES!



+ Ozone  
+ Quasars  
+ More words...



NASA KIDS



+ SEE MORE COOL SITES...



- + Freedom of Information Act
- + The President's Management Agenda
- + FY 2002 Agency Performance and Accountability Report
- + NASA Privacy Statement, Disclaimer,  
and Accessibility Certification
- + Freedom to Manage



Author: Beth Beck  
NASA Official: Brian Dunbar  
Last Updated: November 20, 2002  
+ Contact NASA

# For Students

## For Students section pages:

[View page information from left navigation](#)

## For Students Main (Landing Page)



The For Students Section is further subdivided into the K-4, 5-8, 9-12 and Post Secondary grade levels. Each of these age groups has a section with individual content that is authored specifically for those age groups, but navigation, aside for the few exceptions noted below, remains standard throughout the four different sections.

### Objective

Meet the needs of students looking for "homework help" on NASA-specific or general science and engineering topics, as well as for content relating to personal interests and for opportunities to become involved with the Agency.

### Description

Two Promotional Banners highlight major NASA initiatives in a manner that is accessible by students, as well as compelling subject matter content specific to certain grade levels.

Five revolving Features (most recent at the top) showcase timely (recent newsworthy content) written for the section's specific age group, or provide fun age appropriate activities. Content must be either an article with multiple high quality visuals or accompanying multimedia (not just a press release), an interactive tool, or an engaging activity. When a new feature is added, the most dated item will move to a For Students (specific grade level) Feature Archive.

Student News will provide three student-focused press releases (most recent at the top).

Two Related Multimedia items (most recent at the top) will showcase the most engaging multimedia content appropriate for students that is available, and can directly relate to one of the published banners or features. When a new multimedia item is added, the most dated multimedia piece will move to a For Students (specific grade level) Related Multimedia Archive.

Related NASA Sites (most recent at the top) will provide links to three NASA sites of interest to students. When a new site is added, the most dated will move to a For Students Related NASA Sites Archive.

NASA Fact will highlight a little-known piece of trivia or fact about science in general, or NASA's activities specifically, in a manner appropriate for the section grade level it resides on.

## **Content Examples**

Promotional Banners: NASA Apprenticeship Program link

Features: "Mars Imaging Project: Help create an image map of Mars"

Student News: "NASA shares vision of future with local students" press release

Related Multimedia: "Robot warriors: Tune into the FIRST Robotics regional competitions" Webcast

Related NASA Sites: "NASA Explores"

NASA Fact: "Radiation levels encountered by the Voyager spacecraft at Jupiter was 1,000 times the lethal level for a human."

## **Update Frequency**

Promotional Banners should be available for a minimum of two weeks.

Features, Related Multimedia and Related NASA Sites should be available on the page for a minimum of one week, and no longer than six weeks before being archived.

Student News will change frequently, possibly daily.

NASA Fact should be updated on a monthly basis.

## **For Students - Left Navigation**

### **Homework Help**

*(Note: This section is labeled Research Assistance in the Post Secondary student section)*

#### **Description**

Detail page outlining how to use NASA.gov to search for homework help/research assistance on specific questions/subjects, and links to primary sources of homework/research information.

## Internet Resources

(Note: this section is labeled "Internet" for the K-4 sub-section)

### Description

Direct link to individual Related Sites Archive Pages for the four audiences segmented by grade level.

## Multimedia Resources

(Note: this section is labeled "Multimedia" for the K-4 sub-section)

### Description

Direct link to individual Related Multimedia Archive Pages for the four audiences segmented by grade level.

## NASA Learning Opportunities

(Note: this section is labeled "Learning" for the K-4 sub-section)

### Description

Five features (most recent at the top) outlining learning opportunities for students with NASA. When a new feature is added, the most dated moves to a NASA Learning Opportunities Archive, specific to the section's individual grade level.

### Content Examples

"The 10th Annual Great Moonbuggy Competition" feature article

### Update Frequency

A new Learning Opportunity Feature should be added every two weeks, depending on the availability of such programs.

## Career Information

(Note: This left navigation item does exist for students in the K-4 section)

### Description

Single detail page providing introductory text, descriptions and links to NASA online career-focused content.

## For Students - Contacts for Students (left navigation) (Note: this section is labeled "Contact NASA" for the K-4 sub-section)

## Description

Single detail page with introductory text that provides NASA center contact information throughout the county for students.

 NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION

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+ Contact NASA

FIND IT @ NASA :  
Enter Search Term + GO

+ ABOUT NASA    + NEWS & EVENTS    + MULTIMEDIA    + MISSIONS    + POPULAR TOPICS    + MyNASA

+ Home

**For Students**  
(Grades 9-12)

+ FEATURES AND NEWS  
+ RESEARCH ASSISTANCE  
+ INTERNET RESOURCES  
+ MULTIMEDIA RESOURCES  
+ CAREER INFORMATION  
+ CONTACTS FOR STUDENTS  
+ GLOSSARY

**Choose another audience:**  
+ For Kids  
+ For Students Pre K-6  
+ For Students 7-12  
+ For Educators K-6  
+ For Educators 7-12  
+ For Educators Post Secondary  
+ For Press & Media

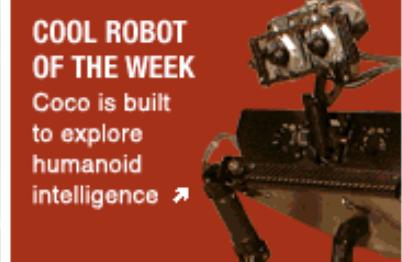
**NASA FACT**

Each year NASA produces new educational materials, which are used by students.  
Did you know that

**THE VIRTUAL ASTRONAUT**  
Find out what it takes to be an astronaut ↗



**COOL ROBOT OF THE WEEK**  
Coco is built to explore humanoid intelligence ↗



Welcome to NASA's page for students. NASA is committed to inspiring and informing students in earthbound classrooms around the world. We are dedicated to offering learners the NASA information they both need and want.

**STUDENT FEATURES**

 **Help Explore and Create Maps of Mars**  
Work with scientists, mission planners and educators to help explore and create an image map of Mars.  
+ Read about the project

 **Want to Work at NASA?**  
Learn about student employment, education and research and development.  
+ Learn more

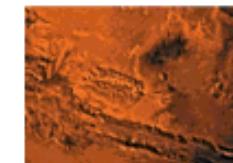
 **The Great Moonbuggy Race**  
Design a vehicle to address engineering challenges similar to those faced by the original Moonbuggy team.  
+ Learn about the project

 **Design a Flying Car**  
NASA invites high school student teams to submit their ideas for a practical flying car.  
+ Learn about the project

 **Building Planets in Cyberspace**  
Scientists plan to build planets. But they won't be using real materials - it will all be done in cyberspace.  
+ View feature

**RELATED MULTIMEDIA**

 **ISS: A home in microgravity**  
Nasa TV webcast scheduled for the International Space Station  
+ View webcast

 **Mars Quicktime**  
View information about Valles Marineris, Olympus Mons and other Mars topography.  
+ View videos

+ More related multimedia...

these products are available on NASA.gov

[+ View more Student features...](#)

## STUDENT NEWS

### **11.20.02 - NASA Selects LEGO to Run Mars Rover Naming Contest**

If you're a K-12 student, you can participate in this LEGO/NASA competition to name the two rovers to be sent to Mars in 2004.

[+ View full story](#)

### **11.15.02 - Accomplishments of Expedition Five Crew**

Scientists using the European Space Agency's (ESA) XMM-Newton X-ray satellite have obtained a key measurement revealing the nature of matter inside neutron stars.

[+ View full story](#)

### **11.13.02 - First International Space Station Turns Two**

The world's first international orbital outpost celebrates the second anniversary of continuous residency and permanent human presence in space Saturday, Nov. 2.

[+ View full story](#)

[+ View more student news](#)

## RELATED NASA SITES

### **Liftoff to Space Exploration**

Enjoy a little more explanation about NASA Science and activities.

[+ View site](#)

### **Jet Propulsion Laboratory Student Page**

Created to serve the needs of students who are interested in Space Science.

[+ View site](#)

### **Marshall Institute**

#### **Student Page**

A good site for current and potential co-op students.

[+ View site](#)

[+ View more NASA sites](#)



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Author: Beth Beck  
NASA Official: Brian Dunbar  
Last Updated: November 20, 2002  
[+ Contact NASA](#)

# For Educators

## For Educators section pages (left navigation):

Learning Resources, Internet Resources, Multimedia Resources, Contacts for Educators, Professional Development, Student Opportunities

## For Educators Main (Landing Page)



The For Educators Section is further subdivided into the K-4, 5-8, 9-12 and Post Secondary grade levels. Each of these sections has individual content that is authored specifically for educators with students from those age groups. Navigation, aside for the one exception noted below, remains standard throughout the four different sections.

### Objective

Meet the needs of educators looking for resource materials on NASA-specific or general science and engineering topics, as well as for content that will inspire their students.

### Description

Two Promotional Banners highlight major NASA education initiatives, as well as compelling subject matter content specific to certain grade levels.

Five revolving Features (most recent at the top) showcase timely (recent newsworthy content) focused on educators of the section's specific grade level, or provide fun age appropriate activities. Content must be either an article with multiple high quality visuals or accompanying multimedia (not just a press release), an interactive tool, an engaging activity or a detailed lesson plan. When a new feature is added, the most dated item will move to a For Educators (specific grade level) Feature Archive.

Educator News will provide three educator-focused press releases.

Two Related Multimedia items (most recent at the top) will showcase the most engaging multimedia content appropriate for educators/students that is available, and can directly relate to one of the published banners or features. When a new multimedia item is added, the most dated multimedia piece will move to a For Educators (specific grade level) Related Multimedia Archive.

Related NASA Sites will provide links to three NASA sites (most recent at the top) of interest to educators. When a new site is added, the most dated will move to a For Educators Related NASA Sites Archive.

NASA Fact will highlight a little-known piece of trivia or fact about science or education in general, or NASA's activities specifically, in a manner appropriate for the section grade level it resides on.

### **Content Examples**

Promotional Banners: "Educator Astronaut: See how you can be an astronaut"

Features: "It's time for FIRST and Botball robotics competitions" feature article

Educator News: "NASA shares vision of the future with local students" press release

Related Multimedia: "The NASA SciFiles: Turn your classroom detectives into seismologists" broadcast

Related NASA Sites: "NASA Educational Products" Web site

NASA Fact: "NASA has Educator Resource Centers across the country that provide free education materials, workshops and more."

### **Update Frequency**

Promotional Banners should be available for a minimum of two weeks.

Features, Related Multimedia and Related NASA Sites should be available on the page for a minimum of one week, and no longer than six weeks before being archived.

Educator News will change frequently, possibly daily.

NASA Fact should be updated on a monthly basis.

## **For Educators - Learning Resources**

### **Description**

Five features providing specific curricula, lesson plans or classroom activities. When a new feature is added, the most dated moves to a Learning Resources Archive, specific to the section's individual grade level.

### **Content Examples**

"Now that's a long distance call" feature article with grade-specific lessons

## **Update Frequency**

A new Learning Resource Feature should be added every week.

## **For Educators - Internet Resources**

### **Description**

Direct link to individual Related Sites Archive Pages for the four audiences segmented by grade level.

## **For Educators - Multimedia Resources**

### **Description**

Direct link to individual Related Multimedia Archive Pages for the four audiences segmented by grade level.

## **For Educators - Contacts for Educators**

### **Description**

Single detail page with introductory text that provides NASA center contact information throughout the county for educators.

## **For Educators - Professional Development**

*Note: This category is labeled Fellowships and Grants in the Post Secondary section.*

### **Description**

Detail page with introductory text and descriptions and hyperlinks to NASA Education professional development and Fellowship and Grant content.

## **For Educators - Student Opportunities**

### **Description**

A direct link to the correlating grade level Learning Opportunities page in the For Students section.



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+ POPULAR TOPICS

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### For Educators (Grades K-4)

- FEATURES AND NEWS

+ LESSON PLANS

+ CLASSROOM ACTIVITIES

+ MULTIMEDIA RESOURCES

+ INTERNET RESOURCES

+ WORKSHOPS & FELLOWSHIPS

+ CONTACTS FOR EDUCATORS

+ GLOSSARY

+ For Kids

+ For Students

+ For Press & Media

### NASA FACT

Each year NASA produces new educational products, which are used by NASA education staff.

Did you know that free electronic versions of these products are

## EDUCATOR ASTRONAUT

See learning in a whole new light

### ROBOTICS EDUCATION PROGRAM

Bring robotics into your classroom →

Welcome to NASA's page for educators. NASA is committed to inspiring the next generation...as only NASA can. We are dedicated to offering educators essential NASA-related educational resources and information.

### EDUCATIONAL FEATURES



#### All About Astronauts

This feature will help explain to your students what it takes to become an astronaut.

[+ View feature](#)



#### Help Explore and Create Maps of Mars

Work with scientists, mission planners and educators to help explore and create an image map of Mars.

[+ Read about the project](#)



#### Centennial of Flight

Interact with NASA scientists and engineers, aviators, and important figures in the history of flight.

[+ Learn about the project](#)



#### Farming In Space

Related Lessons, activities and link to live International Space Station research and webcams.

[+ View feature](#)



#### Design a Flying Car

NASA invites high school student teams to submit their ideas for a practical flying car.

[+ Learn about the project](#)

### EDUCATIONAL MULTIMEDIA



#### NASA TV

November's educational programming on NASA TV  
[+ Watch NASA TV](#)



#### Mars Odyssey Webcast

Mars Odyssey scientists share their adventures on November 14

[+ View the webcast](#)

[+ More educational multimedia](#)

available on NASA  
Spacelink?

+ More educational features

## EDUCATIONAL NEWS

### **10.20.02 - NASA Announces New Associate Administrator for Education**

Administrator Sean O'Keefe announced Dr. Adena Williams Loston, as the Associate Administrator for Education at NASA Headquarters in Washington, effective Oct. 28.

[+ View full story](#)

### **11.15.02 - Director of Mars Exploration Program Goes Live with College Students in Puerto Rico**

Students and faculty from Hispanic Educational Telecommunications Systems (HETS) will participate in a videoconference presentation entitled "Mars: Robotic Exploration in the Coming Decades."

[+ View full story](#)

### **11.13.02 - NASA Sponsors Student Robotics Competition**

Heavy metal will rock-and-roll next spring when students, engineers and their robotic creations take center stage during NASA-sponsored robotics competitions.

[+ View full story](#)

[+ More educational news](#)

## RELATED NASA SITES

### **NASA Education Program Home Page**

NASA's central site for education resources and information.

[+ View site](#)

### **NASA Explores**

Timely educational content and lessons based on real - not theoretical - research, developments and events.

[+ View site](#)

### **NASA Quest**

Interactive projects for students and teachers.

[+ View Site](#)

[+ More educational NASA sites](#)



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Author: Beth Beck  
NASA Official: Brian Dunbar  
Last Updated: November 20, 2002  
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# For Media and Press



## For Media and Press Breaking News (Landing Page)

### Objective

To provide the necessary resources to the Media and Press seeking information on a specific topic, in advance of and/or following up on a NASA story.

### Description

Two Promotional Banners highlight the biggest events/news from NASA, as well as compelling resources for the Media and Press.

Five revolving Breaking News items (most recent at the top) showcase the latest news releases from the Agency. When a new release is added, the most dated item will move to the News Archive.

Three In-Depth Features (most recent at the top) offer a more intuitive look at NASA news. Content must be either an article with multiple high quality visuals or accompanying multimedia (not just a press release). When a new Feature is added, the most dated item will move to an In-Depth Archive.

Two Related Multimedia items (most recent at the top) will showcase the most engaging multimedia content appropriate for the Media and Press that is available, and can directly relate to one of the published banners or features. When a new multimedia item is added, the most dated multimedia piece will move to a Media and Press Related Multimedia Archive.

Related NASA Sites will provide links to three NASA sites (most recent at the top) of interest to the Media and Press. When a new site is added, the most dated will move to a Media and Press Related NASA Sites Archive.

NASA Fact will highlight a little-known piece of trivia or fact about recent NASA news, or about the resources the Agency has in place for the Media and Press.

### Content Examples

Promotional Banners: "Space Shuttle Columbia: The latest on the investigation"

Breaking News: "\$135 million awarded to continue Space Launch Initiative work" press release

In-Depth: "Looking for a planet? Search NASA's Planetary Photojournal" feature

Related Multimedia: "Sun puts on a show" video of solar eruptions

Related NASA Sites: "Kennedy Space Center media resources"

NASA Fact: "Reporters can participate in most press conferences from any NASA center. Check the NASA TV schedule of breaking news events for the latest."

### **Update Frequency**

Promotional Banners should be available for a minimum of two weeks.

Breaking News will be updated frequently, possibly several times a day. When a new piece is added, the most dated will move to the Press Release Archive.

In-Depth, Related Multimedia and Related NASA Sites should be available on the page for a minimum of one week, and no longer than six weeks before being archived.

NASA Fact should be updated on a monthly basis.

## **For Media and Press - Press Release Archive (left navigation)**

Detail page with archived press releases. Press releases should be categorized by month and year of release.

## **Press Kits (left navigation)**

Detail page with archived press kits. Press kits should be made available by month and year of release.

## **For Media and Press - Fact Sheets (left navigation)**

Detail page with archived fact sheets. Fact sheets should be categorized and made available by month and year of release.

