

Magdalena Czubak — Curriculum Vitae

Department of Mathematics
University of Colorado Boulder
Boulder, CO 80309

Email: czubak@math.colorado.edu
<http://math.colorado.edu/~macz9339>
Fax: 303-492-7707

Research Interests

Partial Differential Equations, Differential Geometry, Harmonic Analysis,
Mathematical Physics, Gauge Theory, Probability;

Education

Ph.D. Mathematics, The University of Texas at Austin, 2008
Advisor: Karen Uhlenbeck

B.S. Mathematics, Binghamton University, 2001

B.S. Computer Science, Binghamton University, 2001

Positions

Associate Professor, University of Colorado Boulder, Fall 2020-present

Assistant Professor, University of Colorado Boulder, Fall 2016-Summer 2020

Assistant Professor, Binghamton University, Fall 2011-Summer 2016

Research Member, Mathematical Sciences Research Institute, Fall 2015

Postdoctoral Fellow, University of Toronto, Fall 2008-Spring 2011

Publications & Preprints

Authorship order is alphabetical. Items are listed in reverse chronological order, using the date of appearance on arxiv.org for unpublished items.

Refereed Journal Articles & Preprints

1. *Antithesis of the Stokes paradox on the hyperbolic plane*, (with Chi Hin Chan). J Geom Anal (2020)
2. *Almost sure boundedness of iterates for derivative nonlinear wave equations*, (with Sagun Chanillo, Dana Mendelson, Andrea Nahmod and Gigliola Staffilani). Comm. Anal. Geom. 28 (2020), no. 4, 943–977.
3. *Hodge decomposition of the Sobolev space H^1 on a space form of nonpositive curvature*, (with Chi Hin Chan and Carlos Pinilla Suarez). arXiv:1812.11764.
4. *Liouville theorem for the stationary Navier-Stokes equation on a hyperbolic space*, (with Chi Hin Chan). J. Math. Anal. Appl. 460 (2018), no. 1, 216–231.
5. *Asymptotic behavior of the steady Navier-Stokes equation on the hyperbolic plane*, (with Chi Hin Chan and Che-Kai Chen). Dynamics of Partial Differential Equations, Vol. 14, No. 3 (2017), pp. 239-270.
6. *The formulation of the Navier-Stokes equations on Riemannian manifolds*, (with Chi Hin Chan and Marcelo Disconzi). Journal of Geometry and Physics 121C (2017) pp. 335-346.
7. *On the well-posedness of relativistic viscous fluids with non-zero vorticity*, (with Marcelo M. Disconzi). J. Math. Phys. 57 (2016), no. 4, 042501, 21 pp.
8. *Remarks on the weak formulation of the Navier-Stokes equations on the 2D hyperbolic space*, (with Chi Hin Chan). Ann. Inst. H. Poincaré Anal. Non Linéaire 33 (2016), no. 3, 655–698.
9. *Topological defects in the abelian Higgs model*, (with Robert L. Jerrard). Discrete Contin. Dyn. Syst., Vol. 27 (2015), No. 5, 1933–1968.

