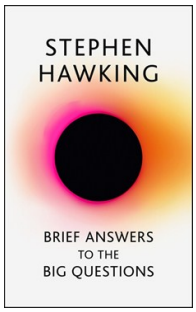
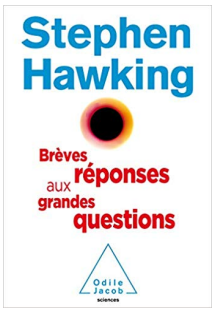
Stephen Hawking's last book:
Brief answers to the big questions, John Murray, 2018 (256 p.) isbn: 978-1473695986
De antwoorden op de grote vragen, Spectrum, 2018 (263 p.) isbn: 978-2738145673
Brèves réponses aux grandes questions, Odile Jacob, 2018 (240 p.) isbn: 978-2738145673







During his life Stephen Hawking did a lot of magic with mathematics to derive revolutionary results in cosmology. Together with Penrose about the origin of our universe and later about the physics of black holes and how they could evaporate by radiation. He also showed that thereby information is not annihilated, so that the second law of thermodynamics still holds. Because of his bright mind despite the ASL he became a rock star in a wheelchair using his computerized voice as a trademark. As a famous scientist he was asked for his opinion about the big questions of humanity. During the last year of his life he was working on this book in which he bundles his (extensive) answers to ten of these questions. It was unfinished when he died on 14 March 2018, so his colleagues finalized it.

The book has a foreword by Eddie Redmayne who played the character of Hawking in the movie *The theory of everything* (2014). An introduction is written by his colleague and coauthor Kip S. Thorne, sketching the work by Hawking and how the questions are related to it. Also Hawking himself starts with an autobiographic part about his scientific findings which he uses to explain why it is important to ask these "Big Questions", but the main part of the book consists of his extensive answers. They can be read independently, so there is sometimes a bit of repetition.

• *Is there a God?* Here he leaves the reader free to believe or not in a supernatural being, but for him, the simplest and most feasible conclusion of his research is that there isn't.

• *How did it all begin?* This is related to the previous question, but basically asking the question does not make sense because computing backwards shows that everything began with the singularity of the Big Bang, so there is nothing before it, like there is no point south of the south pole.

• *Is there other intelligent life in the universe?* He is skeptic that life forms similar to ours would exist. There are many reasons why we haven't found any sign of them, but he supports that we should continue looking for them.

• *Can we predict the future?* Determinism according to Laplace in made impossible by the Heisenberg uncertainty relation, and quantum mechanics only can predict probabilities, but evaporating black holes can disperse information, so his answer is most likely no.

• *What is inside a black hole?* He explains how information sucked in by a black hole can be stored on the event horizon. It should tell us what is inside. No information is lost.

• *Is time travel possible?* Most probably not. Not only would it lead to paradoxes, but even though possibilities exist in theory, there is no evidence so far that it would be possible in reality.

• *Will we survive on Earth?* He is rather pessimistic with climate change, pandemics, and available nuclear war missiles with irresponsible political leaders in charge.

• *Should we colonise space?* It will not at all be easy, but it is the only way out when space and resources of our planet are fully consumed.

• *Will artificial intelligence outsmart us?* It is almost too late, but we should start seriously worrying about it. Now computers are only faster but soon, they will become smarter than humans.

• *How do we shape the future?* The only way is to invest in good education and promote science.

This is the clearest general introduction to his work and his derived answers to these questions of all times. Written with a positive attitude and with tongue-in-cheek humour. Highly recommended.

Adhemar Bultheel