

HANS ULYSSES BODEN

Curriculum Vitae

Department of Mathematics & Statistics
McMaster University
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Education:

- 1985-1990 BRANDEIS UNIVERSITY, Waltham, Massachusetts
 Ph.D. in Mathematics conferred 1991
- 1980-1984 UNIVERSITY OF NEW HAMPSHIRE, Durham, New Hampshire
 B.S. in Mathematics conferred 1984

Professional employment:

- 2006-present Professor of Mathematics, MCMASTER UNIVERSITY, Hamilton, Ontario, Canada
- 2000-2006 Associate Professor of Mathematics, MCMASTER UNIVERSITY, Hamilton, Ontario, Canada
- 2000-2001 Associate Professor of Mathematics, OHIO STATE UNIVERSITY, Mansfield, Ohio
- 1997-2001 Assistant Professor of Mathematics, OHIO STATE UNIVERSITY, Mansfield, Ohio
- 1995-1997 Postdoctoral Fellow in Mathematics, MCMASTER UNIVERSITY, Hamilton, Canada
- 1993-1995 Research Mathematician, MAX-PLANCK-INSTITUT FÜR MATHEMATIK, Bonn, Germany
- 1990-1993 Assistant Professor of Mathematics, UNIVERSITY OF MICHIGAN, Ann Arbor, Michigan

Grants and awards:

- 2001-present Natural Sciences and Engineering Research Council of Canada Grant
 Title: *Gauge theory and low-dimensional topology*
- 2003-2005 Canada Foundation for Innovation/Ontario Innovation Trust
 Title: *Computational algebra in logic and geometry*
- 1999-2001 National Science Foundation Grant, Principal Investigator
 Title: *Moduli spaces, $SU(n)$ gauge theory and 3-dimensional topology*

Visiting positions:

- 2006 (Summer) INSTITUTE FOR ADVANCED STUDY/PARK CITY MATHEMATICS INSTITUTE, Park City, Utah
- 2005 (Spring) MAX-PLANCK-INSTITUT FÜR MATHEMATIK, Bonn, Germany
- 2004-2005 FIELDS INSTITUTE, Toronto, Canada
- 2002 (Spring) MAX-PLANCK-INSTITUT FÜR MATHEMATIK, Bonn, Germany
- 2001 (Summer) INSTITUT DES HAUTES ÉTUDES SCIENTIFIQUES, Bures-sur-Yvette, France
- 1998 (Fall) Department of Mathematics, INDIANA UNIVERSITY, Bloomington, Indiana
- 1994 (April) INSTITUT DES HAUTES ÉTUDES SCIENTIFIQUES, Bures-sur-Yvette, France

Research Interests:

Gauge theory, low-dimensional topology, invariants of knots and 3-manifolds,
and moduli spaces of holomorphic bundles over curves

Books edited:

- 2010 *Chern Simons Gauge Theory: 20 years after*, AMS/IP Studies in Advanced Mathematics,
 Editors: J. E. Anderson, H. U. Boden, A. Hahn and B. Himpel,
 American Mathematical Society & International Press (to appear)
- 2005 *Geometry and Topology of Manifolds*, Fields Institute Communications **47**,
 Editors: H. U. Boden, I. Hambleton, A. J. Nicas and B. D. Park, American
 Mathematical Society, Providence, RI

Publications:

