

Arend Bayer

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Citizenship

German

Research interests

Stability conditions in derived categories
Gromov-Witten invariants of stacks, Frobenius manifolds
Enumerative invariants in derived categories

Education

- 2006 Received Ph.D. from the *University of Bonn, Germany*
Thesis on “Semisimple quantum cohomology, deformations of stability conditions and the derived category”
- 2004–2006 *Max-Planck-Institut für Mathematik, Bonn, Germany*
Graduate studies under supervision of Yuri I. Manin
- 2000–2003 Student at *University of Bonn, Germany*
Diploma thesis “Semisimple Quantum Cohomology and Frobenius manifolds”, written under the supervision of Yuri I. Manin
- 1998–1999 *University of Cambridge, England*
Certificate of Advanced Study in Mathematics (“Part III”), with distinction
Essay on “Mirror symmetry for the elliptic curve”, written under supervision of Alessio Corti
- 1997–1998 Student at *University of Heidelberg, Germany*, Vordiplom
- 1996–1997 Alternative national service in Sindelfingen, Germany
- 1996 Abitur in Sindelfingen, Germany

Employment

- Spring 2009 Postdoctoral fellowship at the MSRI, Berkeley
- 2006–now Post-Doc at the University of Utah
- 2004–2006 PhD position at the Max-Planck-Institut, Bonn, Germany
- 2001–2002 Teaching assistant at Bonn university

Teaching experience

- 2006–2008 Instructor at University of Utah for:
 - Calculus 2 (Fall 2006), Calculus 1 (Spring 2007, 2 sections),
 - Real Analysis (First-year graduate course, Fall 2007)
 - Quantitative Analysis (“Business Calculus”, Spring 2008, 2 sections)
 - Topics in Algebraic geometry (Fall 2008)
- 2002–2004 Weekly tutoring at a school for mathematics tutoring of high school students
- 2001–2002 Teaching assistant for “Lineare Algebra 1, 2”, “Analysis 3” at Bonn university
- 1997–2006 Coach for the German team at the International Mathematical Olympiad

Publications

- Arend Bayer. Polynomial Bridgeland stability conditions and the large volume limit. Submitted for publication. arXiv:0712.1083.
- Arend Bayer and Charles Cadman. Quantum cohomology of $[\mathbb{C}^N/\mu_r]$, 2007. Submitted for publication. arXiv:0705.2158.
- Arend Bayer and Yuri I. Manin. Stability Conditions, Wall-crossing and weighted Gromov-Witten Invariants, 2006. Submitted for publication. arXiv:math.AG/0607580.
- Arend Bayer. Semisimple quantum cohomology and blowups. *Int. Math. Res. Not.*, (40):2069–2083, 2004. math.AG/0403260.
- Arend Bayer and Yuri I. Manin. (Semi)simple exercises in quantum cohomology. In *The Fano Conference*, pages 143–173. Univ. Torino, Turin, 2004. math.AG/0103164.

Honors

- Fellow of the “German National Merit Foundation” (Studienstiftung des deutschen Volkes) 1997–2002
- Stipend of the university exchange between Heidelberg and Cambridge (England) 1998–1999
- Prizes at the International Mathematics Olympiad 1994–1996 (Gold, Silver, Gold) and the International Physics Olympiad 1995–1996 (Silver, Gold)

Lectures at summer schools

- Rencontres mathématiques de Glanon*, June/July 2008, Glanon (France):
Lecture series on derived categories and stability conditions
- VIGRE Mini-Course on Derived Categories*, University of Utah, June 2007:
Three-part lecture series on “Bridgeland stability conditions”

Recent seminars

- Oberseminar Darstellungstheorie at University of Bonn, Germany*, June 2008: “Polynomial stability conditions and Donaldson-Thomas invariants”
- Conference on Gromov-Witten theory and related topics at KIAS, Seoul, Korea*, June 2008: “Polynomial Bridgeland stability conditions and wall-crossing”
- Algebraic Geometry Seminar at University of Illinois, Urbana-Champaign*, April 2008: “Polynomial Bridgeland stability conditions and wall-crossing”
- Algebraic Geometry Seminar at Brown University*, March 2008: “Polynomial stability conditions”
- Algebraic Geometry Seminar at Princeton University*, February 2008: “Polynomial Bridgeland stability conditions and wall-crossing”
- CMS Winter Meeting, Section on Algebraic stacks*, London (Ontario), December 2007: “Quantum Cohomology of $[\mathbb{C}^N/\mu_r]$ ”
- Algebraic Geometry Seminar at University of British Columbia, Vancouver*, October 2007: “Polynomial Bridgeland stability conditions and the large volume limit”
- Working group on Donaldson-Thomas invariants at UBC, Vancouver, October 2007: “PT/DT-correspondence as a wall-crossing in polynomial stability conditions”
- AMS Summer Research Conference on *Derived Categories in Mathematics and Physics*, Snowbird, Utah, June 2007: “Large volume limit of Bridgeland stability conditions”
- Algebraic Geometry Seminar at University of Michigan, Ann Arbor*, March 2007: “ r -th root construction, weighted stable maps and orbifold quantum cohomology”
- Seminar Algebraische Geometrie at Freie Universität Berlin, Berlin (Germany)*, May 2006: “Semisimple Quantum Cohomology and Frobenius Manifolds”

Service

I am currently organizing the Algebraic Geometry Seminar at the University of Utah.

As a regular participant and speaker at the quarterly “Kleine Arbeitsgemeinschaft algebraische Geometrie und Zahlentheorie”¹ (a quarterly workshop on topics in arithmetics and algebraic geometry, self-organized by a group of Post-Docs and graduate students at several universities in and around the “Ruhrgebiet” area in Germany), I have been jointly responsible for the the program and organization of three of the meetings: *Deformation theory and stacks*, 2001; *Degenerations of Hodge structures*, 2004; *Equivalences between derived categories of coherent sheaves*, 2004.

Refereeing

Conferences, summer schools and workshops

Workshop on “Recent Progress on the Moduli Space of Curves” at the Banff International Research Station (BIRS), March 2008.

CAMS Winter meeting, London (Ontario), December 2007.

Western algebraic geometry conference (WAGS): Fall 2006 (University of Utah), Spring 2007 (University of Washington), Fall 2007 (Colorado State University).

AMS Summer Research Conference “Derived Categories in Mathematics and Physics”, Snowbird, Utah, June 2007.

VIGRE Mini-Course on “Derived Categories”, University of Utah, June 2007.

Workshop on “D-bundles and Integrable Hierarchies”, University of Michigan, Ann Arbor, May 2007.

Joint MAA/AMS meeting, New Orleans, January 2007.

AMS Sectional, University of Utah, October 2006.

EMS Summer school “Arithmetic and geometry around quantization”, Istanbul, July 2006.

AMS Summer Research Institute in Algebraic Geometry, Seattle, 2005.

Graduate Student Warm-Up Workshop for AMS Summer Research Institute in Algebraic Geometry, Seattle, 2005.

The Fano conference, Torino (Italy), 2002.

Graduate school “Géométrie Algébrique in Liberté (GAEL)”, Luminy (France), 2002.

¹<http://www.math.uni-bonn.de/people/mad/ag/>

Workshop on Algebraic aspects of Mirror Symmetry, Universität Kaiserslautern, 2001.

Conferences and Workshops at the MPI, Bonn:

Mathematische Arbeitstagung, 2001, 2003, 2005.

Yuri Manin's Emeritierung Conference, 2005.

Workshop on Frobenius manifolds, quantum cohomology and singularities, 2002.

August, 2008