## **For Media and Press - Images (left navigation)**

Direct link to the NASA.gov Image Gallery.

## **For Media and Press - Multimedia Resources (left navigation)**

Direct link to the Media and Press Related Multimedia Archive Page.

## **For Media and Press - Speeches (left navigation)**

Detail page with archived speeches. Speeches should be categorized and made available by month and year.

## **For Media and Press - Press Contacts**

Detail page with NASA contacts for the Media and Press, at Headquarters and centers around the country.



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+ NEWS & EVENTS

+ MULTIMEDIA

+ MISSIONS

+ POPULAR TOPICS

+ MyNASA

+ Home

### For Press & Media

- BREAKING NEWS

+ PRESS RELEASE ARCHIVE

+ PRESS KITS

+ FACT SHEETS

+ IMAGES

+ MULTIMEDIA RESOURCES

+ SPEECHES

+ NASA MEDIA SITE

+ PRESS CONTACTS

+ GLOSSARY

+ For Kids

+ For Students

+ For Educators

### NASA FACT

Did you know that astronauts on the ISS don't do laundry?

After wearing their clothes for two to three

### 2003 BUDGET CHANGES

NASA plans 2003 budget change to implement a new Integrated Space Transportation Plan (ISTP) and ensure the International Space Station is properly financed ↗



### INSIDE A NEUTRON STAR

A neutron star's interior has been probed for the first time ↗

Welcome to NASA's page for the press and media. NASA is committed to providing the easiest route possible to the engaging information that emerges from our activities every day. We are dedicated to offering the press and media access to these stories.

### BREAKING NEWS

#### **10.20.02 - STS 113 Launch Preparations Continue**

With the launch of Space Shuttle Endeavour drawing closer, launch preparations continued to roll along at Kennedy Space Center, Fla., on Wednesday.

[+ View full story](#)

#### **11.15.02 - NASA Helps Unravel Early Colonial Mystery**

NASA Langley high-tech X-ray equipment gave conservators from the Association for the Preservation of Virginia Antiquities (APVA) a peek inside material in Jamestown that may date between 1609 and 1620.

[+ View full story](#)

#### **11.13.02 - Return of Edwards Open House and Air Show Restores Tradition**

An estimated 175,000 people endured long waits at the gates to attend the Edwards Open House and Air Show, which resumed after a one-year absence as the country mourned the Sept. 11 attacks.

[+ View full story](#)

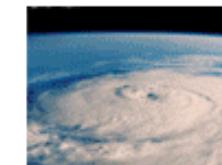
#### **11.13.02 - New Spanish Dish Will Aid Interplanetary Communications**

Construction workers erecting steel components atop a new concrete chamber near Madrid, Spain, are helping NASA study Mars and comets.

[+ View full story](#)

[+ View more breaking news](#)

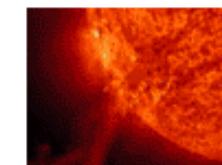
### TODAY'S MULTIMEDIA



#### **NASA Image Exchange**

One-stop searchable database of images and video from across the NASA network.

[↗ View Image Exchange](#)



#### **Sun Puts on a Show**

Not to be outdone by fall's explosion of color, the Sun issued a series of spectacular solar eruptions.

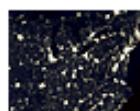
[↗ View video](#)

[↗ View more of today's](#)

[View more of today's multimedia](#)

days, they put them in  
a progress cargo  
vehicle that burns up  
upon re-entry into the  
Earth's atmosphere.

## IN DEPTH



### Bright Lights, Big City

The familiar, rural landscapes of our youth have given way to suburban sameness of modern American life  
[+ View feature](#)



### Fostering the Next Generation of Mars Explorers

Students participated in the Mars Student Imaging Project, sponsored by NASA Arizona State University.  
[+ Learn about the project](#)



### An Interview with Dr. Moustafa Chahine

Moustafa Chahine is the Science Team Leader on a suite of instruments known as the sounding system on the Aqua spacecraft. Together they will measure, among other things, the Earth's atmospheric temperature and humidity profiles.  
[+ View feature](#)

[+ View more in depth features](#)

## RELATED NASA SITES

### Johnson Space Center News

Releases, reports, contacts, fact sheets, photos and videos from the Johnson Space Center.

[+ View site](#)

### Kennedy Space Center Media Resources

Media resources focused on shuttle status and launch countdowns from Kennedy Space Center.

[+ View site](#)

### Goddard Space Flight Center Media

Excellent feature-style news releases from the Goddard Space Flight Center.

[+ View site](#)

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Author: Beth Beck  
NASA Official: Brian Dunbar  
Last Updated: November 20, 2002  
[+ Contact NASA](#)

The screenshot displays the NASA homepage with several text annotations in red and yellow boxes indicating font styles and sizes used throughout the site.

**Header:**

- NASA logo: Helvetica Neue (T1) 67 medium condensed  
18 pt. smooth #333333
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION: Helvetica Neue (T1) 67 medium condensed  
18 pt. smooth #333333
- + Low Bandwidth: Arial regular  
11pt html  
#484848
- + en Español  
+ Contact NASA

**Navigation Bar:**

- + ABOUT NASA
- + NEWS & EVENTS
- + MULTIMEDIA
- + MISSIONS: Helvetica Neue (T1) 67 medium condensed  
18 pt. smooth #333333
- + POPULAR TOPICS
- + MyNASA

**Left Sidebar:**

- + For Kids
- + For Students
- + For Educators
- + For Media & Press

**Middle Content Area:**

- Promo Banner 01:  
Static / Flash / Rotating flash  
363 x 123
- HEADLINES (ALL CAPS):  
Helvetica Neue (T1) 77 bold condensed 14 pt. smooth #FFFFFF
- CALL TO ACTION:  
Helvetica Neue (T1) 65 medium 11 pt. smooth #FFFFFF
- Promo Banner 02:  
Static / Flash  
178 x 123

**Section Headers:**

- + LIFE ON EARTH
- + HUMANS IN SPACE: Helvetica Neue (T1) 67 medium condensed  
14 pt. smooth #FFFFFF
- + EXPLORING THE UNIVERSE

**Content Snippets:**

- Saving Cajun Country**  
Feature: 64 x 48  
Satellite imaging to help save Native American sites  
+ Read this article
- SOLVE Campaign Launches**  
Feature: 64 x 48  
Measuring ozone and other atmospheric gases in the Arctic  
+ Read about this event
- Tracking the ISS**  
Feature: 64 x 48  
When will the International Space Station pass over you?  
+ Visit this site
- Neutron Star Revealed**  
Feature: 64 x 48  
Scientists reveal the nature of matter inside neutron stars  
+ Read this article
- Final Galileo Flyby**  
Feature: 64 x 48  
Monday morning begins a sprint into the inner reaches of the Jupiter system  
↗ Learn about this event
- Shocking Secrets of the Crab Pulsar**  
Feature: 64 x 48  
Chandra X-Ray Observatory and Hubble Space Telescope capture the Crab Pulsar  
↗ See the Crab Pulsar

**Footer:**

- WHAT'S NEW AT NASA
- 11.07.02 - Strike Warning  
A new lightning index that uses measurements of water vapor in the atmosphere from Global Positioning Systems has improved lead-time for predicting thunderstorms.  
↗ Learn more about this
- NASA EVENTS
- Thumbnail 03:

[+ View full story](#)

#### 11.18.02 - Scientists Boost Tally at Uranus

A new moon of the planet Uranus has been discovered and confirmed by a team of astronomers including Dr. Christophe Dumas of NASA's Jet Propulsion Laboratory.  
[+ View full story](#)

#### 10.25.02 - Scientists Test Rover at 'Mars Camp'

When two Mars Exploration Rovers arrive on the red planet in January 2004, mission scientists will rely on them to make discoveries. To prepare for intense operations during the mission, NASA's scientists and engineers are working with a rover here on Earth called FIDO.  
[+ View full story](#)

205 x 75

[+ View more information on this event](#)  
[+ View full events schedule](#)

#### Watch a launch

[+ Launch Information and Schedule](#)

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[+ NASA visitor's information](#)

### MULTIMEDIA FEATURES

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

**Image Feature**  
Cone Nebula from  
Hubble Space  
Telescope.  
[+ View this image](#)  
[+ More images...](#)

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

**Video Feature**  
Nose camera view  
of Space Shuttle  
Launch.  
[+ View Video](#)  
[+ More Videos...](#)

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

**Interactive Feature**  
The Virtual Astronaut  
Interactive feature.  
[+ Visit site](#)  
[+ More features...](#)

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

**NASA TV**  
10.20.02  
Live interview with  
ISS Crew.  
[+ Watch this show](#)  
[+ NASATV Info](#)

Helvetica Neue (T1) 67 medium condensed  
13 pt. smooth #FFFFFF  
↓

**MORE INFO IN THE NASA SITE NETWORK:**

NASA Site Network

GO

NASA Enterprises & Field Stations

GO



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↑  
Arial regular  
11pt html  
#000000



# NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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+ ABOUT NASA

+ NEWS & EVENTS

+ MULTIMEDIA

+ MISSIONS

+ POPULAR TOPICS

+ MyNASA

+ Home

↑  
Arial regular  
12 pt. html #FFFFFF

## Life on Earth

↑  
Section Header: Helvetica Neue (T1) 67 medium condensed  
20 pt. smooth #FFFFFF

+ IN EVERYDAY LIFE

+ LOOKING AT EARTH

+ THE ENVIRONMENT

+ NEW TECHNOLOGIES

+ LIFE SCIENCE

+ MANAGING COMPLEXITY

Choose another category: ← Arial bold 11 pt. html #006699

+ Humans in Space

← Arial regular  
11 pt. html #006699

### NASA FACT

Did you know that astronauts on the ISS don't do laundry? After wearing their clothes for two to three days, they put them in a progress cargo vehicle that burns up upon re-entry into the Earth's atmosphere.

Promo Banner 01:  
Static / Flash / Rotating flash  
363 x 123

Intro: Helvetica Neue (T1) 57 condensed  
16 pt. smooth #006699  
↓

Welcome to Life on Earth. NASA has a mission to help us all better understand and protect our planet. Learn how we are contributing to make our home a better place for all of us.

### HERE ON EARTH FEATURES

↑  
Title: Helvetica Neue (T1) 67 medium condensed  
12.5 pt. smooth #006699  
tracking: 15 pt.

← Left Nav: Helvetica Neue (T1) 67 medium condensed  
12.5 pt. smooth #333333

Feature:  
64 x 48

**Surfers Use Satellites to Chase Big Waves**  
Surf forecasters are now using near real-time meteorological data from satellites to find big waves.  
+ View feature

Feature:  
64 x 48

**Learning How to Explain the Rain**  
Recent efforts by NASA have begun to reveal some of the subtleties that drive various forms of precipitation.  
+ View feature

Feature:  
64 x 48

**NASA Joins International Ozone Study**  
NASA will join more than 350 scientists this winter to measure ozone and other atmospheric gases.  
+ View feature

### RELATED MULTIMEDIA

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

**Black Carbon**  
NASA finds how carbon particles are changing the weather in China.  
↗ View animation

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

**The Adventures of Amelia the Pigeon**  
New educational earth science multimedia adventure for children.  
↗ View adventure

↗ View more related

[View more features](#)  
multimedia

NASA Fact: Arial regular  
14 pt. html #484848

[+ View more Here on Earth features](#)

NASA Fact Title: Helvetica Neue (T1) 67 medium condensed  
14 pt. smooth #006699



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+ NEWS & EVENTS

+ MULTIMEDIA

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### Here on Earth

+ MAIN FEATURES

+ IN EVERYDAY LIFE

+ LOOKING AT EARTH

- THE ENVIRONMENT

+ NEW TECHNOLOGIES

+ LIFE SCIENCE

+ MANAGING COMPLEXITY

+ Humans in Space

+ Exploring the Universe

#### NASA FACT

Did you know that astronauts on the ISS don't do laundry?

After wearing their clothes for two to three days, they put them in a progress cargo vehicle that burns up upon re-entry into the Earth's atmosphere.

#### FEATURE

Page: 1, 2

06.12.03

### City swallowing Sand Dunes

← Article title: Arial bold  
13 pt. html #000000

NASA-supported researchers are studying the complex physics of menacing sand dunes.

↑  
All Body Copy: Arial regular  
11 pt. html #000000

Detail Image:  
maximum 332 px wide

Image Caption: Arial regular  
11 pt. html #000000

↓  
"Singing sand dunes" of the Gobi Desert

Image Credit: A royalty-free image from corbis.com

↑  
Image Credit: Arial regular  
11 pt. html #484848

sloping windward side. Watch how wind-driven sand grains appear to jump an inch or two above the dune, stinging your ankles and making the dune's surface appear to be in constant motion ever upward toward the crest.

At the dune's crest, kneel to examine closely what's happening. Watch how airborne sand grains fall and cascade down the steep lee slope in tiny avalanches. Start hiking down the lee side; notice how suddenly still the air feels, especially just past the dune's crest. You've just observed how dunes grow. More importantly, you've

#### RELATED MULTIMEDIA

##### Listen to this story

+ Streaming audio  
+ Downloadable file

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

##### The world's tallest dunes

Images from Earth Observatory  
↗ Visit Web site

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

##### An optimist in the Kalahari

Images from Earth Observatory  
↗ Visit Web site

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

##### The Taklimakan Desert

Images from Earth Observatory  
↗ Visit Web site

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

You've just witnessed how dunes grow. More importantly, you've also just seen how dunes can migrate--a grave concern in nations where the relentless advance of desert dunes is a serious threat to habitation and agriculture. In arid northern China, for example, dunes are advancing on some villages at a rate of 20 meters per year. Parts of Africa and the Middle East are likewise threatened.

How do you stop a moving sand dune? In some places people simply drench the sand with oil--it's effective, but not very good for the environment. Sand fences, like snow fences, can also help, although in many cases their design is little more than guesswork. Engineers are disadvantaged because there's no complete physical theory for the behaviour of these dunes.

"Moving sand dunes are an example of granular flow--a poorly understood branch of physics," explains James Jenkins, a professor of theoretical mechanics at Cornell University.

Detail Image:  
maximum 332 px wide

Sand dunes advancing on Nouakchott, the capital of Mauritania  
Image Credit: NASA

from the southwest for the other half--a dune will be linear. If wind direction is erratic, a dune may be star-shaped.

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Alien dunes. NASA's Mars Global Surveyor photographed these sand dunes on Mars  
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But the payoff may be significant. Not only might such characterization be useful in designing fences or other restraints effective at mitigating the advance of threatening dunes; it could also be a boon to planetary geologists.

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Authors: Trudy E. Bell, Dr. Tony Phillips

Credits: Arial regular → [Responsible NASA official](#)

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Ron Koczor ← Email link: Arial regular

Production Editor: Dr. Tony Phillips

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Curator: Bryan Walls

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NASA Official: Brian Dunbar  
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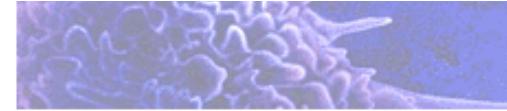


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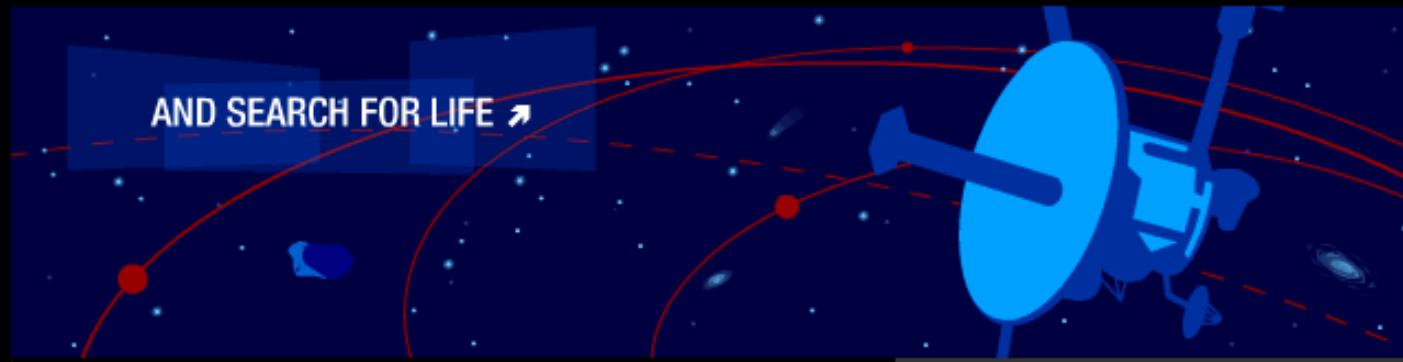


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After wearing their clothes for two to three days, they put them in a progress cargo vehicle that burns up upon re-entry into the Earth's atmosphere.

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06.12.03

### City-swallowing Sand Dunes

NASA-supported researchers are studying the complex physics of menacing sand dunes.



"Singing sand dunes" of the Gobi Desert

Image Credit: A royalty-free image from corbis.com

Next time you're at the beach or in the desert, climb a sand dune in bare feet on a windy day. Stand still in various places on the gently sloping windward side. Watch how wind-driven sand grains appear to jump an inch or two above the dune, stinging your ankles and making the dune's surface appear to be in constant motion ever upward toward the crest.

