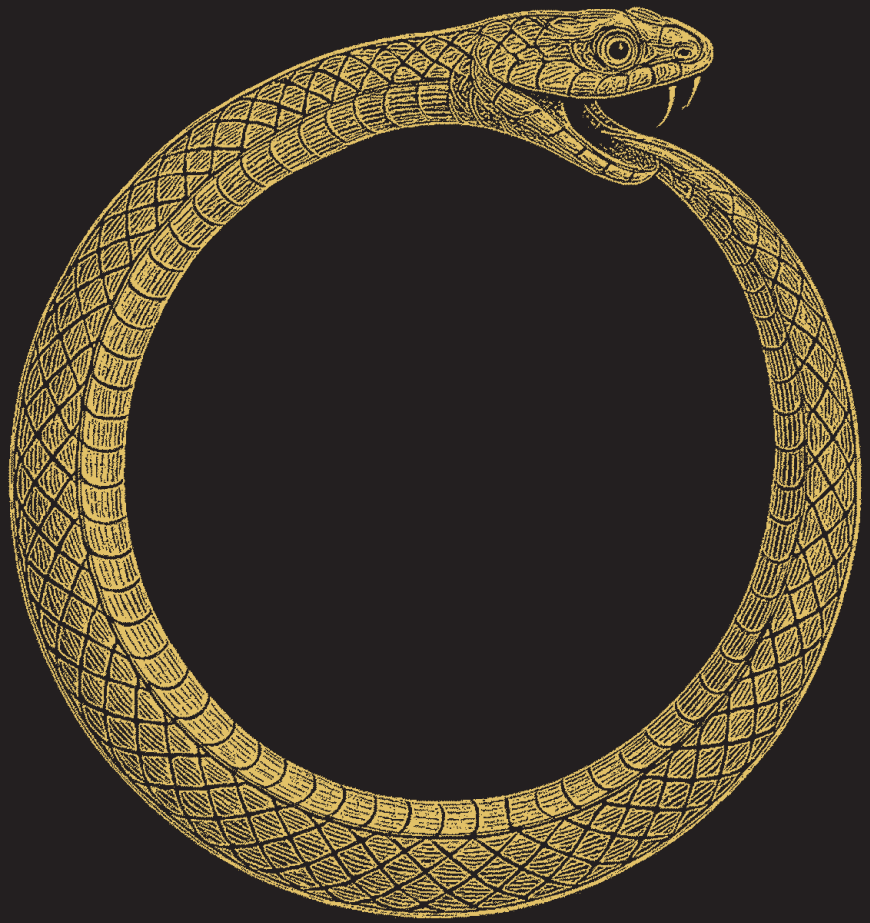

Serpens

Thomas Hertog

Time

We are not angels

A few years ago, while I was traveling in Central Asia, Stephen Hawking sent me an email asking me to return to Cambridge. He had an idea he wanted to share with me.

When I arrived back in Cambridge, I found him as I often did: surrounded by books, working at a dysfunctional desktop, and with a picture of Marilyn Monroe on the wall. By then, he had already lost his natural voice, but he communicated through his computer system.

That was why he had called me back from my travels.

"*I have changed my mind,*" he told me. "A Brief History of Time *is written from the wrong perspective. We are not angels, who view the universe from the outside.*"

Speaking with Hawking was often like consulting the oracle of Delphi—slow, and at times rather enigmatic. But on this occasion, I immediately understood what he was getting at.

My PhD with him had ended on something of a cliffhanger, a puzzle we had not been able to solve. Now, suddenly, there was a sense of a eureka moment—something that would launch us on an entirely new path.

The starting point

A Brief History of Time, Hawking's great book from the 1980s, was built on a particular epistemology—a philosophy of science. It assumed that the laws of nature are fixed, eternal, immutable, transcending the physical universe itself. These laws, cast in mathematical relationships, were thought to describe how the universe came into being, how it evolved, and why it is the way it is.

The philosophy was straightforward: you begin with the laws, and from them physics follows. From physics, eventually, arise chemistry, biology, and the full spectrum of complexity. This was the great idea—the philosophical highlight—of *A Brief History of Time*.