



July 17<sup>th</sup> - August 10<sup>th</sup>, 2012

Room 108, Faculty of Science Building No. 3  
Department of Mathematics, Kyoto University

**Tomoyuki ARAKAWA (RIMS)****Representation theory of W-algebras**

1. What are W-algebras?
2. Finite and Affine W-algebras
3. Representation theory of W-algebras via the quantum Drinfeld-Sokolov reduction functor
4. Kac-Wakimoto admissible representations and rationality of W-algebras

**Alexander I. BUFETOV (Steklov / IITP / HSE)****Measure-preserving actions of infinite-dimensional groups**

1. Introduction to Harmonic Analysis on Infinite-Dimensional Groups
2. Ergodic Measures: the Pickrell Classification, the Olshanski-Vershik Approach
3. Finiteness of Ergodic Unitarily-Invariant Measures on Spaces of Infinite Matrices
4. Determinantal Point Processes

**Ivan CHEREDNIK (North Carolina)****DAHA from scratch**

1. DAHA and its polynomial representation
2. Nonsymmetric Macdonald polynomials
3. The Demazure limit and the p-adic limit
4. Verlinde algebras; singular k, roots of unity

**Boris FEIGIN (HSE / Laudau Institute / RIMS)****Rodger-Ramanujan identity, fermionic formulas, affine flag manifolds, Toda integrable system and around...**

1. Two ways to prove Rodger-Ramanujan

2. Affine algebras ,flag manifolds characters formulas
3. Fermionic formulas and generalizations of Rodgers-Ramanujan
4. Cohomology of sheaves on affine flags Hodge cohomology of affine flags (in the very end)

**Hiroshi IRITANI (Kyoto)****Hodge Theoretic Mirror Symmetry**

1. Quantum cohomology and differential equation
2. Oscillatory and period integrals
3. Isomorphism of non-commutative Hodge structures
4. Givental's Quantization

**Leonid RYBNIKOV (HSE)****Gelfand-Tsetlin bases and beyond**

1. Schur-Weyl duality and representations of  $GL_n$
2. Gelfand-Tsetlin theory
3. Yangians
4. Gelfand-Tsetlin and Geometry

**Ken-ichi YOSHIKAWA (Kyoto)****An introduction to analytic torsion and Quillen metrics**

1. Determinant of Laplacian
2. Determinant of cohomologies
3. Quillen metric and its basic properties
4. Examples related to automorphic forms

		Monday	Tuesday	Wednesday	Thursday	Friday
Jul 16-20	17:15		ARAKAWA 1	ARAKAWA 2*	ARAKAWA 3	ARAKAWA 4
Jul 23-27	17:15	CHEREDNIK 1	CHEREDNIK 2	CHEREDNIK 3	CHEREDNIK 4	FEIGIN 1
Jul 30-Aug 3	15:00		FEIGIN 2	FEIGIN 3	IRITANI 1	BUFETOV 1
	17:15	YOSHIKAWA 1	YOSHIKAWA 2	YOSHIKAWA 3	YOSHIKAWA 4	IRITANI 2
Aug 6-10	15:00	BUFETOV 2	RYBNIKOV 1	BUFETOV 3	RYBNIKOV 3**	BUFETOV 4**
	17:15	FEIGIN 4	RYBNIKOV 2	IRITANI 3	RYBNIKOV 4**	IRITANI 4**

\* Lecture on Wed, July 18 will start at 18:00.

\*\* Lectures on August 9 - 10 will take place at Room 305.