At the dune's crest, kneel to examine closely what's happening. Watch how airborne sand grains fall and cascade down the steep lee slope in tiny avalanches. Start hiking down the lee side; notice how suddenly still the air feels, especially just past the dune's crest. You've just observed how dunes grow. More importantly, you've

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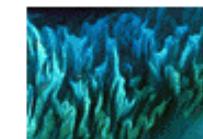
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You've just observed how dunes grow. More importantly, you've also just seen how dunes can migrate--a grave concern in nations where the relentless advance of desert dunes is a serious threat to habitation and agriculture. In arid northern China, for example, dunes are advancing on some villages at a rate of 20 meters per year. Parts of Africa and the Middle East are likewise threatened.

How do you stop a moving sand dune? In some places people simply drench the sand with oil--it's effective, but not very good for the environment. Sand fences, like snow fences, can also help, although in many cases their design is little more than guesswork. Engineers are disadvantaged because there's no complete physical theory for the behaviour of these dunes.

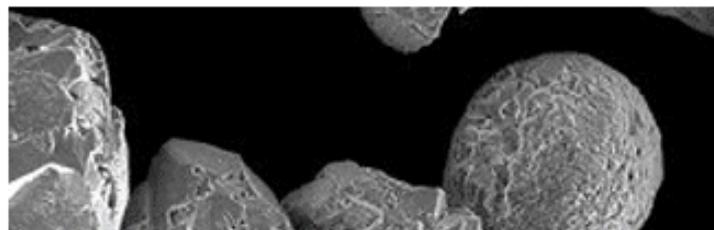
"Moving sand dunes are an example of granular flow--a poorly understood branch of physics," explains James Jenkins, a professor of theoretical mechanics at Cornell University.



Sand dunes advancing on Nouakchott, the capital of Mauritania  
Image Credit: NASA

Physicists have long had neat mathematical equations that fully describe the behavior of solids like bricks, liquids like water, and gases like air. But granular materials like sand dunes don't quite fit in any of those categories.

"Granular materials sometimes act like solids and sometimes like fluids," says Jenkins. "The transition from one behavior to the other can be very rapid." Gravel in the back of a dump truck, for example, sits virtually unmoving in a solid pile, even as the truck bed begins to tilt--until a certain angle is reached, and then suddenly it all tumbles downward in a thundering river of rock. Modern physics cannot predict the avalanche.



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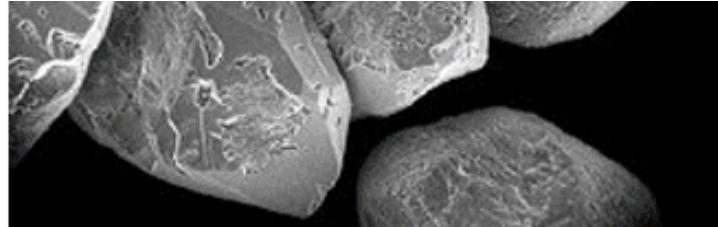
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A close-up view of ordinary sand

Image credit: NASA

Grainy substances are so hard to figure out because they're so complex. In a heap of unmoving sand, for instance, each grain interacts with five to nine immediate neighbors all at once. The transitional state, when the heap begins to move, is scarcely easier: Although each grain is simultaneously interacting with maybe only three to five neighbors, those are not the same neighbors from one moment to the next. Even a supercomputer can't keep track of all the interactions.

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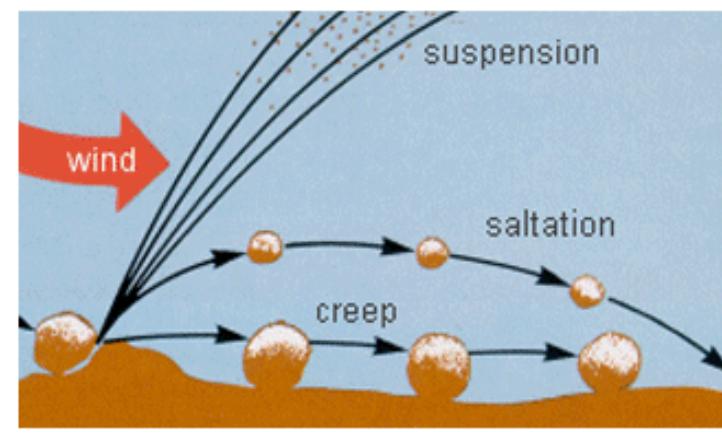
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NASA is supporting Jenkins' research to understand such flows. "Our work involves experiments, field studies, modeling, and numerical simulation of wind-blown sand," he says. "We're trying to understand the mechanisms of dune migration and what makes heaps of sand turn into moving dunes." It's all part of NASA's mission to understand and protect our home planet.

Sand dunes fascinate Jenkins (along with his collaborators in Gainesville, Florida, and Rennes, France) because they manifest three aspects of granular flow.

The first is saltation. "The word comes from the French sauter, meaning to leap or jump," Jenkins noted. Saltation happens above the gently sloping windward sides of dunes when grains are suspended in mid-air by turbulent puffs of wind, fall and strike the sand again, and then rebound and eject other grains--which then can do the same. "Under the right wind conditions, saltation can become a self-sustaining system of jumping sand grains moving along a dune," clearly visible as swaying patterns of sand about ankle height moving upward toward the dune's crest.

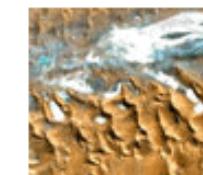


Wind causes saltation, or jumping grains, on the windward side of

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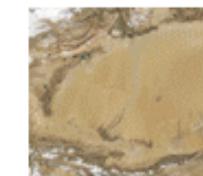
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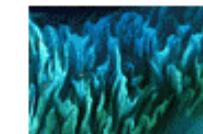
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Wind causes saltation, or jumping grains, on the windward side of sand dunes.

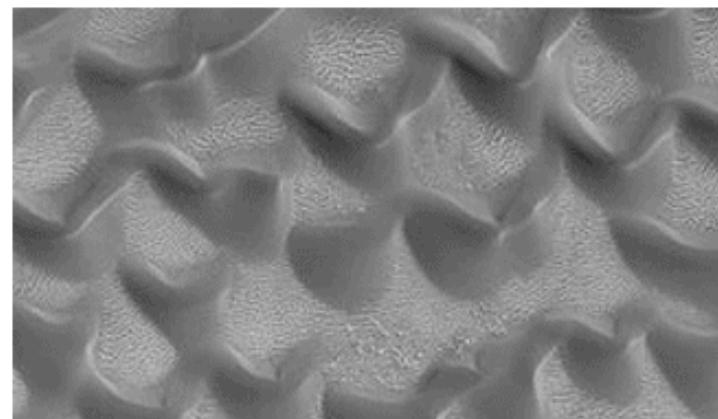
Image credit: NASA

The second is sheet flows, an extension of saltation when the wind becomes strong enough that sand grains begin to collide with one another in mid-air. "In sheet flows, the mass transferred is extremely large," Jenkins says, in some sandstorms moving entire dunes impressive distances--up to tens of meters in a major storm, enough to engulf individual houses or roads.

The third is avalanches of sand down the steep lee side of a dune. Together with sheet flows, avalanches allow an entire dune to move in a sandstorm "a little like a tank tread," Jenkins said, with sand particles continually circulating from the top to the bottom of the dune.

Jenkins's goal is to characterize sheet flows and avalanches using partial differential equations that model the movement of sand grains as if they were particles in a fluid. "These equations should contain within them the way avalanches scale with viscosity, velocity of turbulent wind, grain diameter, and gravity," he pointed out. With such equations in hand, it might be possible to anticipate the onset of dune migration, to predict where they'll go and how fast.

His goal is quite a challenge. Among other things, the exact form of an individual dune depends on the consistency of wind direction. If windblown sand comes from one prevailing direction, for example, a dune will be a crescent-shaped barchan. If winds switch direction seasonally--say, coming from the southeast for half the year and from the southwest for the other half--a dune will be linear. If wind direction is erratic, a dune may be star-shaped.



Alien dunes. NASA's Mars Global Surveyor photographed these sand dunes on Mars

Image Credit: NASA



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#### Credits & Contacts

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- Top Navigation:** Horizontal menu bar with six items: + ABOUT NASA, + NEWS & EVENTS, + MULTIMEDIA, + MISSIONS, + POPULAR TOPICS, and + MyNASA. Each item is 178px wide by 30px high.
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- + LIFE ON EARTH:** 242px wide by 30px high.
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- + EXPLORING THE UNIVERSE:** 242px wide by 30px high.

Each column features a large image at the top and a summary section below. The first column includes a "Feature" box with a thumbnail and text about saving Cajun Country. The second column includes a "Feature" box with a thumbnail and text about the Space Station Supernova. The third column includes a "Feature" box with a thumbnail and text about Neutron Star Revealed.

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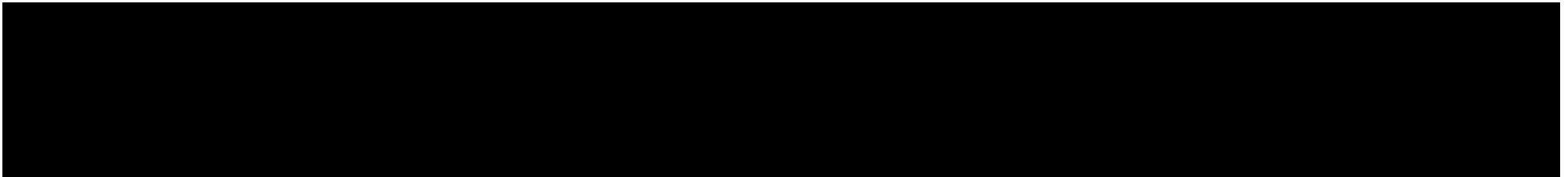
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When two Mars Exploration Rovers arrive on the red planet in January 2004, mission scientists will rely on them to make discoveries. To prepare for intense operations during the mission, NASA's scientists and engineers are working with a rover here on Earth called FIDO.  
[+ View full story](#)

## MULTIMEDIA FEATURES

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

**Image Feature**  
Cone Nebula from  
Hubble Space  
Telescope.  
[+ View this image](#)  
[+ More images...](#)

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

**Video Feature**  
Nose camera view  
of Space Shuttle  
Launch.  
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## My NASA

Thumbnail 03:  
205 x 75

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Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

**Interactive Feature**  
The Virtual Astronaut  
Interactive feature.  
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Images/ Video/  
NASA TV  
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**NASA TV**  
10.20.02  
Live interview with  
ISS Crew.  
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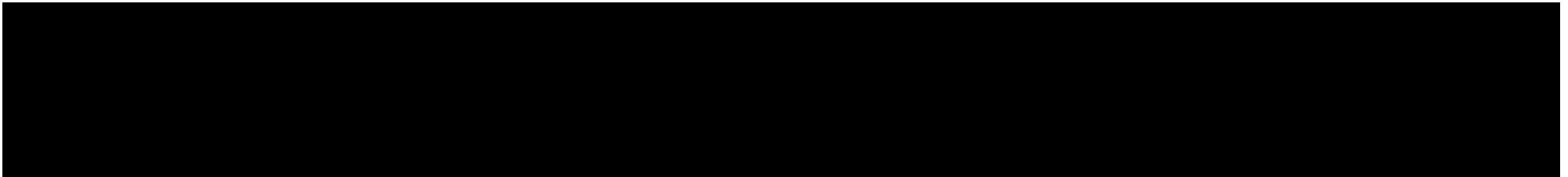
10 MORE INFO IN THE NASA SITE NETWORK: 10 10 NASA Site Network 10 10 10 10 Enterprises & Field Stations 10 10 10 10

FIRST GOV

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Author: Beth Beck  
NASA Official: Brian Dunbar  
Last Updated: November 20, 2002  
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10px

NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION

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FIND IT @ NASA :  
Enter Search Term + GO

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5px

+ Home

Promo Banner 01:  
Static / Flash / Rotating flash  
363 x 123

Promo Banner 02:  
Static / Flash  
178 x 123

15px

Life on Earth

14px

MAIN FEATURES

+ IN EVERYDAY LIFE  
+ LOOKING AT EARTH

27px

+ THE ENVIRONMENT

Welcome to Life on Earth. NASA has a mission to help us all better understand and protect our planet. Learn how we are contributing to make our home a better place for all of us.

10px

HERE ON EARTH FEATURES

Feature: 64 x 48 City-Swallowing Sand Dunes  
NASA supported researchers are studying the complex physics of menacing sand dunes.  
+ View feature

Feature: 64 x 48 SC2002 (Conference of High Performance Computing and Networking)  
NASA computing research to be showcased at conference in Baltimore.  
+ Read more about this event

Feature: 64 x 48 Surfers Use Satellites to Chase Big Waves  
Surf forecasters are now using near real-time meteorological data from satellites to find big waves.  
+ View feature

Feature: 64 x 48 Learning How to Explain the Rain  
Recent efforts by NASA have begun to reveal some of the subtleties that drive various forms of precipitation.  
+ View feature

Feature: 64 x 48 NASA Joins International Ozone Study  
NASA will join more than 350 scientists this winter to measure ozone and other atmospheric gases.  
+ View feature

15px

Choose another category:  
+ Humans in Space  
+ Exploring the Universe

25px

NASA FACT

10px

Did you know that astronauts on the ISS don't do laundry? After wearing their clothes for two to three days, they put them in a progress cargo vehicle that burns up upon re-entry into the Earth's atmosphere.

10px

Multimedia: Images/ Video/ NASA TV 100 x 75

Black Carbon  
NASA finds how carbon particles are changing the weather in China.  
+ View animation

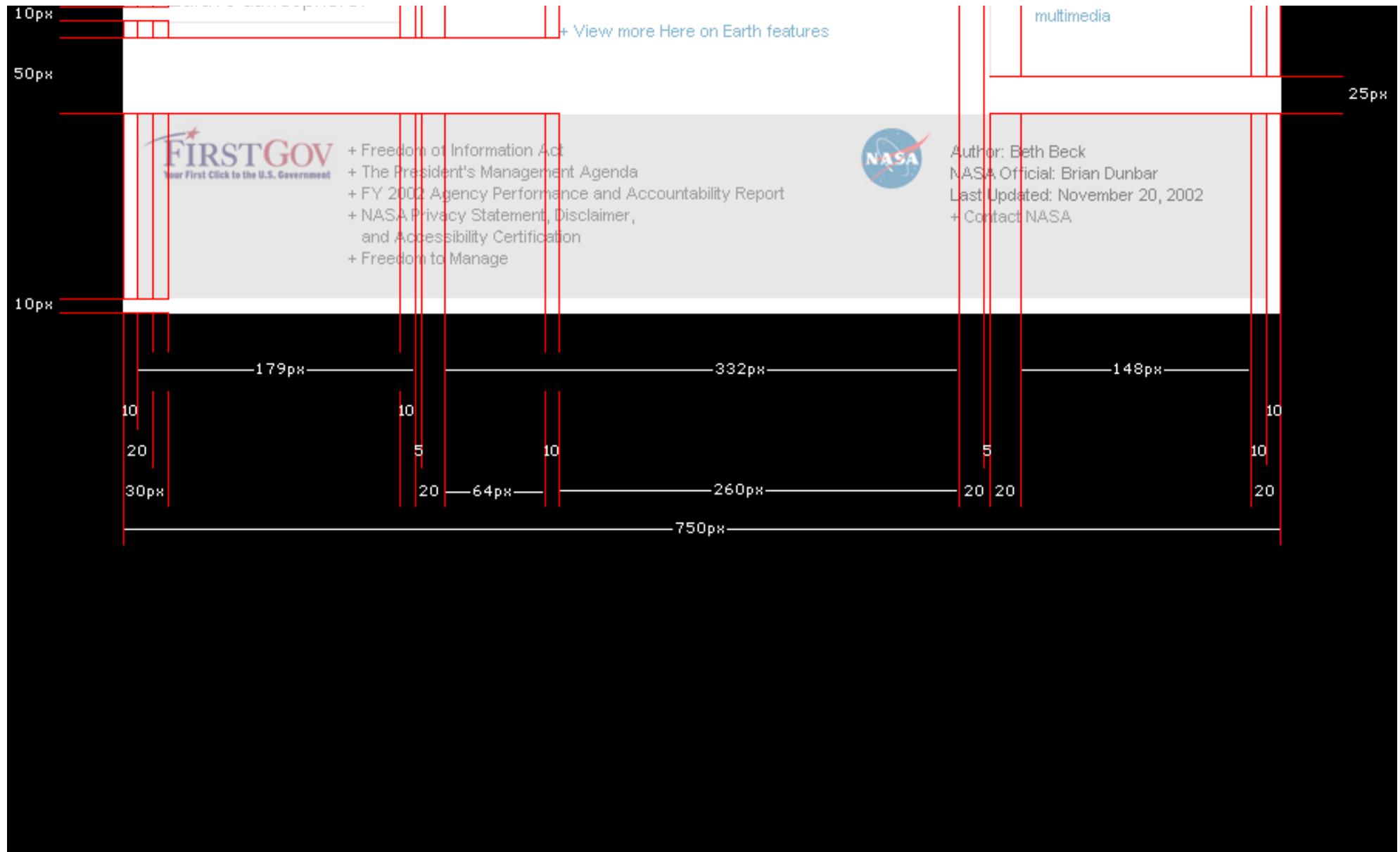
Multimedia: Images/ Video/ NASA TV 100 x 75

The Adventures of Amelia the Pigeon  
New educational earth science multimedia adventure for children.  
+ View adventure

+ View more related

+ View more Here on Earth features

multimedia



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+ Home

FEATURE

Page: 1, 2 06.12.03

## City-swallowing Sand Dunes

NASA-supported researchers are studying the complex physics of menacing sand dunes.

