

# The Pythagorean World

Jane McDonnell

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Why Mathematics Is Unreasonably Effective In  
Physics

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# Preface

Don't be surprised then, Socrates, if it turns out repeatedly that we won't be able to produce accounts on a great many subjects—on gods or the coming to be of the universe—that are completely and perfectly consistent and accurate. Instead, if we can come up with accounts no less likely than any, we ought to be content, keeping in mind that both I, the speaker, and you, the judges, are only human.

Plato, *Timaeus* 29c

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Any and all mistakes or omissions are mine alone.

**Abstract** In this book, I argue that many problems in the philosophy of science and mathematics (in particular, the unreasonable effectiveness of mathematics in physics) can only be addressed within a broader metaphysical framework which provides a coherent world view. I attempt to develop such a framework and draw out its consequences. The attempt is in two parts: firstly, I develop a speculative framework based on an analogy to set theory, then I combine elements of the framework with ideas from Leibnizian monadology and consistent histories quantum theory to introduce (what I call) quantum monadology. The two parts focus on different aspects of the problem and should be viewed as stages on the way to a final formulation. The inspiration for the book came from Plato's *Timaeus* and Wigner's comments on quantum mechanics. As it turned out, Leibniz's *Monadology* became a third key source.

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