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0521497957 - Novikov Conjectures, Index Theorems and Rigidity: Oberwolfach 1993, Volume 2

Edited by Steven C. Ferry, Andrew Ranicki and Jonathan Rosenberg

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Frontmatter

[More information](#)

- 153 L-functions and arithmetic, J. COATES & M.J. TAYLOR (eds)  
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 155 Classification theories of polarized varieties, TAKAO FUJITA  
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Frontmatter

[More information](#)

London Mathematical Society Lecture Note Series. 227

# Novikov Conjectures, Index Theorems and Rigidity

Volume 2

Oberwolfach 1993

Edited by

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Jonathan Rosenberg  
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Frontmatter

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Published by the Press Syndicate of the University of Cambridge  
The Pitt Building, Trumpington Street, Cambridge CB2 1RP  
40 West 20th Street, New York, NY 10011-4211, USA  
10 Stamford Road, Oakleigh, Melbourne 3166, Australia

© Cambridge University Press 1995

First published 1995

*Library of Congress cataloguing in publication data available*

*British Library cataloguing in publication data available*

ISBN 0 521 49795 7 paperback

Transferred to digital printing 2003

The papers in this volume were typeset by the editors using the  $\text{T}_{\text{E}}\text{X}$  typesetting program and the  $\mathcal{A}\mathcal{M}\mathcal{S}\text{-T}_{\text{E}}\text{X}$ ,  $\text{L}\text{A}\text{T}_{\text{E}}\text{X}$ ,  $\mathcal{L}\mathcal{A}\mathcal{M}\mathcal{S}\text{-T}_{\text{E}}\text{X}$ ,  $\mathcal{A}\mathcal{M}\mathcal{S}\text{-L}\text{A}\text{T}_{\text{E}}\text{X}$ , and  $\text{X}_{\text{Y}}\text{-pic}$  macro packages. Style files were prepared by the editors using templates prepared by Cambridge University Press. Some of the figures were prepared in PostScript.  $\text{T}_{\text{E}}\text{X}$  and  $\mathcal{A}\mathcal{M}\mathcal{S}\text{-T}_{\text{E}}\text{X}$  are trademarks of the American Mathematical Society; PostScript is a registered trademark of Adobe Systems Incorporated.  $\text{L}\text{A}\text{T}_{\text{E}}\text{X}$  is copyright (1992) by Leslie Lamport,  $\mathcal{L}\mathcal{A}\mathcal{M}\mathcal{S}\text{-T}_{\text{E}}\text{X}$  is copyright (1989) by the  $\text{T}_{\text{E}}\text{X}$ plorators Corporation, and  $\mathcal{A}\mathcal{M}\mathcal{S}\text{-L}\text{A}\text{T}_{\text{E}}\text{X}$  is copyright (1991) by the American Mathematical Society. The  $\text{X}_{\text{Y}}\text{-pic}$  package is copyright 1991–1994 by Kristoffer H. Rose.

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Edited by Steven C. Ferry, Andrew Ranicki and Jonathan Rosenberg

Frontmatter

[More information](#)

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*To Sergei P. Novikov*  
with respect and admiration

# Contents

## Contents, Volume 2

*Contents, Volume 1* . . . . . viii

*Preface, The Editors* . . . . . ix

### Research and Survey Papers

*Proper affine isometric actions of amenable groups,*  
M. E. Bekka, P.-A. Cherix, and Alain Valette . . . . . 1

*Bounded  $K$ -theory and the assembly map in algebraic  $K$ -theory,*  
Gunnar Carlsson . . . . . 5

*On the rigidity of the index on open manifolds,* Jürgen Eichhorn . . . 128

*Remarks on Steenrod homology,* Steven C. Ferry . . . . . 148

*Epsilon surgery theory,* Steven C. Ferry and Erik K. Pedersen . . . 167

*On the coarse Baum-Connes conjecture,* Nigel Higson and John Roe . . . 227

*Exotic index theory and the Novikov conjecture,* Steven Hurder . . . 255

*Bounded and continuous control,* Erik K. Pedersen . . . . . 277

*On the homotopy invariance of the boundedly controlled signature of a  
manifold over an open cone,*  
Erik K. Pedersen, John Roe, and Shmuel Weinberger . . . . . 285

*3-manifolds and  $PD(3)$ -groups,* C. B. Thomas . . . . . 301

*Orthogonal complements and endomorphisms of Hilbert modules and  
 $C^*$ -elliptic complexes,* Evgenii V. Troitsky . . . . . 309

*Assembly,* Michael Weiss and Bruce Williams . . . . . 332

*Pro-excisive functors,* Michael Weiss and Bruce Williams . . . . . 353

Cambridge University Press

0521497957 - Novikov Conjectures, Index Theorems and Rigidity: Oberwolfach 1993, Volume 2

