Ciprian Manolescu

Curriculum Vitae

University of California
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Research Interests

Low-dimensional topology, symplectic geometry, gauge theory. Particular interests: Floer homology and its applications to knots, 3-manifolds, and 4-manifolds; the Seiberg-Witten equations; Khovanov homology and categorification

Education

Ph.D. in Mathematics, Harvard University, June 2004
    Thesis: *A spectrum valued TQFT from the Seiberg-Witten equations*
    Advisor: Peter B. Kronheimer

B.A. *summa cum laude* in Mathematics, Harvard University, June 2001

Employment

Professor, UCLA, 2012-Present

Associate Professor, UCLA, 2008-2012

Assistant Professor, Columbia University, 2005-2008

Research Fellow, Clay Mathematics Institute, 2004-2008

Veblen Research Instructor, Princeton University and IAS, 2004-2005

Visiting Positions

Visiting Researcher, Simons Center for Geometry and Physics, April-May 2013

C.N.R.S. Visiting Researcher, University of Paris 7, June-August 2012

Visiting Research Professor, MSRI, March-April 2009

Royal Society University Research Fellow, University of Cambridge, Spring 2009

Selected Awards, Grants, and Honors

European Mathematical Society Prize, 2012

National Science Foundation: Principal Investigator, research grants DMS-0803465 "Applications and Refinements of Floer Homology" (2008-2011), DMS-1104406, "Invariants in Low-Dimensional Topology" (2011-2014), and DMS-1402914, "Topological Applications of Floer Theory" (2014-2017)

Robert Sorgenfrey Distinguished Teaching Award at UCLA, 2011

Royal Society University Research Fellowship (UK), 2008

Clay Research Fellowship, 2004-2008

Putnam Fellowship at Harvard University, 2002-2004

AMS/MAA/SIAM Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student, 2001

The Mumford Prize for the most promising undergraduate in mathematics at Harvard, 2001

The Hoopes Prize for outstanding senior thesis at Harvard, 2001

Cue Certificate for Distinction in Teaching, Harvard: 1998, 1999, 2002

Phi Beta Kappa (elected as a junior at Harvard), 2000

William Lowell Putnam Mathematical Competition, top five (Putnam Fellow): 1997, 1998, and 2000

Three Gold Medals with perfect scores (42 points) at the International Mathematical Olympiad: Toronto, Canada (1995); Bombay, India (1996); Mar del Plata, Argentina (1997)

Two Gold Medals with perfect scores at the Balkan Mathematical Olympiad: Bacau, Romania (1996); Kalambaka, Greece (1997)

Publications and Preprints

1. Involutive Heegaard Floer homology (with K. Hendricks), preprint (2015), arXiv:1507.00383

2. Floer theory and its topological applications, to appear in *Japanese Journal of Mathematics*

3. Triangulations of manifolds, *Notices of the International Congress of Chinese Mathematicians*, **2** (2014), no.2, 21–23

4. An introduction to knot Floer homology, preprint (2014), arXiv:1401.7107

5. Cornered Heegaard Floer homology (with C. Douglas and R. Lipshitz), preprint (2013), arXiv:1309.0155

6. The Conley index, gauge theory, and triangulations, *Journal of Fixed Point Theory and Applications* **13** (2013), 431–457

7. On the intersection forms of spin four-manifolds with boundary, *Mathematische Annalen* **359** (2014), 695–728

8. A generalized asynchronous computability theorem (with E. Gafni and P. Kuznetsov), in *Proceedings of the 2014 ACM Symposium on Principles of Distributed Computing* (PODC '14), ACM, New York (2014), 222–231

9. Pin(2)-equivariant Seiberg-Witten Floer homology and the Triangulation Conjecture, to appear in *Journal of the American Mathematical Society*

10. Grid diagrams in Heegaard Floer theory, in *European Congress of Mathematics, Kraków, 2-7 July, 2012*, European Mathematical Society (2013), 643–657

11. An untwisted cube of resolutions for knot Floer homology, *Quantum Topology* **5** (2014), 185–223

12. On the algebra of cornered Floer homology (with C. Douglas), *Journal of Topology* **7** (2014), 1–68

13. Heegaard Floer homology and integer surgeries on links (with P. Ozsváth), preprint (2010), arXiv:1011.1317

14. Grid diagrams and Heegaard Floer invariants (with P. Ozsváth and D. Thurston), preprint (2009), arXiv:0910.1317

15. Floer homology on the extended moduli space (with C. Woodward), in *Perspectives in Analysis, Geometry and Topology: On the Occasion of the 60th Birthday of Oleg Viro*, Progress in Mathematics **296**, Birkhäuser / Springer (2012), 283–329