+ MAIN FEATURES  
+ IN EVERYDAY LIFE  
+ LOOKING AT EARTH  
**- THE ENVIRONMENT**  
+ NEW TECHNOLOGIES  
+ LIFE SCIENCE  
+ MANAGING COMPLEXITY

+ Humans in Space  
+ Exploring the Universe

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25px

**NASA FACT**

Did you know that astronauts on the ISS don't do laundry? After wearing their clothes for two to three days, they put them in a progress cargo vehicle that burns up upon re-entry into the Earth's atmosphere.

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Detail Image:  
maximum 332 px wide  
minimum 225 px wide  
minimum 125 px high

"Singing sand dunes" of the Gobi Desert  
Image Credit: A royalty-free image from corbis.com

Next time you're at the beach or in the desert, climb a sand dune in bare feet on a windy day. Stand still in various places on the gently sloping windward side. Watch how wind-driven sand grains appear to jump an inch or two above the dune, stinging your ankles and making the dune's surface appear to be in constant motion ever upward toward the crest.

At the dune's crest, kneel to examine closely what's happening. Watch how airborne sand grains fall and cascade down the steep lee slope in tiny avalanches. Start hiking down the lee side; notice how suddenly still the air feels, especially just past the dune's crest. You've just observed how dunes grow. More importantly, you've also just seen how dunes can migrate--a grave concern in nations where the relentless advance of desert dunes is a serious threat to habitation and agriculture. In arid northern China, for example, dunes are advancing on some villages at a rate of 20 meters per year. Parts of Africa and the Middle East are likewise threatened.

10px

How do you stop a moving sand dune? In some places people simply drench the sand with oil--it's effective, but not very good for the environment. Sand fences, like snow fences, can also help, although in many cases their design is little more than guesswork. Engineers are disadvantaged because there's no complete physical theory for the behaviour of these dunes.

"Granular materials sometimes act like solids and sometimes like fluids," says Jenkins. "The transition from one behavior to the other can be very rapid." Gravel in the back of a dump truck, for example, sits virtually unmoving in a solid pile, even as the truck bed begins to tilt--until a certain angle is reached, and then suddenly it all tumbles downward in a thundering river of rock. Modern physics cannot predict the avalanche interactions.

Page: 1, 2

50px

25px



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Author: Beth Beck  
NASA Official: Brian Dunbar  
Last Updated: November 20, 2002  
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480px

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30px

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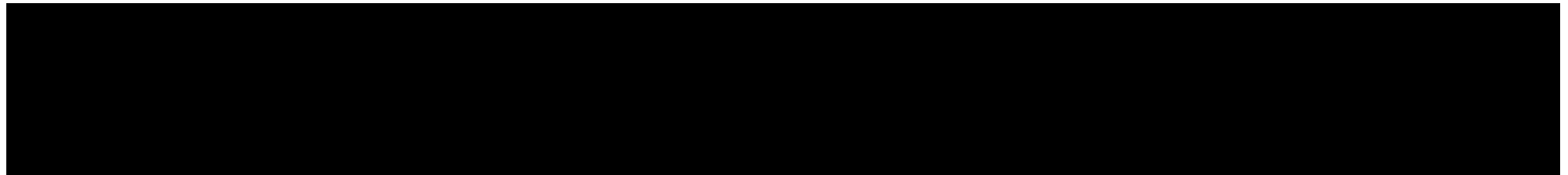
5

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750px



10px

NATIONAL AERONAUTICS  
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Enter Search Term + GO

+ ABOUT NASA + NEWS & EVENTS + MULTIMEDIA + MISSIONS + POPULAR TOPICS + MyNASA

5px

+ Home

FEATURE

Page: 1, 2 06.12.03

## City swallowing Sand Dunes

NASA-supported researchers are studying the complex physics of menacing sand dunes.

Detail Image:  
maximum 332 px wide

15px

Here on Earth

+ MAIN FEATURES  
+ IN EVERYDAY LIFE  
+ LOOKING AT EARTH  
- THE ENVIRONMENT  
+ NEW TECHNOLOGIES  
+ LIFE SCIENCE  
+ MANAGING COMPLEXITY

15px

+ Humans in Space  
+ Exploring the Universe

25px

NASA FACT

10px

Did you know that astronauts on the ISS don't do laundry? After wearing their clothes for two to three days, they put them in a progress cargo vehicle that burns up upon re-entry into the Earth's atmosphere.

10px

RELATED MULTIMEDIA

Listen to this story  
+ Streaming audio  
+ Downloadable file

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

The world's tallest dunes  
Images from Earth Observatory  
↗ Visit Web site

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

An optimist in the Kalahari  
Images from Earth Observatory  
↗ Visit Web site

Multimedia:  
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100 x 75

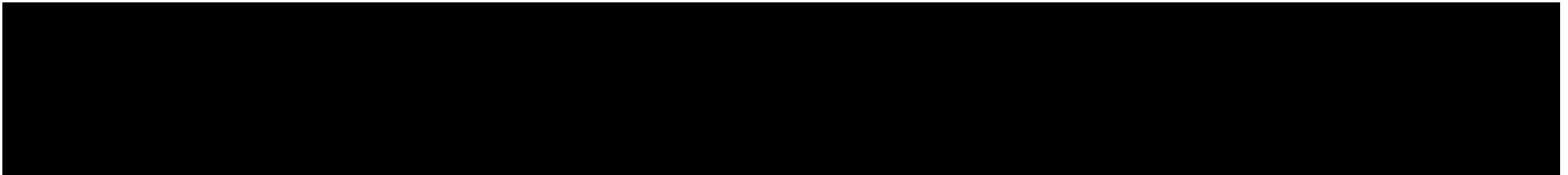
The Taklimakan Desert  
Images from Earth Observatory  
↗ Visit Web site

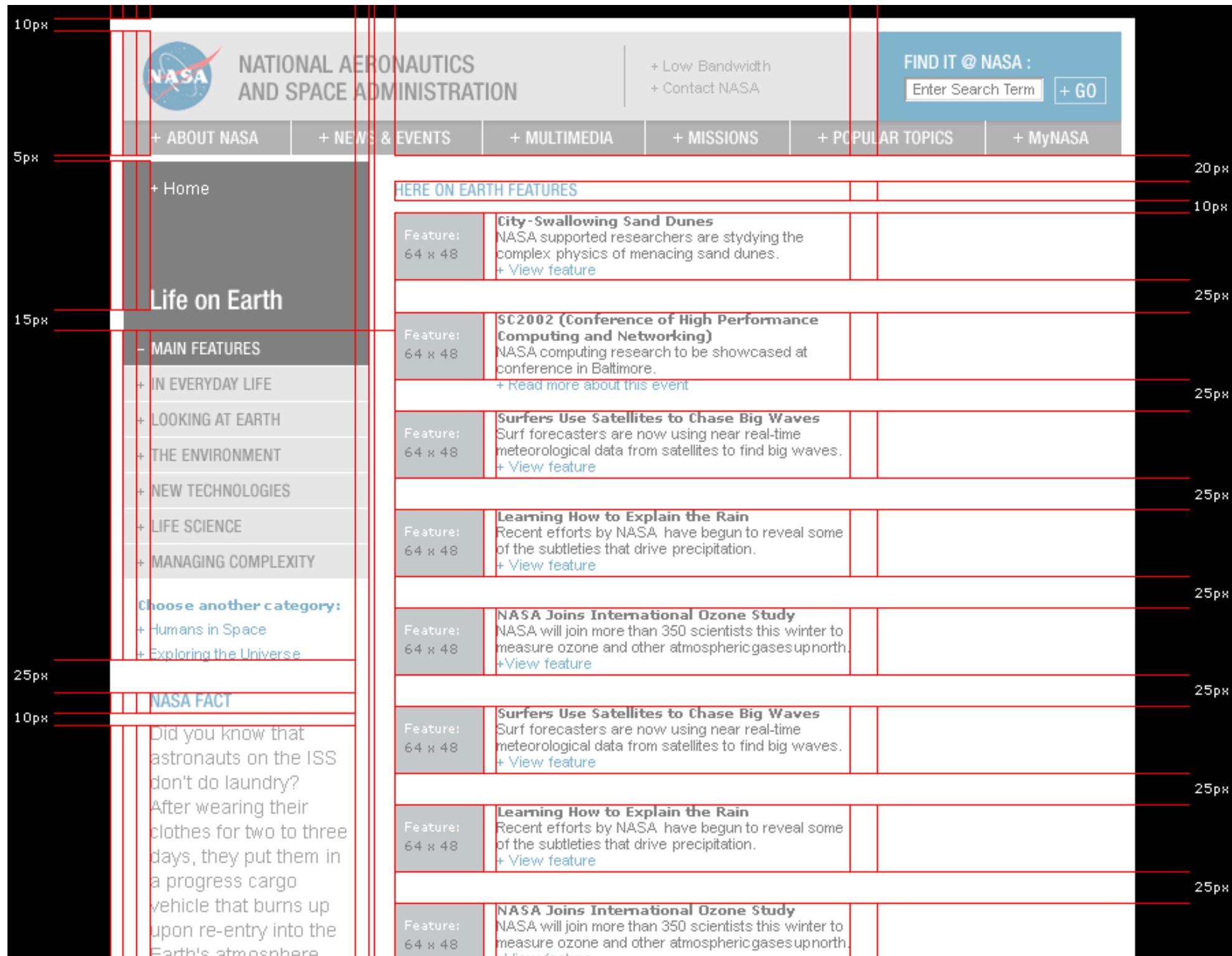
Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

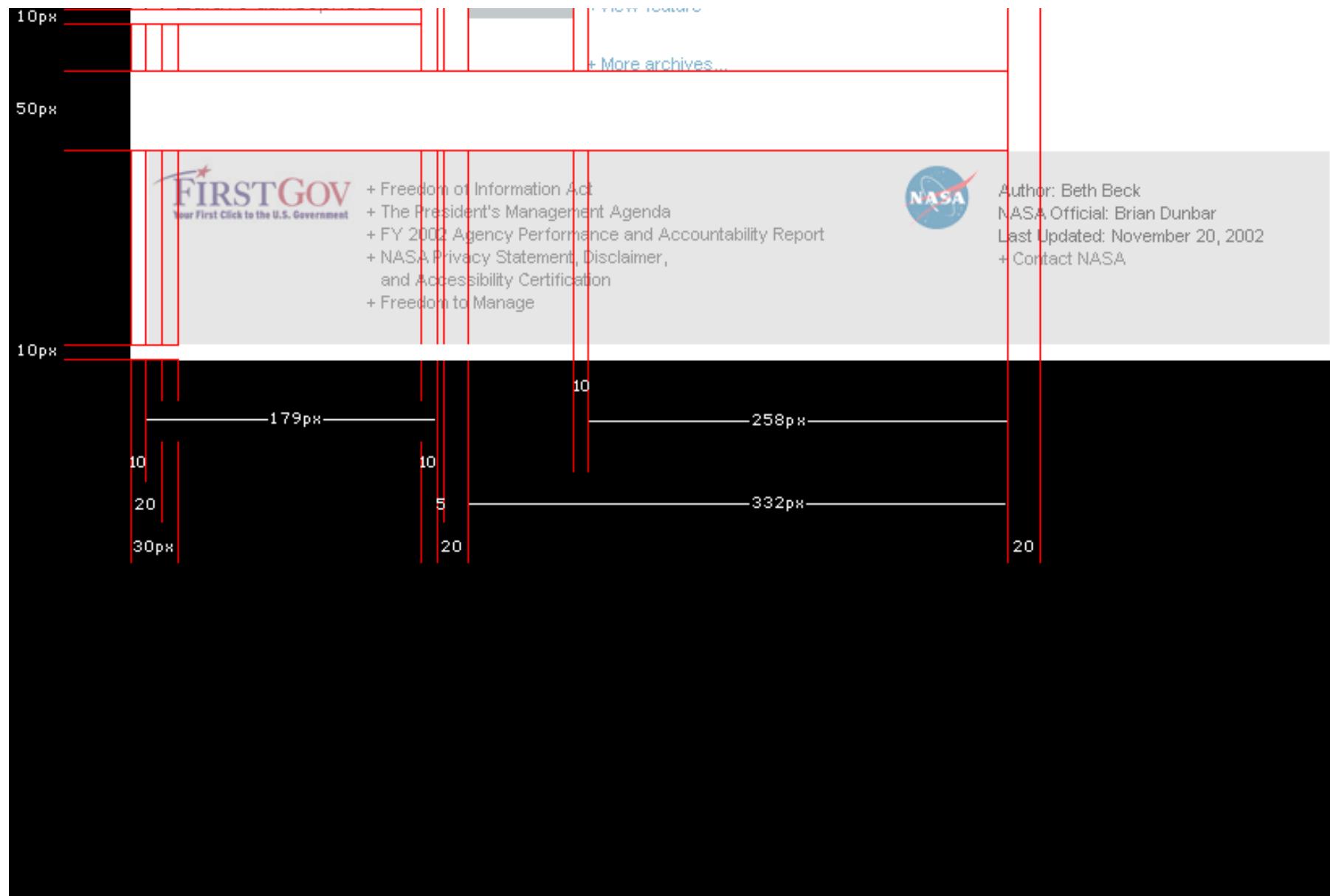
Ocean Sand, Bahamas

The diagram illustrates a 2-column web layout structure with the following dimensions:

- Top Bar:** 10px height.
- Content Area:** Total width is 750px.
  - Left Column:** 179px wide.
  - Right Column:** 571px wide.
- Margin Between Columns:** 10px.
- Bottom Margin:** 20px.
- Image Dimensions:** A close-up view of ordinary sand (image credit: NASA) is 332px wide and 20px high.
- Page Number:** Page: 1, 2
- Related Web Links:** A sidebar on the right contains several links with associated widths:
  - NASA's Office of Biological & Physical Research: 85px wide.
  - The Physics of Sandcastles: 85px wide.
  - Particle Segregation in Collisional Shearing Flows: 85px wide.
  - Desertification and encroaching dunes: 85px wide.
  - China battles against sand invasion (BBC): 85px wide.
- Footer:** 50px height.







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AND SPACE ADMINISTRATION

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+ Home

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Static / Flash / Rotating flash  
363 x 123

Promo Banner 02:  
Static / Flash  
178 x 123

Multimedia

+ MULTIMEDIA HIGHLIGHTS

+ IMAGE GALLERY  
+ VIDEO GALLERY  
+ INTERACTIVE FEATURES  
+ NASA TV

Welcome to the NASA Multimedia Gallery. Experience NASA through our great selection of images, video, and interactive features.

IMAGE FEATURE

NASA TV

Image of the day  
215 x 161

Multimedia:  
Images/ Video/  
NASA TV  
100 x 75

NASA TV  
10.20.02 Live interview with the ISS Crew  
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NASA FACT

Did you know that every day, the Hubble Space Telescope archives 3 to 5 gigabytes of data and delivers between 10 and 15 gigabytes to astronomers all over the world?

+ More NASA Facts...

NASA image of the day  
+ View more information on this image  
+ More NASA images...

RELATED NASA SITES

Copernica Arts Program  
Interact with original artwork commissioned to chronicle the wonders, risks and triumphs of space exploration

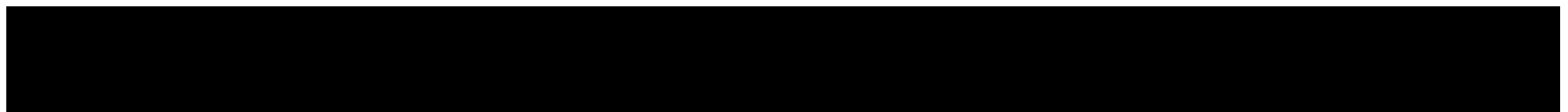
VIDEO FEATURES

STS-107 Crew Cabin Video  
Video footage taken by the crew during re-entry on Feb. 1. The video lasts approximately 13 minutes and is introduced by Astronaut Scott Altman.  
View the video (RealMedia)  
View (RealMedia Mirror 1)  
View (RealMedia Mirror 2)  
+ More videos

Astronomy Picture of the Day  
Each day a different image or photograph of our fascinating universe is featured, along with a brief explanation written by a professional astronomer  
Visit site

25px

INTERACTIVE FEATURES		NASA Image Exchange
Multimedia: Images/ Video/ NASA TV 100 x 75	<b>Interactive Columbia image gallery</b> See an interactive tribute to the Columbia crew and the events from February 1, 2003 <a href="#">View this interactive feature</a>	Entry point for performing searches for NASA photographs and images at multiple NASA Centers <a href="#">Visit site</a>  <a href="#">+ More Related NASA sites...</a>
Multimedia: Images/ Video/ NASA TV 100 x 75	<b>Interactive weather satellite imagery</b> See your weather coming from miles away! This interactive viewer allows you view the latest images from global weather satellites <a href="#">View this interactive feature</a>	<a href="#">+ More interactive features...</a>
50px		
 Your First Click to the U.S. Government		+ Freedom of Information Act + The President's Management Agenda + FY 2002 Agency Performance and Accountability Report + NASA Privacy Statement, Disclaimer, and Accessibility Certification + Freedom to Manage
		
		Author: Beth Beck NASA Official: Brian Dunbar Last Updated: November 20, 2002 <a href="#">+ Contact NASA</a>
10px		
179px 332px 148px		
10	10	5
20	20	5
30px	20	20
750px		
10	10	10
20	20	20



The screenshot shows the NASA website's layout with various menu items and a featured image.

