

## 研究活動 2015年度

### 出版された論文

1. Isomonodromy aspects of the  $tt^*$  equations of Cecotti and Vafa I. Stokes data, with A. R. Its, and C.-S. Lin, Int. Math. Res. Notices 2015 (2015) 11745-11784
2. Isomonodromy aspects of the  $tt^*$  equations of Cecotti and Vafa II. Riemann-Hilbert problem, with A. R. Its, and C.-S. Lin, Commun. Math. Phys. 336 (2015) 337-380

### 研究発表

1. Painleve III, old and new  
TIMS-OCAMI-WASEDA International workshop on Painleve equations and related topics  
National Taiwan University (Taipei)  
2015.5.10
2. 微分方程式、群と幾何学  
早稲田大学  
談話会  
2015.5.28
3. Solutions of the  $tt^*$ -Toda equations: a complete picture  
Australia and Japan workshop: Geometry, Analysis, and their Applications  
University of Adelaide (Australia)  
2015.10.21
4. From Painleve to CFT  
Koriyama Geometry and Physics Days  
Nihon University (Koriyama)  
2016.2.8
5. Convexity for a certain space of solutions of the Hitchin equations  
OCAMI-KOBE-WASEDA Joint International Workshop on Differential Geometry and Integrable Systems

Osaka City University

2016.2.13

6. Convexity for a certain space of solutions of the Hitchin equations

Geometry Seminar

Mannheim University (Germany)

2016.3.11

会議主催

1. TIMS-OCAMI-WASEDA International workshop on Painleve equations and related topics  
10-13 May 2015, National Taiwan University

2. UK-Japan Winter School on Classic and Stochastic Geometric Mechanics 4-7 January  
2016, Imperial College London, UK.

3. Koriyama Geometry and Physics Days 6-8 February 2016, Nihon University (Koriyama,  
Fukushima). Study meeting on the theme: "Painleve equations, integrable systems and  
moduli spaces"

4. OCAMI-KOBE-WASEDA Joint International Workshop on Differential Geometry and  
Integrable Systems 13-17 February 2016, Osaka City University and Kobe University

研究成果

I have studied the  $tt^*$ -Toda equations, by combining three methods: partial differential equations, the Riemann-Hilbert method, and infinite-dimensional Lie theory (loop groups). This a nonlinear p.d.e. which is important in geometry (harmonic maps) and supersymmetric quantum field theory (quantum cohomology). In joint work with Alexander Its (IUPUI, USA) and Chang-Shou Lin (National Taiwan University, Taiwan) we have solved these equations on the punctured complex plane and given parametrizations of the solutions using asymptotic data, monodromy data, and holomorphic data (Weierstrass/DPW data).