

Discover the Moon

Jean Lacroux
Christian Legrand



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Preface

Ever looked at the Moon through a telescope? You have? Then you will have felt 'astronomical awe' for yourself.

The Moon . . . It is the strangest place! A rough, dry mineral sphere with a cloudless sky that is inky black even in bright daylight, waterless seas decked in dust that no winds ever blow, and worn mountains that have never echoed to the slightest sound . . . It is understandable, then, why our satellite should be the favourite target for aspiring astronomers. And it is to help them to become better observers and to enjoy their discoveries to the full that this book has been devised.

It is all very well to stand and stare, but it is so much better to understand what you are looking at. You will want to see the most interesting and most intriguing regions of the Moon. But how do you find them in your telescope's field of view? When is the best time to look for them?

Then, with a little experience, you will be able to keep a watch on places where 'something' might be going on . . .

The Moon is easy enough to observe even with the light pollution of modern cities. Even the smallest telescope will show the maria or 'seas', countless craters and a few mountain ranges. The Moon's spectacular relief and the wondrous calm of its desolate landscapes viewed through a telescope lend it a fascination you will never tire of.

In this book we do not try to present an exhaustive survey of lunar studies; we try simply to answer some of the questions of the 'moonstruck' by providing material to assist in observation. This explorer's guidebook will help them to find their way around.

So, to your telescopes, for some fantastic trips to the Moon!

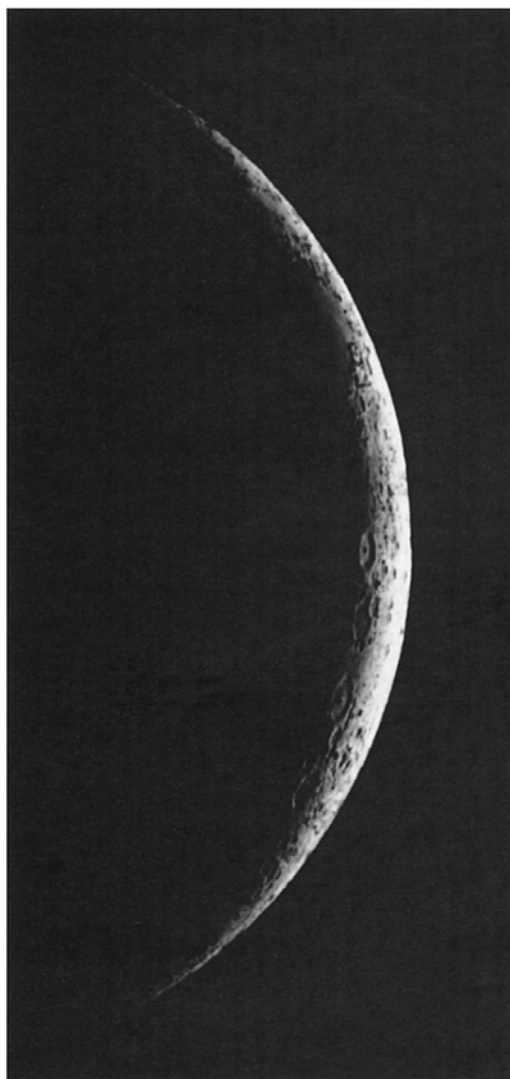


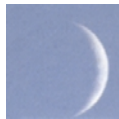


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How to use this book

This guidebook is devised to make it easier to identify and observe the most interesting lunar features. It uses two sets of photos showing the Moon as it appears through the three types of instrument most commonly used by amateur astronomers – refracting telescopes, catadioptric telescopes and Newtonian telescopes. This has not been done before.

Which way is up?

It is often difficult to use a map to locate a lunar feature in a telescope. The thing is, lunar charts show the Moon as it appears to the naked eye (and have done since 1961; see box). If you view the Moon through binoculars there is no difference with the map because binoculars do not invert the image but, instead, show the Moon just as it looks to the unaided eye.

But when the Moon is viewed through any astronomical telescope (be it a refractor or a reflector) without accessories, the images are not the same way round. The objective lens or mirror produces an inverted image.

In a reflecting telescope, the secondary mirror inside it alters the image again! So, with a Newtonian telescope like the famous 115-mm (4.5-inch) model, the image is completely inverted with north at the bottom and east on the left. A lunar map has to be turned through 180° if it is to show the same alignment.

However, with instruments that have a star

diagonal such as astronomical refractors or Cassegrain, Maksutov or Schmidt–Cassegrain catadioptric telescopes (like the Celestron or Meade makes), the image is erected by the star diagonal so that the north of the Moon is at the top and south at the bottom, but east is still on the left and west on the right! This time you would need to view the map in a mirror held alongside it for the chart to match what you see through this type of telescope!

DON'T PANIC!

It may be that what you observe on any given night does not exactly match the photo in the book. Some of the craters may not be illuminated in quite the same way. This is because of librations that make the Moon 'rock and roll' (see p. 15).

The photos are there to help you locate the positions of features relative to each other. The appearance of any given landform will always be different with each phase of the Moon. This is what makes discovering the lunar surface so fascinating time and again.

A SENSE OF DIRECTION

In 1961, the International Astronomical Union stipulated that lunar maps should have north at the top, south at the bottom, east on the right and west on the left. But do not be surprised if you find that older books do the opposite. So now you see why Mare Orientale (the Eastern Sea) has found itself on the Moon's western edge!

As seen through the telescope

This book is unique in that it overcomes these difficulties of orientation by presenting two photos for each lunar region or site. The photos are actually the same but oriented differently:



- the left-hand page shows the view through a refracting telescope or a catadioptric telescope with a star diagonal



- the right-hand page shows the view through a Newtonian telescope.

Night-by-night, 14 guided observing sessions

- **A guidebook based on the Moon's phases**
 Each chapter presents the Moon on a different night throughout the series of phases from New Moon to Full Moon. We have given precedence to evening observations. Most observers prefer this because getting up early is harder than staying up late!

For each evening's observation there is a general photo first, with both possible orientations depending on the telescope used. The locations of features of interest to observe that night are marked by numbers. Boxed regions are described in more detail in the pages that follow.

MEANINGFUL PHOTOS

Where possible the photos shown are typical of what can be seen with a 100–150-mm telescope. We could have opted for the finest photographs or CCD images available, but we decided against using photos with too much detail so that readers would not lose their way among the mass of features they would show. For some features we have used photos taken when the Moon was waning and so the shadows are cast in the opposite direction to those seen for the waxing Moon described in the programme of observations.

- **Detailed descriptions of characteristic regions**

Each of the following double-page spreads in the chapter is about a particular region. The important features are precisely described so you know what to look for.

The photos show details down to distances of about 3 km. This way you can test the resolution of your telescope.

- **Feature size indications**

Each detailed photo has a scale bar so you can compare the dimensions of the different features and get some idea of the true size of these lunar landscapes.

FLAP MAPS

On the front and back flaps of the book are lunar maps. The front-flap map shows the Moon as it appears through a refractor or a catadioptric telescope fitted with a star diagonal. The back-flap map shows the Moon as seen through a Newtonian telescope (or, if you turn it upside down, through binoculars).