

SpringerBriefs in History of Science and Technology

Advisory Board

Dr. Matteo Valleriani, Max Planck Institute for the History of Science,
Berlin, Germany

Prof. Dr. Bretislav Friedrich, Fritz Haber Institut der Max Planck Gesellschaft,
Berlin, Germany

Prof. Gerard Alberts, University of Amsterdam, The Netherlands

Prof. Dr. Theodore Arabatzis, National and Kapodistrian University of Athens,
Greece

Prof. Dr. Tom Archibald, Simon Fraser University Burnaby, Canada

Prof. David Pantalony, University of Ottawa, Canada

More information about this series at <http://www.springer.com/series/10085>

Roberto Lalli

Building the General Relativity and Gravitation Community During the Cold War

 Springer

Roberto Lalli
Max Planck Institute for the History
of Science
Berlin
Germany

ISSN 2211-4564 ISSN 2211-4572 (electronic)
SpringerBriefs in History of Science and Technology
ISBN 978-3-319-54653-7 ISBN 978-3-319-54654-4 (eBook)
DOI 10.1007/978-3-319-54654-4

Library of Congress Control Number: 2017948200

© The Author(s) 2017

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer International Publishing AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

To Serenella and Cosmo

Acknowledgements

This book is one of the outcomes of a multi-institutional research project initiated and organized by Department I of the Max Planck Institute for the History of Science (MPIWG) aimed at exploring the historical process of the renaissance of general relativity. It could have never been written without the financial and organizational support provided by Department I of the MPIWG or the insightful discussion with the project participants. My greatest gratitude goes to the Director of the Department, Jürgen Renn, who made this research possible in many different ways ranging from institutional support to intellectual engagement.

Many of the arguments developed in this book and my historiographical approach have been elaborated in this collaborative environment, and the realization of this volume particularly owes much to the close cooperation with my colleague Alexander Blum and Jürgen Renn since the start of the project in 2014.

I am enormously grateful to a number of scholars who read an earlier version of the essay and made many insightful comments. I am especially indebted to the editor of the SpringerBriefs in the History of Science and Technology, Matteo Valleriani, who carefully followed the entire process from the presentation of a first incomplete version of this essay to its ultimate revision. The constant support of Dieter Hoffmann, also one of the editors of the SpringerBriefs in the History of Science and Technology, has been invaluable as he carefully read and commented on various versions of this book and substantially helped me in my research concerning the situation in East Germany and other Eastern Bloc countries. I also wish to give my heartfelt thanks to Michael Gordin, Jean-Philippe Martinez, and Benjamin Wilson whose comments helped me develop my arguments. I am very grateful to David Kaiser, as this book has been greatly influenced by the many discussions I had with him on the topic. The final version of this book attempts to respond to many of the comments, questions, and remarks these colleagues have made, and I hope that they might see the resulting improvements as their own contribution. All remaining errors, needless to say, are mine.

My heartfelt thanks go to all the participants of the research project “The Renaissance of General Relativity in the Post World-War-II Period” for the many

illuminating discussions on the postwar development of general relativity as well as for having kindly provided some of the historical sources used in this research: Luisa Bonolis, Jean Eisenstaedt, Domenico Giulini, Hubert Goenner, Adele La Rana, Dennis Lehmkuhl, Christoph Lehner, Brian Pitts, Jim Ritter, David Rowe, Donald Salisbury, Tilman Sauer, Matthias Schemmel, and Jeroen van Dongen. The organizational support of Shadiye Leather-Barrow and Petra Schröter has been fundamental for the realization of the project. Additional material has been generously provided by Daniel Kennefick, and Dean Rickles, whom I thank very much.

Some arguments in this book were presented at the workshop “Space-Time Theories: Historical and Philosophical Contexts” at the Van Leer Jerusalem Institute in January 2015 and at the Centenary Conference on the History of General Relativity held at the Harnack-Haus in Berlin in December 2015. I am very grateful to all the organizers and attendees of both events for their comments and stimulating discussion, with special reference to Yemima Ben-Menachem, Diana Kormos-Buchwald, Hanoch Gutfreund, Carlo Rovelli, Robert Schulmann, and Aaron Wright. A very special thank you goes to Dirk Wintergrün who has been working on the technology for performing the network analysis of the general relativity and gravitation community, which inspired some of the arguments developed here. This book was completed during a two-month period spent at the Van Leer Jerusalem Institute, and I am enormously grateful to its previous and current directors, Gabriel Motzkin and Shai Lavi, for the financial and organizational support as well as for their interest in this project. Some of the arguments explored in this volume have been also inspired by the stimulating discussion within the Research Program on the History of the Max Planck Society of which I am a visiting scholar. I am very indebted to all the members of the Program for the illuminating views on the historical epistemology of scientific institutions developed within the program, including the Research Coordinator Florian Schmaltz and members of the Executive Committee Jürgen Kocka and Carsten Reinhardt, as well as Jürgen Renn.