23. *Metabelian $SL(n, \mathbb{C})$ representations of knot groups II: fixed points and deformations*, H. U. Boden and S. Friedl, to appear in Pacific Journal of Mathematics, ArXiv math.GT 0909.3654
22. *Splitting the spectral flow and the $SU(3)$ Casson invariant for spliced sums*, H. U. Boden and B. Himpel, Algebraic and Geometric Topology **9** (2009) 865–902
21. *Metabelian $SL(n, \mathbb{C})$ representations of knot groups*, H. U. Boden and S. Friedl, Pacific Journal of Mathematics **238** (2008) 7–25
20. *Splicing and the $SL_2(\mathbb{C})$ Casson invariant*, H. U. Boden and C. L. Curtis, Proceedings of the American Mathematical Society **136** (2008) 2615–2623
19. *The $SL_2(\mathbb{C})$ Casson invariant for Seifert fibered homology spheres and surgeries on twist knots*, H. U. Boden and C. L. Curtis, Journal of Knot Theory and Its Ramifications **15** (2006) 813–837
18. *The integer valued $SU(3)$ Casson invariant for Brieskorn spheres*, H. U. Boden, C. M. Herald and P. A. Kirk, Journal of Differential Geometry **71** (2005) 23–83
17. *The Calderón Projector for the Odd Signature Operator and Spectral Flow Calculations in 3-Dimensional Topology*, H. U. Boden, C. M. Herald and P. Kirk, Contemporary Mathematics **366** (2005) 125–150
16. *On the integer valued $SU(3)$ Casson invariant*, H. U. Boden, C. Herald and P. Kirk, 2001 Georgia International Topology Conference, AMS Proceedings of Symposia in Pure Mathematics **71** (2003) 209–236
15. *The $SU(3)$ Casson invariant for 3-Manifolds split along a 2-sphere or a 2-torus*, H. U. Boden and C. Herald, Topology and Its Applications **124** (2002) 187–204
14. *An integer valued $SU(3)$ Casson invariant*, H. U. Boden, C. Herald and P. Kirk, Mathematical Research Letters **8** (2001) 589–603
13. *Gauge theoretic invariants of Dehn surgeries on knots*, H. U. Boden, C. Herald, P. Kirk, and E. Klassen, Geometry and Topology **5** (2001) 134–226
12. *Universal formulae for $SU(n)$ Casson invariants of knots*, H. U. Boden and A. Nicas, Transactions of the American Mathematical Society **352** (2000) 3149–3187
11. *A connected sum formula for the $SU(3)$ Casson invariant*, H. U. Boden and C. Herald, Journal of Differential Geometry **53** (1999) 443–464
10. *Rationality of moduli spaces of parabolic bundles*, H. U. Boden and K. Yokogawa, Journal of the London Mathematical Society **59** (1999) 461–478
9. *The $SU(3)$ Casson invariant for integral homology 3-spheres*, H. U. Boden and C. Herald, Journal of Differential Geometry **50** (1998) 147–206
8. *Invariants of fibred knots from moduli*, H. U. Boden, in Geometric Topology, Ed. W. Kazez, AMS/IP Studies in Advanced Mathematics (1997) 259–267
7. *Integrality of the averaged Jones polynomial of algebraically split links*, H. U. Boden, Journal Knot Theory and Its Ramifications **8** (1996) 100–104
6. *Moduli spaces of parabolic Higgs bundles and parabolic $K(D)$ pairs over a smooth curve*, H. U. Boden and K. Yokogawa, International Journal of Mathematics **7** (1996) 573–598
5. *Rationality of the moduli space of vector bundles over a smooth curve*, H. U. Boden, 1995 IHES preprint
4. *Variations of moduli of parabolic bundles*, H. U. Boden and Y. Hu, Mathematische Annalen **301** (1995) 539–559
3. *Unitary representations of Brieskorn spheres*, H. U. Boden, Duke Mathematical Journal **75** (1994) 193–220
2. *Representations of orbifold groups and parabolic bundles*, H. U. Boden, Commentarii Mathematici Helvetici **66** (1991) 389–447
1. *Representations of orbifold groups and parabolic bundles*, (1990) Ph.D. Thesis, Brandeis University

Student and postdoctoral supervision:

