

International Workshop

Logical Approaches to Barriers in Computing and Complexity

Tuesday, February 16, 2010

4.00 pm – 6.00 pm

Registration at the Alfried Krupp Wissenschaftskolleg

7.00 pm

Welcome meeting in the restaurant „Zur Sonne“

Wednesday, February 17, 2010

9.00 am – 9.15 am

Bärbel Friedrich (Greifswald)

Academic Director of the Alfried Krupp Wissenschaftskolleg Greifswald

Welcome Address

Conference Chair's Address

9.15 am – 10.00 am

Keynote Speaker

Russell Impagliazzo (San Diego), Valentine Kabanets (Toronto) and **Antonina Kolokolova** (St. John's)

Axiomatic approach to barriers in complexity

10.00 am – 10.30 am

Invited Speaker (Special Session)

Saugata Basu (West Lafayette) and **Thierry Zell** (Hickory)

Polynomial hierarchy, Betti numbers and a real analogue of Toda's theorem

10.30 am – 11.00 am

Coffee break

11.00 am – 11.50 am

Keynote Speaker

Pascal Koiran (Lyon)

Shallow circuits with high-powered inputs

11.50 am – 12.30 pm

Contributed Talks

Tim Fischbach (Bonn) and Peter Koepke (Bonn)

An analogue of the Church-Turing thesis for computable ordinal functions

Barnaby Dawson (London)

How definitions, equivalent for Turing machines, cease to be equivalent, when generalized to ordinal time Turing machines

12.30 pm – 2.30 pm

Lunch break

2.30 pm – 3.00 pm

Invited Speaker (Special Session)

Klaus Meer (Cottbus)

Diagonal sets for real number complexity classes

3.00 pm – 4.00 pm

Contributed Talks

Olaf Beyersdorff (Berlin), Arne Meier (Hannover), Sebastian Mueller (Berlin), Michael Thomas (Hannover) and Heribert Vollmer (Hannover).

Proof complexity of propositional default logic

Jan Johannsen (München)

Lower bounds for width-restricted clause learning

Satoru Kuroda (Tamamura, Gunma)

Complete problems and bounded arithmetic for LOGCFL

4.00 pm – 4.30 pm

Coffee break

4.30 pm – 5.00 pm

Invited Speaker (Special Session)

Katrin Tent (Münster) and Martin Ziegler (Freiburg)

Computable functions on the reals

5.00 pm – 6.00 pm

Contributed Talks

Tomer Kotek (Haifa) and Johann Makowsky (Haifa)

Definability of combinatorial functions and their linear recurrence relations

Cameron Donnay Hill (Berkeley)

Efficiently inverting the L^2 -invariant through stability theory

Anuj Dawar (Cambridge) and **Bjarki Holm** (Cambridge)

Pebble games for rank logics

6.00 pm – 7.30 pm

Buffet at the Alfred Krupp Wissenschaftskolleg

7.30 pm

Public lecture

Johann Makowsky (Haifa)

Spektrum Problem von H. Scholz und G. Asser. Ein halbes Jahrhundert danach.

Moderation: Christine Gaßner (Greifswald)

Thursday, February 18, 2010

9.00 am – 9.50 am

Keynote Speaker

Alessandra Carbone (Paris)

Logical structures, cyclic graphs and genus of proofs

9.50 am – 10.30 am

Contributed Talks

Artur Wdowiarski (Warsaw)

On transitive closure operators in finite order logic

Yijia Chen (Shanghai), Joerg Flum (Freiburg) and Moritz Mueller (Barcelona)

On optimal algorithms for SAT

10.30 am – 11.00 am

Coffee break

11.00 am – 11.50 am

Keynote Speaker

Bruno Poizat (Villeurbanne)

Transformations and complexity

11.50 am – 12.50 pm

Contributed Talks

Peter Koepke (Bonn) and **Benjamin Seyfferth** (Bonn)

A characterization of Δ_2^1 pointclasses via ordinal machines

Peter Koepke (Bonn) and **Gregor Weckbecker** (Bonn)

Ordinal register machines and combinatorial principles in the constructible universe

Mihai Prunescu (Freiburg)

Triangular perplexity and a stairway to heaven

12.50 am – 2.30 pm

Lunch break

2.30 pm – 3.00 pm

Invited Speaker (Special Session)

Olivier Bournez (Palaiseau), Walid Gomaa (Vandoeuvre-lès-Nancy) and Emmanuel Hainry (Vandoeuvre-lès-Nancy)