10. *An ODE for boundary layer separation on a sphere and a hyperbolic space*, (with Chi Hin Chan and Tsuyoshi Yoneda). Phys. D 282 (2014), 34-38.
11. *Low regularity well-posedness for the 2D Maxwell-Klein-Gordon equation in the Coulomb gauge*, (with Nina Pikula). Commun. Pure Appl. Anal. 13 (2014), no. 4, 1669-1683.
12. *Interaction Morawetz estimate for the magnetic Schrödinger equation and applications*, (with James Colliander and Jeonghun Lee). Adv. Differential Equations Vol. 19 (2014), no. 9/10, 805-832.
13. *Lower bound for the rate of blow-up of singular solutions of the Zakharov system in \mathbb{R}^3* , (with James Colliander and Catherine Sulem). J. Hyperbolic Differential Equations, Vol. 10 (2013), no. 3, 523-536.
14. *Non-uniqueness of the Leray-Hopf solutions in the hyperbolic setting*, (with Chi Hin Chan). Dynamics of Partial Differential Equations 10 (2013), no.1, 43-77.
15. *Stability and Unconditional Uniqueness of Solutions for Energy Critical Wave Equations in High Dimensions*, (with Aynur Bulut, Dong Li, Nataša Pavlović and Xiaoyi Zhang). Comm. Partial Differential Equations, Vol. 38 (2013), no. 4, 575-607.
16. *Eventual regularization of the slightly supercritical fractional Burgers equation*, (with Chi Hin Chan and Luis Silvestre). Discrete Contin. Dyn. Syst., Vol. 27 (2010), no. 2, 847-861. A special issue Trends and Developments in DE/Dynamics Part I.
17. *Regularity of solutions for the critical N -dimensional Burgers' equation*, (with Chi Hin Chan). Ann. Inst. H. Poincaré Anal. Non Linéaire, Vol. 27 (2010), no. 2, 471-501.
18. *Local well-posedness for the $2+1$ dimensional Monopole Equation*. Analysis & PDE, Vol. 3, (2010), no. 2, 151-174.

Refereed Journal Chapters

1. *Blowing up solutions to the Zakharov system for Langmuir waves*, (with Yuri Cher and Catherine Sulem) in Laser Filamentation: Mathematical Methods and Models (CRM Series in Mathematical Physics) 2016; Springer;

Invited Talks

1. SIAM PDE 2019, La Quinta, Minisymposium on Recent Progress in Incompressible Fluid Dynamics, December 14th, 2019
2. Summer Workshop on Nonlinear Partial Differential Equations, Shing-Tung Yau Center, Hsinchu, Taiwan, July 5th, 2019
3. Special Session on Analysis and Geometry of Nonlinear Evolution Equations, Joint Mathematics Meetings, Baltimore, January 17th, 2019
4. Nonlinear Phenomena in Stockholm: Kinetic Meets Dispersive Conference, KTH Royal Institute of Technology, Stockholm, Sweden, November 20, 2018
5. Nonlinear Waves Seminar, Applied Mathematics Department, University of Colorado Boulder, November 14, 2017
6. Geometrical and Statistical Fluid Dynamics Workshop, Simons Center for Geometry and Physics, Stony Brook, October 17, 2017
7. Special Session on Nonlinear Dispersive PDE, AMS Fall Southeastern Sectional Meeting, University of Central Florida, Orlando, September 24, 2017
8. Special Session on Nonlinear and Stochastic Partial Differential Equations, Mathematical Congress of the Americas 2017, Montreal, July 28, 2017
9. Special Session on Nonlinear Dispersive PDE, Mathematical Congress of the Americas 2017, Montreal, July 26, 2017
10. Special Session on Qualitative and Quantitative Properties of Solutions to Partial Differential Equations, AMS Spring Eastern Sectional Meeting, May 7, 2017
11. Shanks Workshop on Mathematical Aspects of Fluid Dynamics, Vanderbilt University, April 9, 2017
12. Special Session on Recent progress on nonlinear dispersive and wave equations, Joint Mathematics Meetings, Atlanta, January 6, 2017