- 2001–present Co-supervisor for Postdoctoral Fellows:
Vincent Bonini, Jaime Cuadros, Tolga Etgü, Hee Jung Kim, Tom Klein, Ben Mares, Eduardo Martinez Pedroza, Martin Niepel, Brendan Owens, Brad Safnuk, Sašo Strle, Özgün Ünlü, Jonathan Yazinski, Ke Zhu
- 2005–present Supervisor for the PhD student George Dragomir
Thesis Topic: *Closed Geodesics on Orbifolds*
- 2010 Supervisor of Perimeter Institute International Scholar Essay
2010 Lokman Tsui, *Chern-Simons Gauge Theory and the Jones Polynomial*
- 2003–present Supervisor for MSc students:
2010 Michael Parchimowicz, *Finite Type Invariants of Knots and Graphs*
2010 Chris Henry, *Group Theory and Pushdown Languages*
2006 David Lorne, *Jones Polynomial, Knot Cohomology and $(2, n)$ torus knots*
2005 George Dragomir, *Orbifolds of Nonpositive Curvature and Their Loop Space*
2003 Richard Smeltzer, *Linear Representations of Braid Groups*
- 2006–present Supervisor for NSERC undergraduate summer research awards:
2010 Vanessa Foster, *Exploration of Knots, Links, and Braids*
2009 Chris Henry, *Research in Geometric Group Theory*
2008 Chris Henry, *Groups via Topological, Combinatorial, and Geometric Methods*
2007 Chris Henry, *Automatic Structures and Combinatorial Group Theory*
2006 Steffen Marcus, *Algebraic Curves and Algebraic Geometry*
- 2006–2007 Supervisor of Arts & Science Senior Thesis for Sylvia Andreae
Thesis Title: *Explorations in Braid Theory*
- 2005–2006 Co-Supervisor of Arts & Science Senior Thesis for Steffen Marcus
Thesis Title: *Mathematical Logic and Point-Set Topology*
- 2002–present Member of MSc Examining Committee for the students:
Nima Anvari, Praphat Fernandes, Darren Gray, Piotr Jagiello, Carolyn Junkins, Qun Li, Qiuping Lu, Wangshan Lu, Ami Mamolo
- 2002–present Member of PhD supervisory committee for the students:
Mehmetcik Pamuk, Semra Pamuk, Lucian Savin

Teaching experience:

- 2000–present MCMaster UNIVERSITY, Hamilton, Ontario, Canada
& 1995–1997 Courses: Math 1K3, 1M3, 1N3, 1X3, 2R3 (4 sections), 2S3, 3EE3 (2 sections), 3T3 (2 sections), 4B3, 4BB3 (2 sections), 4T3, 4SF3 (2 sections), 761 (2 sections), 762, 795
- 1997–2000 OHIO STATE UNIVERSITY, Mansfield & Columbus, Ohio
Courses: Math 104, 130, 148 (5 sections), 150 (3 sections), 152, 153, 868 (graduate)
- 1998 (Fall) INDIANA UNIVERSITY, Bloomington, Indiana
Courses: Math 118, 120
- 1990–1993 UNIVERSITY OF MICHIGAN, Ann Arbor, Michigan
Courses: Math 115 (2 sections), 116, 196 (honors), 215, 286 (honors), 316, 419, 450, 454 (2 sections), and 697 (graduate)
- 1986–1990 BRANDEIS UNIVERSITY, Waltham, Massachusetts
Courses: Math 105, 110 (2 sections), 111 (2 sections), 115; TYP Math I & II (2 sections)
Recipient, Senior Teaching Fellow Award (1990)

Conference organization (since 2005):

- 03/2011 Co-organizer, *Interactions between Contact Symplectic Topology and Gauge Theory*, Banff International Research Station for Mathematical Study and Innovation
- 08/2009 Co-organizer, *Chern-Simons Gauge Theory: 20 years after*, Hausdorff Center for Mathematics, Bonn, Germany
- 03/2009 Co-organizer, *Interactions of Geometry and Topology in Dimensions 3 and 4*, Banff International Research Station for Mathematical Study and Innovation
- 03/2007 Co-organizer, *Interactions of Geometry and Topology in Low Dimensions*, Banff International Research Station for Mathematical Study and Innovation
- 06/2005 Co-organizer, *Special Session on Geometric Topology*, Summer Meeting of the Canadian Mathematical Society, University of Waterloo
- 04/2005 Co-organizer, *Great Lakes Geometry Conference*, Perimeter Institute

Invited conference talks (since 2005):

