
Personal details

Name Mikael Vejdemo-Johansson
Birthdate September 9, 1980
Nationality Swedish
Current position Scientific Officer, University of St Andrews

Degrees

- 2000–2004 **B.Sc. Mathematics**, *Stockholms Universitet*, Stockholm, Sweden.
Advisor: Jörgen Backelin
Thesis: *Computation of denominator polynomials for Poincaré series on monomial rings*
- 2000–2005 **M.Sc. Mathematics**, *Stockholms Universitet*, Stockholm, Sweden.
Advisor: Jörgen Backelin
Thesis: *Computation of denominator polynomials for Poincaré series on monomial rings*
- 2006–2008 **Dr.rer.nat. Mathematics**, *Friedrich-Schiller-Universität*, Jena, Germany.
Advisor: David J. Green
Thesis: *Computation of A_∞ -algebras in group cohomology*
Magna cum Laude
Rigorosum in *Cluster Computing*

Positions held

- 2011–now **Scientific Officer**, *School of Computer Science, University of St. Andrews*, St. Andrews, Scotland.
GAP group, high-performance computer algebra
- 2008–2011 **Postdoctoral Researcher**, *Department of Mathematics, Stanford University*, Stanford, CA, USA.
Workgroup for computational and applied algebraic topology
- 2006–2008 **Wissenschaftlicher Mitarbeiter**, *Lehrstuhl Algebra, Fakultät für Mathematik und Informatik, Friedrich-Schiller-Universität Jena*, Jena, Germany.
PhD student and teaching assistant
- 2005–2006 **Software Designer for Security with focus on mathematical aspects of cryptography**, *Teleca Systems GmbH*, Nürnberg, Germany.
- 2005 **Summer job**, *Teleca Systems GmbH*, Nürnberg, Germany.
- 2003–2004 **Project Assistant**, *Department of Mathematics, Stockholm University*, Stockholm, Sweden.
Administration and teaching duties for the web-based introductory course in mathematics
- 2003 **Project Assistant**, *AstraZeneca*, Södertälje, Sweden.
Designing and running an outreach course in mathematics for 7th grade students.
- 2001–2003 **Project Assistant**, *Department of Classics, Stockholm University*, Stockholm, Sweden.
Implementation and system administration for the web-based introductory course system for latin teaching <http://primalatina.klassiska.su.se>

- 2000 **Summer Job**, *Ericsson Eurolab Deutschland GmbH*, Nürnberg, Germany.
Implementation and optimization of Montgomery multiplication for cryptographical applications on DSP processors.

Conference organization

- 2012 **ATMCS**, Edinburgh, Scotland.
Local co-organizer together with Andrew Ranicki and Mike Fourman
- 2012 **Joint Mathematics Meetings; AMS special session on computational and applied algebraic topology**, Boston, MA, USA.
Session organizer
- 2011 **SIAM conference on Applied Algebraic Geometry; mini-symposium: Persistent homotopy and its applications**, *North Carolina State University*, Raleigh, NC, USA.
Symposium organizer
- 2010 **ATMCS**, Münster, Germany.
Webmaster
- 2008 **Junior Mathematical Congress**, *Friedrich-Schiller-Universität Jena*, Germany.
Main organizer, media liaison for the organizing team
- 2003–2004 **4th European Congress of Mathematics**, Stockholm, Sweden.
Organizer.
- 2002–2004 **Junior Mathematical Congress 2004**, Stockholm, Sweden.
Organizer.

Selected Conference participation

- 2011 **SIAM conference on Applied Algebraic Geometry**, *North Carolina State University*, Raleigh, NC, USA.
Conference talk: Point Clouds of Varieties and Persistent Homology
- 2011 **British Topology Meeting**, *ICMS*, Edinburgh, Scotland.
Conference talk: Persistent cohomology and its applications
- 2011 **Applied Algebraic Topology**, *ETH*, Zürich, Switzerland.
Conference talk: Incremental and exploratory persistence
- 2011 **MEGA – Effective Methods in Algebraic Geometry**, *Stockholm University*, Stockholm, Sweden.
Peer reviewed conference talk: javaPlex – persistent homology in Java
- 2010 **International Conference on Mathematical Software**, Kobe, Japan.
Peer reviewed conference talk: Operadic Gröbner bases: an implementation
- 2010 **Algebraic Topology: Methods, Computation and Science**, Münster, Germany.
Conference talk: Persistent cohomology and period reconstruction
- 2009 **Recent advances on topological and geometric data analysis**, *INRIA-Saclay*, Paris, France.
Conference talk: Persistent cohomology and circular coordinates
- 2009 **de Brún workshop on computational algebra**, *NUI Galway*, Ireland.
Conference talk: Persistent cohomology and circular coordinates