**Header:**

- NASA logo
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
- + Low Bandwidth
- + Contact NASA
- FIND IT @ NASA : Enter Search Term + GO

**Top Navigation:**

- + ABOUT NASA
- NEWS & EVENTS
- + MULTIMEDIA
- + MISSIONS
- + POPULAR TOPICS
- + MyNASA

**Left Sidebar (Multimedia):**

- + Home
- Multimedia**
- + MULTIMEDIA HIGHLIGHTS
- IMAGE GALLERY**
- + VIDEO GALLERY
- + INTERACTIVE FEATURES
- + NASA TV

**Section Headings:**

- IMAGE OF THE DAY**
- Cone Nebula**

**Text:**

520 x 390 pixels

**NASA FACT**

Did you know that every day, the Hubble Space Telescope archives 3 to 5 gigabytes of data and delivers between 10 and 15 gigabytes to astronomers all over the world?

+ More NASA Facts...

**Text (Image Description):**

Cones, pillars, and majestic flowing shapes abound in stellar nurseries where natal clouds of gas and dust are buffeted by energetic winds from newborn stars. A well-known example, the Cone Nebula within the bright galactic star-forming region NGC 2264, was captured in this close-up view from the Hubble Space Telescope's newest camera. While the Cone Nebula, about 2,500 light-years away in Monoceros, is around 7 light-years long, the region pictured here surrounding the cone's blunted head is a mere 2.5 light-years across. In our neck of the galaxy that distance is just over half way from the Sun to its nearest stellar neighbor, Alpha Centauri. The massive star NGC 2264 IRS, seen by Hubble's infrared camera in 1997, is the likely source of the wind sculpting the Cone Nebula and lies off the top of the image. The Cone Nebula's reddish veil is produced by glowing hydrogen gas.

image Credit: NASA  
+ View high res (5 mb)

20px  
15px  
5px  
5px

[+ View next image](#)  
[+ Return to gallery index](#)

50px



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NASA Official: Brian Dunbar  
Last Updated: November 20, 2002  
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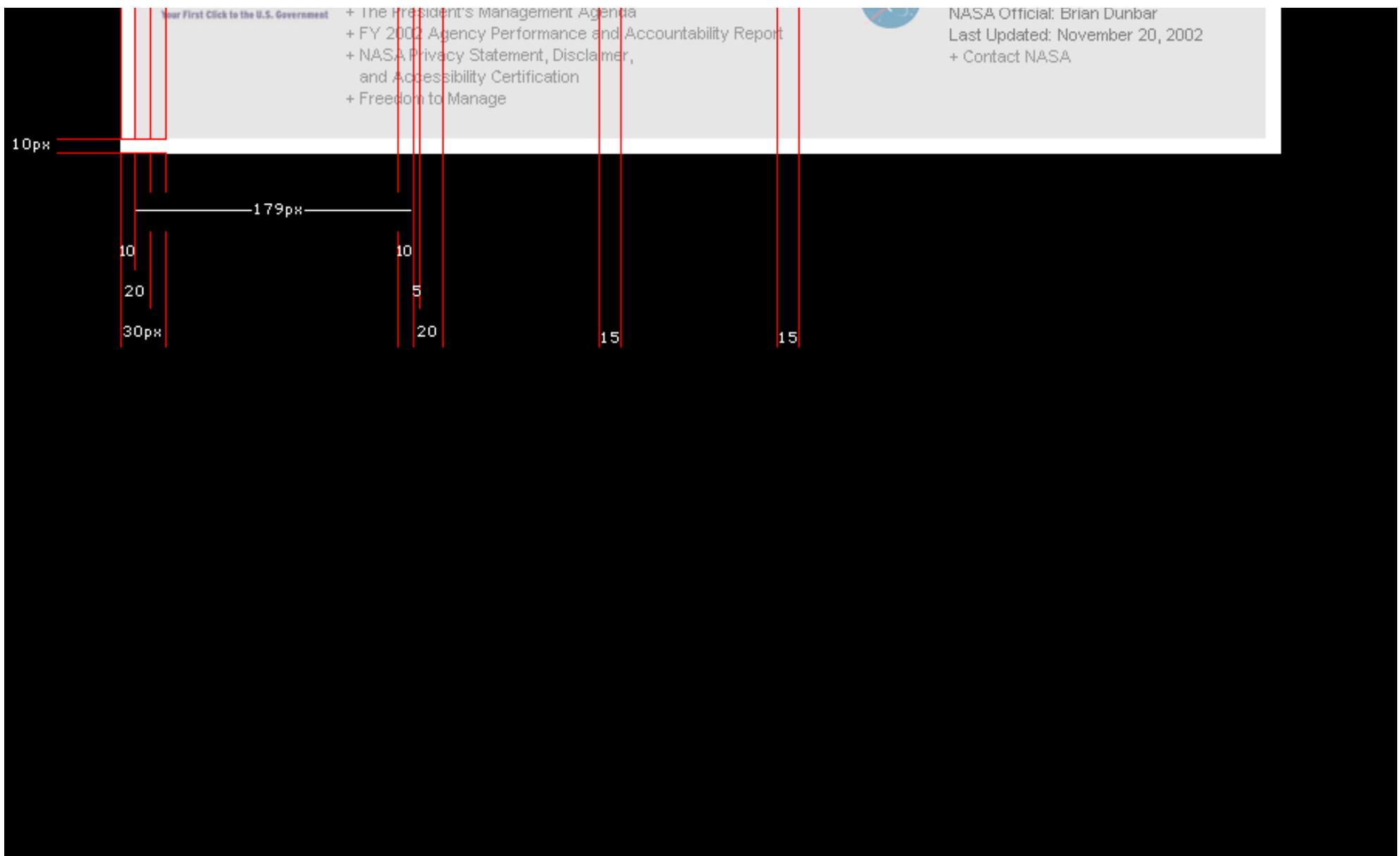
The screenshot shows the layout of the NASA website with various sections and their dimensions:

- Header:** 10px top padding.
- NASA Logo:** Located at the top left.
- Section Headers:** "NATIONAL AERONAUTICS AND SPACE ADMINISTRATION" and "Multimedia".
- Navigation Bar:** Includes links for "ABOUT NASA", "NEWS & EVENTS", "MULTIMEDIA", "MISSIONS", "POPULAR TOPICS", and "MyNASA".
- Search Function:** "FIND IT @ NASA" with a search bar and "GO" button.
- Image of the Day Archive:** A section titled "IMAGE OF THE DAY ARCHIVE" containing three placeholder boxes labeled "100 x 75 pixels".
- Related NASA Sites:** A section titled "RELATED NASA SITES" with two entries:
  - Astronomy Picture of the Day:** Describes daily image/photograph features with a professional astronomer. Includes a "Visit site" link.
  - NASA Image Exchange:** Entry point for searching NASA photographs and images at multiple NASA Centers. Includes a "Visit site" link.
- Multimedia Section:** Contains links for "MULTIMEDIA HIGHLIGHTS", "IMAGE GALLERY" (highlighted in blue), "VIDEO GALLERY", "INTERACTIVE FEATURES", and "NASA TV".
- NASA Fact:** A section titled "NASA FACT" with a fact about the Hubble Space Telescope's data archiving.
- Footer:** Includes the "FIRST GOV" logo, a "Freedom of Information Act" link, the NASA logo, and author information ("Author: Beth Beck").

Margin and padding values are indicated by red lines and labels throughout the layout:

- 10px (top padding)
- 5px (padding between header and navigation)
- 15px (padding between navigation and multimedia section)
- 25px (padding between multimedia section and NASA fact)
- 10px (padding between NASA fact and footer)
- 25px (padding between footer and bottom)
- 50px (padding between bottom and bottom-most element)
- 20px (padding between right edge of related sites and right edge of page)
- 10px (padding between right edge of related sites and right edge of page)
- 15px (padding between right edge of related sites and right edge of page)
- 15px (padding between right edge of related sites and right edge of page)
- 15px (padding between right edge of related sites and right edge of page)
- 25px (padding between right edge of footer and right edge of page)

NASA Official: Brian Dunbar  
Last Updated: November 20, 2002  
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+ Home

Multimedia

+ MULTIMEDIA HIGHLIGHTS

+ IMAGE GALLERY

+ VIDEO GALLERY

+ INTERACTIVE FEATURES

+ NASA TV

**NASA FACT**

Did you know that every day, the Hubble Space Telescope archives 3 to 5 gigabytes of data and delivers between 10 and 15 gigabytes to astronomers all over the world?

+ More NASA Facts...

**MULTIMEDIA ARCHIVE**

**Multimedia item 1**  
10.20.02 Text description of multimedia item fills this space here  
+ Link to quick time version  
+ Link to real media version  
+ Link to windows media version

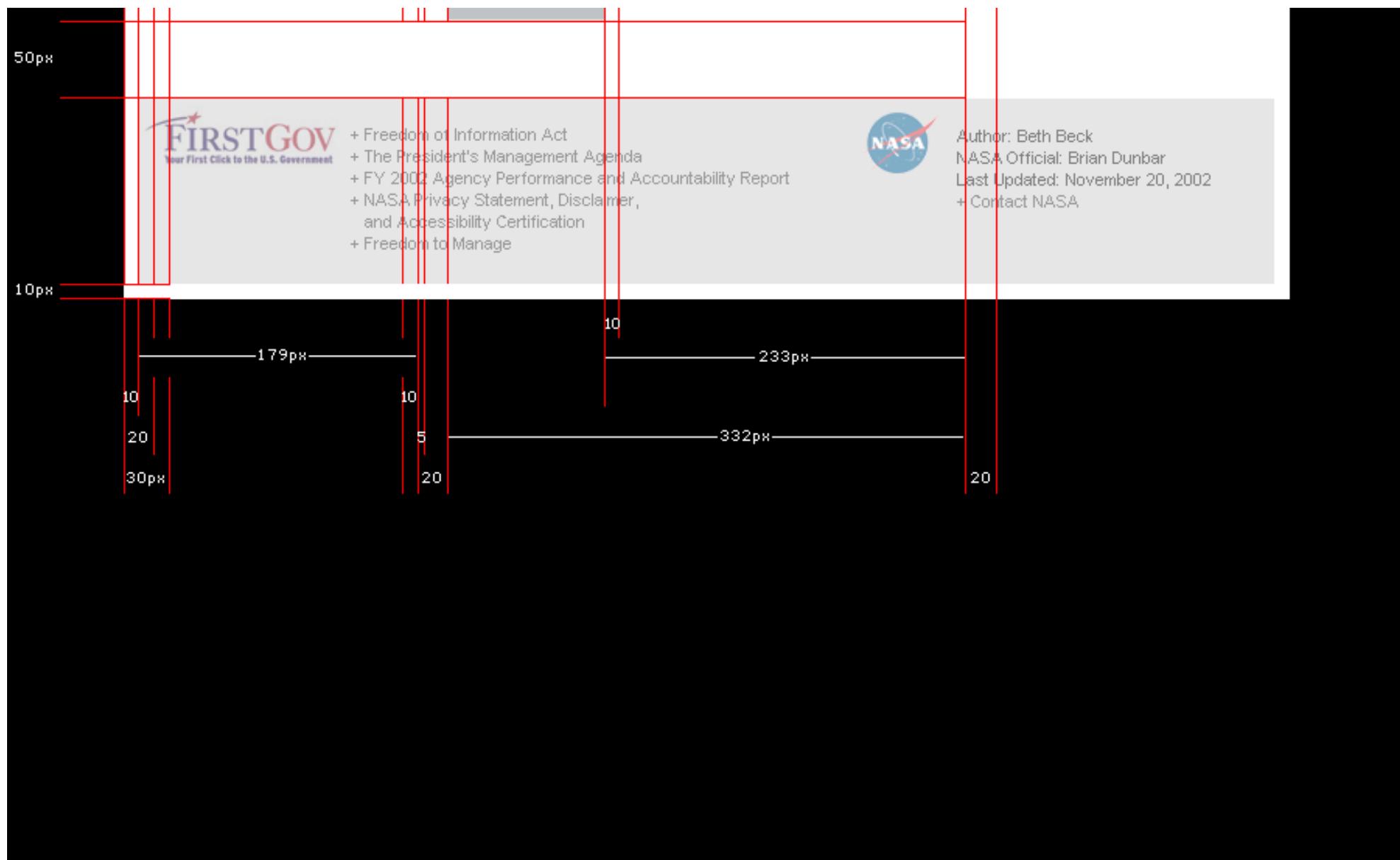
**Multimedia item 2**  
10.20.02 Text description of multimedia item fills this space here  
+ Link to quick time version

**Multimedia item 3**  
10.20.02 Text description of multimedia item fills this space here  
+ Link to quick time version  
+ Link to real media version

**Multimedia item 4**  
10.20.02 Text description of multimedia item fills this space here  
+ Link to quick time version  
+ Link to windows media version

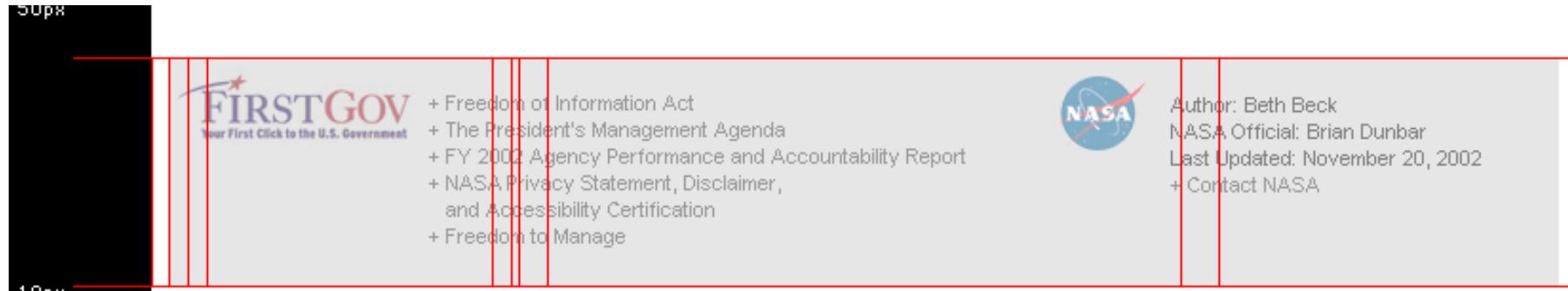
**Multimedia item 5**  
10.20.02 Text description of multimedia item fills this space here  
+ Link to windows media version

**Multimedia item 6**  
10.20.02 Text description of multimedia item fills this space here  
+ Link to windows media version



The diagram illustrates the layout of the NASA News Archive page with the following dimensions:

- Header:** 10px top padding.
- NASA Logo:** 10px left padding.
- Header Content:** 10px left padding for "NATIONAL AERONAUTICS AND SPACE ADMINISTRATION".
- Header Links:** 10px left padding for "+ Low Bandwidth" and "+ Contact NASA".
- Search Bar:** "FIND IT @ NASA :" (10px), "Enter Search Term" (10px), "+ GO" (10px).
- Main Menu:** + ABOUT NASA (10px), - NEWS & EVENTS (10px), + MULTIMEDIA (10px), + MISSIONS (10px), + POPULAR TOPICS (10px), + MyNASA (10px).
- Left Sidebar:** 5px top padding, 15px left padding for "+ Home" and "News and Events".
  - + THIS WEEKS HIGHLIGHTS
  - + LAUNCHES AND DOCKINGS
  - + SPECIAL EVENTS
  - + VISITING NASA
  - + AGENCY NEWS
  - + MISSION NEWS
  - + RESEARCH NEWS
  - NEWS ARCHIVE** (highlighted in blue)
- Right Content Area:** 20px right padding, 10px bottom padding.
  - Webchat With Astronaut William Pogue**  
00.00.00 Thursday, November 14 offers two webcasts and one chat opportunity to meet and ask questions of retired astronaut William Pogue.  
[+ View feature](#)
  - Last Chance to See Meteor Shower until 2099**  
00.00.00 Sky watchers will have an opportunity to see the most dramatic light show of the past several decades.  
[+ View feature](#)
  - NASA Sponsors Student Robotics Competition**  
00.00.00 Heavy metal will rock-and-roll at seven different locations across the country early next year.  
[+ View feature](#)
  - SeaWINDS Instrument Ready for Flight**  
00.00.00 At Japan's Tanegashima Space Center, preparations continue for the Dec. 14 launch of Japan's Advanced Earth Observation Satellite II.  
[+ View feature](#)
  - Webchat With Astronaut William Pogue**  
00.00.00 Thursday, November 14 offers two webcasts and one chat opportunity to meet and ask questions of retired astronaut William Pogue.  
[+ View feature](#)
  - Last Chance to See Meteor Shower until 2099**  
00.00.00 Sky watchers will have an opportunity to see the most dramatic light show of the past several decades.  
[+ View feature](#)
  - NASA Sponsors Student Robotics Competition**  
00.00.00 Heavy metal will rock-and-roll at seven different locations across the country early next year.  
[+ View feature](#)
  - SeaWINDS Instrument Ready for Flight**  
00.00.00 At Japan's Tanegashima Space Center, preparations continue for the Dec. 14 launch of Japan's Advanced Earth Observation Satellite II.  
[+ View feature](#)
- Bottom Padding:** 25px left padding, 10px top padding, 10px bottom padding.
- Footer:** 10px left padding for "Did you know that NASA is also working to improve life on earth? From medical devices to better tires, from satellite imaging to remote sensing, NASA is helping make our home a better place to live."



