

ON THE MOON WITH APOLLO 16

A Guidebook to the Descartes Region



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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by
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PREFACE

The program to land man on the Moon and to return him safely to Earth, begun 10 years ago by President Kennedy, has shown science in the making to a world-wide audience. And we scientists have had a growing responsibility to tell that audience more about the scientific aspects of the lunar missions. This booklet is intended to meet a part of that responsibility. In the preface to *On the Moon With Apollo 15*, I wrote—

Never before in man's history has it been possible for more than a few people to witness major scientific discoveries. Yet with each Apollo mission to the Moon's surface, millions of people throughout the world can watch through television the activities of the astronauts. The understanding by the viewer of those activities and his sense of sharing in the scientific excitement of the mission are greatly increased when there is a general understanding of the scientific and engineering aspects. Yet for most of us, the usual discussions are clouded with jargon.

My purpose in writing this new guidebook is to give in simple terms information about the Apollo 16 mission to the Moon so that others can share with me the excitement of the scientific exploration of the Descartes region of the Moon.

I have benefitted greatly from constructive comments on the Apollo 15 booklet by many people. Several hundred individuals sent me advance copy of their work and suggested ways to improve the Apollo 16 booklet. Especially helpful were the comments by Ed Roedder, Pembroke Hart, John Baum, J. W. DeWitt, Jr., Edward Anders, Nancy Anders (age 12) and George Anders (age 14).

Many people helped me prepare this guidebook. Richard Baldwin, Gordon Tevedahl, John S. Kennoy, Jr., and George Esenwein collected background material. Rex Cline coordinated all art. Jerry Elmore, Norman Tiller, Ray Bruneau, Barbara Matelski, and Boyd Mounce drew most of the original sketches. Andrew Patnesky, Fred Hörz, and Mike Duke each provided several new photographs. The manuscript was improved greatly as a result of comments by Ruth and David Fitterman, Scott Baldrige, Amy and Mayme Strickland, James Head, George Esenwein, Terry Todd, Herb Wang, William Allen, Joe Allen, George Abbey, Doug Ward, Jack Sevier, Peter Mason, John Pomeroy, Don Bane, and Don Beattie. My former secretary Jean Ellis helped with many revisions. To all of these people, I express my thanks.

GENE SIMMONS

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Winchester, Massachusetts

HOW TO USE THIS GUIDEBOOK

Excellent commentaries have been available over television for each previous Apollo mission. However, because of the increased complexity of the surface operations beginning with Apollo 15 and especially because of the greater amount of time devoted to science-activities, I believe that a written guide would be welcomed by the interested viewer of Apollo 16. The material in this guidebook is intended to be used in conjunction with the other material shown over television.

The science-activities of the astronauts on the surface are divided between "experiments" and "traverses." For the experiments, the astronauts set up equipment on the Moon that collects data and (generally) transmits the data back to Earth. These experiments are described briefly in the section "Lunar Surface Scientific Experiments and Hardware." The reader need not read about all the details of each experiment on first reading. Quite frankly, even I find that section is rather lengthy although complete, but I have chosen to keep it in the present form so that you may refer to the individual experiments as you wish. I do recommend *scanning* this section before the first Extra Vehicular Activity (EVA) in order to understand something about each of the experiments.

Most of the astronauts' time on the lunar surface will be spent on the traverses along which they describe the geologic features of the landing site, collect rocks, shoot pictures, drive core tubes, and so on. The section "Traverse Descriptions" is a guide to those activities. It tells in general terms the things the astronauts will do on each traverse. It should be used in the same way that a flexible itinerary for a vacation trip through New England would be used. Refer to it during the traverse. But do not try to read it in great detail before the traverse.

The section "Lunar Geology Experiment" should be read before the traverses begin. There you will find descriptions of the tools that are used, the various kinds of photographs taken, and so on.

An important part of this guidebook is concerned with "orbital science." By orbital science, I mean those science activities done in space rather than on the lunar surface. The orbital experiments will probably not be covered extensively on television. But the data obtained on the last mission, Apollo 15, are so exciting that I think you may wish to know what is being done on Apollo 16. A general discussion of the scientific work to be done is given in the section "Introduction to Orbital Science." And then in the section "Orbital Science Activities," you will find the experiments and their objectives described. You may not wish to read these sections through at one sitting. Rather, I have included them chiefly for your reference when needed.

Finally, you should know that a glossary, a list of acronyms and some tables are included in the rear of the guidebook. I expect the definitions and short discussions to be found in the glossary will help in understanding some

of the terms and concepts now in common use in the scientific exploration of the Moon. Acronyms are short, usually pronounceable, abbreviations, such as NASA, LM, and ALSEP. In two tables, I list the people and companies that have built the scientific equipment. I think the extent of the participation in the scientific part of the Apollo Program may interest you. In another, I list the activities of the astronauts at each station along the traverses.