Characterizing algebraically computability and complexity classes over the reals in recursive analysis

3.00 pm – 4.00 pm

Contributed Talks (Special Session)

Peter Scheiblechner (West Lafayette)

Comparison of complexity over the real vs. complex numbers

Wesley Calvert (Murray), Ken Kramer (New York) and **Russell Miller** (New York)

Noncomputable functions in the Blum-Shub-Smale model

Tobias Gärtner (Saarbrücken)

Representation theorems for analytic machines

4.00 pm – 4.30 pm

Coffee break

4.45 pm

Excursion to the fusion reactor Wendelstein 7-X

Friday, February 19, 2010

9.00 am – 9.50 am

Keynote Speaker

Erich Grädel (Aachen)

Fixed point logics, games, and polynomial-time complexity

9.50 am – 10.30 am

Contributed Talks

Marcin Mostowski (Warsaw)

Classification of the classes of finite models in Tarski' style

Pawel Parys (Warsaw)

Some results on complexity of mu-calculus evaluation in the black-box model

10.30 am – 11.00 am

Coffee break

11.00 am – 11.50 am

Keynote Speaker

Leszek Kolodziejczyk (Warsaw)

The scheme of induction for sharply bounded arithmetic formulas

11.50 am – 12.50 pm

Contributed Talks

Bruno Courcelle (Bordeaux) and Irène Durand (Bordeaux)

Tractable constructions of finite automata from monadic second-order formulas

Ilia Averbouch (Haifa), Johann Makowsky (Haifa) and **Peter Tittmann** (Mittweida)

A case study in graph polynomials: The subgraph component polynomial

André Souto, Luis Antunes and Andreia Teixeira

A characterization of one-way functions based on time-bounded Komogorov complexity

12.50 am – 2.30 pm

Lunch break

2.30 pm – 3.00 pm

Invited Speaker (Special Session)

Klaus Weihrauch (Hagen)

Computational complexity in analysis

3.00 pm – 4.00 pm

Contributed talks (Special Session)

Margarita Korovina (Manchester) and Oleg Kudinov (Novosibirsk)

Computability over positive predicate structures

Arno Pauly (Cambridge)

Nash equilibria and fixed points in the BSS model

Oleg Kudinov (Novosibirsk), Victor Selivanov (Novosibirsk) and **Anton Zhukov** (Novosibirsk)

Undecidability in Weihrauch degrees

4.00 pm – 4.30 pm

Coffee break

4.30 pm – 5.00 pm

Invited Speaker (Special Session)

Joris van der Hoeven (Palaiseau)

Ball arithmetic

5.00 pm – 6.00 pm

Contributed talks

Sam Sanders (Gent) and Andreas Weiermann (Gent)

Unbounded arithmetic

Saeed Salehi (Tabriz)

Herbrand consistency of $I\Delta_0$ and $I\Delta_0+\Omega_1$

Zofia Adamowicz (Warsaw) and **Konrad Zdanowski** (Warsaw)

Lower bounds for the provability of Herbrand consistency in weak arithmetics

7.30 pm

Dinner in the restaurant „Zur Sonne”

Saturday, February 20, 2010

9.00 am – 9.30 am

Invited Speaker (Special Session)

Monika Seisenberger (Swansea) and Ulrich Berger (Swansea)

Efficient synthesis of exact real number algorithms

9.30 am – 10.30 am

Contributed talks

Mathieu Hoyrup (Vandœuvre-lès-Nancy)

Randomness and the ergodic decomposition

Victor Selivanov (Novosibirsk)

Fine hierarchies via Priestley duality

Eryk Kopczynski (Warsaw)

Complexity of problems of commutative grammars

10.30 am – 11.00 am

Coffee break

11.00 am – 11.50 am

Keynote Speaker

Lance Fortnow (Evanston)

Hardness of instance compression and its applications

11.50 am – 12.50 pm

Contributed talks

Markus Lohrey (Leipzig), Dietrich Kuske (Bordeaux) and Jiamou Liu (Leipzig)

The isomorphism problem on classes of automatic structures

Oleg Kudinov (Novosibirsk) and Victor Selivanov (Novosibirsk)

A logic to capture P-time computability on Cantor space

12.50 am – 2.15 pm

Lunch break

2.15 pm – 3.15 pm

Discussions

3.30 pm

Excursion to the Ozeaneum (Stralsund)