16. A combinatorial description of knot Floer homology (with P. Ozsváth and S. Sarkar), *Annals of Mathematics* **169** (2009), 633–660

17. Combinatorial cobordism maps in Heegaard Floer theory (with R. Lipshitz and J. Wang), *Duke Mathematical Journal* **145** (2008), 207–247

18. On the Khovanov and knot Floer homologies of quasi-alternating links (with P. Ozsváth), in *Proceedings of the Fourteenth Gökova Geometry / Topology Conference* (2007), 60–81

19. On combinatorial link Floer homology (with P. Ozsváth, D. Thurston and Z. Szabó), *Geometry and Topology* **11** (2007), 2339–2412

20. An unoriented skein exact triangle for knot Floer homology, *Mathematical Research Letters* **14** (2007), 839–852

21. Link homology theories from symplectic geometry, *Advances in Mathematics* **211** (2007), 363–416

22. A concordance invariant from the Floer homology of double branched covers (with B. Owens), *International Mathematics Research Notices* **2007**, doi:10.193/imrn/rnm077

23. A gluing theorem for the relative Bauer-Furuta invariants, *Journal of Differential Geometry* **76** (2007), 117–153

24. Nilpotent slices, Hilbert schemes, and the Jones polynomial, *Duke Mathematical Journal* **132** (2006), 311–369

25. Periodic Floer pro-spectra from the Seiberg-Witten equations (with P.B. Kronheimer), eprint (2002), arXiv:math/0203243

26. Seiberg-Witten-Floer stable homotopy type of 3-manifolds with $b_1 = 0$, *Geometry and Topology* **7** (2003), 889–932

Invited Talks

Lecture Series and Mini-courses

PIMS Symposium on the Geometry and Topology of Manifolds, Vancouver, Canada, July 2015

Gökova Geometry / Topology Conference, Gökova, Turkey, May 2015

Myhill Lectures, University at Buffalo, April 2015

Takagi Lectures, University of Tokyo, November 2014

Perspectives in Geometry lecture series, University of Texas at Austin, December 2013

Seminar series at Microsoft Station Q, Santa Barbara, September 2013

Workshop on the Topology and Invariants of Smooth 4-Manifolds, University of Minnesota, August 2013

Summer school on Physics and Mathematics of Link Homology, University of Montreal, July 2013

Seminar series at the Jussieu Mathematics Institute, June 2012

Link homology and categorification, conference at Kyoto University, May 2007

Conference Talks

Categorification in Algebra, Geometry and Physics (A conference in honor of the 60th Birthday of Christian Blanchet), Cargèse, Corsica, May 2015

Yamabe Memorial Symposium, University of Minnesota, October 2014

38th Congress of the American Romanian Academy of Arts and Sciences, TED-styled lecture, Pasadena, July 2014

Fourth Conference of Tsinghua Sanya International Mathematics Forum, China, December 2013

A Day of Triangulations, UCLA, November 2013

Conference on the Topology and Invariants of Smooth 4-Manifolds, University of Minnesota, August 2013

Conference on Low-dimensional Topology after Floer, CRM, Montreal, July 2013

Workshop on the Geometry and Topology of Smooth 4-Manifolds, Max Planck Institute, Bonn, June 2013

Workshop on Low Dimensional Topology, Simons Center at Stony Brook, May 2013

Southern California Topology Colloquium, California Institute of Technology, March 2013

AMS Special Session on Knots, Links, and Three-Manifolds, Joint Mathematics Meetings, San Diego, January 2013

Conference on Holomorphic Curves and Low Dimensional Topology, Stanford University, August 2012

Conference on Geometry, Topology and Group Theory, in honor of the 80th birthday of Valentin Poenaru, Autrans, France, July 2012

6th European Congress of Mathematics, Krakow, Poland, July 2012

Solstice International Colloquium on Topology, Groups and Algebra, Jussieu, Paris, June 2012

Gökova Geometry / Topology Conference, Gökova, Turkey, May 2012

Simons Symposium on Knot Homologies and BPS States, Caneel Bay, U.S. Virgin Islands, April 2012

Conference on Contact and Symplectic Geometry, University of Nantes, June 2011

Workshop on Interactions between contact symplectic topology and gauge theory in dimensions 3 and 4, Banff, Canada, March 2011

