SURGERY AND GEOMETRIC TOPOLOGY

Andrew Ranicki and Masayuki Yamasaki, Editors

Proceedings of a conference held at Josai University
Sakado, September 1996

Contents

Foreword v

Program of the conference vii

List of participants ix

Toshiyuki Akita, *Cohomology and Euler characteristics of Coxeter groups* 3

Frank Connolly and Bogdan Vajiac, *Completions of Stratified Ends* 17

Zbigniew Fiedorowicz and Yongjin Song, *The braid structure of mapping class groups* 21

Bruce Hughes, *Controlled topological equivalence of maps in the theory of stratified spaces and approximate fibrations* 31

Tsuyoshi Kato, *The asymptotic method in the Novikov conjecture* 51

Tomohiro Kawakami, *A note on exponentially Nash G manifolds and vector bundles* 63

Masaharu Morimoto, *On fixed point data of smooth actions on spheres* 77

Eiji Ogasa, *Some results on knots and links in all dimensions* 81

Erik K. Pedersen, *Controlled algebra and topology* 91

Frank Quinn, *Problems in low-dimensional topology* 97

Andrew Ranicki, *45 slides on chain duality* 105

Andrew Ranicki and Masayuki Yamasaki, *Controlled L-theory* (preliminary announcement) 119

John Roe, *Notes on surgery and C^*-algebras* 137

Tatsuhiko Yagasaki, *Characterizations of infinite-dimensional manifold tuples and their applications to homeomorphism groups* 145

Foreword

As the second of a conference series in mathematics, Josai University sponsored the Conference on Surgery and Geometric Topology during the week of September 17 – 21, 1996. The scientific program consisted of 13 lectures, listed below, and there was an excursion to Takaragawa, Gunma on the 21st.

This volume collects papers by participants, as well as some of the abstracts prepared by the lecturers for the conference. The articles are also available electronically on WWW from:

`http://math.josai.ac.jp/~yamasaki/conference.html`

at least for several years.

We would like to thank Josai University, and Grant-in-Aid for Scientific Research (A)(1) of the Ministry of Education, Science, Sports and Culture of Japan, for their generous financial support. Thanks are also due to the university staff for their various support, to the lecturers and to the participants of the conference.

Andrew Ranicki
(Edinburgh, Scotland)
Masayuki Yamasaki
(Sakado, Japan)
December, 1996

Program of the Conference

Surgery and Geometric Topology
Sakado, Saitama

September 17, Tuesday

10:00 – 11:20 **Andrew Ranicki**
Chain Duality.

13:20 – 14:40 **Erik Pedersen**
Simplicial and Continuous Control

15:00 – 16:20 **Toshiyuki Akita**
Cohomology and Euler Characteristics of Coxeter Groups

September 18, Wednesday

10:00 – 11:20 **Frank Quinn**
Problems with Surgery and Handlebodies in Low Dimensions

13:20 – 14:40 **John Roe**
Surgery and Operator Algebras

15:00 – 16:20 **Tsuyoshi Kato**
The Asymptotic Method in the Novikov Conjecture

16:30 – 17:20 **Eiji Ogasa**
On the Intersection of Spheres in a Sphere

September 19, Thursday

10:00 – 11:20 **Bruce Hughes**
Stratified Spaces and Approximate Fibrations

13:20 – 14:40 **Francis Connolly**
An End Theorem for Manifold Stratified Spaces

15:00 – 16:20 **Tatsuhiko Yagasaki**
Infinite-dimensional Manifold Triples of Homeomorphism Groups

September 20, Friday

10:00 – 11:20 **Yongjin Song**

The Braid Structure of Mapping Class Groups

13:20 – 14:40 **Masaharu Morimoto**

On Fixed Point Data of Smooth Actions on Spheres

15:00 – 16:00 **Masayuki Yamasaki**

Epsilon Control and Perl

List of Participants

(The numbers correspond to the keys to the photograph on page xi.)

6 **Toshiyuki Akita** (Fukuoka Univ) akita@ssat.fukuoka-u.ac.jp

Yuko Asada (Nagoya Univ)

32 **Naoaki Chinen** (Univ of Tsukuba)

18 **Frank Connolly** (Univ of Notre Dame, USA) connolly.1@nd.edu

Koji Fujiwara (Keio Univ) fujiwara@math.keio.ac.jp

28 **Hiroo Fukaishi** (Kagawa Univ) fukaishi@ed.kagawa-u.ac.jp

Hiroaki Hamanaka (Kyoto Univ)

29 **Tetsuya Hosaka** (Univ of Tsukuba)

3 **Bruce Hughes** (Vanderbilt Univ, USA) hughes@math.vanderbilt.edu

Kazumasa Ikeda (Tokyo Univ) nikeda@hongo.ecc.u-tokyo.ac.jp

Jun Imai (NTT Communication Sci Lab) imai@cslab.kecl.ntt.jp

Hiroyuki Ishibashi (Josai Univ) hishi@math.josai.ac.jp

2 **Hiroyasu Ishimoto** (Kanazawa Univ) ishimoto@kappa.s.kanazawa-u.ac.jp

27 **Osamu Kakimizu** (Niigata Univ) kakimizu@ed.niigata-u.ac.jp

12 **Tsuyoshi Kato** (Kyoto Univ) tkato@kusm.kyoto-u.ac.jp

23 **Tomohiro Kawakami** (Osaka Pref College) ls040@ipc.osaka-pct.ac.jp

5 **Kazuhiro Kawamura** (Univ of Tsukuba) kawamura@math.tsukuba.ac.jp

16 **Takahiro Kayashima** (Kyushu Univ) kayap@math.kyushu-u.ac.jp

Yukio Kuribayashi (Tottori Univ)

