WORKSHOP

GEOMETRIC ANALYSIS IN GEOMETRY AND TOPOLOGY 2015

Date   November 9th − 12th, 2015
Place   Morito Memorial Hall
        Tokyo University of Science
        Kagurazaka 4-2-2, Shinjuku-ku, Tokyo 162-8601, JAPAN

★   November 10th, 18:00∼
        Party of the celebration of the sixtieth birthday of Professor Osamu Kobayashi

Invited speakers
• **Bernd Ammann**   Regensburg, Germany
• **Boris Botvinnik**   University of Oregon, USA
• **Claude LeBrun**   SUNY at Stony Brook, USA
• **Rafe Mazzeo**   Stanford University, USA
• **Jimmy Petean**   CIMAT, Mexico
• **Harish Seshadri** (Bangalore, India
• **Osamu Kobayashi**   Osaka University
• **Masahiko Kanai**   University of Tokyo
• **Miyuki Koiso**   Kyushu University
• **Motoko Kotani**   Tohoku University
• **Masaaki Umehara**   Tokyo Institute of Technology
• **Kotaro Yamada**   Tokyo Institute of Technology
• **Shin Nayatani**   Nagoya University
• **Shinichiroh Matsuo**   Osaka University

Schedule

	10:00–11:00	11:30–12:30	14:00–15:00	15:30–16:30	18:00∼
Nov. 9	LeBrun	Mazzeo	Kanai	Matsuo	
Nov. 10	LeBrun	Yamada	Kotani	Kobayashi	**Party**
Nov. 11	Botvinnik	Ammann	Seshadri	Koiso	
Nov. 12	Ammann	Petean	Umehara	Nayatani	

Organizers
• Naoyuki Koike (Tokyo University of Science)
• Shu Nakamura (University of Tokyo)
• Mikio Furuta (University of Tokyo)
• Osamu Kobayashi (Osaka University)
• Shinichiroh Matsuo (Osaka University)
• Rafe Mazzeo (Stanford University, Foreign adviser)
• Kazuo Akutagawa (Tokyo Institute of Technology)
• Akiko Takagi (Tokyo Institute of Technology, Secretary)

November 9th (Monday)

10:00–11:00
   Claude LeBrun
   " Einstein Metrics, Weyl Curvature, and Symplectic 4-Manifolds "

11:30–12:30
   Rafe Mazzeo
   " TBA "

12:30–14:00   **Lunchtime**

14:00–15:00
   Masahiko Kanai
 " The cross ratio and its folks "

15:30–16:30
   Shinichiroh Matsuo
   " Kobayashi's prescribed scalar curvature problem "

November 10th (Tuesday)

10:00–11:00
   Claude LeBrun
   " Mass in Kähler Geometry "

11:30–12:30
   Kotaro Yamada
   " Analytic extensions of spacelike maximal surfaces in Minkowski 3-space to timelike surfaces "

12:30–14:00   **Lunchtime**

14:00–15:00
   Motoko Kotani
   " Mathematical Challenge to structural understanding of Materials "
Abstract AIMR challenges to establish a basis of predicting properties/functions of materials by mathematics-materials science collaboration. Three target projects " non- equilibrium materials based on mathematical dynamical system " ," Topological functional materials " ," Multi-scale hierarchical materials based on discrete geometric analysis " are set up. I would like to discuss some emerging results in the projects.

15:30–16:30
   Osamu Kobayashi
 " Conformal length through Laguerre geometry "

18:00 ∼ **Dinner (Party)**

November 11th (Wednesday)

10:00–11:00
   Boris Botvinnik
   " Topology of the space of metrics with positive scalar curvature "

11:30–12:30
   Bernd Ammann
   " Topology of the space of D-minimal metrics "

12:30–14:00   **Lunchtime**

14:00–15:00
   Harish Seshadri
   " Positive isotropic curvature and self-duality "

15:30–16:30
   Miyuki Koiso
   " On bifurcation and local rigidity of triply periodic minimal surfaces in the three-dimensional Euclidean space "

November 12th (Thursday)

10:00–11:00
   Bernd Ammann
   " The Yamabe invariant and surgery "

11:30–12:30
   Jimmy Petean
" Stability of the Yamabe equation on non-compact manifolds "
Abstract We will discuss the stability of solutions of the Yamabe equation on non-compact manifolds. In the case of the Riemannian product of Euclidean space with a closed manifold M of positive constant scalar curvature there is a unique solution F which depends only on the Euclidean variable. The solution F is actually an extremal function for the Gagliardo-Nirenberg inequality. It is believed that it is a minimizer for the Yamabe functional on the product in some cases (for instance when M is Einstein). We will see that there is a dimensional constant L such that F is stable if and only if the first (positive) eigenvalue of the Laplace operator on M is greater than or equal to L. We will discuss how to compute L to see that F is stable if the metric on M is a Yamabe minimizer.

12:30–14:00   **Lunchtime**

14:00–15:00
   Masaaki Umehara
   " indices of isolated umbilics on surfaces "

15:30–16:30
   Shin Nayatani
   " Fixed-point property for uniformly Lipschitz affine actions on a Hilbert space"