ICM Satellite Conference on Geometric Topology and Riemannian Geometry, Bangalore, August 2010

Workshop on Homology Theories of Knots and Links, MSRI, March 2010

Southern California Topology Colloquium, Claremont Colleges, February 2010

Categorification and Geometrisation from Representation Theory, University of Glasgow, April 2009

AMS Central Meeting, Western Michigan University, October 2008

Fifty Years since Fox and Milnor, conference at Brandeis University, June 2008

Workshop on Mirror Symmetry and Symplectic Geometry, MIT, May 2008

Knots in Washington XXVI, George Washington University, April 2008

Great Lakes Geometry Conference, University of Minnesota, September 2007

Conference on Symplectic Geometry and Physics, ETH Zürich, Switzerland, September 2007

Gökova Geometry / Topology Conference, Gökova, Turkey, May 2007

Midwest Topology Conference, Indiana University, October 2006

Categorification in Algebra and Topology, Uppsala University, Sweden, September 2006

IAS/PCMI Program in Low Dimensional Topology, Park City, July 2006

Conference in Honor of the 60th Birthday of John Morgan, Columbia University, April 2006

AMS Spring Southeastern Meeting, Florida International University, April 2006

Around Khovanov Homology, workshop in Montréal, Canada, October 2005

Differentialgeometrie im Großen, workshop in Oberwolfach, Germany, August 2005

SYMAT'05 Workshop on symplectic topology in Lisbon, Portugal, July 2005

IAS Holomorphic Curves Workshop, Princeton, May-June 2005

Georgia Topology Conference, University of Georgia at Athens, August 2004

Conference on 3-dimensional topology at Ohio State University, December 2003

MSRI Workshop on Floer homology for 3-manifolds in Banff, Canada, November 2003

Conference on invariants in low-dimensional topology at the Renyi Institute, Budapest, June 2003

MAA MathFest in Burlington, Vermont, August 2002

JAMI Workshop on low-dimensional topology at Johns Hopkins University, March 2002

Colloquia

2014: Princeton University, Vanderbilt University, UC Irvine

2013: University of Texas at Austin

2012: IMAR Bucharest, Istanbul Center for Mathematical Sciences

2011: CSU Fullerton, Rice University

2010: University of Southern California

2007: UCLA, Bryn Mawr College, University of Bonn, Northwestern Unversity, Rutgers University

2006: Rice University

2004: California Institute of Technology

Seminar Talks

2015: Stanford University (2), University of Oxford, University of Cambridge, Imperial College, University of Edinburgh, University of Glasgow, University of Warsaw (2), IMAR Bucharest

2014: UC Davis

2013: University of North Carolina, Massachusetts Institute of Technology, University of Cambridge

2012: Columbia University, University of Cologne, University of Nantes

2011: University of Southern California, Massachusetts Institute of Technology, Michigan State University (2), Stanford University, UC Berkeley, Simons Center, Princeton University

2010: MSRI, Harvard University, SUNY Stony Brook (Simons Center Seminar), Princeton University

2009: University of Warwick, UC Berkeley

2008: University of Cambridge, Imperial College, California Institute of Technology, University of Southern California (Joint LA Topology Seminar)

2007: Massachusetts Institute of Technology, New York University, Bryn Mawr (Philadelphia Area Contact / Topology Seminar), Columbia University, Northwestern University, University of Michigan

2006: Columbia University, Stanford University, University of Aarhus, University of Marseille, Columbia University, Harvard University, New York University, Stanford University (Bay Area Topology Seminar)

2005: Stanford University (2), UC Berkeley, Harvard University, Georgia Institute of Technology, University of Cambridge

2004: University of Notre Dame, California Institute of Technology, Princeton University, Columbia University

2003: University of Porto, Ludwig Maximilian University of Munich, Michigan State University, McMaster University

2001: Harvard University, University of Notre Dame, Université du Québec à Montréal

Teaching Experience

Graduate Level

UCLA: Gauge theory (Winter 2015), Combinatorial Heegaard Floer Homology (Fall 2011), Symplectic Geometry (Winter 2011), Riemannian Geometry (Fall 2010, Fall 2013), Characteristic Classes and K-theory (Winter 2010, Winter 2012), Differential Topology (Fall 2009, Fall 2012), Heegaard Floer Homology (Fall 2008)

Princeton University: Four-Manifolds (Spring 2005)

