



# Three Steps to the Universe: From the Sun to Black Holes to the Mystery of Dark Matter

*David Garfinkle, Richard Garfinkle*

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If scientists can't touch the Sun, how do they know what it's made of? And if we can't see black holes, how can we be confident they exist? Gravitational physicist David Garfinkle and his brother, science fiction writer Richard Garfinkle, tackle these questions and more in *Three Steps to the Universe*, a tour through some of the most complex phenomena in the cosmos and an accessible exploration of how scientists acquire knowledge about the universe through observation, indirect detection, and theory.

The authors begin by inviting readers to step away from the Earth and reconsider our Sun. What we can directly observe of this star is limited to its surface, but with the advent of telescopes and spectroscopy, scientists know more than ever about its physical characteristics, origins, and projected lifetime. From the Sun, the authors journey further out into space to explore black holes. The Garfinkle brothers explain that our understanding of these astronomical oddities began in theory, and growing mathematical and physical evidence has unexpectedly supported it. From black holes, the authors lead us further into the unknown, to the dark matter and energy that pervade our universe, where science teeters on the edge of theory and discovery. Returning from the depths of space, the final section of the book brings the reader back down to Earth for a final look at the practice of science, ending with a practical guide to discerning real science from pseudoscience among the cacophony of print and online scientific sources.

*Three Steps to the Universe* will reward anyone interested in learning more about the universe around us and shows how scientists uncover its mysteries.

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