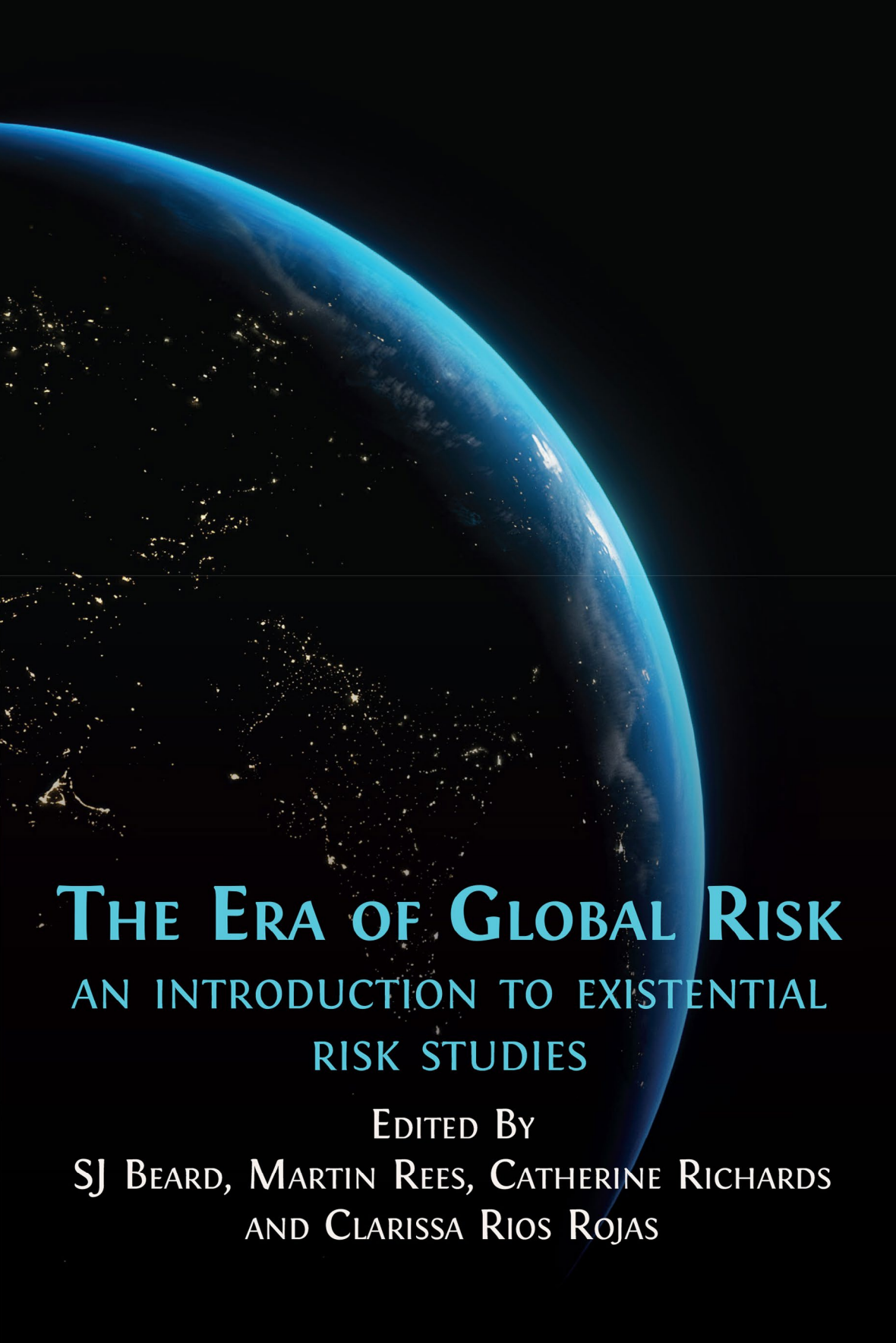

The Era of Global Risk

An Introduction to Existential Risk Studies

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SJ Beard, Martin Rees, Catherine Richards and Clarissa Rios Rojas (eds), *The Era of Global Risk: An Introduction to Existential Risk Studies*. Cambridge, UK: Open Book Publishers, 2023, https://doi.org/10.11647/OBP.0336

Digital material and resources associated with this volume are available at https://doi.org/10.11647/OBP.0336#resources

ISBN Paperback: 978-1-80064-786-2
ISBN Hardback: 978-1-80064-787-9
ISBN Digital (PDF): 978-1-80064-788-6
ISBN Digital ebook (epub): 978-1-80064-789-3
ISBN XML: 978-1-80064-791-6
ISBN HTML: 978-1-80064-792-3
DOI: 10.11647/OBP.0336

Cover image: Anirudh, *Our Planet* (October 14, 2021), https://unsplash.com/photos/Xu4Pz7GI9JY. Cover design by Jeevanjot Kaur Nagpal.

Preface

Martin Rees

This book is about our entire planet's future. The stakes have never been higher. The Earth has existed for 45 million centuries, but this is the first century in which one dominant species—ours—can determine, for good or ill, the future of the entire biosphere. Over most of history, the benefits we garner from the natural world have seemed an inexhaustible resource; the worst terrors humans confronted—floods, earthquakes, and diseases—came from nature too. But we are now deep in the 'Anthropocene' era. The human population, now exceeding eight billion, makes collective demands on energy and resources that are not sustainable without new technology and threaten irreversible changes to the climate. Novel technologies—especially bio and cyber—are socially transformative, but open up the possibility of severe threats if misapplied. The worst threats to humanity are no longer 'natural' ones; they are caused (or at least aggravated) by us.

