

CONTEMPORARY MATHEMATICS

146

Algebraic Topology Oaxtepec 1991

Proceedings of an International Conference
on Algebraic Topology, held July 4–11, 1991
in Oaxtepec, Mexico

Martin C. Tangora
Editor

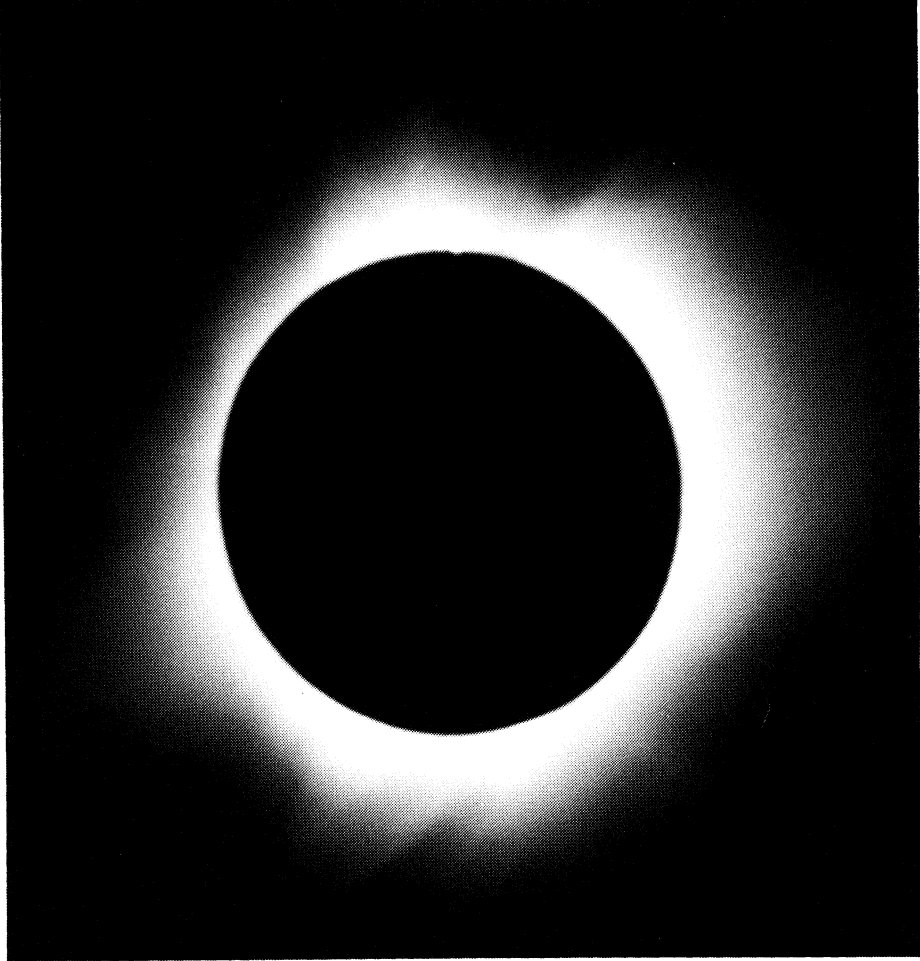


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Algebraic Topology
Oaxtepec 1991



Oaxtepec, July 11, 1991

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146

Algebraic Topology Oaxtepec 1991

Proceedings of an International Conference
on Algebraic Topology, July 4-11, 1991
with support from the National Science Foundation
and the Consejo Nacional de Ciencia y
Tecnología (Mexico)

Martin C. Tangora
Editor



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An International Conference on Algebraic Topology was held in Oaxtepec, Mexico, on July 4–11, 1991 with support from the National Science Foundation and from the Consejo Nacional de Ciencia y Tecnología (Mexico).

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Preface

At the Adams Memorial Symposium, in Manchester in July 1990, Doug Ravenel called our attention to the coincidence in 1991 of Mark Mahowald's sixtieth year and an exceptionally promising total eclipse of the sun passing over the spa and conference center of Oaxtepec in Mexico. Planning began at that time for the International Conference in Algebraic Topology of which this volume is the record.

Arrangements and preparations were undertaken by the organizers, Don Davis, Mike Hopkins, Guillermo Moreno, and Paul Shick, while the undersigned agreed to edit the proceedings.

Partial financial support for the meeting was obtained from the National Science Foundation, through Hopkins' Presidential Young Investigator grant, and from the Consejo Nacional de Ciencia y Tecnología (Mexico).

