Pre-conference MCM2016 program

Venue: Room 002, Math. Dep. Univ. of Tokyo (Komaba Campus)

Organizers: Nariya Kawazumi (U. Tokyo) and Shinobu Hikami (OIST)

Conference secretary: Shiho Saito (OIST), shiho.saito@oist.jp

Schedule:

Oct.20 (Thu.)

10:00 – 11:00 Nariya Kawazumi (U. Tokyo)

“The Kashiwara-Vergne problem and the Goldman-Turaev Lie bialgebra in genus zero”

(break 30 min.)

11:30 – 12:30 Vladimir Fock (U. Strasbourg)

“Integrable systems, Newton polygons and configurations of flags.”

(lunch 12:30 – 13:45)

13:45 – 14:45 Rinat Kashaev (U. Geneve)

“Pacher’s 3-3 relations and Hopf algebras”.

Dinner 18:30 - 20:30 (Restaurant “Lever Son Verre”)

Oct. 21 (Fri.)

10:00 – 11:00 Takashi Ueda (U. Tokyo)

(break 30 min.)

11:30 – 12:30 Paul Norbury (U.Melbourne)

“Irregular spectral curves and Givental decomposition”

(lunch 12:30 -13:45)

13:45－14:45 Sergey Natanzon (Higher School of Economics)

“Moduli space of N=1 Riemann super surfaces”.

Oct. 22 (Sat.)

10:00 – 11:00 Ferdinando Gliozzi (U. Torino)

“The Conformal Bootstrap approach to critical systems”

(break 11:00 – 11:30)

11:30-12:30 Sergey Natanzon

“Real curves”(to be confirmed)

(lunch)

end

Title and Abstract:

Nariya Kawazumi

“The Kashiwara-Vergne problem and the Goldman-Turaev Lie bialgebra in genus zero”

In view of results of Goldman and Turaev, the free vector space over the free loops on an oriented surface has a natural Lie bialgebra structure. The Goldman bracket has a formal description by using a special (or symplectic) expansion of the fundamental group of the surface.

It is natural to ask for a formal description of the Turaev cobracket. We will show how to obtain a formal description of the Goldman-Turaev Lie bialgebra for genus 0 using a solution of the Kashiwara-Vergne problem. A similar description was recently obtained by Massuyeau using the Kontsevich integral.

Moreover we propose a generalization of the Kashiwara-Vergne problem in the context of the Goldman-Turaev Lie bialgebra.

This talk is based on a joint work with A. Alekseev, Y. Kuno and F. Naef.

Sergey Natanzon

“Moduli space of N=1 Riemann super surfaces”.

In the report, I will describe a connected components of a moduli space of N=1

Riemann super surfaces. For each component I built a Fricke-Klein-Teichmuller space.

Ferdinando Gliozzi

“The Conformal Bootstrap approach to critical systems”

In recent years new numerical and analytical applications of conformal bootstrap equations to critical systems made it possible to evaluate their critical exponents with unprecedented accuracy. I describe one these methods.

Paul Norbury

“Irregular spectral curves and Givental decomposition”

In joint work with Leonid Chekhov we prove an analogue of the Givental decomposition for irregular spectral curves. We produce an element R(z) of the twisted loop group with quantisation given by a differential operator that acts on an analogue of the Kontsevich-Witten tau function. I will describe the main example of a matrix model with two hard edges and spectral curve (x^2-4)y^2=1. I will also describe the relation of these ideas with cohomological field theories.

Rinat Kashaev

“Pacher’s 3-3 relations and Hopf algebras”.

Pacher’s 3-3 relations underly combinatorial 4D TQFT’s based on triangulations. I will discuss a particular construction of solutions to Pacher’s 3-3 relations by using the structure maps of Hopf algebras and duality pairings. In the particular case of self-dual bi-commutative Hopf algebras there are solutions carrying the full symmetry of the regular 4-dimensional simplex. Further specialization to finite dimensional Hopf algebras over complex numbers gives rise to simple models of 4D TQFT.

Vladimir Fock

“Integrable systems, Newton polygons and configurations of flags.”

A large class of classical finite dimensional integrable systems are known to be defined on Bruhat cells of affine Poisson Lie groups. On the other hand

Goncharov and Kenyon has defined a class of integrable systems enumerated by convex polygons on a plane. We will present both constructions and show a relation between them. Then we interpret the phase space of such integrable systems as a space of collections of flags. This description is analogous to the one of moduli of local systems on surfaces thus showing that these objects are of the same nature. At the end we briefly discuss quantization and possible generalizations of this approach.

Takashi Ueda

“Algebraic interpretation of McShane’s/Mirzakhani’s identity in the 1-punctured/hole case”

McShane’s and Mirzakhani’s identities are known as the geometric identities in the Teichmüller space of Rienmann surfaces. We prove these identities in the 1-punctured/hole case by the purely algebraic method. In other words, we consider trace functions as the real quantities satisfying some relations, forgetting its geometric meaning, and we replace the calculation of the sum in two identities by the finding of the solution of some new relations. And we find the solutions.