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179px

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# NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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+ Home

## NASA FACTS

Did you know that NASA is also working to improve life on earth?

From medical devices to better tires, from satellite imaging to remote sensing, NASA is helping make our home a better place to live.

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Did you know that NASA is also working to improve life on earth?

From medical devices to better tires, from satellite imaging to remote sensing, NASA is helping make our home a better place to live.

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Did you know that NASA is also working to improve life on earth? From medical devices to better tires, from satellite imaging to remote sensing, NASA is helping make our home a better place to live.

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Page: 1, 2, 3, 4, 5, 6, 7

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NASA Official: Brian Dunbar  
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+ INTERNET  
+ MULTIMEDIA  
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+ For Students 5-6  
+ For Students 7-12  
+ For Students Post Secondary

**did you know?**  
That on the moon you  
can jump 20 feet in the  
air? Way more than you  
can on Earth...  
+ Click here to find out why

**what does it mean?**

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Static / Flash / Rotating flash  
363 x 123

Promo Banner 02:  
Static / Flash  
178 x 123

**STUDENT FEATURES**

Kids feature: 80 x 60   **In Search of Moon Trees**  
Said the little acorn to the new maple, "My father was a mighty oak." Said the maple back, "My father was a Moon tree!"  
+ Find out what a Moon Tree is

**MULTIMEDIA**

Kids Multimedia: 120 x 90   **Image of the day**

+ Look at this image  
+ View more images...

Kids feature: 80 x 60   **Put Your Name On Mars**  
Send your name in to NASA and have it added to a DVD that will be sent to Mars!  
+ Send your name to Mars!

**NASA Space Club**

Kids Multimedia: 120 x 90   + Join the Space Club

Kids feature: 80 x 60   **Meet Me at the Space Station**  
Hello everybody! I'm MC the robot. Join me and i will take you on a tour of the Space Station travelling around Earth.  
+ Come on, let's go check it out  
+ More student features

**RELATED SITES**

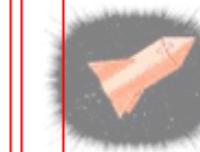
Space Kids

NASA Quest

STARCHILD

(Click on a word below to  
find out what it means)

- + Black Hole
- + Comet
- + Gravity
- + Meteor
- + more words...



The Space  
Place

20px

50px



- + Freedom of Information Act
- + The President's Management Agenda
- + FY 2002 Agency Performance and Accountability Report
- + NASA Privacy Statement, Disclaimer,  
and Accessibility Certification
- + Freedom to Manage



Author: Beth Beck  
NASA Official: Brian Dunbar  
Last Updated: November 20, 2002  
+ Contact NASA

20

179px

5 20

10

233px

20

5

20

10

138px

10px 5px 5px 15px 5px 25px 10px 10px 10px 25px 10px 10px 10px 20px

NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION

+ Low Bandwidth  
+ Contact NASA

FIND IT @ NASA :  
Enter Search Term + GO

+ INFO FOR MOM & DAD + INFO FOR TEACHERS + CHILDREN'S PROTECTION ACT

+ Home

Greetings  
Kid Earthlings!

+ KIDS MAIN PAGE

**GAMES**

**CARTOONS**

**ACTIVITIES**

did you know?

That on the moon you can jump 20 feet in the air? Way more than you can on Earth...  
+ Click here to find out why

What does it mean?  
(Click on a word below to find out what it means)

+ Black Hole  
+ Comet  
+ Gravity  
+ Meteor  
+ Nebulae

PROMO

PROMO

NEW FOR KIDS!

Feature →  
64x48  
↓ 80x60

Thumbnails for the kids pages are scaled up in HTML from the standard sizes.

Put Your Name On Mars  
Send your name in to NASA and have it added to a DVD that will be sent to Mars!  
+ Send your name to Mars!

Meet Me at the Space Station  
Hello everybody! I'm MC the robot. Join me and i will take you on a tour of the Space Station travelling around Earth.  
+ Come on, let's go check it out

Multimedia:  
Images/ Videos/  
Games/ TV →  
100x75  
↓ 120x90

Earth & Sun by Tuska  
+ Look at this image  
+ View more images...

+ Join the Space Club

NASA EMAIL CREW

Title title title...  
+ Look at this image  
+ Get Email updates here!

+ CHECK OUT MORE NASA STUFF...

Space Kids

COOL NASA SITES!

STARCHILD

http://hubble.etouch.net/support/standards/images/section1/1\_4/01\_template\_specs/15\_kids\_main.gif (1 of 2) 11/25/2003 6:58:51 AM

The screenshot shows the layout of the NASA Kids website. At the top, there's a navigation bar with links like 'Ozone', 'Quasars', 'More words...', 'NASA Quest', 'The Space Place', 'NASAKIDS', 'AERO-VENTURE', and '+ SEE MORE COOL SITES...'. Below the navigation, there's a section for 'FIRST GOV' with links to various government documents. To the right of this is a NASA logo and contact information for Beth Beck and Brian Dunbar. The main content area has a width of 750px and includes sections for 'Freedom of Information Act', 'The President's Management Agenda', 'FY 2002 Agency Performance and Accountability Report', 'NASA Privacy Statement, Disclaimer, and Accessibility Certification', and 'Freedom to Manage'. The layout uses a grid system with red lines indicating margins and widths.

15px 170px

+ Ozone  
+ Quasars  
+ More words...

NASA Quest

The Space Place

NASAKIDS

AERO-VENTURE

+ SEE MORE COOL SITES...

50px

10px

FIRST GOV  
Your First Click to the U.S. Government

+ Freedom of Information Act  
+ The President's Management Agenda  
+ FY 2002 Agency Performance and Accountability Report  
+ NASA Privacy Statement, Disclaimer, and Accessibility Certification  
+ Freedom to Manage

179px

10 10 10 10

20 5 5 20

30px 750px

Author: Beth Beck  
NASA Official: Brian Dunbar  
Last Updated: November 20, 2002  
+ Contact NASA

**WHAT DOES IT MEAN?**

[x CLOSE](#)

Aurora

<p>Reference Image</p>  <p>215 x 161</p>	<p>Aurora over Alaska Image credit: NASA <a href="#">+ View larger image</a></p>
--	--

-20-

A glow in the sky, seen often in a ring-shaped region around the magnetic poles ("auroral zone") and occasionally further equatorward. The name comes from an older one, "aurora borealis," Latin for "northern dawn," given because an aurora near the northern horizon (its usual location when seen in most of Europe) looks like the glow of the sky preceding sunrise. Also known as "northern lights," although it occurs both north and south of the equator.

The aurora is generally caused by fast electrons from space, guided earthward by magnetic field lines, and its light comes from collisions between such electrons and the atoms of the upper atmosphere, typically 100 km (60 miles) above ground.

**CHECK OUT THE LINKS BELOW TO FIND OUT MORE**

NASA Aurora Observatory  
[+ View site](#)

30

10

10



NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION

10px

NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION

+ ABOUT NASA + NEWS & EVENTS + MULTIMEDIA + MISSIONS + POPULAR TOPICS + MyNASA

5px

+ Home

MyNASA tour banner:  
Static / Flash  
546 x 123

15px

14px

Welcome to MyNASA. Register or log in to your account for NASA information customized to suit your needs.

27px

MyNASA BENEFITS

Register for MyNASA and get the NASA information you want. Customize your MyNASA page with content and channels of interest to you and archive any articles or features throughout NASA.gov for quick access during future visits.

+ Register for MyNASA

LOG IN TO MyNASA

Email

Password

+ SIGN IN

Forgot your password?  
Enter your email address below and we will send it to you.

Email

+ SUBMIT

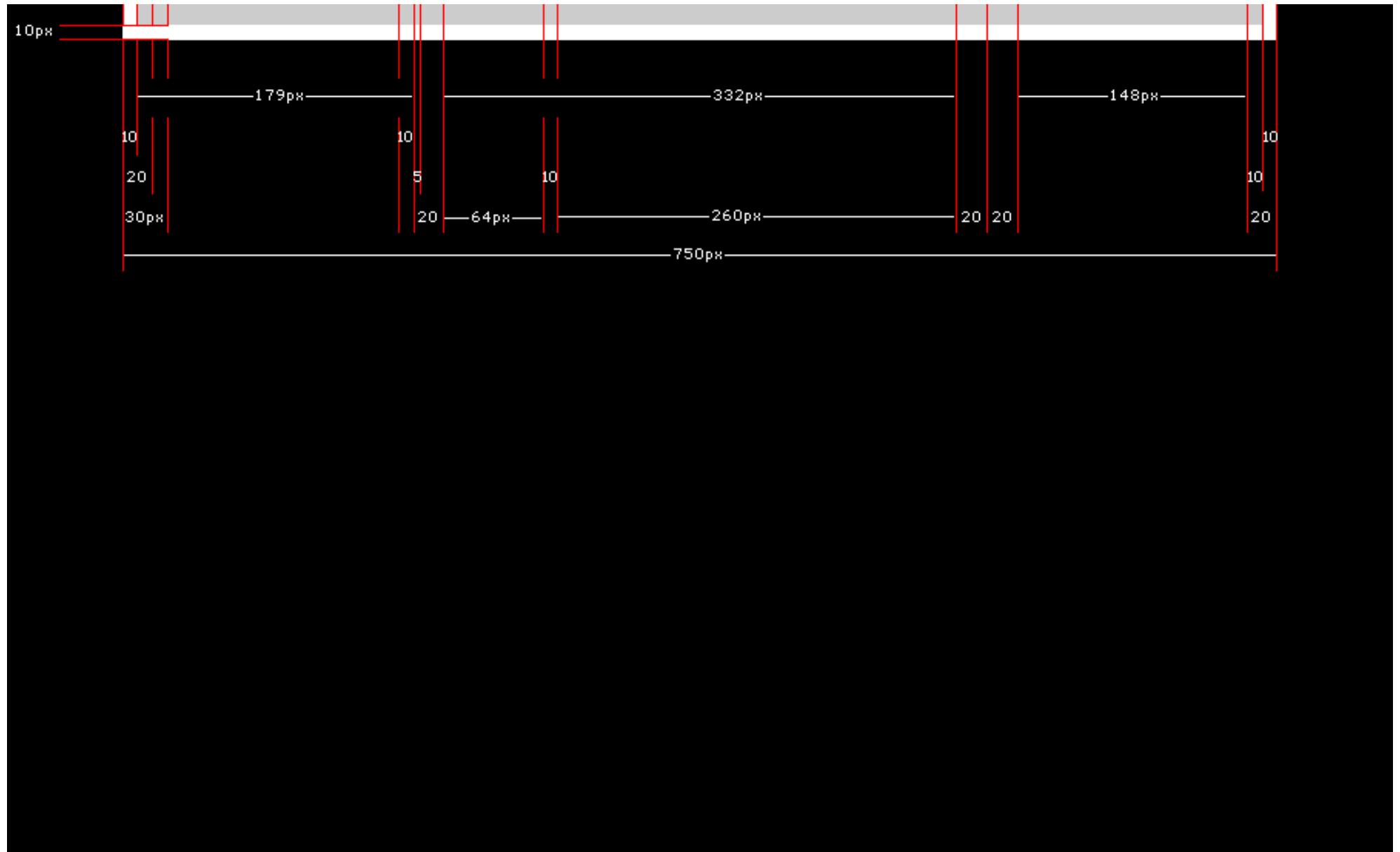
50px

FIRST GOV  
Your First Click to the U.S. Government

+ Freedom of Information Act  
+ The President's Management Agenda  
+ FY 2002 Agency Performance and Accountability Report  
+ NASA Privacy Statement, Disclaimer, and Accessibility Certification  
+ Freedom to Manage

NASA

Author: Beth Beck  
NASA Official: Brian Dunbar  
+ Comments and Questions



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FIND IT @ NASA :  
Enter Search Term + GO

+ ABOUT NASA + NEWS & EVENTS + MULTIMEDIA + MISSIONS + POPULAR TOPICS - MyNASA

+ Home Welcome Mark  
+ LOG OUT

+ Change Image / Image Credits

MyNASA

+ MyNASA HOME

+ BOOKMARKED ARTICLES

+ EDIT CHANNELS

+ EDIT PERSONAL PROFILE

+ MyNASA HELP

NASA NEWSLETTER

Receive all of the latest news direct from NASA.

+ Sign up

+ More Aeronautics articles

AERONAUTICS

**Solar Powered Flight**  
Pathfinder-Plus flies higher than any previous propeller-driven aircraft, its wings also converted sunlight into power.  
+ View Feature  
+ Bookmark Feature

**Experimental Aircraft**  
The newest line of Reusable Launch Vehicles  
+ View Video  
+ Bookmark Feature

**Experimental Aircraft**  
The newest line of Reusable Launch Vehicles  
+ View Video  
+ Bookmark Feature

NASA INVENTIONS

**Robotic Explorers**  
Making them more agile and autonomous  
+ View Feature  
+ Bookmark feature

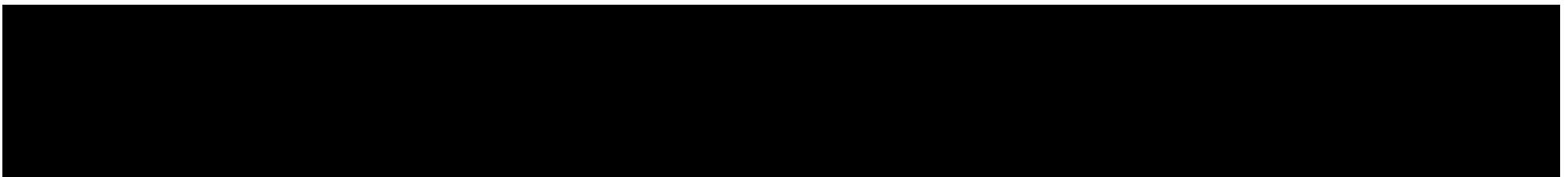
**Heat Resistant Fabric**  
The latest materials designed to protect us in harsh environments

**Robotic Explorers**  
Making them more agile and autonomous  
+ View Feature  
+ Bookmark feature

**Heat Resistant Fabric**  
The latest materials designed to protect us in harsh environments

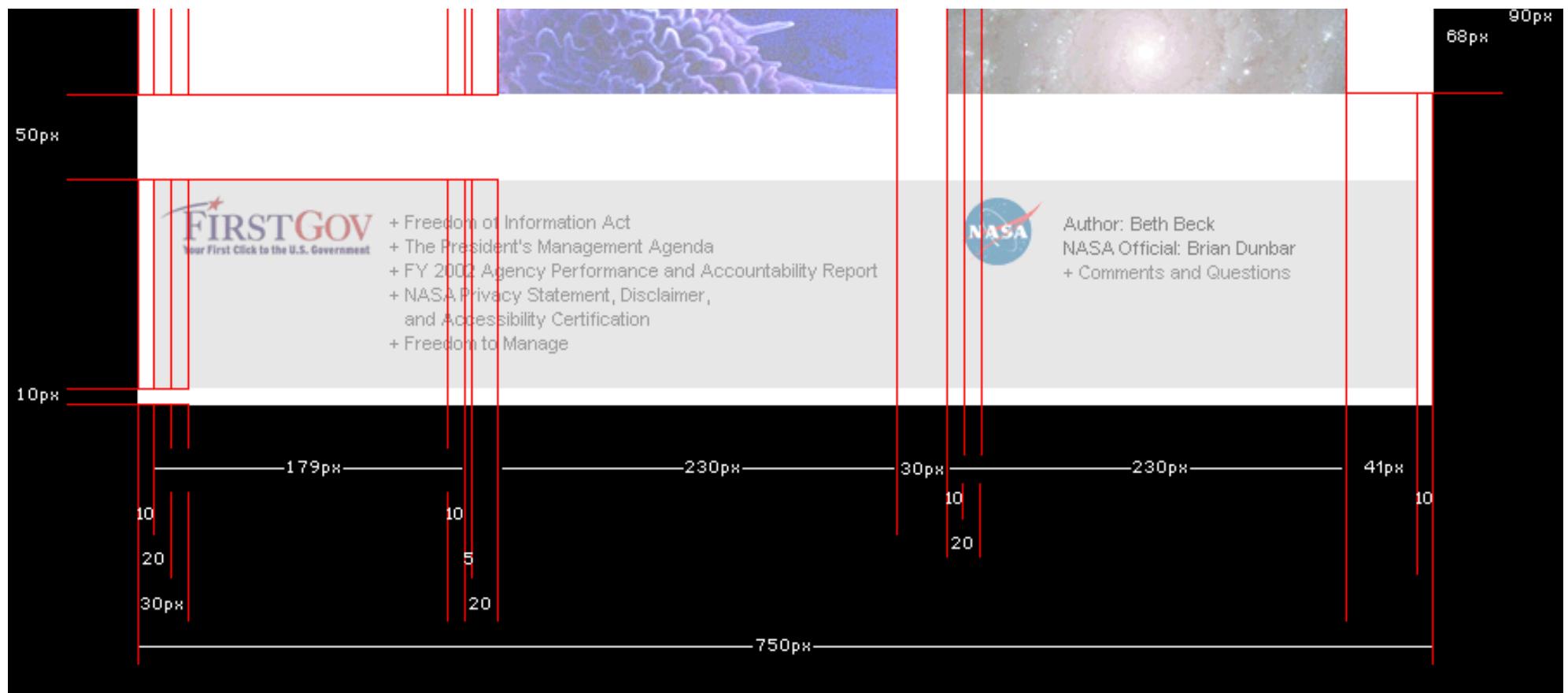
The diagram illustrates a web page layout with the following dimensions and key elements:

- Header:** A dark grey header bar at the top.
- Left Sidebar:** A vertical black sidebar on the left side of the page.
- Main Content Area:** The central area containing the main content.
- Astronomy Section:** A section titled "ASTRONOMY" with two items:
  - "Comet Watch": A brilliant display will be visible in the coming months.  
+ View Feature  
+ Bookmark feature
  - "Comet Watch": A brilliant display will be visible in the coming months.  
+ View Feature  
+ Bookmark feature
- Inventions Section:** A section with a link "+ More NASA Inventions articles".
- Footer:** A light grey footer bar at the bottom.
- Footer Links:** A column of links on the left side of the footer:
  - FIRST GOV Your First Click to the U.S. Government
  - + Freedom of Information Act
  - + The President's Management Agenda
  - + FY 2002 Agency Performance and Accountability Report
  - + NASA Privacy Statement, Disclaimer, and Accessibility Certification
  - + Freedom to Manage
- Footer Contact:** A column of contact information on the right side of the footer:
  - NASA logo
  - Author: Beth Beck
  - NASA Official: Brian Dunbar
  - + Comments and Questions
- Dimensions:** The main content area has a width of 750px. The footer links area is 179px wide, and the footer contact area is 166px wide. Various padding and margin values are indicated by red lines and numbers throughout the layout.