Administrative support was provided by several institutions, especially John Carroll University and the Centro de Investigación y de Estudios Avanzados of the Instituto Politécnico Nacional. We would particularly like to thank Kim Balk and Dal Lanese of John Carroll, and Jacqueline Desfassiaux, Enrique Polska, Ismael Muños, and Guillermo Davila of the CINVESTAV del I.P.N.

The conference was held at Oaxtepec July 4 through 11, 1991, with a banquet in honor of Mark Mahowald on the evening of July 10. There were also outings to Tepozteco and to Cuernavaca. The eclipse followed, as scheduled, on July 11.

Plenary talks were held in the splendid observatory tower looking out over the park and the countryside. Contributed talks were held in rooms at the stadium as well as in the tower. The speakers and their titles are listed after the Table of Contents. A number of other participants were prepared to contribute talks but could not be accommodated in the time available. In addition there was a Poster Session on July 9.

All participants were invited to contribute to the Proceedings, and the papers published in this volume correspond only in part to the talks at the conference. However, the surveys here by Miller and Ravenel and by Davis are based on the plenary talks by those three authors at the conference.

All papers have been refereed. Any such volume is deeply indebted to the anonymous referees for their thankless task of reviewing, editing, and in some cases correcting the papers submitted. I would particularly like to thank Don Davis, who not only was one of the prompt referees, but who gave me invaluable help in selecting the referees. It should also be stated that Davis served as the editor for my own article.

The publications staff at the AMS has had to deal with literally thousands of e-mail and other communications from the authors and me, and we owe them our gratitude, especially Donna Harmon and Chris Thivierge.

Credit is due as follows for special features of this volume: for the chart of the Adams spectral sequence, produced by Paul Shick, which was the place mat at the banquet and is now Appendix 2; for the conference logo, designed by Ismael Muños; and for the eclipse photo, credited to Ralph Cohen and Jim Milgram.

Doug Ravenel has suggested that we conclude this Preface with a mention of the solar eclipse of August 11, 1999, which will be visible in Cornwall, parts of northern France and southern Germany, and various points east. We join Ravenel in suggesting that this would be an excellent occasion for another international conference in algebraic topology.

Martin C. Tangora
University of Illinois at Chicago

List of Speakers

Invited Speakers

- Alejandro Adem, Wisconsin: Cohomological non-vanishing and topological invariants of discrete groups
- Fred Cohen, Rochester: An inconvenient category of topological spaces
- Ralph Cohen, Stanford: Morse theory, classifying spaces, and the loop space of a symplectic manifold
- Don Davis, Lehigh: Immersions of projective spaces, a historical survey
- Sam Gitler, Rochester: The work of Jose Adem on biaxial maps and some recent results
- Paul Goerss, Washington: Witt vectors, Hopf algebras, and Brown-Gitler spectra
- Francisco González-Acuña, UNAM: Lusternik-Schnirelman and related category of 3-manifolds
- Brayton Gray, Illinois Chicago: v_2 -periodicity in the secondary EHP spectral sequence
- Hans-Werner Henn, Heidelberg: Refinements of Quillen's description of equivariant mod p cohomology
- Mike Hopkins, MIT: Perspectives in homotopy theory
- John Jones, Warwick: Floer homotopy type
- Nick Kuhn, Virginia: On topologically realizing finitely generated A-modules
- Ib Madsen, Aarhus: Cyclotomic trace invariant for the integers
- Mark Mahowald, Northwestern: On the tertiary suspension
- Jim McClure, Kentucky: Topological Andre-Quillen cohomology
- Jim Milgram, Stanford: The geometry of instantons and a proof of the Atiyah-Jones conjecture
- Haynes Miller, MIT: On the image of J in unstable homotopy
- Fabien Morel, Paris VII: A theorem of Lannes viewed as a representability theorem
- Guillermo Moreno, CINVESTAV: On spherical classes in the homology of exceptional Lie groups
- Goro Nishida, Kyoto: A certain localization of the space X_Γ

Mikhail Postnikov, Steklov Institute: Simplicial sets with symmetries
 Stewart Priddy, Northwestern: On the stable homotopy type of BG
 Doug Ravenel, Rochester: A history of the stable homotopy groups of spheres
 Charles Thomas, Cambridge: Contact manifolds and hyper-contact manifolds
 Clarence Wilkerson, Purdue: On leading off a conference...

