Ivan Veselić

Fakultät für Mathematik
Technische Universität Chemnitz
09107 Chemnitz

Phone 49 (371) 531 2708
Fax 49 (371) 531 2141

http://www.tu-chemnitz.de/mathematik/schoedinger/

PERSONAL DATA: German citizen, born 6. 6. 1973 in Zagreb

EDUCATION

Ph.D. in Mathematics, March 2001, ("Dr. rer. nat. summa cum laude")
Ruhr-Universität Bochum, Germany
Thesis Advisor: *Prof. Dr. W. Kirsch*
Thesis Title: *Indefinite Problems Arising in Anderson Localization*

M.Sc. in Mathematics, February 1997, ("Diplom")
Ruhr-Universität Bochum, Germany
Thesis Advisor: *Prof. Dr. W. Kirsch*
Thesis Title: *Localization for Randomly Perturbed Periodic Schrödinger Operators in One Dimension*

High school diploma, June 1991, ("Irish Leaving Certificate Examination")
Rockbrook Park School, Dublin

POSITIONS

Head of a Emmy-Noether junior research group at the Department of Mathematics of the TU Chemnitz, since Juli 2004

Visiting Associate, California Institute of Technology & **Postdoctoral Research Scholar** of the German Science Foundation (GSF), July 2002 – June 2004

Postdoctoral Research Associate, Ruhr-Universität Bochum, Collaborative Research Centre "Disorder and Large Fluctuations" of the GSF, March 2001 – June 2002

Graduate Research Associate, Ruhr-Universität Bochum, same Collaborative Research Centre, April 1998 – February 2001

Graduate Teaching Associate, Ruhr-Universität Bochum, April 1997 – March 1998

Additional research experience

Research Period at the Universities at Chemnitz and Erlangen, sponsored by the Priority Programe network "Interacting stochastic systems of high complexity" of the GSF, January 2002

Research Period at Universidad Nacional Autonoma de Mexico, sponsored by the GSF, and the Ruth & Gerd Massenberg Foundation, December 2001

Spring School at the Mathematical Research Institute, Netherlands, March 2001

Research Fellowship of the Japan Society for the Promotion of Science, Osaka, Kyoto and Tsukuba, June – August 2001

Summer School & Research Period at the MaPhySto Centre, Denmark, August 2000

Research Period at the Universities of Trondheim, Norway, and Lulea, Sweden, sponsored by the German Academic Exchange Service, September 1999

Research Period at the Universities Paris 7 and 13 visiting Professor F. Klopp and Professor L. Pastur, April – June 1997

Teaching

Mentoring of a Master Thesis on the topic *Quantum Percolation* and a Semerster project on the topic *Treshholds in Percolation Theory*

Course Percolation Theory, 2 hours per week, summer 05

Course Graph Theory, 4 hours per week, winter 04

Invited mini-course lecturer at the UNA Mexico. Part of a workshop on Schrödinger Operators aimed among others for graduate students considering a Ph.D. thesis in this field, December 2001

Student seminar tutoring: tutoring undergraduate students for seminars, where they had to present a 90 min. lecture on an advanced textbook topic. Seminar themes: Functional Analysis, Game Theory, Statistical Mechanics, Mathematical Physics, 1999 – 2002

Co-organization and lecturing in a monthly Saturday seminar on Financial Mathematics and Economics. The participants were under- and postgraduate mathematics students, professionals from the banking and insurance sector, and faculty of a polytechnic college, 1999 – 2002

Master Thesis co-tutoring: co-tutoring two students of Prof. Kirsch with the preparation of their M.Sc. thesis on scattering theory for lattice Hamiltonians, 1998 – 2001

Teaching assistant conducting recitations in Analysis, Functional Analysis and Introductory Mathematics for Engineering Students, including preparation of exercises, supervision of the grader, co-examining in oral exams, and occasional lecturing in replacement of the professor, 1997 – 1999

Undergraduate Teaching Assistant and Grader for Probability Theory, Applied Functional Analysis, Topology, and two different Linear Algebra courses, 1993 –1996

Publications:

1. Quantum site percolation on amenable graphs. In *Proceedings of the Conference on Applied Mathematics and Scientific Computing, Juni 2003, Brijuni*. Z. Drmač, M. Marušić, Z. Tutek (Edt.), Springer, 12 pages, 2005.

