

Curriculum Vitae

Personal Data

Name: Johannes Aastrup
Birth date: 14. of August 1974
Nationality: Danish

Contact Information

Institut für Analysis
Universität Hannover
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Research Interests

Noncommutative Geometry, Geometric Analysis, Mathematical Physics.

Education

August 1998: Cand. Scient. (Masters) in Mathematics from Matematisk Institut, Københavns Universitet. Title of Thesis: Stabile relationer for C^* -algebraer. (Stable Relations for C^* -algebras.) Thesis Advisor: Prof. Gert Kjærgaard Pedersen.

July 2002: Ph.D. from Matematisk Institut, Københavns Universitet. Title of Thesis: Deformation Quantization of Endomorphism Bundles. Advisor: Ryszard Nest. Referees: Prof. Gert Kjærgaard Pedersen, Prof. Elmar Schrohe, Potsdam Universität, Germany, Prof. Boris Tsygan, Northwestern University, U.S.A.

Academic Career

October 2010 - ...: Akademischer Rat at Institut für Analysis, Universität Hannover, Germany, financed by Universität Hannover.

January 2010 - September 2010: Postdoc at Mathematisches Institut, Universität Göttingen, Germany, financed by DFG (Deutsche Forschungs Gemeinschaft)

April 2007 - December 2009: Postdoc. at Mathematisches Institut, Universität Münster, Germany, financed by DFG

April 2004 - March 2007: Postdoc. at Institut für Analysis, Universität Hannover, Germany, financed by DFG.

November 2003 - March 2003: Assistant Professor at Institut für Analysis, Universität Hannover, Germany, financed by Universität Hannover.

October 2003: Stipend at the Mittag-Leffler Institute in Stockholm, Schveeden.

June 2003 - September 2003: Postdoc. in the EU network "Geometric analysis and index theory" at Mathematisches Institut, Universität Potsdam, Germany.

August 2002 - May 2003: Postdoc. in the EU network "Quantum spaces - Noncommutative geometry" at Mathematisches Institut, Universität Münster, Germany.

June 2002 - July 2002: Stipend at Mathematisches Institut, Universität Münster, Germany,

financed by DFG.

November 1998 - May 2002: Phd-student at Matematisk Institut, Københavns Universitet. Financed by Naturvidenskabelig Fakultet, Københavns Universitet.

November 2001 + January 2002: Predoc. in the EU network Geometric analysis and index theory at the institute of mathematics, I.S.T. Lisbon, Portugal.

September 1998 - October 1998: Research assistant at Matematisk Institut, Københavns Universitet.

September 1993 - August 1998: Mathematics and physics student at Københavns Universitet.

Recent Visits at other Universities

Institut for Matematiske fag, Københavns Universitet, 6.-10. February 2006.

CPT, Marseilles, 8.-16. March 2006.

MPI, Leipzig, 20.-22. June 2006.

Institute of mathematics and statistics, University of Sao Paulo, 10-22. July 2006.

Isaac Newton Institute for Mathematical Sciences, Cambridge, England, 20-24 August 2006.

Isaac Newton Institute for Mathematical Sciences, Cambridge, England, 20-30 November 2006.

Niels Bohr Instituttet, Københavns Universitet, 17.-24. April 2007.

Niels Bohr Instituttet, Københavns Universitet, 10.-20. December 2007.

Perimeter Institute, 23. May - 3. May, 2008.

Hamburg University and DESY, 6.-12 June 2008.

MSRI, University of California, 25. August - 1. October, 2008.

Max-Planck-Institut für Gravitationsphysik, Golm, Germany, 6.-13. November, 2008.

ANU, Canberra, 24 November - 8. December, 2008.

Perimeter Institute, 12.-17. October 2009.

Penn State, 18.-22. October 2009.

Recent Talks

Conference on C^* -algebras and Ellipticity in Bedlewo, Poland, 23. January 2006.

Institut for Matematiske Fag, Københavns Universitet, 10. February 2006.

CPT, Marseilles, 18. March 2006.

Mathematisches Institut, Universität Göttingen, 4. May 2006

Mathematisches Institut, Universität Dortmund, 9. May 2006

MPI, Leipzig, 21. June 2006

Institute of mathematics and statistics, University of Sao Paulo, 13. July 2006.

Brazilian operator algebras conference, Florianopolis, 15. July 2006.

Institut Henri Poincare, Paris, February 2007.

EMS Joint Mathematical Weekend, Copenhagen, February 2008.

DESY, Hamburg, June 2008.

Max-Planck-Institut für Gravitationsphysik, Golm, Germany, 8. November, 2008.

Conference on Algebras, Operators and Noncommutative Geometry, Canberra, 4. December, 2008.

Danish-Norwegian workshop on operator algebras, Oslo, 14. December, 2008.

2nd School and Conference on Noncommutative Geometry, Tehran, 28. April, 2009.

EU mid term review and conference, Copenhagen, 2. October 2009.

Ecole Polytechnique, Paris, 20. November 2009.

Workshop on Modern Geometry, Luxembourg, 23. November, 2009.

Workshop on Loop, Algebras and Spectral Triples, Oberwolfach, February, 2010.

26th workshop "Foundations and Constructive Aspects of QFT", Münster, 18. June 2010.

NetsFest, Copenhagen, 4. September 2010.

External Funding

Although I have not directly obtained external funding in my own name, I have participated in applying to several external sources.