Contributed Talks

Marcelo Aguilar, UNAM: Multiple points of immersions and cyclic reductions
 David Blanc, Northwestern: Abelian Pi-algebras and their projective dimensions
 Carl-Friedrich Boedigheimer, Göttingen: Moduli of Riemann surfaces and interval exchange maps
 Bob Bruner, Wayne State: Extended powers of manifolds and the Adams spectral sequence
 Giora Dula, Israel: Hopf invariants in general categories
 Mark Hovey, Yale: A geometric description of mod 2 elliptic cohomology
 Kenshi Ishiguro, Hofstra: Retracts of classifying spaces
 Lisa Langsetmo, Northwestern: K-theory localization of odd spheres
 Wen-Hsung Lin, Tsing-Hua: The EHP sequence and the lambda algebra
 John Martino, Virginia: More on classifying the stable type of BG
 John McCleary, Vassar: Mod 2 associative H-spaces
 Chuck McGibbon, Wayne State: Clones of spaces and maps
 Jean-Pierre Meyer, Johns Hopkins: Combinatorial homotopy and multiple groupoids
 Kaoru Morisugi, Wakayama: Periodic behavior of CP^∞ and applications
 Erich Ossa, Wuppertal: On the cohomology of braid groups
 John Palmieri, MIT: Nilpotence for modules over the Steenrod algebra
 Bill Richter, MIT: Knots with fundamental group Z
 Yuly Rudyak, Moscow: On Mahowald's conjecture concerning Thom spectra
 Paul Silberbush, Rochester: The order of the self map of the summands of the Snaithe splitting for odd spheres
 Jeff Smith, Purdue: Applications of algebra to a problem in topology
 Ross Staffeldt, New Mexico State: The chromatic convergence theorem and a tower in algebraic K-theory
 Marty Tangora, Illinois Chicago: The May spectral sequence revisited
 Volodia Vershinin, Novosibirsk: A conjecture of Mahowald on MSP
 Peter Webb, Minnesota: Structure of Mackey functors
 Steve Wilson, Johns Hopkins: Morava K-theory of loops on a finite Postnikov system
 Jay Wood, Purdue Calumet: A peculiar feature of $H^* BSpin(n)$
 Zen-Ichi Yosimura, Osaka: K_* -localizations of stunted projective spaces

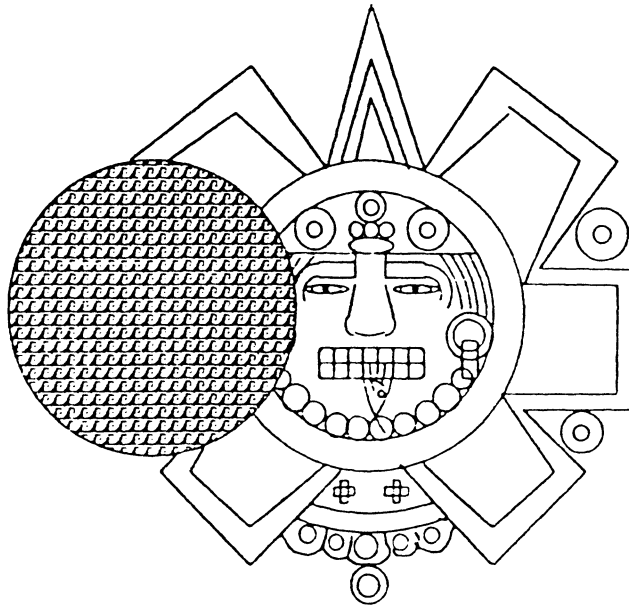
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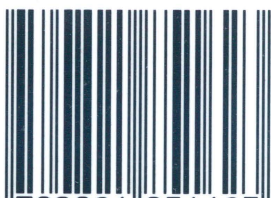
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Algebraic Topology
Martin C. Tangora, Editor

This book consists of twenty-nine articles contributed by participants of an International Conference on Algebraic Topology held in July 1991 in Oaxtepec, Mexico. In addition to papers on current research, there are several surveys and expositions on the work of Mark Mahowald, whose sixtieth birthday was celebrated during the conference. The conference was truly international, with over 130 mathematicians from fifteen countries. It ended with a spectacular total eclipse of the sun, a photograph of which appears as the frontispiece. The papers range over much of algebraic topology and cross over into related areas, such as K -theory, representation theory, and Lie groups. Also included is a chart of the Adams spectral sequence and a bibliography of Mahowald's publications.

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