To successfully pursue this research, I had the opportunity to access a number of historical documents stored in various archives and libraries around the world. This would have never been possible without the kind and extremely professional assistance of archivists, librarians, institute directors, and many dedicated experts I had the good fortune to meet. My sincerest thanks go to all the archivists and librarians who substantially helped me locate the materials, provided access to the documents, and gave permission to quote them. More specifically, I am immensely grateful to the following: Finn Aaserud, Helle Kiilerich, and Robert J. Sunderland (Niels Bohr Archive, Copenhagen) for Christian Møller’s papers, institutional documents concerning the organization of the GR6 conference, and the related permission to use some excerpts and images in this book; Niklaus Bütikofer (Archives of the University of Bern) for some of the relevant documents concerning André Mercier; Gregory Good and Melanie Mueller (Niels Bohr Library & Archive, Center for the History of Physics, American Institute of Physics) for some documents belonging to the International Society on General Relativity and Gravitation; Diana Kormos-Buchwald and the staff of the Einstein Papers Project

(Pasadena, CA) for having provided access to some of the documents in the Einstein collection; Michael Miller (Archive of the American Philosophical Society, Philadelphia) for documents belonging to John A. Wheeler; Elisabeth Schlenk (library of the Albert Einstein Institute in Potsdam-Golm) for the papers of the International Society on General Relativity and Gravitation and for having organized the relocation of this material to the library of the MPIWG; Heffa Schucking for having lent the documents belonging to his father, Engelbert Schucking, to the library of the MPIWG; Natasha Swainston (Churchill Archives Centre, Cambridge) for having given access to the documents of Hermann Bondi, and for having provided permission to publish two images of this archival collection; the staff of the Syracuse University Archives (Syracuse University) for the permission to quote papers from the collection by Peter Bergmann. I wish to express my gratitude to Jean-Philippe Martinez for having discussed with me the content of the archival documents concerning Vladimir Fock's participation in the activities of the International Committee on General Relativity and Gravitation, preserved at the Archive of the Russian Academy of Science in St. Petersburg.

I wish to express my deep gratitude to Esther Chen, Urte Brauckman, Sabine Bertram, and all the staff in the library of the MPIWG for all the logistic support essential to the finalization of this book. The meticulous and dedicated work of the student assistants Felix Brümmer and Christopher Wasmuth has been of immense help throughout the entire research process. The final version of the text was produced with the invaluable editorial support of Linda Jayne Turner and Lindy Divarci. Words cannot express how indebted I am for all this priceless help in the production of this book. I am also very grateful to Lucy Fleet for the editorial assistance that allowed this essay to be published in the format of the *SpingerBriefs*.

My deep gratitude is for the persons to whom this book is dedicated, the "relativists" themselves, and their efforts to maintain historical records of this activity, starting with the former Secretary of the International Society of the General Relativity and Gravitation, Malcolm MacCallum, who has been extremely helpful in locating the society's historical materials. Georg Dautcourt, Joshua Goldberg, Kip Thorne, and Louis Witten have kindly shared important recollections on the events analyzed here and also provided insightful comments on the text itself. My thoughts go especially to those who made a major contribution to the evolution of the international General Relativity and Gravitation community and are no longer here to read this essay, particularly Vladimir Braginsky, Cécile DeWitt-Morette, and Felix Pirani, who sadly passed away while this book was being completed.

Certainly, every production is also the sum of the various experiences that implicitly or explicitly led to its realization. It is probably impossible to quote all the persons who have played an important part, in one way or another, in the very existence of this book. I wish only to mention my former mentor and Ph.D. advisor Pasquale Tucci, who introduced me to the history of physics and shaped my future career in many important ways, as well as my colleagues Massimiliano Badino, Leonardo Gariboldi, and John Stachel, who all had an impact on the evolution of my thoughts and research interests. Finally, my warmest thoughts go to my friends

and my family who have always supported my studies in what is seen as a rather idiosyncratic discipline in Italy. I would like to thank my close friends Camilla Barbarito, Alberto Boccardi, Francesca Bonelli, Mila Casali, Giulia Damonte, Andrea Mei, my brother Emilio, and my sister Maria Irma. My deepest gratitude is for my late parents Irene and Manfredi, whose long-term, caring support I miss very much.

