

Doppler Institute

for Mathematical Physics and Applied Mathematics

2007 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 17 members the salaries of whom were payed by the three participating institutions, CTU (Exner-part, Burdík, Havlíček, Jex, Pelantová, Šťovíček, Tolar, Chadzitaskos, Pošta, Svoboda), NPI (Exner-part, Znojil, Dittrich, Krejčířík, Tater) and UHK (Šeba, Kříž, Martiník) and one supported by the DI grant LC06002 (Masáková).
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)* to Cacciapuoti, Junhua Chen, Fülöp, Harmer, Kubieniec, Mantile and Soldán, and *short-term ones* to Ambrož, Jakubský, Kochan, Kondej, Krbek, Lev and Štefaňák. In addition to that, Jiří Patera spent two months in DI as a visiting professor.
3. *Students:* the DI members supervised PhD theses preparation of 24 students, of which 18 were registered at the CTU (in one case simultaneously with NPI), 3 at the NPI and 3 at the UHK; a part of the theses were prepared in collaboration with institutes abroad. In addition, some number of undergraduate students was supervised.
4. *Degrees obtained:* Five *PhD theses* were defended: *Ondřej Lev:* Time-periodic quantum systems (supervized by Šťovíček, May), *Hynek Lavíčka:* Simulation of agents on social network (Jex, October), *Jaroslav Novotný:* Entanglement and its role in quantum information processes (Jex, October), *Milena Svobodová:* Gradings of Lie algebras (Pelantová, December), *Jiří Hrivnák:* Invariants of Lie algebras (Tolar, December)

5. *Visitors*: About 33 people visited DI from abroad for collaboration purposes, typically with a talk given at one of the DI seminars.

Publications

1. *Research papers*: there were 50 journal papers published, of which 27 of this year while 23 were accepted earlier and published in 2007; In addition there were 14 papers accepted; a full list is attached. Of the fifty journal publications nine were in *J. Phys. A: Math. Theor.*, five in *Phys. Rev. A*, three in *Phys. Lett. A*, *J. Math. Phys.*, *Theor. Comput. Sci.* and *Discrete Math. Theor. Comput. Sci.*, two in *Rev. Math. Phys.*, *Rep. Math. Phys.*, *Phys. Lett. B*, *Russ. J. Math. Phys.*, *Math. Phys. Anal. Geom.* and *RAIRO*, plus single papers in twelve other journals
2. *Submitted papers and proceedings contributions*: 20 items, see the attached list

Meetings

1. 16th Student Winter School on *Mathematical Physics*, Horní Polubný, January 21–27, 2007; about 25 participants from DI and University of Bialystok
2. A microconference *Analytic and algebraic methods in physics*, Prague, February 20, 2007; about 20 participants from 6 countries
3. A microconference *Analytic and algebraic methods in physics II*, Prague, April 3, 2007; about 25 participants from 8 countries
4. Spring School and Workshop on *Combinatorics on Words*, Herbertov, May 19–26, 2007; about 20 participants from DI and Paris
5. Advanced School *Symmetries in Physics: Modern Trends*, Prague, June 8–13, 2007; about 50 participants from 19 countries; minicourses by F. Smirnov, A. Molev, F. Toppan, A. Stolin, A. Sitarz, G. Duchamp and M. Olshanetsky
6. A microconference *Analytic and algebraic methods in physics III*, Prague, June 19, 2007; about 30 participants from 12 countries
7. 6th International Workshop on *Pseudo Hermitian Hamiltonians in Quantum Physics*, City University London, July 16–18, 2007; about 100 participants from 21 countries; invited lectures by C. Bender, P. Dorey, T. Curtright, H. Geyer, J. Feinberg, A. Mostafazadeh, M. Ogilvie, R. Tateo and M. Znojil

Seminars

Four regular seminars worked:

1. *Doppler Institute Seminar*, 10 sessions in 2007
2. *Quantum Circle Seminar*, 13 sessions apart of the workshops
3. *Combinatorial and Algebraic Structures Seminar*, 21 sessions
4. A microseminar on *PT Symmetries*, 15 sessions

DI Council Activity

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

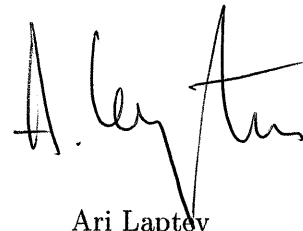
Other important facts

1. *The next ICMP*: As mentioned in the last year report, the International Association of Mathematical Physics choose Prague as *the site of its next congress* in the summer of 2009 and its organization will be done within the DI. This event will require all the resources for 2009, hence the planned workshop on data analysis will be organized one year earlier, in 2008.
2. *Václav Votruba Prize*: the DI 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 *Miroslav Ježek* for the work entitled "Quantum measurement and reconstruction with applications in optics".

Signed in Vienna on December 15, 2007



Pavel Exner
DI Scientific Director



Ari Laptov
DI Council Chairman