13. Special Session on Women in Analysis and Partial Differential Equations, AMS Fall Central Sectional Meeting, University of St. Thomas, October 30, 2016
14. AMS Special Session on Nonlinear and Stochastic Partial Differential Equations, University of Denver, October 9th, 2016
15. Colloquium, UC Santa Cruz, February 9, 2016
16. Colloquium, University of Colorado Boulder, January 14, 2016
17. PDE and Applied Math Seminar, UC Davis, January 12, 2016
18. SIAM PDE 2015, Scottsdale, Minisymposium on Nonlinear Parabolic Equations and Applications, December 10, 2015
19. SIAM PDE 2015, Scottsdale, Minisymposium on Analytical Methods in Fluid Mechanics, December 8, 2015
20. MSRI Workshop, Connections for Women: Dispersive and Stochastic PDE, August 19, 2015
21. Lecture series in DC Grad Summer School in PDE, George Washington University, July 26-July 30, 2015
22. Central Spring Sectional Meeting, AMS Special Session on Harmonic Analysis and Partial Differential Equations, March 14, 2015
23. Analysis and Geometry Seminar, University of Colorado, Boulder, October 28, 2014
24. PDE/Applied Math Seminar, Drexel University, May 22, 2014
25. Mathematical Finance, Probability, and PDEs Seminar, Rutgers University, April 8, 2014
26. Applied Math Seminar, University of Toronto, Canada, February 28, 2014
27. AMS Special Session on Dispersive and Geometric Partial Differential Equations, Joint Mathematics Meetings, Baltimore, January 18, 2014
28. SIAM PDE 2013, Orlando, Minisymposium on Water Waves, December 8, 2013
29. SIAM PDE 2013, Orlando, Minisymposium on Recent Advances in Nonlinear Dispersive Partial Differential Equations, December 7, 2013
30. PDE/Analysis Seminar, MIT, November 19, 2013
31. PDE Seminar, Vanderbilt University, November 15, 2013
32. Applied Analysis Seminar, Penn State University, April 8, 2013
33. AWM Research Symposium 2013, Santa Clara University, Special Session on Analysis of PDE in Newtonian and Non-Newtonian Fluid Mechanics, March 16, 2013
34. Geometry Seminar, Purdue University, November 5, 2012
35. Fall Eastern Sectional Meeting, Rochester Institute of Technology, AMS Special Session on Microlocal Analysis and Nonlinear Evolution Equations, September 23, 2012
36. Workshop on Evolution equations of physics, fluids, and geometry: asymptotics and singularities, Banff International Research Station, Canada, September 13, 2012
37. Workshop on Nonlinear Evolution Problems, Mathematisches Forschungsinstitut Oberwolfach, Germany, May 16, 2012
38. Spring Eastern Sectional Meeting, George Washington University, AMS Special Session on Nonlinear Dispersive Equations, March 17, 2012
39. Joint Mathematics Meetings, Boston, AMS Special Session on Stability Analysis for Infinite Dimensional Hamiltonian Systems, January 4, 2012
40. CMS Winter Meeting, Nonlinear PDE and Applications Session, Toronto, Canada, December 11, 2011
41. SIAM PDE11, Analysis of PDE arising in Fluid Dynamics Mini-Symposium, San Diego, November 16, 2011
42. Fall Southeastern Section Meeting, Wake Forest University, Special Session on Nonlinear Dispersive Equations, September 24, 2011

43. Analysis Seminar, University of North Carolina, Chapel Hill, September 23, 2011
44. 40 Years and Counting: AWM's Celebration of Women in Mathematics, Brown University Special Session on Nonlinear Wave Phenomena, September 17, 2011
45. Binghamton University, Colloquium, March 2011
46. Rutgers University-Camden, Colloquium, February 2011
47. Stony Brook University, Colloquium, February 2011
48. Southern California Analysis & PDE meeting, UCLA, November 2010
49. Thematic Program on Asymptotic Geometric Analysis, Fields Institute, Canada, October 2010
50. Applied Math Seminar, University of Toronto, Canada, October 2010
51. SIAM conference on Nonlinear Waves and Coherent Structures, Modulation of Nonlinear Solutions in Dispersive Partial Differential Equations, Philadelphia, August 2010
52. Nonlocal operators and partial differential equations, Będlewo, Poland, June 2010
53. Dispersive PDE Seminar, University of Toronto, Canada, June 2
54. Connections in Geometry and Physics, Perimeter Institute, May 2010
55. Analysis Seminar, University of Rochester, November 2009
56. AMS Special Session on Harmonic Analysis and PDE, Baylor University, October 2009
57. Dispersive PDE Seminar, University of Toronto, October 2009
58. Analysis Seminar, UT Austin, March 2009
59. Applied Math Seminar, University of Toronto, Canada, September 2008
60. AMS Special Session on Harmonic Analysis Applied to PDE, University of New Mexico, October 2007

