The 26th 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 21 to January 27, 2018.

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) (6), Comenius University in Bratislava (1), University of Groningen (1) and the Czech Technical University in Prague (29).

Topics of the presentations were related to several fields of contemporary mathematical physics — see Book of abstracts https://wsmp.fjfi.cvut.cz/history/2018-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 4, 2018

David Břeň, Jiří Hrivnák and Petr Novotný
on behalf of the Organizing Committee

# Monday, January 22

Morning session
Chairperson: M. Štefaňák

09:00 – 09:30 **Radek Novák**
*Kramers-Fokker-Planck equation with a short-range potential*

09:35 – 10:05 **Jan Kotrbatý**
*Octonions and physics*

10:10 – 10:40 **Josef Navrátil**
*Skew-symmetric reaction-diffusion systems*

10:40 – 11:00 *Intermission*

11:00 – 11:25 **Kateřina Zahradová**
*Spectral analysis of quantum nanoribbons*

11:30 – 11:55 **Vojtěch Šmíd**
*Analytic aspects of domain perturbations due to twisting*

12:00 – 12:25 **Tereza Štefková**
*Quantum walks on directed lattices*

# Tuesday, January 23

Morning session
Chairperson: A. Odzijewicz

09:00 – 09:50 **Marián Fecko**
*Vector analysis in 3 and 2 dimensions*

10:00 – 10:30 **Karolina Żukowska**
*Combining intrinsic and extrinsic geometry with the shape tensor*

10:35 – 11:00 **Bernard Rybołowicz**
*On group objects in a monoidal category*

11:00 – 11:20 *Intermission*

11:20 – 11:45 **Magdalena Dabrowska**
*Copulas - basic properties and examples*

11:50 – 12:15 **Krzysztof Bardadyn**
*Characterisations of Amenable Groups*

Afternoon session
Chairperson: M. Fecko

15:20 – 15:50 **Nina J. Rutten**
*Calculus of the Kontsevich unoriented graph complex*

16:00 – 16:25 **Jan Mazáč**
*On the self-similarities of cut-and-project sets*

16:30 – 16:55 **Michal Tichý**
*Diffusion equation and symmetries of differential equations*

17:00 – 17:25 **Daniel Štěrba**
*ADM formalism in general relativity*

17:30 – 17:55 **Pavel Lokvenc**
*Continuous contractions and invariants of Lie algebras*

# Wednesday, January 24

excursions, skiing

# Thursday, January 25

Morning session
Chairperson: L. Hlavatý

09:00 – 09:30 **Václav Zatloukal**
*Shape tensor and geometry of embedded manifolds*

09:35 – 10:05 **Tomasz Czyżycki**
*Tau method and its applications to differential equations*

10:10 – 10:40 **Ivo Petr**
*Secret sharing schemes*

10:40 – 11:00 *Intermission*

11:00 – 11:25 **Marie Fialová**
*Spectrum of Dirac operator with a translationally invariant potential*

11:30 – 11:55 **Jaroslav Kňap**
*Weyl gravity and its comparison with General Relativity*

12:00 – 12:25 **Zlata Tabachová**
*Transfer entropies*

# Friday, January 26

Morning session
Chairperson: G. Chadzitaskos

09:00 – 09:30   **Martin Malachov**
*Box-counting and chaos in quantum distillation*

09:35 – 10:05   **Iveta Semorádová**
*Quantum square well with logarithmic central spike*

10:10 – 10:40   **Stanislav Skoupý**
*Szegedy's quantum walk search algorithm on regular graphs*

10:40 – 11:00   *Intermission*

11:00 – 11:25   **Patrik Urban**
*Effective action in field theories*

11:30 – 11:55   **Tereza Kurimaiová**
*The first Robin eigenvalue with negative boundary parameter*

12:00 – 12:25   **Jan Šmejkal**
*Bending and twisting of quantum waveguides*