The screenshot shows the NASA website's Popular Topics landing page. A vertical red grid is overlaid on the page to indicate layout dimensions.

- Top Bar:** 10px height. Contains the NASA logo, the text "NATIONAL AERONAUTICS AND SPACE ADMINISTRATION", and a search bar labeled "FIND IT @ NASA : Enter Search Term + GO".
- Header Navigation:** 5px height. Includes links for "+ ABOUT NASA", "+ NEWS & EVENTS", "+ MULTIMEDIA", "+ MISSIONS", "- POPULAR TOPICS", and "+ MyNASA".
- Left Sidebar:** 15px height. Labeled "Popular Topics". Below it is a list of links:
  - + POPULAR TOPICS MAIN PAGE
  - + LOOKING AT EARTH
  - + AERONAUTICS
  - + NASA TECHNOLOGY
  - + NASA IN THE LAB
  - + THE SPACE SHUTTLE
  - + INTERNATIONAL SPACE STATION
  - + OUR SOLAR SYSTEM
  - + STARS AND GALAXIES
- Main Content Area:** 27px height. A large image of a person looking up at stars. To its right is a sidebar:
  - A SPACE OF YOUR OWN. MyNASA**  
Customize your own NASA page with images and content. +
- Content Panels:** The main content area is divided into several panels:
  - + LOOKING AT EARTH**: An image of Earth from space.
  - + AERONAUTICS**: An image of an aircraft in flight.
  - + NASA TECHNOLOGY**: An image of a close-up of a technological component.
  - + NASA IN THE LAB**: An image of a laboratory environment.
  - + THE SPACE SHUTTLE**: An image of a space shuttle in orbit.
  - + THE INTERNATIONAL SPACE STATION**: An image of the International Space Station.
  - + OUR SOLAR SYSTEM**: An image showing celestial bodies like planets and a comet.
  - + STARS AND GALAXIES**: An image of a star field or galaxy.
- Bottom Left:** 20px height. Labeled "MyNASA". Below it is a description: "A space of your own. Get the NASA information that's important to you".
- Bottom Right:** 22px height. A small section labeled "+ MyNASA Registration / Log in".



## Visual affinity

### Overview

NASA's challenge lies in unifying a disparate network of sites to achieve a more consistent look and feel throughout the NASA network. The affinity top banners and footer have been provided to allow both content (rich media) and sites on the NASA network to adopt an affinity with the NASA.gov look and feel.

Additionally source code and detailed specifications have been created for use by webmasters able to adopt a higher level of visual affinity. This creates pages on a black background with a centered white area that is 750 pixels wide. The header and footer should have a 10 pixel margin on either side within the white area.

#### Header 1 [High Level Affinity](#)

#### Header 2 [High Level Affinity](#)

#### Header 3 [High Level Affinity](#)

#### Header 4 - Rich Media Popup

### Footer



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FIND IT @ NASA :



Direct to People!  
[science.nasa.gov](http://science.nasa.gov)



## The Roar of Innovation

**The space shuttle's main engines are the best performing chemical rockets on Earth. You can listen to one roar during a live webcast of a engine test-firing on Nov. 8th.**

Listen to this story via [streaming audio](#), a [downloadable file](#), or [get help](#).

**Nov. 6, 2002:** They can lift 375,000 pounds and outrun a speeding bullet. They consume fuel that's colder than interstellar space, yet their exhaust is as hot as a small star. Three of them working together unleash as much power as 23 Hoover dams.

They're the space shuttle's main engines (SSMEs).

Onlookers who have seen the shuttle take off and land many times might be excused for thinking the engines must be old technology. What else could be so reliable? In fact, says NASA engineer Everett Runkle, the shuttle's engines are cutting-edge.

"The SSMEs are the best-performing engines on Earth," he says. They have a specific impulse (a measure of fuel efficiency) of 450 seconds--higher than any other chemical rocket. "If we wanted a better combination of power and 'gas mileage,' we would have to go to nuclear propulsion."



**Above:** A space shuttle main engine undergoes a full-power test firing at the Stennis Space Center in Mississippi. [[more](#)]

Even more remarkable, perhaps, is their resiliency.

Consider this: Almost every rocket engine ever launched lies in pieces at the bottom of the sea or scattered across remote terrains. "Most rocket engines are built to fly just once," explains Runkle. "They deliver their payload to space and then fall back to Earth." An Apollo moon rocket is a good example. "When we launched Saturn V rockets during the Apollo program," he recalls, "the first two stages of the rocket would be discarded during ascent. They ended up in the Pacific Ocean. A third stage, the S-IVB, was either crashed into the Moon or sent into orbit around the Sun."

The shuttle's main engines, on the other hand, are not disposable. "We bring 'em intact back after every trip," he says. Most have flown 20 or more times and they are designed for 100 missions.



## How do these engines work?

"It's a little like a car engine," he answers. "In an automobile, gas is injected into a combustion chamber and a spark plug lights it off. The explosion pushes a piston, which provides force to move the car."



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Author: Beth Beck  
NASA Official: Brian Dunbar  
Last Updated: January 8, 2003  
+ Contact NASA



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# Mars Exploration

OVERVIEW SCIENCE TECHNOLOGY MISSIONS NEWSROOM CLASSROOM EVENTS GALLERY

MARS HOME JPL HOME SPOTLIGHT RELATED SITES SEARCH:

## FunZone



## Current Missions

Mars Global Surveyor

1896 days in orbit

2001 Mars Odyssey

384 days in orbit

Mars Exploration Rover Mission Countdown

## All Mars Missions

Communications with Earth

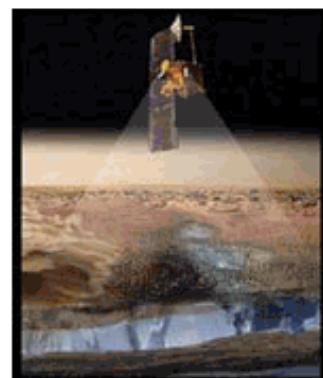
Odyssey Webcast Info

Rover Naming Contest   
Enter here!

Imagine Mars

Mars Student Imaging Project

## LIVE WEBCAST - Mars Odyssey Scientists Share Their Adventures!



November 14, 2002  
9:00 a.m. - 10:00 a.m. Pacific

Join the Principal Investigators for the 2001 Mars Odyssey mission as they explain Odyssey's initial discoveries and take questions from schools, museums and employees at the Jet Propulsion Laboratory during a live interactive webcast broadcast from JPL's von Karman auditorium. [\[more...\]](#)

Odyssey Wins Popular Science's "Best of What's New Award"! [\[more...\]](#)

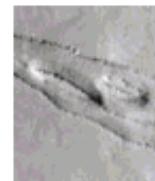
## Send Your Name to Mars



Last Chance to [Send your Name to Mars!](#)

Find out more about the [Mars Exploration Rover Mission!](#)

## ► IMAGE OF THE DAY



Mars Odyssey Image for Nov 08, 2002:  
**Elysium Fossae**  
[High-resolution version](#)  
located at the Arizona State University THEMIS web site

## ► LATEST IMAGES



[Mars Exploration Rover Makes Progress](#)

## ► SPOTLIGHT



[JPL's Bionic Woman, Dr. Ayanna Howard](#)



[Building Blocks and Designing Students](#)



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[Classroom](#) | [Events](#) | [Gallery](#)

[JPL Home](#) | [Mars Home](#) | [Spotlight](#) | [Search](#)

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Author: Beth Beck  
NASA Official: Brian Dunbar  
Last Updated: January 8, 2003  
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# Mars Exploration

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[MARS HOME](#) [JPL HOME](#) [SPOTLIGHT](#) [RELATED SITES](#) [SEARCH:](#) 
**FunZone**

**Current Missions**
**Mars Global Surveyor**

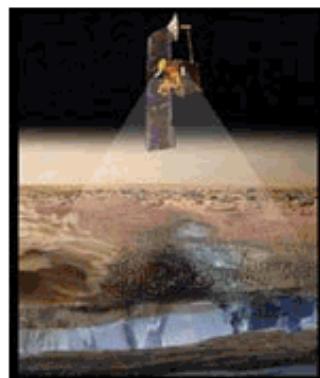
1896 days in orbit

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384 days in orbit

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**All Mars Missions**
**Communications with Earth**
**Odyssey Webcast Info**
**Rover Naming Contest** [Enter here!](#)
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Odyssey Wins Popular Science's "Best of What's New Award"! [\[more...\]](#)

## Send Your Name to Mars

**Send Your Name to Mars Hurry! Project ends Nov. 15th**
**Last Chance to Send your Name to Mars!**

Find out more about the [Mars Exploration Rover Mission](#)!

**► IMAGE OF THE DAY**


Mars Odyssey Image for Nov 08, 2002:  
**Elysium Fossae**  
[High-resolution version](#)  
 located at the Arizona State University THEMIS web site

**► LATEST IMAGES**


[Mars Exploration Rover Makes Progress](#)

**► SPOTLIGHT**


[JPL's Bionic Woman, Dr. Avanna Howard](#)



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[JPL Home](#) | [Mars Home](#) | [Spotlight](#) | [Search](#)

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Author: Beth Beck  
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Last Updated: January 8, 2003  
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## EXPEDITION 7

HISTORY  
MISSION  
CREWS  
IMAGES

# HISTORY

History

Soyuz History

Soyuz Elements

## RUSSIAN SOYUZ

Soyuz means *UNION* Soyuz-TM is the Russian manned spacecraft that typically ferries three crewmembers to and from Mir. It was also available as an escape vehicle in the event Mir experienced a life-threatening situation, and was used as a *FLY-AROUND* vehicle in the vicinity of Mir. U.S. Mir astronaut Norman Thagard is the only American to have launched in a Soyuz, although several international Mir crewmembers have launched and returned in Soyuz spacecraft. U.S. Mir astronaut Jerry Linenger took part in a *FLY-AROUND* of Mir. Soyuz-TM has a mass of 7,100 Kg, a length of seven meters, a maximum diameter of 2.7 meters, and a pressurized volume of 10 cubic meters. After re-entering the atmosphere, a Soyuz capsule deploys parachutes, then fires braking rockets when it is just





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### Audience Segmentation Navigation:

[For Kids](#)

[For Students grade K - 7](#), [For Students Grade 7 - 12](#), [For Students Post Secondary](#)

[For Educators Grade K - 7](#), [For Educators Grade 7 - 12](#), [For Educators Post Secondary](#)

[For Media and Press](#)

### NASA's Vision Features, Life on Earth:

#### Saving Cajun Country

Satellite imaging to help save Native American sites

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#### SOLVE Campaign Launches

Measuring ozone and other atmospheric gases in the Arctic

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#### Black Carbon

NASA discovers how carbon particles are changing the weather in China

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#### Saving Cajun Country

Satellite imaging to help save Native American sites

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#### Black Carbon

NASA discovers how carbon particles are changing the weather in China

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### NASA's Vision Features, Exploring the Universe:

#### Saving Cajun Country

Satellite imaging to help save Native American sites

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#### SOLVE Campaign Launches

Measuring ozone and other atmospheric gases in the Arctic

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## Black Carbon

NASA discovers how carbon particles are changing the weather in China

[Read this article](#)

## What's new at NASA

---

### 11.07.02 - Strike Warning

A new lightning index that uses measurements of water vapor in the atmosphere from Global Positioning Systems has improved lead-time for predicting thunderstorms.

[Read this article](#)

### 11.18.02 - Scientists Boost Tally at Uranus

A new moon of the planet Uranus has been discovered and confirmed by a team of astronomers including Dr. Christophe Dumas of NASA's Jet Propulsion Laboratory.

[Read this article](#)

### 10.25.02 - Scientists Test Rover at 'Mars Camp'

When two Mars Exploration Rovers arrive on the red planet in January 2004, mission scientists will rely on them to make discoveries. To prepare for intense operations during the mission, NASA's scientists and engineers are working with a rover here on Earth called FIDO.

[Read this article](#)

## NASA Events

---

### 19th Endeavor Mission Live on NASA TV

[View more information on this event](#)

[View full events schedule](#)

### Watch A Launch

[Launch Information and Schedule](#)

### Visit NASA

[NASAVisitor's information](#)

## Multimedia Features

---

### Image Feature Cone Nebula from Hubble Space Telescope

[View this image](#)

[More images...](#)

### Video Feature Nose camera view of Space Shuttle Launch

[View Video](#)

[More Videos...](#)

### Interactive Feature The Virtual Astronaut

[Interactive feature](#)

[Visit site](#)

[More features...](#)

### NASA TV 10.20.02 Live interview with ISS Crew

[Watch this show](#)

[NASATV Info](#)

## MyNASA

---

[Take the tour](#)

[Register now](#)

**Login to MyNASA**

**Sign in**

**More info in the NASA Site Network:**

NASA Site Network

**GO**

NASA Enterprises & Field Stations

**GO**



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Author: Beth Beck

NASA Official: Brian Dunbar

Last Updated: November 20, 2002

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## Welcome to Life on Earth.

NASA has a mission to help us all better understand and protect our planet. Learn how we are contributing to make our home a better place for all of us.

### Life on Earth Navigation:

[MAIN FEATURES](#)

[IN EVERYDAY LIFE](#)

[LOOKING AT EARTH](#)

[THE ENVIRONMENT](#)

[NEW TECHNOLOGIES](#)

[LIFE SCIENCE](#)

[MANAGING COMPLEXITY](#)

### Choose another category:

[Humans in Space](#)

[Exploring the Universe](#)

### Life on Earth Features:

#### **City-Swallowing Sand Dunes**

NASA supported researchers are studying the complex physics of menacing sand dunes.

[Read this article](#)

#### **SC2002 (Conference of High Performance Computing and Networking)**

NASA computing research to be showcased at conference in Baltimore.

[Read about this event](#)

#### **Surfers Use Satellites to Chase Big Waves**

Surf forecasters are now using near real-time meteorological data from satellites to find big waves.

[Read this article](#)

#### **Learning How to Explain the Rain**

Recent efforts by NASA have begun to reveal some of the subtleties that drive various forms of precipitation.

[Read this article](#)

#### **NASA Joins International Ozone Study in Arctic**

NASA will join more than 350 scientists this winter to measure ozone and other atmospheric gases up north.

[Read this article](#)

[up arrow](#)  
[Read this article](#)

[View more Here on Earth features](#)

## NASA Fact

Did you know that astronauts on the ISS don't do laundry?

After wearing their clothes for two to three days, they put them in a progress cargo vehicle that burns up upon re-entry into the Earth's atmosphere.

## Related Multimedia

### Black Carbon

NASA finds how carbon particles are changing the weather in China.

[Play animation](#)

### The Adventures of Amelia the Pigeon

New educational earth science multimedia adventure for children.

[Launch this adventure](#)

[More related multimedia](#)



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### City-swallowing Sand Dunes

NASA-supported researchers are studying the complex physics of menacing sand dunes.

"Singing sand dunes" of the Gobi Desert

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Next time you're at the beach or in the desert, climb a sand dune in bare feet on a windy day. Stand still in various places on the gently sloping windward side. Watch how wind-driven sand grains appear to jump an inch or two above the dune, stinging your ankles and making the dune's surface appear to be in constant motion ever upward toward the crest.