My last word of heartfelt thanks is for my wife Serenella who tolerated my mental absence and my poor sleeping while this book was under construction and she was pregnant with our first child. I see that this book is hers as much as it is mine.

Contents

1 Introduction	1
References.	6
2 The Renaissance of General Relativity: A New Perspective	7
2.1 Review of the Historiographical Debate	9
2.2 Re-assessing the Low-Water-Mark Period	13
2.3 Exploiting the Untapped Potential of General Relativity.	16
References.	19
3 (Re-)Establishing International Cooperation After World War II	23
References.	32
4 The Formative Phase of the GRG Community	35
4.1 The Jubilee Conference in Bern	37
4.2 Starting a Stable Tradition: The International Conferences on GRG	47
4.3 A New Community on Paper: The Bulletin on General Relativity and Gravitation.	54
4.4 The Rapid Growth of the Community: New Opportunities, New Threats	58
References.	69
5 From Crisis to a New Institutional Body	75
5.1 From Cold-War Negotiations to Real-War Tensions: Crisis and Resolution in the Organization of the 1968 Conference in Tbilisi.	75
5.2 The Establishment of a New Scientific Periodical: <i>General Relativity and Gravitation</i>	97

5.3 Toward the International Society on General Relativity
and Gravitation. 101
References. 125

6 Conclusion 129
References. 139

**Appendix A: Research Centers on Fields Related to General
Relativity Around the Mid-1950s. 141**

Appendix B 167

Abbreviations

ASP	Alfred Schild Papers, 1915–1982, Briscoe Center for American History, University of Texas at Austin
APS	American Physical Society
BBAW	Berlin-Brandenburgische Akademie der Wissenschaften, Berlin
BOND	The Papers of Sir Hermann Bondi, GBR/0014/BOND, Churchill Archives Centre, Churchill College, Cambridge, UK
CDWP	Cécile DeWitt-Morette Papers, Briscoe Center for American History, University of Texas at Austin
CERN	European Council for Nuclear Research, Geneva
CMP	Christian Møller Papers, Correspondence 1971–81, Niels Bohr Archive, Copenhagen
CNRS	Centre National de la Recherche Scientifique, France
CPAE	Collected Papers of Albert Einstein, Einstein Papers Project, California Institute of Technology, Pasadena, CA
DAUT	Papers of George Dautcourt, personal collection, Berlin
DAWB	Deutsche Akademie der Wissenschaften zu Berlin (from 1972 Akademie der Wissenschaften der DDR)
DIAS	Dublin Institute for Advanced Studies, Dublin
ESP	Engelbert Schucking Papers, Library of the Max Planck Institute for the History of Science, Berlin
ETH	Eidgenössische Technische Hochschule, Zürich
GR6P	R6 Conference in Copenhagen, NORDITA Collection, Niels Bohr Archive, Copenhagen
HAM	Handakten Prof. André Mercier, 1934–1998, Staatsarchiv Bern, Bern
IAS	Institute for Advanced Studies, Princeton, NJ
IAU	International Astronomical Union
ICGRG	International Committee on General Relativity and Gravitation
ICSU	International Council of Scientific Unions
IGY	International Geophysical Year

IMU	International Mathematical Union
IOFP	Institute of Field Physics, University of North Caroline, Chapel Hill, NC
ISGRG	International Society on General Relativity and Gravitation
ISGRGR	International Society on General Relativity and Gravitation Records, 1961–1982, AR235, American Institute of Physics, Niels Bohr Library & Archives, College Park, MD
IUBS	International Union of Biological Sciences
IUGG	International Union of Geodesy and Geophysics
IUGS	International Union of Geological Sciences
IUPAC	International Union of Pure and Applied Chemistry
IUPAP	International Union of Pure and Applied Physics
JWP	John Archibald Wheeler Papers, 1880–2008, Mss.B.W564, American Philosophical Society, Philadelphia, PA
MATS	Military Air Transport Service
PBP	Peter Bergmann Papers (unprocessed collection), University Archives, Special Collections Research Center, Syracuse University Libraries, Syracuse, NY
PISGRG	Papers of the International Society on General Relativity and Gravitation (unprocessed collection), Library of the Max Planck Institute for the History of Science, Berlin
SGC	Soviet Gravity Committee
SPS	Swiss Physical Society
Technion	Israel Institute of Technology, Haifa, Israel
URSI	International Union of Radio Science
VFP	Vladimir Fock Papers, 1919–1974, Fond 1034, Inventaire 2, Archive of the Russian Academy of Sciences, St. Petersburg Branch, St. Petersburg
ZIAP	Zentralinstitut für Astrophysik, Deutsche Akademie der Wissenschaften zu Berlin