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**RIMS Kôkyûroku Bessatsu B38**

# Singularity theory, geometry and topology

edited by Kentaro Saji

April, 2013

Research Institute for Mathematical Sciences  
Kyoto University

*RIMS Kôkyûroku Bessatsu B38*

*Singularity theory, geometry and topology*

*November 29 ~ December 2, 2011*

*edited by Kentaro Saji*

*April, 2013*

*Research Institute for Mathematical Sciences*

*Kyoto University, Kyoto, Japan*

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## Preface

The RIMS workshop “Singularity theory, geometry and topology” was held at the Research Institute for Mathematical Sciences of Kyoto University from November 29 to December 2, 2011, which I had the pleasure to organize.

The aim of the workshop was to give an overview of recent developments in the singularity theory of smooth maps and its applications to geometry and topology. There were 15 lectures during the workshop.

This volume of the RIMS Kôkyûroku Bessatsu is a collection of articles contributed by 9 speakers. In addition I invited two other participants to write papers as well. Although they did not give talks, they substantially contributed to the workshop via discussions, comments and crucial questions, and their papers increased the value of this volume. Each paper was refereed by an expert, and is published here in final form. I would like to express my sincere gratitude to all participants, speakers, RIMS secretaries and referees for their efforts, which made this meeting a success.

March, 2013

Kentaro Saji (Kobe University)

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## Program of the workshop

Title Singularity theory, geometry and topology

Venue Room 111, Research Institute for Mathematical Sciences, Kyoto University

Dates November 29 - December 2, 2011

### 29, November

13:40–14:40 ··· Masayuki Kawashima

On  $(2, p)$  quasi torus curves and weak Zariski pairs

14:50–15:50 ··· Kosuke Naokawa

Singularities of the asymptotic completion of developable Möbius strips

16:00–17:00 ··· Makoto Kimura

Ricci solitons on hyperspheres in space forms

### 30, November

10:00–11:00 ··· Takashi Nishimura

Topological aspect of Wulff shapes

11:10–12:10 ··· Atsufumi Honda

Extrinsically flat surfaces and the geometric structure on the space of geodesics in the 3-sphere

13:40–14:40 ··· Isao Nakai

Topology of cubic maps of  $\mathbf{C}^3$  to  $\mathbf{C}^2$

14:50–15:50 ··· Kazuto Takao

Singularities of product maps and Heegaard splittings

16:00–17:00 ··· Daiki Sumida

A  $C^\infty$  map into the torus induced by a pair of milnor fibrations

### 1, December

10:00–11:00 ··· Shintaro Yoshizawa

Real analytic gradientflows and matrix eigenvalue problems

11:10–12:10 . . . Naoki Kitazawa

Numerical invariants we can define from singularities of generic fold maps

13:40–14:40 . . . Kaname Hashimoto

Cohomogeneity one special Lagrangian submanifolds in the complex sphere

14:50–15:50 . . . Masaru Hasegawa

Height functions on Whitney umbrella

16:00–17:00 . . . Yusuke Mizota

Multicusps

## **2, December**

10:00–11:00 . . . Laurentiu Paunescu

The SPP-geometry

11:10–12:10 . . . Goo Ishikawa

Openings of stable unfoldings