- 2009 **ACM Symposium on Computational Geometry**, *Aarhus Universitet*, Århus, Denmark.
Peer reviewed conference talk: Persistent cohomology and circular coordinates
- 2009 **AMS Spring Southeastern Sectional Meeting**, *North Carolina State University*, Raleigh, NC, USA.
Conference talk: Finite time computation of A-infinity algebra structures on Ext algebras
- 2009 **Data Analysis using Computational Topology and Geometric statistics**, *Banff International Research Station*, Banff, Canada.
Conference talk: Persistent cohomology and circular coordinates
- 2009 **DARPA Topological Data Analysis**, Santa Barbara, CA, USA.
Conference talk: Persistent cohomology and circular coordinates
- 2008 **Algebraic Structures in Geometry and Physics**, Leicester, United Kingdom.
Invited talk: On the computation of A-infinity algebras and Ext-algebras
- 2008 **Oberwolfach conference on Computational Algebraic Topology**, *Oberwolfach Mathematical Research Institute*, Germany.
Invited participant
- 2008 **Graduate Students Topology Conference**, *UIUC*, Urbana-Champaign, IL, USA.
Contributed talk: On the computation of A-infinity algebras and Ext-algebras
- 2008 **AMS-MAA Joint Mathematics Meetings**, *AMS Session on Geometry and Topology II*, San Diego, CA, USA.
Contributed talk: On an A_∞ -structure on $H^*(C_n \times C_m)$
- 2008 **AMS-MAA Joint Mathematics Meetings**, *AMS Special session on applications of computer algebra in enumerative and algebraic combinatorics*, San Diego, CA, USA.
Contributed talk: Enumerating the Sanedlidze-Umble diagonal in Haskell
- 2007 **International Conference on Homology theories, Homotopy theory and K-theory**, T'bilisi, Republic of Georgia.
Invited talk on A_∞ -structures in group cohomology
- 2007 **National meeting**, *Deutsche Mathematikervereinigung*, Berlin, Germany.
Was elected *Sprecher* of the Special Interest Group *Information und Kommunikation*.
- 2000 **Junior Mathematical Congress 2000**, Miskolc, Hungary.
Participant with contributed talk.

Selected seminar talks and research visits

- 2011 **Topological Data Analysis**, *University of Edinburgh*, Edinburgh, Scotland.
Seminar talk
- 2011 **Topological Data Analysis**, *University of St Andrews*, St Andrews, Scotland.
Seminar talk
- 2011 **The Mayer-Vietoris Spectral Sequence**, *Stanford University*, Stanford, CA, USA.
Seminar talk
- 2011 **The Topology of Politics**, *Dartmouth University*, Hanover, NH, USA.
Colloquium talk
- 2011 **Point clouds of varieties and persistent homology**, *Dartmouth University*, Hanover, NH, USA.
Seminar talk

- 2011 **Point clouds of varieties and persistent homology**, *Texas A&M*, College Station, TX, USA.
Seminar talk
- 2011 **Point clouds of varieties and persistent homology**, *University of Pennsylvania*, Philadelphia, PA, USA.
Seminar talk
- 2011 **Applications of Algebraic Topology**, *KTH, workgroup in Robotics and Computer Vision*, Stockholm, Sweden.
Seminar talk
- 2011 **AMS Mathematical Research Community: Computational and Applied Algebraic Topology**, *Snowbird*, Utah, USA.
Participant and teaching assistant
- 2011 **Algebraic Geometry and its Applications**, *Mittag-Leffler research institute*, Stockholm, Sweden.
Member of the half-year research program
- 2011 **Topological data analysis and the construction of intrinsic circle-valued coordinates**, *NCSU*, Raleigh, USA.
Colloquium talk
- 2010 **Current trends in persistent homology**, *University of Pennsylvania*, Philadelphia, USA.
Seminar talk
- 2010 **Operadic Gröbner bases: an implementation**, *University of Pennsylvania*, Philadelphia, USA.
Seminar talk
- 2010 **Persistente Kohomologie und Kreis-werte Koordinaten**, *TU Kaiserslautern*, Kaiserslautern, Germany.
Colloquium
- 2010 **Persistent cohomology, circle-valued coordinates and periodicity**, *UWO*, London, Ontario, Canada.
- 2010 **Persistent Homology**, *KTH*, Stockholm, Sweden.
4 lecture mini-course
- 2010 **Topology of Politics**, *KTH*, Stockholm, Sweden.
- 2010 **Species, differentiation of types and Gröbner bases for operads**, *KTH*, Stockholm, Sweden.
- 2010 **Politikens Topologi**, *Linköpings Universitet*, Linköping, Sweden.
- 2010 **∂ für Datentypen**, *FSU Jena*, Jena, Germany.
- 2010 **Die Topologie der Politik**, *FSU Jena*, Jena, Germany.
- 2009 **Persistent cohomology and circle-valued coordinates: analyzing periodicity with sparse sampling**, *Uppsala Universitet*, Uppsala, Sweden.
- 2009 **Persistent cohomology and circular coordinates**, *Duke University*, Durham, NC, USA.
- 2008 **Finite time computation of A_∞ algebra structures**, *University of Pennsylvania*, Philadelphia, PA, USA.
- 2008 **On the computation of A-infinity algebras and Ext-algebras**, *University of Pennsylvania*, Philadelphia, PA, USA.
- 2008 **On the computation of A-infinity algebras and Ext-algebras**, *Millersville University*, Lancaster, PA, USA.