30 **Yasuhiko Kitada** (Yokohama National Univ) kitada@mathlab.sci.ynu.ac.jp

Minoru Kobayashi (Josai Univ) mkoba@math.josai.ac.jp

Yukihiro Kodama (Kanagawa Univ)

10 **Akira Koyama** (Osaka Kyoiku Univ) koyama@cc.osaka-kyoiku.ac.jp

Ken-ichi Maruyama (Chiba University) maruyama@cue.e.chiba-u.ac.jp

Mikiya Masuda (Osaka City Univ) masuda@sci.himeji-tech.ac.jp

26 **Mamoru Mimura** (Okayama Univ) mimura@math.okayama-u.ac.jp

Kiyoshi Mizohata (Josai University) mizohata@math.josai.ac.jp

21 **Masaharu Morimoto** (Okayama Univ) morimoto@math.ems.okayama-u.ac.jp

Yutaka Morita (Josai Univ) ymori@euclides.josai.ac.jp

Hitoshi Moriyoshi (Hokkaido Univ) moriyosi@math.hokudai.ac.jp
22 **Mitsutaka Murayama** (Tokyo Inst Tech) murayama@math.titech.ac.jp
Ikumitsu Nagasaki (Osaka Univ) nagasaki@math.sci.osaka-u.ac.jp
35 **Masatsugu Nagata** (Kyoto Univ, RIMS) nagata@kurims.kyoto-u.ac.jp
4 **Kiyoko Nishizawa** (Josai Univ) kiyoko@math.josai.ac.jp
Eiji Ogasa (Tokyo Univ) i33992@m-unix.cc.u-tokyo.ac.jp
19 **Jun O'Hara** (Tokyo Metropolitan Univ) ohara@math.metro-u.ac.jp
Hiroshi Ohta (Nagoya Univ) ohta@math.nagoya-u.ac.jp
Nobuatsu Oka (Aichi Kyoiku Univ)
7 **Kaoru Ono** (Ochanomizu Univ) ono@math.ocha.ac.jp
15 **Erik Pedersen** (SUNY at Binghamton, USA) erik@math.binghamton.edu
24 **Frank Quinn** (Virginia Tech, USA) quinn@math.vt.edu
1 **Andrew Ranicki** (Edinburgh Univ, UK) aar@maths.ed.ac.uk
9 **John Roe** (Oxford Univ, UK) jroe@jesus.ox.ac.uk
Katsusuke Sekiguchi (Kokushikan Univ)
31 **Kazuhisa Shimakawa** (Okayama Univ) kazu@math.okayama-u.ac.jp
11 **Yongjin Song** (Inha Univ, Korea) yjsong@math.inha.ac.kr
34 **Toshio Sumi** (Kyushu Institute of Design) sumi@kyushu-id.ac.jp
13 **Toshiki Suzuki** (Josai Univ)
25 **Hideo Takahashi** (Nagaoka Inst Tech)
Jun-ya Takahashi (Tokyo Univ)
Tatsuru Takakura (Fukuoka Univ) takakura@ssat.fukuoka-u.ac.jp
20 **Dai Tamaki** (Shinshu Univ) rivulus@gipac.shinshu-u.ac.jp
8 **Fumihiro Ushitaki** (Kyoto Sangyo Univ) ushitaki@ksuvx0.kyoto-su.ac.jp
17 **Tatsuhiko Yagasaki** (Kyoto Inst Tech) yagasaki@ipc.kit.ac.jp
Yuichi Yamada (Tokyo Univ) yyyamada@ms.u-tokyo.ac.jp
Hiroshi Yamaguchi (Josai Univ) hyama@math.josai.ac.jp
Tsuneyo Yamanoshita (Musashi Inst Tech)
36 **Masayuki Yamasaki** (Josai Univ) yamasaki@math.josai.ac.jp
14 **Katsuya Yokoi** (Univ of Tsukuba) yokoi@math.tsukuba.ac.jp
Zen-ichi Yoshimura (Nagoya Inst Tech) yosimura@math.kyy.nitech.ac.jp

Surgery and Geometric Topology

Contents

Foreword v

Program of the conference vii

List of participants ix

Toshiyuki Akita, *Cohomology and Euler characteristics of Coxeter groups* 3

Frank Connolly and Bogdan Vajiac, *Completions of Stratified Ends* 17

Zbigniew Fiedorowicz and Yongjin Song, *The braid structure of mapping class groups* 21

Bruce Hughes, *Controlled topological equivalence of maps in the theory of stratified spaces and approximate fibrations* 31

Tsuyoshi Kato, *The asymptotic method in the Novikov conjecture* 51

Tomohiro Kawakami, *A note on exponentially Nash G manifolds and vector bundles* 63

Masaharu Morimoto, *On fixed point data of smooth actions on spheres* 77

Eiji Ogasa, *Some results on knots and links in all dimensions* 81

Erik K. Pedersen, *Controlled algebra and topology* 91

Frank Quinn, *Problems in low-dimensional topology* 97

Andrew Ranicki, *45 slides on chain duality* 105

Andrew Ranicki and Masayuki Yamasaki, *Controlled L-theory* (preliminary announcement) 119

John Roe, *Notes on surgery and C^*-algebras* 137

Tatsuhiko Yagasaki, *Characterizations of infinite-dimensional manifold tuples and their applications to homeomorphism groups* 145