

GERMAN – POLISH COLLABORATION

on

**MATHEMATICS OF KEY TECHNOLOGIES
AND COMPLEX SYSTEMS**



**DFG Research Center MATHEON
Mathematics for Key Technologies**



**Interdisciplinary Centre for
Mathematical and Computational
Modelling of the Warsaw University**

German Contact:

Professor Dr. Martin Grötschel
Institut für Mathematik
Technische Universität Berlin
Straße des 17. Juni 136
10623 Berlin, Germany
groetschel@zib.de

Polish Contact:

Professor Marek Niezgodka
icm
University of Warsaw
Pawinskiego 5a
02-106 Warsaw, Poland
marekn@icm.edu.pl

INTRODUCTION

Two national research centres, one in Germany and one in Poland, and with similar missions: “to bring advanced mathematics to key technologies and complex systems”, have decided to collaborate, in the confident expectation that by working together they will add value to the separate efforts of the two centres.

DFG RESEARCH CENTER MATHEON "MATHEMATICS FOR KEY TECHNOLOGIES"

The DFG Research Center MATHEON "Mathematics for key technologies: Modelling, simulation, and optimization of real-world processes" began operating in 2002 with funding of 5 million Euro per annum from the Deutsche Forschungsgemeinschaft (DFG), and additional funding from three cooperating Berlin universities (Freie Universität Berlin, Humboldt-Universität zu Berlin and Technische Universität Berlin) and two research institutes (Konrad-Zuse-Zentrum für Informationstechnik Berlin and Weierstraß-Institut für Angewandte Analysis und Stochastik im Forschungsverbund Berlin e.V.). MATHEON has about 200 members, more than 40 of them are professors at Berlin universities.

INITIAL THEMES OF MATHEON:

- Life sciences (computer-assisted surgery; patient-specific therapies; protein data base analysis; protein conformation dynamics).
- Logistics, traffic and telecommunication networks (planning of multi-level and multi-layer communication networks; planning of the UMTS radio interface; line planning, periodic time-tabling, and revenue management in public transport).
- Production (Multi-functional materials, aspects of power generation).
- Circuit simulation and opto-electronic devices (quantum mechanical modelling of optoelectronic devices; design of nano-photonic devices; integrated circuits for future chip generations).
- Finance (measurement and hedging of risks; interaction models for asset price fluctuation).
- Visualization (discrete differential geometry; image processing).
- Education, Outreach, Administration.

See also <http://www.matheon.de>

ICM INTERDISCIPLINARY CENTRE FOR MATHEMATICAL AND COMPUTATIONAL MODELLING

ICM – Interdisciplinary Centre for Mathematical and Computational Modelling was established in 1993 as an interfaculty unit of the University of Warsaw. ICM is both one of key elements in the national infrastructure for scientific high-end computing and provider of advanced information services, with focus on content (e.g. numerical weather prediction – NWP) and technology (multimedia). ICM is also a coordinating centre for national virtual library of science and knowledge repositories infrastructure.

The ICM's yearly budget amounts to 15 million EUR, including appr. 1 million EUR as a 3rd party contracted research.

Number of permanent employees amounts to 100, including 30 scientific workers, appr. 50 contracted project members in addition.

THE MAIN FIELDS OF ACTIVITIES ARE AS FOLLOWS:

Research and development:

- computational sciences and mathematical modelling:
 - functional materials (in particular on nanoscale) characterization and design
 - systems biology
 - biomedical engineering
 - neuroinformatics
 - natural environment
 - complex process engineering
 - experiment design and optimization, including airlines, airport authorities, governmental bodies
- large-scale data analysis and support of decision making in complex environments
- visual modelling
- distributed and parallel computing
- content analysis, metrisation and processing

Education:

- 3rd Bologna level of educational programs in computational sciences, mathematical modelling and applications in science and technology
- various collaborative education programs and tutorials

Technology implementation:

- planning and decision supporting solutions for airline industry
- applications enabling for grid environments

See also <http://www.icm.edu.pl>

THE AGREEMENT

This agreement establishes a framework for collaboration between the DFG Research Center MATHEON "Mathematics for key technologies" (hereafter called "MATHEON") and the Interdisciplinary Centre for Mathematical and Computational Modelling – ICM (hereafter called ICM). The agreement is founded on mutual respect between the two Centres and the recognition that many of the aims of the Centres are similar, and is established in the belief that collaboration between the Centres will bring added value to both parties.

Each Centre has received substantial funding, from national and provincial governments, universities and other institutions. Each has responsibilities at national levels for scientific excellence, training in research, and industry outreach. It is recognized that the parties can be of mutual assistance in achieving their aims.

The cooperation is seen as occurring through the following mechanisms:

1. JOINT WORKSHOPS

It is proposed that at least one workshop per year be held, either in a German or a Polish location, in an area of mutual interest, to bring together researchers with complementary expertise.

It is envisaged that each party would be responsible for its travel costs, while the host party would be responsible for living and accommodation costs in the host nation. The participation of other German and Polish researchers (that is, not from either Centre) is to be welcomed if facilities permit.

2. COLLABORATIVE RESEARCH

The agreement will support collaborative research relationships that already exist, use the resources of the Centres to develop new collaborative relationships, and aim to develop one or more industrially focused joint projects.

3. EXCHANGE OF RESEARCH STUDENTS

With the approval of all parties, research students within a Centre will be able to spend periods of between one month and one year at a host university or institute of the other Centre. For an exchange of more than two months an approved joint supervisor at the host institution would be appointed for the period of the exchange.

The home Centre of the student will be responsible for travel costs. Living costs and accommodation costs in the host country will be shared in a mutually agreed way.

4. EXCHANGE VISITS FOR JUNIOR RESEARCHERS

Postdoctoral and other researchers of a Centre are to be encouraged to spend periods of between one month and three months at the other Centre, in order to broaden their range of experience. In each case a personal "mentor" will be appointed at the host Centre, but it is envisaged that the visitor can move between the institutions that make up the host Centre.

The home Centre of the researcher will be responsible for travel costs. Living expenses and accommodation expenses in the host country are to be shared on a mutually agreed basis.

5. EXCHANGE VISITS OF SENIOR RESEARCHERS

Principal investigators and other senior researchers of each Centre will be invited to visit the other Centre for mutually agreed periods. The host Centre will be responsible for travel, living and accommodation expenses.

Signed in Berlin on 29. 5. 2007, in two originals in English language, one for each side.



Marek Niezgodka
Director-in-Chief
Interdisciplinary Centre for Mathematical
and Computational Modelling



Martin Grötschel
Chair
DFG Research Center MATHEON
"Mathematics for key technologies"