

## 20th Student Conference – Winter School on **MATHEMATICAL PHYSICS**

The Doppler Institute of the Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague and the Department of Mathematics and Informatics, University of Białystok have organized the annual international student conference and winter school for undergraduate and graduate students in the village Horní Polubný (Jizera Mountains), January 23 – 29, 2011.

The main aim of the School was the same as in the past: to give students a unique opportunity to present results of their research work in English and, consequently, contribute to the improvement of their communication skills in a very informal international setting. Presentations were given by an international mix of students from Czech Republic, Hungary, Poland and Slovakia. For majority of students this was their first scientific presentation in English ever.

In addition there were lectures by professor M. Fecko (Comenius University) and two postdocs (A. Gábris, CTU Prague, T. Czyzycki, University of Białystok) reviewing certain mathematical aspects of modern physical theories.

Altogether, there were 52 participants coming from the University of Białystok (Poland) (7), University of Hradec Králové (2), Comenius University in Bratislava (Slovakia) (3), University of Budapest (Hungary) (2), Masaryk University Brno (3) and Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague (35).

The varied topics dealt with in the Winter School were related to several fields of contemporary mathematical physics (see the list of contributions).

Up to five daily lectures of the Winter School were held in the morning (9.00 – 13:00 a.m.) and late afternoons were devoted to discussions. The setting of the Jizera mountains covered with snow enriched the overall informal atmosphere of this fruitful meeting.

Prague, February 5, 2011

Goce Chadzitaskos and Libor Šnobl,  
(on behalf of the Organizing committee)

## List of contributions

- Lucie Augustovičová: Shape resonances.
- Martin Bacovský: Central dependencies of  $U_q(sl(2))$ .
- Iva Bezděková: Three-state quantum walk on a line.
- Tomasz Czyżycki: Algebraic criteria of linearization of second order PDE
- Kamil Červenka: Trace dynamics as a precursor of quantum field theory.
- Marián Fecko: Canonical structure of Nambu mechanics.
- A. Gábris: Higher dimensional quantum walks using optical delay loops.
- Veronika Gáliková: Non-commutative quantum theory.
- Pavel Hoc: Higgs mechanism.
- Antonín Hoskovec: Perfect state transfer.
- Robert Jankowski: Characteristic functions - examples and applications.
- Michal Jex: Ground state and point interactions in one dimension.
- László Kekczkés: Chaos in the dynamics of qubits.
- Bálint Kollár: Quantum walks on the triangular lattice.
- Jan Korbel: Lévy distribution and hungry sharks.
- Gabriela Malenová: Hardy inequalities in the twisted quantum waveguides.
- Josef Navrátil: Energy momentum tensor in Poisson-Lie T-duality.
- Radek Novák: PT symmetric model with magnetic field.
- Barbara Pietruczuk: Waszewski topological principle.

- Václav Potoček: Quantum Lévi walks.
- Josef Schmidt: Nagel-Schrenckenberg model.
- Petr Siegl: Introduction to PT symmetry.
- Jan Smotlacha: Electronic Structure of Carbon Nanohorns in a Uniform Magnetic Field.
- Helena Šediváková: The Life Without Frenet.
- Lukáš Tomek: The ant on a gramophone disc (a problem of sub-Riemannian geometry).
- Jan Vysoký: Growing Poisson - Lie vegetables.
- Jakub Železný: Simple PT-symmetric model.