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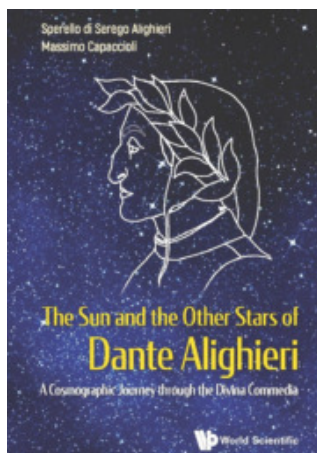
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# Dante on Astronomy

## THE SUN AND THE OTHER STARS OF DANTE ALIGHIERI:

*A Cosmographic Journey Through the Divina Commedia*

Sperello di Serego Alighieri and  
Massimo Capaccioli  
World Scientific Publishing Co., 2022  
180 pages, ISBN 978-981-124-549-7  
US\$58.00, hardcover



### REFERENCES TO ASTRONOMY

abound in Dante Alighieri's *The Divine Comedy*. Dante assumed his readers understood them — people in his day were more familiar with the skies than we are today, in part because they had to rely on the stars and their feeble light for traveling at night. Sperello di Serego Alighieri, an astrophysicist and direct descendant of Dante (19th generation after the poet), and Massimo Capaccioli, a top Italian astronomer, wrote *The Sun and the Other Stars of Dante Alighieri* to explicate those astronomical references within the context of the cosmological knowledge of Dante's time.

Dante (1265–1321) set his fictional journey through Hell, purgatory, and paradise (the narrative poem's *Inferno*, *Purgatorio*, and *Paradiso*) within an Earth-centered cosmological model. He located Hell at the core of our planet and envisaged purgatory as a mountain located on the opposite side of the globe

from where his journey began. (Dante made himself a character in his own story.) He imagined the different levels of paradise to comprise the heavenly bodies — the Sun, the Moon, and the planets out to Saturn — revolving around Earth along with the fixed stars. The journey ended at the highest level of paradise, the Empyrean, a heaven of pure light lying beyond the stars at the edge of the universe.

Despite living at a time when people thought the Sun lay at the center of the universe, and despite espousing the medieval view that did not distinguish astronomy from astrology (the authors devote a chapter to this topic), Dante actually got much of the science right.

For instance, in *Purgatorio* the poet correctly attributes the appearance of rainbows to refraction of solar rays in raindrops: “And just as the air, when it is very moist, becomes adorned with various colors because it reflects another's rays . . .” Dante also, in *Paradiso*, accurately explains the tides: “And as the turning of the heaven of the moon covers and uncovers the shores without pause, so Fortune does with Florence.”

Even when referring to the darkness that the Gospels say fell as Christ hung on the cross, Dante alluded to the fact that solar eclipses happen during new Moon rather than full Moon. Hence, the twilight that scripture says descended as Christ died — which occurred during full Moon — was, Dante claims in *Paradiso*, an extraordinary phenomenon: “One says the Moon turned back during Christ's passion and interposed itself so that the light of the Sun could not reach the Earth.”

The dialogue that Dante the character has with Beatrice, his guide from the end of *Purgatorio* through *Paradiso*, on

what created the “spots” on the Moon serves as a masterful scientific treatise. Beatrice corrects Dante's notion that differences in density of lunar matter cause the dark regions we now call *maria* to stand out from lighter-colored areas of the Moon. After walking Dante through thought experiments (which remind one of what Einstein did so famously six centuries later), Beatrice explains the causes of the Moon's color differences. They arise, she says, from the “virtue” that the Empyrean distributes — in other words, from the different degrees that various substances reflect light. Indeed, as we know today, the Moon's dark *maria* consist of basalt, which reflects light less than the more reflective anorthosite in the lunar highlands.

The authors discuss the state of astronomy before Dante as well as the date and time in which *The Divine Comedy* was set based on his descriptions of the sky. They also delve into parallel universes, the planets and stars, and the mysteries of the Milky Way. Altogether the book is a fascinating peek into the state of medieval astronomy, which, despite its errors, was more sophisticated than we moderns give it credit for. As such, the book is a valuable resource on the history of astronomy.

*The Sun and the Other Stars of Dante Alighieri* is somewhat technical, but astronomy enthusiasts interested in Dante, Dante enthusiasts curious about astronomy, and anyone fascinated by medieval astronomy will love the book.

■ **CRISTINA MONTES** is an attorney, law professor, and writer based in Manila, the Philippines. Her Focal Point “From Street to Streaming” ran in the July 2022 issue, p. 84.