Edited by Steven C. Ferry, Andrew Ranicki and Jonathan Rosenberg

Frontmatter

[More information](#)

viii

**Contents, Volume 1**

<i>Contents, Volume 2</i> . . . . .	viii
<i>Preface, The Editors</i> . . . . .	ix
<b>Introductory Material</b>	
<i>Programme of the Conference</i> . . . . .	1
<i>Participant List from the Conference</i> . . . . .	3
<i>A history and survey of the Novikov conjecture,</i> Steven C. Ferry, Andrew Ranicki, and Jonathan Rosenberg . . . . .	7
<i>Annotated Problem List</i> . . . . .	67
<b>Classic Papers</b>	
<i>On the Steenrod homology theory</i> (first distributed 1961), John Milnor . . . . .	79
<i>Homotopy type of differentiable manifolds</i> (first distributed 1962), William Browder . . . . .	97
<i>K-theory, group <math>C^*</math>-algebras, and higher signatures</i> ( <i>Conspectus</i> ) (first distributed 1981), Gennadi G. Kasparov . . . . .	101
<b>Research and Survey Papers</b>	
<i>A coarse approach to the Novikov conjecture,</i> Steven C. Ferry and Shmuel Weinberger . . . . .	147
<i>Geometric reflections on the Novikov conjecture</i> , Mikhael Gromov . . . . .	164
<i>Controlled Fredholm representations</i> , Alexander S. Mishchenko . . . . .	174
<i>Assembly maps in bordism-type theories</i> , Frank Quinn . . . . .	201
<i>On the Novikov conjecture</i> , Andrew Ranicki . . . . .	272
<i>Analytic Novikov for topologists</i> , Jonathan Rosenberg . . . . .	338

## Preface

These volumes grew out of the conference which we organized at the Mathematisches Forschungsinstitut Oberwolfach in September, 1993, on the subject of “Novikov conjectures, index theorems and rigidity.” The aim of the meeting was to examine the Novikov conjecture, one of the central problems of the topology of manifolds, along with the vast assortment of refinements, generalizations, and analogues of the conjecture which have proliferated over the last 25 years. There were 38 participants, coming from Australia, Canada, France, Germany, Great Britain, Hong Kong, Poland, Russia, Switzerland, and the United States, with interests in topology, analysis, and geometry. What made the meeting unusual were both its interdisciplinary scope and the lively and constructive interaction of experts from very different fields of mathematics. The success of the meeting led us to try to capture its spirit in print, and these two volumes are the result.

It was not our intention to produce the usual sort of conference proceedings volume consisting of research announcements by the participants. There are enough such tomes gathering dust on library shelves. Instead, we have hoped to capture a snapshot of the status of work on the Novikov conjecture and related topics, now that the subject is about 25 years old. We have also tried to produce volumes which will be helpful to beginners in the area (especially graduate students), and also to those working in some aspect of the subject who want to understand the connection between what they are doing and what is going on in other fields. Accordingly, we have included here :

- (a) a fairly detailed historical survey of the Novikov conjecture, including an annotated reprint of the original statement (both in the original Russian and in English translation), and a reasonably complete bibliography of the subsequent developments;
- (b) the texts of hitherto unpublished classic papers by Milnor, Browder, and Kasparov relevant to the Novikov conjecture, which are known to the experts but hard for the uninitiated to locate;
- (c) several papers (Ferry, Ferry-Weinberger, Ranicki, Rosenberg) which, while they present some new work, also attempt to survey aspects of the subject; and
- (d) research papers which reflect the wide range of current techniques used to attack the Novikov conjecture: geometry, analysis, topology, algebra, . . . .

All the research papers have been refereed.

We hope that the reader will find the two volumes worthwhile, not merely as a technical reference tool, but also as stimulating reading to be browsed



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Frontmatter

[More information](#)

---

x

through at leisure.

We should like to thank the Director and staff of the Mathematisches Institut Oberwolfach for their expert logistical help, for their financial support, and for the marvellous working environment that made possible the 1993 conference that got this project started. Thanks are due as well to all the participants at the meeting, to the contributors to the two volumes, to the referees of the research papers, to the contributors to the problem list and bibliography, and to Roger Astley and David Tranah of Cambridge University Press. We thank the National Science Foundation of the U. S. for its support under grants DMS 90-03746, DMS-93-05758 and DMS 92-25063, the European Union for its support via the *K*-theory Initiative under Science Plan SCI-CT91-0756, as well as the Centenary Fund of the Edinburgh Mathematical Society.

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June, 1995