

Current Developments in Mathematics 1999

Edited by

David Jerison
Barry Mazur
Wilfried Schmid
Isadore Singer
Daniel Stroock
S.-T. Yau

Current Developments in Mathematics, 1999

Editorial Board:

Barry Mazur
Wilfried Schmid
S.-T. Yau

Harvard University
Cambridge, Massachusetts

David Jerison
Isadore Singer
Daniel Stroock

Massachusetts Institute of Technology
Cambridge, Massachusetts

Copyright © 1999, 2010 by International Press
Somerville, Massachusetts, U.S.A.

All rights reserved. Individual readers of this publication, and non-profit libraries acting for them, are permitted to make fair use of the material, such as to copy a chapter for use in teaching or research. Permission is granted to quote brief passages from this publication in reviews, provided the customary acknowledgement of the source is given. Republication, systematic copying, or mass reproduction of any material in this publication is permitted only under license from International Press.

Excluded from these provisions is material in articles to which the author holds the copyright. In such cases, requests for permission to use or reprint should be addressed directly to the author. (Copyright ownership is indicated in the notice on the first page of each article.)

ISBN 978-1-57146-148-3

Paperback reissue 2010. Previously published in 1999 under ISBN 1-57146-043-8 (clothbound).

Typeset using the LaTeX system.

CONTENTS

Recent Proofs of the Riemannian Penrose Conjecture <i>Hubert L. Bray and Richard M. Schoen</i>	1
Recent Progress in Sphere Packing <i>J. H. Conway, C. Goodman-Strauss, and N. J. A. Sloane</i>	37
A report on the proof of the Langlands conjectures for $GL(N)$ over p-adic fields <i>Guy Henniart</i>	77
The Langlands Correspondence for Function Fields following Laurent Lafforgue <i>G�rard Laumon</i>	115

Preface

These are the proceedings of the joint seminar by M.I.T. and Harvard on the current developments in mathematics for the year 1999. Established in 1995, this seminar will be continued each year.

The organizing committee for the seminar is made up of representatives from the mathematics departments of the two institutions: B. Mazur, W. Schmid, and S.-T. Yau from Harvard; and David Jerison, Isadore Singer, and Dan Stroock from M.I.T.

We would like to thank each of the contributors and to recognise some of the institutions without whose participation the seminar would not have been possible including the departments of mathematics at Harvard and M.I.T. for their financial aid.

Editors