

## Scientific report on “Algebra, Geometry, and Mathematical Physics 2010, Tärnö

The conference was organized by the MP2 Research Centre at the University of Gothenburg with support from the ESF (the ITGP network) and the Faculty of Science, University of Gothenburg.

The conference had a number of plenary talks listed below and consisted of the following sessions (session organizers are indicated in brackets):

- 1A ADT Algebraic deformation theory (A. Siqueland, Norway)
- 1B IS Integrable systems (H. Johannesson, Sweden and P. Kulish, Russia)
- 2A NA Noncommutative algebra (N. Iyudu, Northern Ireland and A. Laudal, Norway)
- 2A QA Quantum algebra (S. Caenepeel, Belgium and H. Rosengren, Sweden)
- 3A CMP Categorical methods in physics (I. Burban, Germany)
- 4A OAD Operator algebras, dynamics, applications (S. Eilers, Denmark and L. Turowska, Sweden)
- 4B NTM Number theoretical methods in string theory (B. E. W. Nilsson, Sweden and D. Persson, Swiss)
- 4C QI Quantum information (T. Dorlas, Ireland)
- 5A GLT Generalized Lie theory (A. Makhlof, France and S. Silvestrov, Sweden)
- 5B, 6B Geometry (M. Kures, Czech Republic)
- 5C SP Spectral problems in quantum mechanics (G. Rozenblioum, Sweden)
- 6A SCM Spectral and computational methods for Maxwell equations (L. Beilina, Sweden)

Very interesting and fruitful discussions between mathematicians and physicists were held during the sessions and later in common rooms.

The plenary talks are listed below. Among the speakers one can find a number of outstanding researchers such as E. Effros (UCLA, leading researcher in operator algebras), A. Holevo (Steklov Mathematical Institute, Moscow, one of the founders of the quantum information theory) R. Iordanescu (Romania, leading researcher in Jordan algebras), A. Smoktunowicz (University of Edinburgh, Scotland, EMS Prize winner 2008, leading researcher in non-commutative algebra).

Opening Monday 25 October, 08:45, Hörsalen

Professor Bo Hellsing, Chairman of the Physics Department, University of Gothenburg

Plenary talks (Hörsalen)

\* Monday 25 October, 09:00-09:40

Olav Arnfinn Laudal (University of Oslo), Non-commutative deformations. Applications to mathematics and physics.

\* Monday 25 October, 09:45-10:25

Tony (Teunis) Dorlas (Institute for Advanced Studies, Dublin), Magnetisation for the transverse-field Ising model

\* Tuesday 26 October, 09:00-09:40

Igor Burban (University of Bonn), Hall algebras of some non-commutative curves and quantum affine algebras

\* Tuesday 26 October, 09:45-10:25

Agata Smoktunowicz (University of Edinburgh, Scotland), Algebraic algebras with small growth

\* Wednesday 27 October, 09:00-09:40

Bernd Kreussler (Mary Immaculate College, Limerick, Ireland), Vector bundles on cubic curves and solutions of Yang-Baxter equations

\* Wednesday 26 October, 09:45-10:25

Thilo Henrich (University of Bonn), Classical Yang-Baxter equation, its quantization and the  $A_\infty$  constraint

\* Thursday 29 October, 09:00-09:40

Boris Pioline (LPTHE, CNRS and Universit Pierre et Marie Curie, Paris), Wall crossing from Boltzmann Black Hole Halos

\* Thursday 28 October, 09:45-10:25

Edward Effros (UCLA, USA), Quantum information theory in the context of quantized functional analysis

\* Friday 29 October, 09:00-09:40

Alexander Holevo (Steklov Mathematical Institute, Moscow), Capacities of quantum channel

\* Friday 29 October, 09:45-10:25

Radu Iordanescu (Institute of Mathematics of the Romanian Academy, Bucharest), Jordan structures in mathematical physics

\* Saturday 30 October, 09:00-09:40

Roman Novikov (CNRS, Centre de Mathmatiques Appliques, Palaiseau, France), New global stability estimates for the Gel'fand-Calderon inverse problem

\* Saturday 30 October, 09:45-10:25

Ricardo Alonso Blanco (University of Salamanca, Salamanca, Spain), Weil jets theory, connections and curvature tensor

Researches from the following countries participated in the conference: Portugal, Spain, France, UK, Ireland, Belgium, Germany, Swiss, Denmark, Norway, Sweden, Poland, Estonia, Czech Republic, Hungary, Romania, Russia and also Brasil, USA, Japan.

This series of expository presentations and keenest researches in mathematics and physics was intended to contribute to the dissemination of mathematical and physical knowledge in both communities and especially among young researchers. The work of the conference was so successful that it was decided to organize a Summer School "Selected Mathematical Topics in Quantum Mechanics and Quantum Information" in Tjärnö in September 2011 (see <http://www.agmp.eu/3q11/>).