Undergraduate Level

UCLA: Advanced Problem Solving Seminar (Fall 2014) Honors Analysis (Winter 2014), Integration and Infinite Series (Winter 2013, Spring 2014), Introduction to Discrete Structures (Winter 2012), Problem Solving (Fall 2011, Fall 2012, Fall 2013, Fall 2014), Honors Linear Algebra and Applications (Lower Division, Winter 2011), Honors Linear Algebra (Upper Division, Fall 2009)

Columbia University: Topology (Fall 2005 and Fall 2007), Multivariable Calculus (Fall 2007)

Harvard University: Tutorial on Morse theory (Fall 2003), Tutorial on Symplectic and Contact Geometry (Summer 2003), Multivariable Calculus (Spring 2003), Tutorial on Knots and 3-Manifolds (Summer 2002), Course Assistant for various classes (1998-2004)

Supervision

Postdoctoral researchers

Andy Manion (NSF Fellow, UCLA, 2015-2018), Kristen Hendricks (UCLA, 2013-2016), Tova Brown (NSF Fellow, UCLA, 2011-2014), Allison Gilmore (NSF Fellow, UCLA, 2012-2014), Daniel Krasner (UCLA, 2010), Liam Watson (UCLA, 2009-2013)

Ph.D. students

Eamonn Tweedy (UCLA, Ph.D. 2011), Tye Lidman (UCLA, Ph.D. 2012), Christopher Scaduto (UCLA, Ph.D. 2015), Yajing Liu (UCLA, Ph.D. 2015), Jianfeng Lin (UCLA, started 2012), Matthew Stoffregen (UCLA, started 2012), Ian Zemke (UCLA, started 2013), Haofei Fan (UCLA, started 2015)

Undergraduate students

Yilong Wang (UCLA, Summer 2010; visiting from Zhejiang University through the CSST program), Michael Lock (Columbia, Spring 2008), Dmytro Karabash (Columbia, Spring 2008 and Spring 2006), Sanjay Arora (Columbia, Spring 2007), Mikhail Shklyar (Columbia, Spring 2006), Geillan Aly (Columbia, Fall 2006), Mio Alter (Columbia, Fall 2006)

Service and Miscellaneous

Member of the Editorial Boards of *Geometry & Topology*, *Selecta Mathematica*, *Geometry & Topology Monographs*, and *Journal of Fixed Point Theory and Applications*

Reviewer for *Mathematical Reviews*

Grant Reviewer for the National Science Foundation, the American Mathematical Society, the European Research Council, and the Research Grant Council of Hong Kong

Referee for *Advances in Mathematics, Algebraic and Geometric Topology, Communications in Analysis and Geometry, Duke Mathematical Journal, Geometric and Functional Analysis, Geometry and Topology, International Mathematics Research Notices, Journal of the American Mathematical Society, Journal of Differential Geometry, Journal of the European Mathematical Society, Journal of Topology, Mathematical Research Letters, Mathematische Annalen, Memoirs of the American Mathematical Society, Proceedings of the National Academy of Sciences, Publications Mathématiques de l'IHES, Selecta Mathematica, Topology and its Applications*, and several conference proceedings

Organizer of "A Day of Triangulations," workshop at UCLA, November 16, 2013

Organizer of the special session "Topology and Symplectic Geometry," AMS Western Section Meeting, UCLA, October 9-10, 2010

Seminars (co-)organized: Joint LA Topology Seminar (2008-Present), UCLA Topology Seminar (2008-Present), UCLA Geometry Seminar (2009-2010), Columbia Gauge Theory and Symplectic Geometry Seminar (2005-2008)

Graduate committees: Yi Li (Qualifying Committee, UCLA, 2014), David Duncan (Doctoral Committee, Rutgers, 2013), Anton Malyshev (Qualifying Committee, UCLA, 2013), Michael Hall (Qualifying Committee, UCLA, 2010), John Baldwin (Doctoral Committee, Columbia, 2008), Allison Gilmore (Qualifying Committee, Columbia, 2007)

Staff Search Committee, UCLA Mathematics Department (2009-2014)

Guest lecturer at the Romanian Master of Mathematics competition for high school students, Bucharest (2012)

Guest lecturer at the Fullerton Math Circle for high school students (2013)

Guest lecturer at the Los Angeles Math Circle for high school students (2008-2013)

Guest lecturer at the Oxford Invariants—maths society for undergraduate students (2015)

Coach of the Columbia team for the Putnam Mathematical Competition (2005-2007)

Coach of the UCLA team for the Putnam Mathematical Competition (2009-Present)

Personal

Born on December 24, 1978 in Alexandria, Romania

Dual citizen: Romania and USA