- 08/2011 *Aarhus gauge theory workshop*, Center for Quantum Geometry and Moduli Spaces, Aarhus University, Denmark (expected)
- 05/2011 *Knots, surfaces and 3-manifolds*, Special session of the 1071th Meeting of the AMS, University of Nevada–Las Vegas (expected)
- 04/2010 *Character varieties in the geometry and topology of low-dimensional manifolds*, Banff International Research Station for Mathematical Study and Innovation
- 12/2009 *Knot theory and related topics*, Special session of the joint meeting of the KMS-AMS, Ewha Womans University, Seoul, Korea
- 06/2009 *Algebraic Geometry and Topology*, CMS/CSHPM summer meeting, St. Johns, Newfoundland
- 03/2009 *Geometric Topology*, Spring Topology and Dynamics Conference, University of Florida, Gainesville
- 01/2009 *Geometry, Algebra, and Topology of Character Varieties*, Special session of the 115th Annual Meeting of the AMS, Joint meeting of the AMS and MAA, Washington, DC
- 06/2008 *Conference on Topology, Knots and Related Fields, Congress Canada-France 2008*, Montreal, Quebec
- 01/2007 *Recent Developments in Floer Homology*, Special session of the 113th Annual Meeting of the AMS, Joint meeting of the AMS and MAA, New Orleans
- 10/2006 *Floer Methods in Low-Dimensional Topology*, Special session of the 1019th Meeting of the AMS, University of Utah
- 09/2006 *Conference on Low Dimensional Topology*, First joint meeting of the CMS–SMM, Guanajuato, Mexico

Invited seminar talks and colloquia (since 2005):

- 01/2010 *Colloquium*, University of Miami
- 12/2009 *Topology Seminar*, Michigan State University
- 12/2008 *Colloquium*, The College of New Jersey
- 10/2008 *Topology Seminar*, Max-Planck-Institut für Mathematik, Bonn, Germany
- 08/2008 *Colloquium*, University of Nevada, Reno
- 02/2008 *Topology Seminar*, Université du Québec à Montréal
- 10/2005 *Geometry Seminar*, University of Toronto
- 09/2005 *Colloquium*, University of Western Ontario
- 03/2005 *Colloquium*, University of Waterloo
- 03/2005 *Topology Seminar*, University of Wisconsin

Professional activities and service:

- 2009–present Chair, Department of Mathematics & Statistics, McMaster University
- 2009 Member, Site Visit Team, Mathematical Research Sciences Institute
Division of Mathematical Sciences, National Science Foundation
- 2006–2009 Member & Chair (2007–2009), Grant Selection Committee 336, Pure and Applied
Mathematics A, Natural Sciences and Engineering Research Council of Canada
- 2009–present Member, Committee of Academic Sponsors, Mathematical Research Sciences Institute,
Berkeley, California
- 2009–present Member, Corporation of the Fields Institute, Toronto, Ontario
- 2005–2007 Associate Chair for Graduate Studies
& 2002–2004 Department of Mathematics & Statistics, McMaster University
- 2005–2007 Chair, Graduate Admissions and Curriculum Committee
& 2002–2004 Department of Mathematics & Statistics, McMaster University
- 2007–2009 Member, Math-NSERC Liaison Committee
- 2006–2007 Member, Tenure and Promotion Committee
& 2003–2004 Department of Mathematics & Statistics, McMaster University
- 2004–2005 Member, Appointments Committee
& 2002–2003 Department of Mathematics & Statistics, McMaster University
- 2005–2007 Member, Graduate Science Curriculum Committee
& 2002–2004 Faculty of Science, McMaster University
- 1998–present Referee of grant applications to NSF and NSERC
- 1997–present Reviewer for Mathematical Reviews
Reviewed > 100 journal articles
- 2008–present Reviewer for Zentralblatt
- 1994–present Referee for the following mathematical journals:
Advances in Mathematics, Algebraic and Geometric Topology,
American Journal of Mathematics, Canadian Math Bulletin,
Communications in Contemporary Mathematics,
Compositio Mathematica, Experimental Mathematics,
Geometry and Topology, Journal of Differential Geometry,
Journal of Mathematical Sciences, Journal of Pure and Applied Algebra,
Indiana University Mathematics Journal,
Mathematische Annalen, Mathematische Zeitschrift,
Memoirs of the American Mathematical Society,
Michigan Mathematical Journal, Pacific Journal of Mathematics,
Proceedings of the American Mathematical Society,
Quarterly Journal of Mathematics,
Rocky Mountain Journal of Mathematics, Topology, and
Transactions of the American Mathematical Society

Personal data:

- Born: September 18, 1962, in Boston, Massachusetts
- Citizenship: Canada & USA (dual)
- Family: Married to Laurel Ann Wilkinson with children
Alexander Robert, Nina Elizabeth, and Julia Mae