2. Spectral analysis of percolation Hamiltonians. *Math. Ann.*, 331(4):841–865 , 2005.

3. Bounds on the spectral shift function and the (integrated) density of states. (based on joint work with D. Hundertmark, R. Killip, S. Nakamura, und P. Stollmann), In *Mathematics and Physics of Disordered Systems*, *Oberwolfach Reports*, 1 (2):1214-1216, 2004.

4. Integrated density of states for random metrics on manifolds. (with D. Lenz und N. Peyerimhoff), *Proc. London Math. Soc.*, 88(3):733–752, 2004.

5. The integrated density of states and Wegner estimates for random Schrödinger Operators. *Contemp. Math.* 340:97-183, Amer. Math. Soc., Providence, 2004.

6. Random Schrödinger operators on manifolds. (with D. Lenz und N. Peyerimhoff), *Markov Process. Related Fields*, 9(4):717-728, 2003.

7. Existence of the density of states for some alloy type models with single site potentials that change sign. In *Applied Mathematics and Scientific Computing, Juni 2001, Dubrovnik*, pages 293–303, Kluwer Acad. Publ., Dordrecht, 2003.

8. Wegner estimate for indefinite Anderson potentials: some recent results and applications. (with V. Kostrykin), In *Applications of renormalization group methods in mathematical sciences*, Sūrikaisekikenkyūsho Kōkyūroku No. 1275:65 – 84, 2002.

9. Integrated density of states for ergodic random Schrödinger operators on manifolds. (with N. Peyerimhoff), *Geom. Dedicata*, 91:117–135, 2002.

10. Wegner estimate and the density of states of some indefinite alloy-type Schrödinger operators. *Lett. Math. Phys.*, 59(3):199–214, 2002.

11. Localization for random perturbations of periodic Schrödinger operators with regular Floquet eigenvalues. *Ann. Henri Poincaré*, 3(2):389–409, 2002.

12. Existence of the density of states for one-dimensional alloy-type potentials with small support. (with W. Kirsch), *Contemp. Math.*, 307:171–176, Amer. Math. Soc., Providence, 2002.

13. Wegner estimate for sparse and other generalized alloy type potentials. (with W. Kirsch), *Proc. Indian Acad. Sci. Math. Sci.*, 112(1):131–146, 2002

Accepted papers and preprints :

1. Lipschitz continuity of the integrated density of states for sign-indefinite potentials. (with V. Kostrykin), 24 pages, accepted for publication in *Math Zeit.*.

2. Bounds on the spectral shift function and the density of states (with D. Hundertmark, R. Killip, S. Nakamura, und P. Stollmann), 15 pages, accepted for publication in *Comm. Math. Phys.*.

3. Von Neumann algebras, groupoids and the integrated density of states. (with D. Lenz und N. Peyerimhoff), 33 pages.

In preparation :

1. Continuity properties of the integrated density of states on manifolds. (with D. Lenz, N. Peyerimhoff, and O. Post).

Doctoral Thesis :

Indefinite Probleme bei der Anderson-Lokalisierung. Ruhr-Universität Bochum, 2001.

Master Thesis :

Lokalisierung bei zufällig gestörten periodischen Schrödingeroperatoren in Dimension Eins Ruhr-Universität Bochum, 1996.

For more details please consult
http://www.tu-chemnitz.de/mathematik/schroedinger/publikationen.php

Conference and Invited Seminar Talks:

Bounds on the spectral shift function and the density of states:
• MPI Leipzig, May '05 • *Mathematics and Physics of Disordered Systems*, Oberwolfach, May '04

Localization for alloy-type models: rigorous results and methods:
• Institut für Physik, TU Chemnitz, April '05

Quantum Mechanics of disordered solids: the phenomenon of locatisation
• colloquium of the Croatian Mathematical Society, Zagreb

Spectral shift induced by a compactly supported potential:
• TU Dresden, November '04 • *Symposium über Analysis*, Universität Basel, April 2004 • Universität Mainz, December '03 • Universität Stuttgart, November '03 • Universität Konstanz, November '03 • University of Alabama at Birmingham, October '03 • Caltech, October '03 • TU Chemnitz, Germany, July '03, • Ruhr-Universität Bochum, July '03, • University of Zagreb, Croatia, July '03.

Spectral properties of the quantum percolation model on graphs:
• Universite Paris 7, March '05 • University of Durham, February '05 • Universität Augsburg, November '04 • CalTech, March 2004, • Ruhr-Universität Bochum, December '03 & July '03, • *Applied Mathematics and Scientific Computing*, Brijuni, Croatia, June '03.

Wegner estimates for indefinite potentials and inverses of Toeplitz matrices:
• *Western States Mathematical Physics Meeting*, Caltech, February '03, • UC Irvine, December '02.

