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Preface

Space and time capture the imagination like no oth
For good reason. They form the arena of reality, the v
mos. Our entire existence—everything we do, think
takes place in some region of space during some i
science is still struggling to understand what space ar
Are they real physical entities or simply useful ideas
they fundamental, or do they emerge from more basic
does it mean for space to be empty? Does time have
it have an arrow, flowing inexorably from past to fut
perience would indicate? Can we manipulate spac
book, we follow three hundred years of passionate sci
seeking answers, or at least glimpses of answers, to s
questions about the nature of the universe.

Our journey also brings us repeatedly to another,
tion, as encompassing as it is elusive: What *is* realit
have access to the internal experiences of perception
can we be sure they truly reflect an external world
long recognized this problem. Filmmakers have pop
story lines involving artificial worlds, generated by fir
ical stimulation that exist solely within the minds o
And physicists such as myself are acutely aware
observe—matter evolving on the stage of space and ti
to do with the reality, if any, that's out there. Neverth
vations are all we have, we take them seriously. We c
the framework of mathematics as our guides, not ur
tion or unrelenting skepticism, and seek the simplest
ing theories capable of explaining and predicting the
and future experiments. This severely restricts the the
this book, for example, we won't find a hint that I'm