

## Shoot the Moon

The Moon boasts an unexpected variety of landscapes, including volcanic features, sinuous valleys, and ghost craters readily visible from Earth. This practical guide explains and demonstrates how you can capture impressive images of our nearest neighbor in space using a variety of different techniques. As the first guide to be dedicated to modern lunar imaging, this volume offers an in-depth and illustrated approach to common optics, the essentials of digital images, imaging devices, and image-processing software. Even in light-polluted areas, the countless features and finest details of the Moon can be captured by following the instructions of this comprehensive and accessible guide. Covering equipment ranging from smartphones and DSLRs to specialist planetary cameras, whether you are a novice without a telescope, an amateur developing your skills in imaging or an experienced astro-photographer, you will benefit from the hints, insights, and expertise within.

**Nicolas Dupont-Bloch** is an amateur astronomer, based in Sautron, near Nantes, France. He has previously published two books (in French) and has translated a third into English. Many of his images have been showcased in *Astronomie Magazine* and chosen as the Lunar Picture of the Day (LPOD). This is his first English astrophotography guide.

## Shoot the Moon

A Complete Guide to Lunar Imaging

**Nicolas Dupont-Bloch**

With image contributions from

*Mikhail Abgarian (Belarus)*

*Mathias Barbarroux (France)*

*Gilles Boutin (Canada)*

*Dani Caxete (Spain)*

*Frédéric Géa (France)*

*Maxime Giraudet (France)*

*Yuri Goryachko (Belarus)*

*Etienne Martin (France)*

*Konstantin Morozov (Belarus)*

*Catherine Port (France)*

All other photographs and drawings by the author  
unless otherwise mentioned

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For Catherine, Léna, and Maud for their patience with  
regard to my astronomical obsessions

and

in remembrance of Pierre Bourge and Jean Lacroux for  
their talent and their independence.

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## Preface

Being bright, large, and easy to aim at, the Moon is probably the first celestial object we observe with our naked eyes, binoculars, or a telescope.<sup>1</sup> Usually, we move on to observing planets, stars, and then deep-sky objects. Most of us take a simple and occasional glance at lunar craters when we have no more objects to observe, no more astrophotography to do, after a nebula has set in the West and before a planet rises in the East. Furthermore, the Moon is very bright – a continuous spectrum, drowning the faint light of elusive galaxies. And, after having appreciated some dramatic craters and beautiful sharp mountain peaks, who could honestly be interested in these countless regular small craters, all these strange features whose names we cannot remember? At the same time, the Universe is a living, changing place: Jupiter shows ever-changing clouds, novae or comets can suddenly appear, and even numerous diffuse nebulae can be imaged from a light-polluted suburb with appropriate filters. That's why I didn't seriously look at the Moon for years – until I observed it through a small, professional telescope, during a cold night in town.

The image was incredibly sharp, with such a contrast that I suddenly understood that I could directly see the bare soil of another miniature “planet,” with a variety of rocks, topographic features, grazing impacts, bright or dark areas showing the evolution and history of a whole world.<sup>2</sup> Of course, we all want to see smaller and smaller details on the Moon, such as craterlets, wrinkle ridges, domes, or channels, but large areas showing high contrast also provide major hints to understand the lunar soil: they show ancient lava fountains and blasts, the age of lunar “seas” (maria) and their mineralogical composition.

The Moon is actually an open book, telling the history of the whole Solar System to whoever wants to read it through a simple eyepiece. Geology, volcanism, fractures, impacts, giant cliffs, magnetic mysteries beneath strange surface features, overlapping or negative craters, curved mountains . . . Although there are no frontiers on the Moon, its differentiated landscapes clearly show that a history involving a huge variety of events has occurred, and the evidence remains there to be observed. Unfortunately, I was quite unable to understand this fascinating

<sup>1</sup> The Sun and solar eclipses are not mentioned in this book. Observing the Sun requires specially secured solar filters.

<sup>2</sup> Our Moon is one of the seven large moons in the Solar System. It is the only one, among these massive moons, which has an extremely sparse exosphere, very little water ice relative to the icy moons of Jupiter and Saturn, and hardly any volcanic activity. That is why the record of its geological history has remained unscathed, especially over the last three billion years.

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story. With a moderate magnification of 166×, countless craters and other mineralogical or volcanic stories all appeared at once: this exceeded my capacity to carefully observe each detail.

However, imaging can record and emphasize these features, and this can far exceed the resolving power and contrast of a simple telescopic observation. That's why I undertook a photographic survey of the Moon, whereupon I realized that processing lunar images is a unique process, quite different from other types of imaging. I hope that the experience I have gained will help other amateur astronomers to successfully start and improve their lunar imaging under the best possible conditions, with a very wide range of equipment.

Our trek begins with a simple smartphone and a basic beginner's refractor.