Integrated density of states for random metrics on manifolds:
• Caltech, November '02 • Ruhr-Universität Bochum, Germany, October '02.

Lipschitz continuity of the integrated density of states for for single site potentials with
small support:
• *Between Order ans Disorder*, Greifswald, September '02, • *Mathematical results in Quantum Mechanics*, Taxco, Mexico, December '01.

Wegner estimates with local continuity requirements on the coupling constants:
• UC Irvine, December '02, • *Differential Equations and Mathematical Physics*, Birmingham, AL, March '02. • UNA Mexico, December '01.

Grupoids, von Neumann algebras and the density of states:
• Universität Erlangen-Nürnberg, January '02.

Localization by disorder at Floquet-regular spectral boundaries:

• Universität Erlangen-Nürnberg, Germany, January '02. • University of Osaka, July '01, • Physikzentrum Bad Honnef, Germany, September '99.

Wegner estimates for alloy type potentials with changing sign:
• TU Chemnitz, Germany, January '02, • *Disorder and Large Fluctuations*, Tutzing, Germany, October '01 • Research Inst. for the Mathematical Sci., Kyoto, July '01, • University of Osaka, July '01, • *Schrödinger operators*, Oberwolfach, May '01, • *Disordered systems*, Bochum, September '00, • Physikzentrum Bad Honnef, Germany, September '99, • TU Trondheim, Norway, August 99, • University of Lulea, Sweden, September '99 • *Conference on Differential Equations and Mathematical Physics*, Birmingham, AL, March '99,

Integrated density of states and Wegner estimates:
• UNA Mexico, December '01,

Regularity properties of the integrated density of states of random Schrödinger operators:
• *Applied Mathematics and Scientific Computing*, Dubrovnik, Croatia, June '00,

Spectral properties of periodic and random Schrödinger operators:
• University of Bath, February '05. • University of Zagreb, Croatia, May '01.
• Fernuniversität Hagen, Germany, March '01.

Integrated density of states for random Schrödinger operators on manifolds:
• UNA Mexico, December '01, • University of Tsukuba, Japan, August '01, • *Differential Geometry and Quantum Physics*, Berlin, March '00, • Universität Bonn, Germany, January '00.

Other invited conference participation:

• *Anderson localization, quantum chaos and random matrices: rigorous methods vs physical intuition* ICTP, Trieste, Italy, September 2001
• *Aspects Mathématiques des Systèmes Aléatoires et de la Mécanique Statistique*, Luminy, Marseille, France, May 2002
• Invitation to *Mathematics and Physics of Disordered Systems*, Oberwolfach, May 2004
• Invitation to *Differential and Integral operators in L^p space*, Gregynog Conference Centre, University of Wales, Juli 2005.
• Invitation to *Workshop on Analytic and Computational problems in spectral theory and related topics*, Gregynog Conference Centre, University of Wales, Juli 2005.

Grants, Fellowships & Awards

Project Leader Grant of the German Science Foundation (support period: 2+2+1 years), December 2003. Includes funding for two graduate student or one postdoc in the first 2 years, which may be renewable in the second 2-year period

Research Grant of the German Science Foundation (support period: 2 years), 2002

Scholarship of the Japan Society for the Promotion of Science (support period: 2 months), 2001

Spring School Scholarship of the Mathematical Research Institute, Netherlands, (support period: 1 month), 2001

Summer School Stipend of the MaPhySto Centre, Denmark, (support period: 1 month), 2000

Travel grants of the Ruth & Gerd Massenberg Foundation, Dubrovnik 2000 & Mexico 2001

Scholarship of the Ruth & Gerd Massenberg Foundation for final-year undergraduates, 1996

References

Peter Hislop Department of Mathematics, University of Kentucky, 753 Patterson Office Tower, Lexington, Kentucky 40506-0027, USA

Werner Kirsch Fakultät für Mathematik, Ruhr-Universität Bochum, 44780 Bochum, Germany,

Gerhard Knieper Fakultät für Mathematik, Ruhr-Universität Bochum, 44780 Bochum, Germany,

Peter Stollmann Fakultät für Mathematik, Technische Universität Chemnitz, 09107 Chemnitz, Germany

Günter Stolz Department of Mathematics, University of Alabama at Birmingham, 452 Campbell Hall, Birmingham, AL 35294-1170, USA

All of the above professors have a good insight in my research. W. Kirsch and P. Stollmann, in addition, can comment on my teaching abilities.