At the dune's crest, kneel to examine closely what's happening. Watch how airborne sand grains fall and cascade down the steep lee slope in tiny avalanches. Start hiking down the lee side; notice how suddenly still the air feels, especially just past the dune's crest.

You've just observed how dunes grow. More importantly, you've also just seen how dunes can migrate--a grave concern in nations where the relentless advance of desert dunes is a serious threat to habitation and agriculture. In arid northern China, for example, dunes are advancing on some villages at a rate of 20 meters per year. Parts of Africa and the Middle East are likewise threatened.

How do you stop a moving sand dune? In some places people simply drench the sand with oil--it's effective, but not very good for the environment. Sand fences, like snow fences, can also help, although in many cases their design is little more than guesswork. Engineers are disadvantaged because there's no complete physical theory for the behaviour of these dunes.

although in many cases their design is little more than guesswork. Engineers are disadvantaged because there's no complete physical theory for the behaviour of these dunes.

"Moving sand dunes are an example of granular flow--a poorly understood branch of physics," explains James Jenkins, a professor of theoretical mechanics at Cornell University.

Sand dunes advancing on Nouakchott, the capital of Mauritania

Image Credit: NASA

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Physicists have long had neat mathematical equations that fully describe the behavior of solids like bricks, liquids like water, and gases like air. But granular materials like sand dunes don't quite fit in any of those categories.

"Granular materials sometimes act like solids and sometimes like fluids," says Jenkins. "The transition from one behavior to the other can be very rapid." Gravel in the back of a dump truck, for example, sits virtually unmoving in a solid pile, even as the truck bed begins to tilt--until a certain angle is reached, and then suddenly it all tumbles downward in a thundering river of rock. Modern physics cannot predict the avalanche.

A close-up view of ordinary sand

Image credit: NASA

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Grainy substances are so hard to figure out because they're so complex. In a heap of unmoving sand, for instance, each grain interacts with five to nine immediate neighbors all at once. The transitional state, when the heap begins to move, is scarcely easier: Although each grain is simultaneously interacting with maybe only three to five neighbors, those are not the same neighbors from one moment to the next. Even a supercomputer can't keep track of all the interactions.

NASA is supporting Jenkins' research to understand such flows. "Our work involves experiments, field studies, modeling, and numerical simulation of wind-blown sand," he says. "We're trying to understand the mechanisms of dune migration and what makes heaps of sand turn into moving dunes." It's all part of NASA's mission to understand and protect our home planet.

Sand dunes fascinate Jenkins (along with his collaborators in Gainesville, Florida, and Rennes, France) because they manifest three aspects of granular flow.

The first is saltation. "The word comes from the French sauter, meaning to leap or jump," Jenkins noted. Saltation happens above the gently sloping windward sides of dunes when grains are suspended in mid-air by turbulent puffs of wind, fall and strike the sand again, and then rebound and eject other grains--which then can do the same. "Under the right wind conditions, saltation can become a self-sustaining system of jumping sand grains moving along a dune," clearly visible as swaying patterns of sand about ankle height moving upward toward the dune's crest.

Wind causes saltation, or jumping grains, on the windward side of sand dunes.

Image credit: NASA

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The second is sheet flows, an extension of saltation when the wind becomes strong enough that sand grains begin to collide with one another in mid-air. "In sheet flows, the mass transferred is extremely large," Jenkins says, in some sandstorms moving entire dunes impressive distances--up to tens of meters in a major storm, enough to engulf individual houses or roads.

The third is avalanches of sand down the steep lee side of a dune. Together with sheet flows, avalanches allow an entire dune to move in a sandstorm "a little like a tank tread," Jenkins said, with sand particles continually circulating from the top to the bottom of the dune.

Jenkins's goal is to characterize sheet flows and avalanches using partial differential equations that model the movement of sand grains as if they were particles in a fluid. "These equations should contain within them the way avalanches scale with viscosity, velocity of turbulent wind, grain diameter, and gravity," he pointed out. With such equations in hand, it might be possible to anticipate the onset of dune migration, to predict where they'll go and how fast.

His goal is quite a challenge. Among other things, the exact form of an individual dune depends on the consistency of wind direction. If windblown sand comes from one prevailing direction, for example, a dune will be a crescent-shaped barchan. If winds switch direction seasonally--say, coming from the southeast for half the year and from the southwest for the other half--a dune will be

example, a dune will be a crescent-shaped barchan. If winds switch direction seasonally--say, coming from the southeast for half the year and from the southwest for the other half--a dune will be linear. If wind direction is erratic, a dune may be star-shaped.

Alien dunes. NASA's Mars Global Surveyor photographed these sand dunes on Mars

Image Credit: NASA

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But the payoff may be significant. Not only might such characterization be useful in designing fences or other restraints effective at mitigating the advance of threatening dunes; it could also be a boon to planetary geologists.

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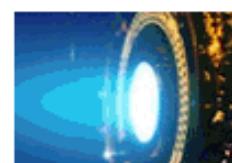
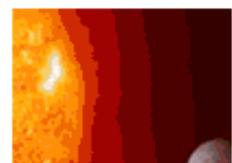
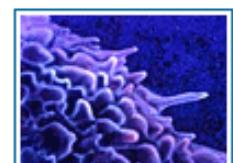
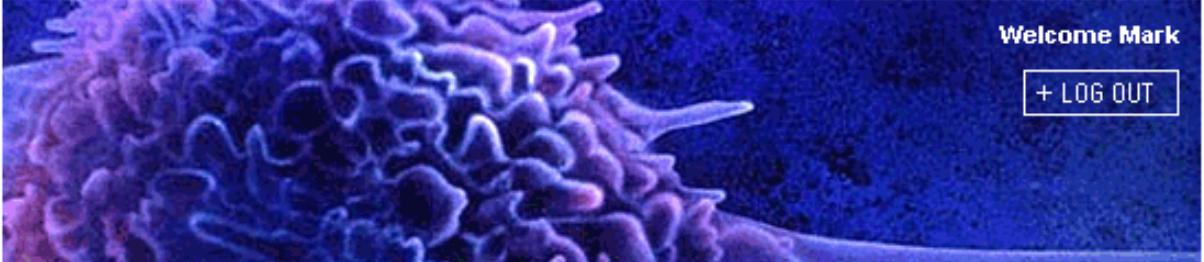
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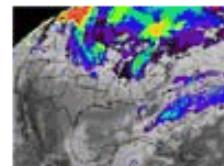
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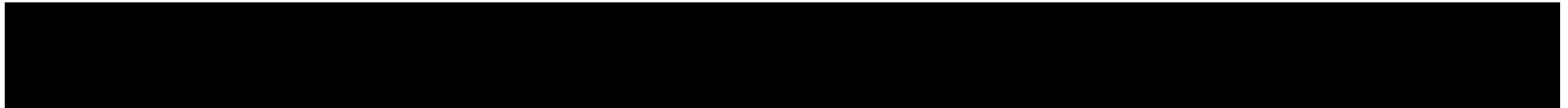


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NASA Official: Brian Dunbar

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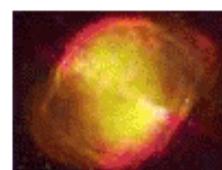
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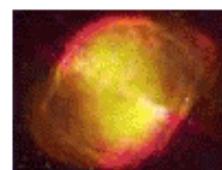
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### IMAGE OF THE DAY

#### Cone Nebula



Cones, pillars, and majestic flowing shapes abound in stellar nurseries where natal clouds of gas and dust are buffeted by energetic winds from newborn stars. A well-known example, the Cone Nebula within the bright galactic star-forming region NGC 2264, was captured in this close-up view from the Hubble Space Telescope's newest camera. While the Cone Nebula, about 2,500 light-years away in Monoceros, is around 7 light-years long, the region pictured here surrounding the cone's blunted head is a mere 2.5 light-years across. In our neck of the galaxy that distance is just over half way from the Sun to its nearest stellar neighbor, Alpha Centauri. The massive star NGC 2264 IRS, seen by Hubble's infrared camera in 1997, is the likely source of the wind sculpting the Cone Nebula and lies off the top of the image. The Cone Nebula's reddish veil is produced by glowing hydrogen gas.

image Credit: NASA

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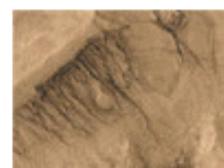
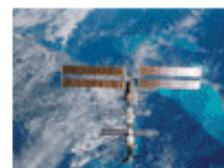
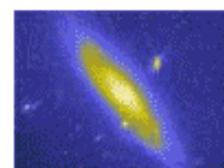
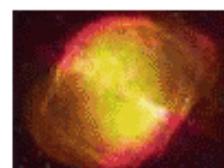


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NASA supported researchers are studying the complex physics of menacing sand dunes.

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#### **SC2002 (Conference of High Performance Computing and Networking)**

NASA computing research to be showcased at conference in Baltimore.

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Surf forecasters are now using near real-time meteorological data from satellites to find big waves.

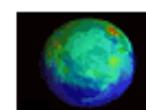
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#### **Learning How to Explain the Rain**

Recent efforts by NASA have begun to reveal some of the subtleties that drive various forms of precipitation.

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#### **NASA Joins International Ozone Study in Arctic**

NASA will join more than 350 scientists this winter to measure ozone and other atmospheric gases up north.

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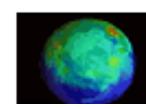
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### did you know?

That on the moon you can jump 20 feet in the air? Way more than you can on Earth...

+ Click here to find out why

### what does it mean?

(Click on a word below to find out what it means)

+ Black Hole

+ Comet

+ Gravity

+ Meteor

+ Nebulae

+ Ozone

## FEATURE

### Spring Is Here!

March 19, 2003

March 20th is the first day of spring - why does that happen?



Spring time in the park

Image credit: NASA

In the northern half of the world, March 20th is the first day of spring. The cold winds of winter are gone, and wild flowers are starting to bloom. It's time to find swimming suits and baseball gloves and plan summer trips.

Far to the south, across the equator, autumn is about to arrive. The hottest days of summer are past. Each day is shorter than the last. It will soon be time to rake leaves and get out warm coats.

The reason for these changes has to do with the



Earth & Sun by Tuska

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+ Quasars

+ more words...

Earth's yearly trip around the sun. For part of the year the Earth's North Pole points away from the sun and part of the time toward it. This is what causes our seasons. When the North Pole points toward the sun, the sun's rays hit the northern half of the world more directly. That means it is warmer and we have summer. But when the North Pole is pointed toward the sun, the South Pole is pointed away. So the Earth south of the equator gets less warmth from the sun and it is winter there.

#### Credits & Contacts

Authors: [Trudy E. Bell](#), [Dr. Tony Phillips](#)

Responsible NASA official: [Ron Koczor](#)

Production Editor: [Dr. Tony Phillips](#)

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Said the little acorn to the new maple, "My father was a mighty oak." Said the maple back, "My father was a Moon tree!"  
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### Pigeon Tracker

Send your name in to NASA and have it added to a DVD that will be sent to Mars!  
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### Rescue Mission

Hello everybody! I'm MC the robot. Join me and i will take you on a tour of the Space Station travelling around Earth.  
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### Blast Off to Mars

Ask Dr. Marc! He will answer this question and more with his amazing facts!  
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### Saturn Ring Race

Said the little acorn to the new maple, "My father was a mighty oak." Said the maple back, "My father was a Moon tree!"  
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Jump salute on the Moon

Image Credit: NASA

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Click on the a word below to find out what it means.

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+ Aeronautics  
+ Aurora  
+ Atmosphere  
+ Axis  
+ Biology  
+ Black Hole  
+ Booster Rocket  
+ Comet  
+ Constellation  
+ Core  
+ Electron  
+ Energy  
+ Experiment  
+ Frequency  
+ Fuel  
+ Galaxy  
+ Gas  
+ Gravity  
+ Infrared  
+ Ion  
+ Launch  
+ Light Year  
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+ Magnetic Field  
+ Meteor  
+ Nebulae  
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+ Ozone  
+ Plasma  
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## WHAT DOES IT MEAN?

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### Aurora



Aurora over Alaska

Image credit: NASA

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A glow in the sky, seen often in a ring-shaped region around the magnetic poles ("auroral zone") and occasionally further equatorward. The name comes from an older one, "aurora borealis," Latin for "northern dawn," given because an aurora near the northern horizon (its usual location when seen in most of Europe) looks like the glow of the sky preceding sunrise. Also known as "northern lights," although it occurs both north and south of the equator.

The aurora is generally caused by fast electrons from space, guided earthward by magnetic field lines , and its light comes from collisions between such electrons and the atoms of the upper atmosphere, typically 100 km (60 miles) above ground.

### CHECK OUT THE LINKS BELOW TO FIND OUT MORE

NASA Aurora Observatory

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## Aurora

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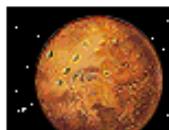
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**In Search of Moon Trees**  
Said the little acorn to the new maple, "My father was a mighty oak." Said the maple back, "My father was a Moon tree!"  
+ Find out what a Moon Tree is

  
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## NEWS ARCHIVE

### Webchat With Astronaut William Pogue

00.00.00 Thursday, November 14 offers two webcasts and one chat opportunity to meet and ask questions of retired astronaut William Pogue.

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### Last Chance to See Meteor Shower until 2099

00.00.00 Sky watchers will have an opportunity to see the most dramatic light show of the past several decades.

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### NASA Sponsors Student Robotics Competition

00.00.00 Heavy metal will rock-and-roll at seven different locations across the country early next year.

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### SeaWINDS Instrument Ready for Flight

00.00.00 At Japan's Tanegashima Space Center, preparations continue for the Dec. 14 launch of Japan's Advanced Earth Observation Satellite II.

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### LIVING IN SPACE

A look into the day-to-day life of astronauts.

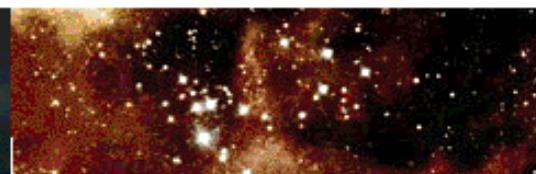
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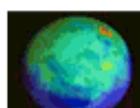
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#### Final Galileo Flyby

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#### Black Carbon

NASA discovers how carbon particles are changing the weather in China

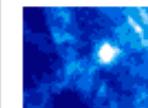
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#### Tracking the ISS

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#### Shocking Secrets of the Crab Pulsar

Chandra X-Ray Observatory and Hubble Space Telescope capture the Crab Pulsar

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## NEWS AND EVENTS FEATURES

### 06.19.03 - South America Shines In NASA's Latest Space Radar Map Release

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### COMING UP ON NASA TV:

Thanks to cloud-penetrating radar flown on NASA's Shuttle Radar Topography Mission (SRTM), more than 340 million residents of the fourth largest continent have access to high-resolution topographic data.

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#### **06.19.03 - Reviewing Educator Astronaut Applications**

NASA will use criteria developed by a Blue Ribbon Panel to identify the final candidates for the Astronaut Corps.

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#### **06.19.03 - The Secret Lives Of Galaxies Unveiled In Deep Survey**

Two of NASA's Great Observatories are beginning to harvest new clues to the origin and evolution of galaxies.

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#### **06.19.03 - Nighttime Clouds Shed Light On Space Weather.**

Three of the four rocket experiments, launched from WFF, will include the formation of milky, white clouds.

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#### **06.19.03 - Research Helps Highlight Lightning Safety Awareness Week**

Summer brings increased chances of thunderstorms and dangerous lightning. NASA marks National Lightning Safety Awareness Week, June 22-29.

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#### **06.18.03 - Keys To International Space Station Module Received**

Two cornerstone components for future research and operations aboard the International Space Station are ready to begin integrated testing at the Kennedy Space Center.

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#### **Monday - Friday**

11:00 a.m. - 12:00 p.m. - Expedition/ISS Commentary - JSC

#### **June 25, Wednesday**

Mars Exploration Rover "Opportunity" MER-B Launch Coverage - KSC

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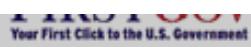
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+ Cassini  
+ Challenger  
+ Chandra  
+ Comets  
+ Contrails  
+ Eclipses  
+ Earth  
+ Earth at night  
+ Employment  
+ Europa  
+ Galileo  
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+ Hubble (also "Hubble Space Telescope")  
+ Hyper-X  
+ Images (also "photographs" or "pictures")  
+ International Space Station  
+ Jobs  
+ John Glenn  
+ Johnson Space Center (also "JSC")

- + JPL (also "Jet Propulsion Laboratory")
- + Jupiter
- + Logo
- + Mars
- + NASA's Mars Exploration Program
- + Mercury
- + The first NASA human spaceflight program
- + Mir
- + Moon
- + Moon Landing
- + Fake moon landing, or Moon landing hoax
- + MPEG (also "MPG")
- + NASA
- + Near Earth Asteroid Rendezvous (also "NEAR" or "NEAR Shoemaker")
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- + the Mars Rover
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**With at least one of these words:** This option searches for results that match either one or more of the words you require. (e.g., entering "apollo pathfinder" searches for pages with either apollo or pathfinder, not both)

**Without these words:** This option excludes certain words from your search. (e.g., for information about the Solar System, but not comets, enter "solar system" in the search box and enter "comets" in the "Without these words" box)

**Sort by:** Sort search results based on either relevance or title.

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**Show:** Choose the number of matches per page you would like to see displayed.

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