CONTEMPORARY MATHEMATICS

620

Algebraic Topology: Applications and New Directions

Stanford Symposium on
Algebraic Topology: Applications and New Directions
July 23–27, 2012
Stanford University, Stanford, CA

Ulrike Tillmann
Søren Galatius
Dev Sinha
Editors

American Mathematical Society

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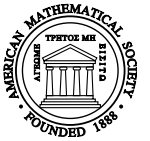

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In honour of Gunnar Carlsson, Ralph Cohen, and Ib Madsen

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Preface

The Stanford Symposium "Algebraic Topology: Applications and New Directions" took place 23–27 July 2012. The conference was held in honour of Gunnar Carlsson, Ralph Cohen and Ib Madsen, who celebrated their 60th and 70th birthdays that year. It showcased current research in Algebraic Topology reflecting the celebrants' broad interests and profound influence on the subject. The topics varied broadly from stable equivariant homotopy theory to persistent homology and application in data analysis, covering topological aspects of quantum physics such as string topology and geometric quantisation, examining homology stability in algebraic and geometric contexts, including algebraic K-theory and the theory of operads.

There were 250 participants attending the conference and 50 talks were delivered in plenary and parallel sessions. A special session was devoted to applied algebraic topology, and a lively panel discussion explored the theme of "Future directions in algebraic topology".

Speakers were invited to contribute to these proceedings. As editors we were keen to catch the vibrancy and diversity of the subject area as evident at the symposium and produce a volume that would honour the three celebrants. Authors were invited to submit research and survey articles as well as work that is forward looking and speculative.

The conference was supported financially primarily by the National Science Foundation and the Stanford University Mathematics Research Center. The scientific programme was much enhanced by many social events including a barbecue, a hike and a conference dinner. As organisers of the symposium we would like to express our deep gratitude to Ralph Cohen and all those who assisted him for the organisation of these and the generous hospitality offered throughout the week. Finally, we would like to thank all speakers and participants for their excellent contributions and enthusiasm.

Ulrike Tillmann
Søren Galatius
Dev Sinha

November 2013

Scientific Programme

Plenary Lectures

Andrew Blumberg
New directions for trace methods

Bill Dwyer
Operads and higher knots

Dan Freed
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Søren Galatius
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Lars Hesselholt
Real algebraic K-theory

Michael Hopkins
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Matthew Kahle
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Jacob Lurie
p-Divisible groups, and character theory

Graeme Segal
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Ulrike Tillmann
On the work of three eminent topologists

Craig Westerland
A higher chromatic analogue of the image of J

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Equivariant K-theory and spaces of commuting elements in a compact Lie group

David Ayala
Higher categories are sheaves on manifolds

Clark Barwick
Dévissage

Alexander Berglund
Homological stability for automorphisms of manifolds

Julie Bergner
Diagrams encoding group actions

Carl-Friedrich Bödigheimer
Homology operations for moduli spaces

Tom Church
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Chris Douglas
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Bjorn Ian Dundas
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Reverse engineering the classical Adams-Novikov spectral sequence

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Homological stability for moduli spaces of manifolds

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Cellular decompositions of planar configuration spaces
and the Fulton Mac Pherson operad

Dev Sinha
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Justin Curry
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Daniel Müllner
Consistent scale selection for exploratory visualization and analysis of data sets

Monica Nicolau
Unraveling the biology of disease
through data transformations and topological data analysis

Primoz Skraba
Persistence of Random Points

Mikael Vejdemo-Johansson
Computation of spectral sequences of double complexes,
with applications to persistent homology

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Panelists:

Alejandro Adem (moderator)
David Ayala
Bill Dwyer
Dan Freed
Kathryn Hess
Michael Hopkins
Nick Kuhn

List of Participants and Conference Photo

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