

ON THE MOON WITH APOLLO 17

A Guidebook to Taurus-Littrow



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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**by
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PREFACE

The Apollo Program, begun by NASA in 1960, was given impetus by President John F. Kennedy on May 25, 1961, when he dedicated this Nation to exploration of the Moon stating:

Now is the time to take longer strides, time for a great new American enterprise, time for this Nation to take a clearly leading role in space achievement, which in many ways may hold the key to our future on Earth.

The 11 manned Apollo missions were each major steps in man's conquest of space. Apollo 17—scheduled for launch on December 6—marks the end of a series of scientific explorations in which man first walked on the Moon in his effort to learn more about the Universe in which he lives.

Throughout history, major scientific discoveries have been the result of work by one person—or a small group of people—and only later were shared with the general public. The newly discovered information was traditionally communicated by scientists in the form of technical papers or addresses made before scientific groups.

The Apollo missions drastically changed parts of this process. Millions of people throughout the world “participated” in some of the greatest scientific discoveries of our age. The speed and comprehensive reporting provided by modern communications—through television, radio, and print—gave people everywhere in the world “instant” knowledge concerning the experiences of our astronauts on the Moon. Science and scientists have been exposed to the public eye throughout the progress of the lunar experiments in a way never before seen. We have had an ever growing responsibility to explain more about our science. 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 17 mission to the Moon so that others can share with me the excitement of the scientific exploration of the Taurus-Littrow area of the Moon.

Many people helped me prepare this guidebook. Richard Baldwin, Gordon Tevedahl, John S. Kenney, 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 and Mike Duke each provided several new photographs. Jeffrey Warner and Uel Clanton helped me select photographs of lunar rocks. The manuscript was improved greatly as a result of comments by: William Muehlberger, Edward Wolfe, Robert Parker, Jack Schmitt, George Abbey, Doug Ward, Jack Sevier, Herb Wang, Terry Todd, Sheila Murphy, Ruth and David Fitterman, George Esenwein, Floyd Roberson, Jim Head, Don Beattie, Peter Mason, John Pomeroy, William Vagt, Richard Naylor, and Rob Leppzer. Ludy Benjamin and the MSC Photographic Technology Division provided the excellent photographic prints, often working against very short deadlines. To all of these people, I express my thanks.

The accuracy and readability of the guidebook were improved by the comments and corrections made by the following persons upon the section dealing with their experiment: Mark Langseth, Joseph Webber, Otto Berg, Robert Kovach, William Muehlberger, David Strangway, Manik Talwani, Don Burnett, Fred Doyle, Robert Kaula, Roger Phillips (for ALSE), and William Sjogren. Their help is greatly appreciated.

And finally a special note of thanks to my wife Mary Jane who not only suggested improvements to the text, but persevered through the typing of several drafts.

GENE SIMMONS
Winchester, Massachusetts
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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 17. 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 setup 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, that section is somewhat long but rather complete, and 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. In the section "What We've Learned About the Moon," you will find a brief discussion of the new information about lunar science. I believe that perusal of that section will help you understand better the various experiments and surface procedures.

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 few missions are so exciting that I think you may wish to know what is being done on Apollo 17. 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.