Moreover, the world is far more interconnected by travel, the internet and supply chains; a disaster in one region will cascade globally.

Despite the concerns, there are some countervailing grounds for optimism. For most people in most nations, there has never been a better time to be alive, thanks to advances in health, agriculture, and communication, which have boosted the Global South as well as the northern world. Everyday life has been transformed in less than two decades by mobile phones, social media, and the internet; we would have been far less able to cope with recent shutdowns without these facilities. Computers double their power every two years. Gene-sequencing is a million times cheaper than it was 20 years ago: spin-offs

 https://doi.org/10.11647/OBP.0336.12

from genetics could soon be as pervasive as those we've already seen from the microchip.

And this optimism about science need not be eroded by COVID-19. Indeed, in dealing with this globe-spanning plague, science has been our salvation. The response has shown the scientific community's strengths—a colossal worldwide effort to develop and deploy vaccines, combined with honest efforts to keep the public informed. The crucial role of the underlying science—and the 'scenario planning' needed to minimise the likelihood of bio- and cyber- catastrophes—are key themes of the present book.

The challenges to governance posed by COVID-19 were unprecedented (at least in peacetime) in their urgency, impact, and global scope; 'experts' had to engage with politicians and the wider public in order to overcome them. But the world would have coped far better had there been more planning and preparedness at international levels. And there are conjectural threats—engineered pandemics and massive cyber attacks, for instance—that could create at least equal devastation at any time. Indeed, their probability and potential severity is increasing. COVID-19 must act as a wake-up call, reminding us—and our governments—of our vulnerabilities.

Looming over the world in this century is the threat of climate change. This is potentially a 'global fever', in some ways resembling a slow-motion version of COVID-19. For instance, both crises aggravate the level of inequality within and between nations. Those in megacities in the majority of the world can't isolate from rogue viruses; medical care is minimal, and they are less likely to have access to vaccines. Likewise, it is those countries, and the poorest people in them, that will suffer most from global warming and the subsequent effects on food production and water supplies. Climate change and environmental degradation may well, later this century, have global consequences that are even graver than pandemics and could last longer (or, indeed, be irreversible). So too could the loss of biodiversity, leading to mass extinctions. Many, from Pope Francis downward, believe that the natural world's diversity has value in its own right, quite apart from its crucial importance for us humans.

But a potential slow-motion catastrophe doesn't engage our public and politicians: our predicament resembles that of the proverbial boiling

frog, content in a warming tank until it's too late to save itself. We fail to prioritise prevention and countermeasures, because their worst impact stretches beyond the time-horizon of political and investment decisions. Politicians recognise a duty to prepare for floods, terrorist acts, and other risks that are likely to materialise in the short term—and are localised within their own domain. But unless there is a clamour from voters, they have minimal incentive to address longer-term threats that aren't likely to occur while they're still in office—and which are global rather than local.

And of course most of the challenges are global. Coping with COVID-19 is plainly a global challenge. Similarly, the threats of potential shortages of food, water, and natural resources—and the challenge of transitioning to low carbon energy—can't be overcome by each nation separately. Nor can the regulation of potentially threatening innovations, especially those spearheaded by globe-spanning conglomerates. Indeed, a key issue is to what extent, in a 'new world order', nations will need to yield more sovereignty to new organisations along the lines of the IAEA, WHO, etc. And how do we manage the tension between privacy, security, and freedom in a world where small groups (or even a malign individual) empowered by bio or cyber technology could cause global devastation?

Scientists have an obligation to promote beneficial applications of their work in meeting these global challenges. Their input is crucial in helping governments decide wisely which scary scenarios—ecothreats or risks from misapplied technology—can be dismissed as science fiction, and how best to avoid the serious ones. We also need the insights of social scientists to help us envisage how human society can flourish in a networked and AI-dominated world.

The case for intense study of these extreme threats is compelling. But, until recently, they received minimal attention—far less than has been devoted to 'routine' accidents. Unless voters speak up, governments won't properly prioritise the study of mega-threats that could jeopardise the very survival of future generations. So scientists must enhance their leverage by involvement with NGOs, via blogging and journalism, and by enlisting charismatic individuals and the media to amplify their voices and change the public mindset. It is encouraging to witness the number of activists increasing, especially the young—who can hope

to live into the 22nd century. Their campaigning is welcome. Their commitment gives grounds for hope.

These areas of study, crucial to the world's future, are still underprioritised in the world of academia and policy studies. I am glad that my university, Cambridge, is one of a still-small number that has created a Centre for the Study of Existential Risks (CSER). Staffed by idealistic young researchers, with expertise spanning natural and social sciences, the CSER has helped to deepen and solidify our understanding of this crucial agenda, and has thereby gained traction with policymakers.

This book, marking the 10th anniversary of CSER's foundation—and written in collaboration with experts from other centres—offers a perspective on the key topics, in a clear format and style which we hope will spread an informed awareness of the epochal issues that it addresses.

I am an astronomer, and would like to close with a cosmic perspective. Our Earth—this tiny 'pale blue dot' in the cosmos—is a special, maybe even unique, place. We are its stewards during an especially crucial era. That is an important message for us all.

We need to think globally, we need to think rationally, we need to think long-term—we need to be 'good ancestors', empowered by 21st-century technology but guided by values that science alone cannot provide. This book should provide some grounding for these aspirations.