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978-1-107-16887-9 — Conversations on Quantum Gravity
Edited by Jácome (Jay) Armas
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Conversations on Quantum Gravity

The holy grail of theoretical physics is to find the theory of everything that combines all the forces of nature, including gravity. This book addresses the question: How far are we from such discovery? Over the last few decades, multiple roads to finding a quantum theory of gravity have been proposed but no obvious description of nature has emerged in this domain. What is to be made of this situation? This volume probes the state of the art in this daunting quest of theoretical physics by collecting critical interviews with nearly forty leading theorists in this field. These broad-ranging conversations give important insights and candid opinions on the various approaches to quantum gravity, including string theory, loop quantum gravity, causal set theory and asymptotic safety. This unique, readable overview provides a gateway into cutting-edge research for students and others who wish to engage with the open problem of quantum gravity.

JÁCOME (JAY) ARMAS is an assistant professor at the Institute of Physics and coordinator of the Dutch Institute for Emergent Phenomena, University of Amsterdam. He completed his PhD at the Niels Bohr Institute and held postdoctoral positions at the University of Bern and Université Libre de Bruxelles. His research interests span foundational issues in string theory, hydrodynamics and black holes, as well as emergent phenomena in quantum and soft matter. In addition to his research activities, he established the international science outreach platform and event series *Science & Cocktails*. This volume, compiled over more than ten years of mainly in-person interviews, is his gift to the physics community.

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This book is dedicated to:

Signe, Bertrand and Marguerite
My family
My family in Fabrikken, Christiania
My family-in-law
My closest friends
My closest colleagues

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Preface: Why This Book and Why Did It Take So Long?

In 2010 I was in the second year of my PhD at the Niels Bohr Institute in Copenhagen, spending most of my evenings working at, and co-managing, a cocktail bar and art gallery. In between organising events and washing dishes, I relaxed by reading popular science books on neuroscience, which inspired the book I was writing at the time, *Conjunto Homem* (or *The Set of All Men*), published much later in 2014. In that period of time, I came across *Conversations on Consciousness*, a book by Susan Blackmore that left a deep impression on me. The book consisted of a series of interviews of leading neuroscientists about their views on the still unresolved problem of consciousness. It offered an overview of multiple theories about the mechanisms underlying the phenomenon of consciousness, without making any judgement on whether one theory was more convincing than any other. I was struck by the fact that someone with only a popular science background in neuroscience like me was able to follow these explanations as if looking through an open window to an ongoing scientific endeavour.

I clearly remember thinking, perhaps naively, that a similar book focused on the open problem of finding a theory of quantum gravity could also be made available to anyone trying to make sense of this problem. Not long after, I would embark on an almost 10-year journey to complete *Conversations on Quantum Gravity* – the book you are reading now.

By the middle of 2010 I had closed the bar and moved to Copenhagen's renowned hippie commune Christiania, where I would co-run a cinema for several years. These new personal circumstances provided me with a safe and supporting social environment and an activist attitude that led me – realising that no one in my field would ever write this book, and upholding some idealised sense of duty – to take on the task myself. It was only in the beginning of 2011 that I voiced this idea, discussing it first with Shiraz Minwalla, one of the interviewees and the host of my long-term visit to the Tata Institute for Fundamental Physics in Mumbai. His encouraging words, "Thank you for doing this," together with the support of my PhD supervisor Niels Obers, were sufficient, and so this book began in India.

My original hope was to complete it within two years. This obviously did not happen. Until the very end, I insisted on conducting the interviews in person, leading to a lot of travelling. This was fun but occasionally bewildering, for instance, when I felt as if I was walking on a desert in Texas trying to catch a bus to interview Steven Weinberg.

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Additionally, it occurred to me only much later the possibility of a third party transcribing the interviews. Performing such transcription work in the beginning was as time-consuming as demotivating.

But the most important cause for the longevity of this process was, in fact, the attitude of the high-energy physics community towards projects of this kind. As one of the interviewees put it at the end of his interview, "This book may be good for the public and it may be good for the physics community but in the end what matters is the papers that you publish." Indeed, the standard by which one's career in a precarious academic job market is measured, according to the scientific community and the funding bodies, is almost purely based on scientific excellence.

A more wholistic perspective that views the scientist as an agent within the community and in the public sphere is lacking. Additional *duties* or *services* to the community and the public are privileges that one may decide to accept when holding comfortable long-term academic positions. This was not my case and, my Christiania-style non-conformism aside, I did focus on writing papers in order to find the next best job.

There is always space in life for hobbies, and I could have taken this book as one. Instead, I focused on another duty toward society and the scientific community for the past 11 years, namely, that of establishing an international science outreach platform and event series *Science & Cocktails*.[1] The immediate impact of *Science & Cocktails* in people's lives brought much richness to my life, while pushing the book to the sidelines for a time. It was only because of many motivational discussions with friends, family, colleagues and acquaintances, whom I cannot thank enough, that I kept pursuing the book project over the years. In fact, in 2013 I had the pleasure to host Susan Blackmore at *Science & Cocktails*, who was surprised to know that I was inspired by her book and in the process of conducting interviews on quantum gravity. She offered me one of her books with the written dedication "Keep asking those questions!" And I did.

The amount of time that I spent on completing the book over the past years is uncountable. However, though quite painful at times, I would do it all over again, as I have strong faith in its value for the physics community as a whole. Depending on the feedback that I receive from this community, I could be motivated to compile a second volume, since there are at least 37 other scientists whose views and opinions on this subject I would find useful, interesting and unique and which, due to limited time and space, I did not get the chance to record.

[1] http://scienceandcocktails.org.

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