- 2008 **On the computation of A-infinity algebras and Ext-algebras**, *Stanford University*, Stanford, CA, USA.
- 2008 **On the computation of A-infinity algebras and Ext-algebras**, *University of Washington*, Seattle, WA, USA.
- 2008 **On the computation of A-infinity algebras and Ext-algebras**, *NUI Galway*, Galway, Ireland.
- 2008 **On the computation of A-infinity algebras and Ext-algebras**, *Stockholm University*, Stockholm, Sweden.
- 2007 **Research visit**, *University of Sydney*, Sydney, Australia.
5 weeks visit to the MAGMA group
- 2007 **A-infinity structures in group cohomology**, *Macquarie University*, Sydney, Australia.

Teaching experience

- 2010 **Persistent homology**, *KTH*, Stockholm, Sweden.
4-lecture mini-course
- 2010 **MATH 20: Calculus**, *Stanford University*, Stanford, CA, USA.
A second course in freshman calculus for non-mathematics majors. The theory, practice and applications of Riemann integration.
- 2009 **MATH 198: Category Theory and Functional Programming**, *Stanford University*, Stanford, CA, USA.
Elementary category theory with applications in computer science and functional programming.
- 2008 **Übungen: Algebraische Topologie**, *Friedrich-Schiller-Universität Jena*, Jena, Germany.
- 2008 **Übungen: Lineare Algebra und analytische Geometrie 3**, *Friedrich-Schiller-Universität Jena*, Jena, Germany.
- 2007–2008 **Übungen: Mathematik I (Lineare Algebra)**, *Friedrich-Schiller-Universität Jena*, Jena, Germany.
Linear algebra for computer science majors.
- 2007 **Übungen: Lineare Algebra und analytische Geometrie 2**, *Friedrich-Schiller-Universität Jena*, Jena, Germany.
- 2006–2007 **Übungen: Lineare Algebra und analytische Geometrie 1**, *Friedrich-Schiller-Universität Jena*, Jena, Germany.
- 2006 **Übungen: Algebra 2**, *Friedrich-Schiller-Universität Jena*, Jena, Germany.
- 2003–2004 **Introductory mathematics**, *Stockholm University*, Stockholm, Sweden.
Course taught using internet-based learning tools.

Advising experience

- 2009–2010 **Senior honors thesis**, *Stanford University*, Stanford, CA, USA.
Andrew Yarmola: Cup products in persistent cohomology.
- 2007–2008 **Independent study**, *Carl Zeiss Gymnasium*, Jena, Germany.
Algebraic topology and elementary knot theory with two 9th–10th grade students from the Gymnasium.

Grant applications

- 2011 Applied for ERC Starting research grant. Scored 2.38.
- 2011 Applied for Vetenskapsrådet: Postdoc funding.
- 2011 Applied for Vetenskapsrådet: Project funding for young scientists.
- 2008 The Junior Mathematical Congress won funding from “Stiftung für Technologie, Innovation und Forschung, Thüringen” as well as from “Jugend für Europa”.
- 2004 The Junior Mathematical Congress won funding from “Riksbankens Jubileumsfond”.

Other experiences

- 2007–2008 Sprecher for the Arbeitsgruppe Information und Kommunikation of the Deutsche Mathematikervereinigung
- 2012 **Art exhibit**, *AMS-MAA Joint Mathematics Meeting*, Boston, MA, USA.
Laser-etched hyperbolic geometry pieces; selected by jury for the exhibit