

The 24th Student Conference  
"Winter School on Mathematical Physics"

The Department of Physics and the Doppler Institute of the Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague together with the Department of Mathematics and Informatics, University of Białystok organized the international student conference for undergraduate and graduate students in Janské Lázně (Krkonoše Mountains) from January 25 to January 31, 2015.

The aim of the conference was to provide students a unique opportunity to present results of their research work in front of an international audience. This opportunity to present a talk in the English language contributed to the improvement of communication skills of each student. There were 37 participants from the University of Białystok (Poland) (8), Université de Montréal (1) and the Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague (28).

Topics of the presentations were related to several fields of contemporary mathematical physics — see Book of abstracts <http://kmlinux.fjfi.cvut.cz/ambrop1/wsmp/history/2015-proc.pdf>. The program comprised five blocks and each consisted of up to six lectures. The detailed program is included below. The setting of spa Janské Lázně enriched the overall informal atmosphere of this fruitful meeting.

Prague February 2, 2015

Goce Chadzitaskos, Jiří Hrivnák and Martin Štefaňák  
on behalf of the Organizing Committee

## Conference program

### Monday, January 26

Morning session

Chairperson: G. Chadzitaskos

- 09:00 – 09:30 **Ivo Petr**  
*Index calculus and the discrete logarithm problem*
- 09:35 – 10:05 **Jan Vysoký**  
*Atiyah-Lie algebroid for pedestrians*
- 10:10 – 10:40 **Michal Jex**  
*Spectrum of delta' interaction supported by a curve*
- 11:00 – 11:30 **Hana Zemanová**  
*The interaction of electron with the electromagnetic wave complex propagating in plasma in the Earth's magnetic field*
- 11:35 – 12:00 **Martin Malachov**  
*Chaos in quantum information*
- 12:05 – 12:30 **Jan Vábek**  
*Theory of high-harmonic generation: quantum description of single-atom response*

## Tuesday, January 27

Morning session

Chairperson: L. Hlavatý

- 09:00 – 09:35 **Lenka Motlochová**  
*Multivariate gaussian cubature formulas arising in connection with root systems*
- 09:40 – 10:10 **Adam Brus**  
*Killing algebra of PP-wave metric*
- 10:15 – 10:40 **František Růžička**  
*Solvable models in PT-symmetric quantum mechanics*
- 11:00 – 11:25 **Iveta Semorádová**  
*Crypto-Hermitian interpretation of Klein-Gordon equation*
- 11:30 – 11:55 **Filip Hložek**  
*Operators in the theory of metamaterial cloaking*
- 12:00 – 12:25 **Kamila Vysoká**  
*Radiation hardness testing*

Afternoon session

Chairperson: L. Šnobl

- 14:30 – 15:05 **Petr Novotný**  
*A remark on Noether's theorem*
- 15:10 – 15:35 **Martin Prokš**  
*Applications of Information theory in time series analysis*
- 15:40 – 16:05 **Václav Svoboda**  
*Tsallis entropy and generalized Black-Scholes formula*
- 16:25 – 17:00 **Martin Štefaňák**  
*Modelling excitation transport with quantum walk*
- 17:05 – 17:30 **Jan Korběl**  
*On the Lambert W-function*

## Wednesday, January 28

excursions, skiing

## Thursday, January 29

Morning session

Chairperson: A. Sliżewska

09:00 – 10:00 **Pavel Winternitz**

*Superintegrability in classical and quantum mechanics I*

10:10 – 10:45 **Antonella Marchesiello**

*Third-order superintegrable systems with potentials satisfying nonlinear equations*

11:00 – 11:30 **Joanna Zonenberg**

*Boundedness of solution of four-dimensional difference system*

11:35 – 12:05 **Josef Navrátil**

*Pattern formation in reaction-diffusion systems with unilateral condition*

12:10 – 12:40 **Iva Bezděková**

*Limit distributions of quantum walks*

## Friday, January 30

Morning session

Chairperson: A. Odziejewicz

- 09:00 – 10:00 **Pavel Winternitz**  
*Superintegrability in classical and quantum mechanics II*
- 10:10 – 10:40 **Václav Zatloukal**  
*Geometry via Clifford Algebra*
- 11:00 – 11:25 **Jan Kotrbatý**  
*Automatic identification of low dimensional Lie algebras*
- 11:30 – 11:55 **Martyna Żuk**  
*Gauge groupoid*
- 12:00 – 12:25 **Izabela Wawreniuk**  
*The spectral theorem for self adjoint operators and orthogonal polynomials*