Conferences & Workshops organized

Co-organizer for the Special Session on Recent advances in the theory of fluid dynamics, Virtual AMS Fall Western Sectional Meeting, October 24-October 25, 2020

Co-organizer for Geometry & Analysis Day, Department of Mathematics, University of Colorado Boulder, October 16th, 2018

Co-organizer for a minisymposium on PDEs in Fluid Dynamics: Analysis and Computation at the 3rd Annual Meeting of SIAM Central States Section, Colorado State University, Fort Collins, CO, September 29 - October 1, 2017

Co-organizer for AMS Special Session on Recent progress on nonlinear dispersive and wave equations, JMM Atlanta, GA, January 12-January 14, 2017

Co-organizer for Recent Advances in Hydrodynamics, Banff International Research Station, Canada, June 5-June 10, 2016;

Co-organizer for Minisymposium on Nonlinear Partial Differential Equations at SIAM Analysis of PDE 2015, Scottsdale, Arizona, December 7-December 10, 2015

Contact organizer for the Special Session on Hamiltonian PDE at the Fall Western Section Meeting, San Francisco State University, October 25-26, 2014;

Grants

Simons Foundation Collaboration Grant, PI, 09/01/2018 - 08/31/2023
“Fluid Flows on Manifolds”

Simons Foundation Collaboration Grant, PI, 09/01/2012 - 08/31/2018
“Topics in Geometric PDE”

Vanderbilt International Research Grant, Co-PI, 06/2015 - 06/2016
“The Navier-Stokes equations in curved backgrounds”
Co-PI: Chi Hin Chan, National Chiao Tung University, Taiwan
Co-PI: Marcelo Disconzi, Vanderbilt University, USA

Teaching Experience

Instructor at University of Colorado Boulder

Math 6230 Differential Geometry 1, Spring 2021, Spring 2020

Math 3001 Analysis 1, Spring 2021

Math 4470-5470 Partial Differential Equations, Fall 2020, Spring 2018, Fall 2017, Fall 2016

Math 3430 Ordinary Differential Equations, Fall 2019, Spring 2019, Fall 2018

Math 4001-5001 Analysis 2, Fall 2019

Math 6240 Differential Geometry 2: Riemannian Geometry, Fall 2018

Math 2400 Calculus 3, Instructor and Coordinator, Spring 2017

Math 6240 Differential Geometry 2: Sobolev Spaces on Manifolds, Fall 2016

Instructor at Binghamton University (SUNY)

Math 472 PDE and Mathematical Analysis, Spring 2016, Spring 2013

Math 471 Partial Differential Equations, Spring 2016, Spring 2014

Math 479 Real Analysis II, Spring 2015, Spring 2014, Spring 2012

Math 478 Real Analysis I, Fall 2014 (two sections), Fall 2011

Math 590F Graduate course in Partial Differential Equations, Spring 2013

Math 371 Ordinary Differential Equations, Fall 2012

Instructor at the University of Toronto

Mat223S Linear Algebra I, Spring 2011

APM346 Partial Differential Equations, Fall 2010

Mat135Y Calculus, full year course: Fall 2009-Spring 2010

Mat135Y Calculus, full year course: Fall 2008-Spring 2009

Instructor at the University of Texas at Austin

M316K Foundations of Arithmetic, Fall 2007 (two sections)

M305G Precalculus, Fall 2006

Graduate Learning Seminars Organizer

Dispersive PDE, Spring 2019, Fall 2019

Cohomology, Fall 2018

Service to the profession

NSF grant reviewer

Journal referee

Service at University of Colorado Boulder

University

Honors Council representative for the Department of Mathematics, Fall 2016-present
Joint Colloquium with APPM co-organizer, September 24, 2019
Honors Thesis Committee outside-member for Department of Physics, Fall 2020, Spring 2017