In Hannover I was funded for three years externally by DFG in a project on deformation quantization and boundary value problems. The project application was written in collaboration with Elmar Schrohe and Ryszard Nest, and submitted to the DFG through Elmar Schrohe.

Also in Hannover I contributed to writing the application for the Graduiertenkolleg "Analysis, Geometry and Stringtheory" with the project "Twisted algebraic index theory", i.e. a project on index theory for twisted pseudo-differential operators. The Graduiertenkolleg is a project supporting Ph.D. students and young post. doc., and runs for four and half years from 1. of October 2008. It is a collaboration between mathematics and theoretical physics.

My last position in Münster was funded by the DFG and was a part of the SFB 478 "Geometrische Strukturen in der Mathematik" in Münster. This application was written in collaboration with Raimar Wulkenhaar and Jesper Grimstrup, and submitted through Raimar Wulkenhaar. The project was exactly the project I founded with Jesper Grimstrup described in the research statement.

Publications

1. Johannes Aastrup. Deformation quantization of endomorphism bundles. *J. Reine Angew. Math.*, 579:203-236, 2005.

2. Johannes Aastrup, Ryszard Nest, and Elmar Schrohe. A continuous field of C^* -algebras and the tangent groupoid for manifolds with boundary. *J. Funct. Anal.*, 237(2):482-506, 2006.

3. Johannes Aastrup and Jesper M. Grimstrup. Spectral triples of holonomy loops. *Comm. Math. Phys.*, 264(3):657-681, 2006.

4. Johannes Aastrup and Jesper M. Grimstrup. Intersecting Connes noncommutative geometry with quantum gravity. *Internat. J. Modern Phys. A*, 22(8-9):1589-1603, 2007.

5. Johannes Aastrup, Jesper M. Grimstrup, and Ryszard Nest. On spectral triples in quantum gravity. I. *Classical Quantum Gravity*, 26(6):065011, 53, 2009.

6. Johannes Aastrup, Jesper M. Grimstrup, and Ryszard Nest. On spectral triples in quan-

tum gravity. II. J. Noncommut. Geom., 3(1):47-81, 2009.

7. Johannes Aastrup, Ryszard Nest, and Elmar Schrohe. Index theory for boundary value problems via continuous fields of C^* -algebras. J. Funct. Anal., 257(8):2645-2692, 2009.

8. Johannes Aastrup, Jesper M. Grimstrup, and Ryszard Nest. A new spectral triple over a space of connections. Comm. Math. Phys., 290(1):389-398, 2009.

9. J. Aastrup, J. Grimstrup, and R. Nest. Holonomy loops, spectral triples and quantum gravity. Classical Quantum Gravity, 26(16):165001, 17, 2009.

10. J. Aastrup, S. Melo, B. Monthubert, and E. Schrohe. Boutet de Monvel's calculus and groupoids I. In press, J. Noncommut. Geom., arXiv:math.KT/0611336.

11. J. Aastrup and J. Grimstrup. Lattice loop quantum gravity. arXiv:0911.4141, 2009.

12. J. Aastrup, J. Grimstrup, R. Nest, and M. Paschke. On semi-classical states of quantum gravity and noncommutative geometry. Accepted for publication in Comm. Math. Phys., arXiv:0907.5510, 2009.

13. J. Aastrup, J. Grimstrup, and M. Paschke. Emergent dirac hamiltonians in quantum gravity. arXiv:0911.2404, 2009.

14. J. Aastrup, J. Grimstrup, and M. Paschke. On a derivation of the dirac hamiltonian from a construction of quantum gravity. arXiv:1003.3802, 2010.

15. J. Aastrup, J. Grimstrup and M. Paschke. Quantum Gravity coupled to Matter via Noncommutative Geometry. In preparation, 2010.

Teaching experience

In Copenhagen:

Fall Semester 1997: 3MI, Measure theory, for third year students, exercises.

Spring Semester 1998: 3GE, Differential geometry, for third year students, exercises.

Fall Semester 1998: Matematik 1, first year mathematics, exercises.

Spring Semester 1999: Matematik 1, exercises.

Fall Semester 1999: Matematik 1, exercises.

Fall Semester 2000: Lectures on K-theory, for advanced undergraduate/graduate students.

Spring Semester 2001: Matematik 1, exercises.

The teaching on Matematik 1 also included written and oral examination of the students.

In Hannover:

Fall-Winter Semester 2003-2004: Analysis 1, analysis for first year students, exercises.

Teaching included written examination of the students.

In Münster:

Spring semester 2007: Coorganizing with Raimar Wolkenhaar seminars for students on Loop Quantum Gravity, for third year students and later.

Fall-Winter semester 2007-2008: Coorganizing with Raimar Wolkenhaar seminars for students on Loop Quantum Cosmology, for third year students and later.

Cosupervising with Raimar Wolkenhaar the Master thesis of Ben Sahlmüller. Topic of the Master thesis: Computation of the spectral action of spectral triples over algebras of holonomy loops on finite graphs.

Currently cosupervising with Raimar Wolkenhaar the ph.d. thesis of Ben Sahlmüller.

The seminars were of the form where the students had to prepare talks on a selected topic from a selected literature.

In Göttingen:

Spring semester 2010: Lectures on "Deformation quantization: C^* -algebraic and formal" for fourth year students and later. Lectures given in English.