

Doppler Institute

for Mathematical Physics and Applied Mathematics

2011 Activity Report

This is a short overview of the DI activities; a list of publications is given in the attachment. The full account covering all aspects of the work done can be found at the DI web page, <http://doppler.ujf.cas.cz/index.html>

People

1. *Permanent staff* consisted of 18 members the salaries of whom were paid by the three participating institutions, CTU (Exner-part, Burdík, Havlíček, Jex, Masáková, Pelantová, Šťovíček, Tolar, Chadzitaskos, Pošta, Svoboda), NPI (Exner-part, Znojil, Dittrich, Krejčířík, Tater) and UHK (Šeba, Kříž, Martiník).
2. *Temporary positions* covered by the DI grant LC06002 were given to postdocs, in exceptional cases to PhD students, specifically the *long-term ones (six months or more, in some cases extending to the next year with the help of other financial resources)* to Gábris, Hamilton, Štefaňák (all continued from the last year) and Barseghyan.
3. *Students:* the DI members supervised PhD theses preparation of 15 students, of which 12 were based at the CTU, 2 in the NPI and one at the UHK; a part of the theses was prepared in collaboration with institutes abroad. In addition, some number of undergraduate students was supervised.

4. *Degrees obtained:* Three *PhD theses* were defended: *Stanislav Vymětal:* Purification protocols in quantum information (supervised by Jex, March), *Petr Siegl:* Non-Hermitian quantum models, indecomposable representations, and coherent state quantization (Gazeau and Znojil, September), and *Jiří Lipovský:* Quantum graphs and their generalizations (Exner, September).
5. *Visitors:* About 45 people visited DI from abroad for collaboration purposes, typically with a talk given at one of the DI seminars.

Publications

1. *Edited volume:* proceedings of the last year QMath11 Conference, ed. by P. Exner, *xi+274 p.*, were published by *World Scientific*.
2. *Research papers:* there were 52 journal papers published, of which 25 of this year while 27 were accepted earlier and published in 2011 (or at the very end of 2010). In addition there were seven papers accepted; a full list is attached. Of the 52 journal publications seven were in *Theor. Comput. Sci.*, five in *Phys. Lett. A*, four in *New J. Phys.* and *Int. J. Theor. Phys.*, three in *Phys. Rev. Lett.* and *Acta Polytechnica*, two in *J. Math. Phys.*, *J. Phys. A: Math. Theor.*, *Phys. Rev. A* and *Eur. J. Phys.*, plus single papers in *SIAM J. Appl. Math.*, *Integral Eq. Operator Theory*, *Physica A*, *Ann. Phys.*, *Phys. Rev. D*, *J. Geom. Phys.* and eleven other journals.
3. *Submitted papers and proceedings contributions:* 29 items, see the attached list

Meetings

1. 20th Student Winter School on *Mathematical Physics*, Horní Polubný, January 23–29, 2011; 52 participants from DI constituents, Masaryk University Brno, Comenius University, Budapest University, and University of Bialystok; three main lectures and a number of student presentations were heard.
2. Microconference *Analytic and algebraic methods in physics VII*, Prague, March 17–18, 2011; about 40 participants from six countries and 19 talks
3. Microconference *Words, numeration and automata*, Prague, March 19–20, 2011; about 27 participants, 20 talks

4. Spring school and workshop *Combinatorics on words*, Vlachovice, May 15–21, 2011; about 25 participants
5. Conference on *Special Functions and Orthogonal Polynomials of Lie Groups and their Applications*, Děčín, August 14–20, 2011; about 55 participants from 15 countries, 45 talks
6. DI participated in organization of the *5th Student Colloquium and School on Mathematical Physics*, Stará Lesná, August 29–September 4, 2011; cca 25 participants and the same number of talks
7. Conference *WORDS 2011*, Prague, September 12–16, 2011; about 90 participants from 13 countries, 35 talks.
8. Autumn school and workshop *Combinatorics on words*, Telč, October 28–30, 2011; about 15 participants
9. Microconference *Analytic and algebraic methods in physics IX*, Prague, December 12–15, 2011; about 30 participants from ten countries and 23 talks

Seminars

Four regular seminars worked:

1. *Doppler Institute Seminar*, 10 sessions in 2011
2. *Quantum Circle Seminar*, 21 sessions apart from the workshops
3. *Combinatorial and Algebraic Structures Seminar*, 22 sessions apart from the workshops
4. A *microseminar* on quantum theory and related topics and methods, 16 sessions

DI Council Activity

1. *Discussions of Council members* occurred on *ad hoc* basis, either during meetings at various conferences and other occasions, or through more or less regular electronic correspondence.
2. *The present report* was discussed and approved electronically

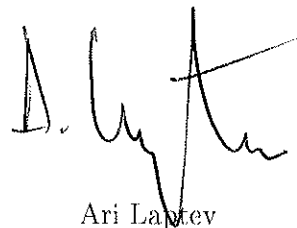
Other facts to mention

1. *Václav Votruba Prize*: Doppler Institute supports this award for the best PhD thesis in theoretical physics, sponsored by the *Foundation for Support of Theoretical Physics*. This year prize went to *Steffen Giesen* for the work entitled “Geometric Aspects of Gauge and Spacetime Symmetries”; honorable mention was given to Martin Scholtz.
2. DI Scientific Director was elected vicepresident of the *European Research Council*.

Signed in Prague and Stockholm on December 22, 2011



Pavel Exner
DI Scientific Director



Ari Laptev
DI Council Chairman