Department of Mathematics

Teaching Quality Framework Team member, Fall 2020-present
Ph.D. Defense Committee member (not a principal advisor), Summer 2020, Fall 2016
Math Club co-organizer, Fall 2018-Spring 2020
Hiring Committee member, Fall 2019, Fall 2016-Spring 2017
Faculty Comprehensive Review Committee member, Fall 2020, Summer/Fall 2019, Fall 2018
Analysis Preliminary Exam Committee member, Summer 2019, Summer 2017
PhD Comprehensive Exam Committee member (not a principal advisor), Summer 2019, Spring 2019
Co-organizer and panelist for Graduate School Informational Panel, Math Club, Spring 2019
Math 5905 Teacher Training panelist, January 30, 2019
Graduate School Fair, Department of Mathematics representative, Joint Mathematics Meetings, Baltimore, January 18, 2019
Geometry & Analysis Seminar co-organizer, Fall 2016-present
Master's Committee member, Spring 2020, Fall 2018, Spring 2018, Spring 2017
Preliminary Exam proctor, September, 2020, August 20, 2018
Undergraduate Honors Committee member, Spring 2018 (two committees)
Graduate Committee member, Fall 2017-Spring 2018
Math 2400-Calculus 3 coordinator, Spring 2017
Math Club Talk, Fall 2016

Service at Binghamton University

Undergraduate Committee member, Fall 2011-Spring 2013, Spring 2016
Faculty Senate member, Fall 2012-Spring 2015, Spring 2016
Undergraduate Math Academic Advisor, Fall 2011-Spring 2015
Curriculum Development Committee member, April 2014-Spring 2015
MA Exam Committee member: December 15, 2014, April 30, 2015
Freshman Orientation Session, Faculty Advisor for Dept. of Math Sciences, July 29, August 1, 2014
Graduate Committee member, Fall 2013-Spring 2014
Transfer Students Orientation Session, Faculty Advisor for Dept. of Math Sciences, June 2013
Organizer for Analysis Seminar, Fall 2012-Spring 2013
Dean's Speaker Series for Dept. of Math. Sciences Co-organizer, Fall 2012-Spring 2013
Undergraduate Advising Committee member, Fall 2011-Spring 2013
Admissions Open House, Dept. of Math Sciences representative, October 2012
MA Exam Committee member, May 10, 2012
Visiting Panelist, Graduate school information panel, Colgate University, Fall 2011

Previous Service

Co-organizer for Dispersive PDE Seminar, University of Toronto, Fall 2010

Hosted visits from local high school classes in calculus lecture, University of Toronto, Fall 2008

Co-started & Co-organized Junior PDE Seminar (now Junior Analysis)-UT Austin, Fall 2004-Spring 2006

Awards and Honors

Marinus Smith Award nominee, University of Colorado Boulder, Spring 2019

Dean's Research Semester Award, Binghamton University, Fall 2013

Frederick V. Atkinson Teaching Award, University of Toronto, Spring 2011

Frank Gerth III Graduate Excellence Dissertation Award, UT Austin, Spring 2008

Professional Development Award, Office of Graduate Studies, UT Austin, Fall 2007

Frank Gerth III Teaching Excellence Award, UT Austin, 2003

Helen P. Beard Award for Excellence in Undergraduate Mathematics, Binghamton University, 2001

United Federation of Teachers Scholar, Binghamton University, 1996-2000

Professional Development Activities at University of Colorado Boulder

Doing It All: The first seven years, FTEP, March 7, 2019

What are your students learning, FTEP, February 12, 2019

Undergraduate research opportunities and you, FTEP, September 18, 2018

Flipping the class for the skeptic, FTEP, February 23, 2018

Time Management, FTEP, March 1, 2017

Addressing Challenging Situations in the Classroom, FTEP, February 9, 2017