Casey P. Rodriguez

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Contact Information

Department of Mathematics
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Education

University of Chicago, Chicago, IL **2011-2017**

- PhD, Mathematics, Advisor - Carlos E. Kenig

Texas A&M University, College Station, TX **2010-2011**

- MS, Mathematics, Committee Chair - Harold P. Boas

Texas A&M University, College Station, TX **2007-2010**

- BS, Applied Mathematical Sciences, Summa Cum Laude, Honors in Mathematics

Professional Experience

University of North Carolina at Chapel Hill, Chapel Hill, NC **2021-Present**

- Assistant Professor

Massachusetts Institute of Technology, Cambridge, MA **2017-2021**

- NSF Postdoctoral Fellow, Sponsoring scientist - Gigliola Staffilani, CLE Moore Instructor

Honors

University of North Carolina at Chapel Hill, Chapel Hill, NC

- Goodman-Petersen Award for Excellence in Undergraduate Education (2024)

Massachusetts Institute of Technology, Cambridge, MA

- Infinite Kilometer Award (2020)

University of Chicago, Chicago, IL

- Physical Sciences Division Teaching Prize (2016)
- Lawrence and Josephine Graves Teaching Prize (2015)

Funding

University of North Carolina at Chapel Hill, Chapel Hill, NC

- NSF DMS-2135998, Research and Training Grant (Co-PI, 2022-2027)
- NSF DMS-2307562, Standard Grant (PI, 2023-2026)

Massachusetts Institute of Technology, Cambridge, MA

- NSF DMS-1703180, Postdoctoral Research Fellowship (PI, 2017-2021)

Bibliography

1. D. Cichra, V. Průša, K. R. Rajagopal, C. Rodriguez, and M. Vejvoda. The conclusion that metamaterials could have negative mass is a consequence of improper constitutive characterisation. Preprint, arXiv:2409.05906, 12 pp.
2. R. Bustamante, K. R. Rajagopal, and C. Rodriguez. Piecewise linear constitutive relations for stretch-limited elastic strings. Preprint, arXiv:2408.05309, 13 pp.
3. K. R. Rajagopal and C. Rodriguez. A mathematical justification for nonlinear constitutive relations between stress and linearized strain. Preprint, arXiv:2405.20977, 18 pp.
4. C. Rodriguez. A midsurface elasticity model for a thin, nonlinear, gradient elastic plate. *Int. J. Eng. Sci.*, 197 (2024), 104026, 17 pp.
5. C. Rodriguez. Elastic solids with strain-gradient elastic boundary surfaces. *J. Elast.*, 156 (2024), p. 769-797.
6. K. R. Rajagopal and C. Rodriguez. Special Cosserat rods with rate-dependent evolving natural configurations. *Int. J. Eng. Sci.*, 191 (2023), 103890, 19 pp.
7. K. R. Rajagopal and C. Rodriguez. On an elastic strain-limiting special Cosserat rod model. *Math. Models Methods Appl. Sci.*, 33 (2023), p. 1-30.
8. K. R. Rajagopal and C. Rodriguez. On evolving natural curvature for an inextensible, unshearable, viscoelastic rod. *J. Elast.* (2022), https://doi.org/10.1007/s10659-022-09956-7.
9. M. Bulicek, J. Malek, and C. Rodriguez. Global well-posedness for two dimensional flows of viscoelastic rate-type fluids with stress diffusion. *J. Math. Fluid Mech.*, 24:61 (2022), 19 pp.
10. C. Rodriguez. Longitudinal shock waves in a class of semi-infinite stretch-limited elastic strings. *Math. Mech. Solids*, 27 (2022), p. 474-490.
11. J. Jendrej, A. Lawrie, and C. Rodriguez. Dynamics of bubbling wave maps with prescribed radiation. *Ann. Sci. de l'ENS.*, 55 (2022), p. 1135-1198.
12. C. Rodriguez. On stretch-limited elastic strings. *Proc. R. Soc. Lond. A* (2021), 477: 20210181, 15 pp.
13. F. Bemfica, M. Disconzi, C. Rodriguez and Y. Shao. Local well-posedness in Sobolev spaces for first-order conformal relativistic viscous hydrodynamics. *Commun. Pure Appl. Anal.* 20 (2021), p. 2279-2290.
14. C. Rodriguez. Threshold dynamics for corotational wave maps. *Analysis and PDE*, 14 (2021), p. 2123-2161.
15. A. Lawrie and C. Rodriguez. Conditional stable soliton resolution for a semi-linear Skyrme equation. *Ann. PDE* (2019), no. 2, Paper No. 15, 59 pp.
16. C. Rodriguez. Soliton resolution for corotational wave maps on a wormhole. *Int. Math. Res. Not. IMRN*, 15 (2019), p. 4603-4706.
17. C. Rodriguez. Soliton resolution for equivariant wave maps on a wormhole. *Comm. Math. Phys.* 359 (2018), p. 375-426.
18. C. Rodriguez Scattering for radial energy–subcritical wave equations in dimensions 4 and 5. *Comm. Partial Differential Equations* 42 (2017), p. 852-894.
19. C. Rodriguez. Profiles for the radial focusing energy-critical wave equation in odd dimensions. *Adv. Differential Equ.*, 21 (2016), p. 505-570.

20. C. Rodriguez. A partial data result for less regular conductivities in admissible geometries. *Inverse Probl. Imag.*, 10 (2016), p. 247-262.

Invited Talks

- Blackwell-Tapia Conference, ICERM, Brown University (Fall 2024)
- Modelling, PDE Analysis and Computational Mathematics in Material Sciences, Prague, Czech Republic (Fall 2024)
- International Conference on Nonlinear Solid Mechanics, University of Cagliari, Italy (Summer 2024)
- Great Lakes Mathematical Physics Meeting (GLaMP), Michigan State University (Spring 2024)
- PDE Seminar, Georgia Tech (Spring 2024)
- Colloquium, Virginia Tech (Fall 2023)
- 13th AIMS Conference on Dynamical Systems, Differential Equations and Applications, UNC-Wilmington (Spring 2023)
- AMS 2023 Spring Central Sectional Meeting, University of Cincinnati (Spring 2023)
- EQUADIFF 15, Brno, Czech Republic (Summer 2022)
- Applied Math and Analysis Seminar, Duke University (Spring 2022)
- ICERM, Brown University (Fall 2021)
- Analysis and PDE Seminar, University of North Carolina at Chapel Hill (Fall 2021)
- Mathematical Congress of the Americas (Summer 2021)
- PDE CDT Seminar, University of Oxford (Spring 2021)
- Colloquium, University of North Carolina at Chapel Hill (Fall 2020)
- Mathematical Physics and Harmonic Analysis Seminar, Texas A&M University (Fall 2020)
- Online North-East PDE and Analysis Seminar (ONEPAS), (Summer 2020)
- Colloquium, Rutgers University (Spring 2020)
- Applied Math and Analysis Seminar, Duke University (Fall 2019)
- Calderón-Zygmund Analysis Seminar, University of Chicago (Spring 2019)
- Partial Differential Equations Seminar, Brown University (Spring 2019)
- Analysis and Partial Differential Equations Seminar, Johns Hopkins University (Spring 2019)
- Analysis and Partial Differential Equations Seminar, UMass Amherst (Spring 2019)
- Analysis and Partial Differential Equations Seminar, MIT (Fall 2018)
- FRG Conference, Princeton University (Fall 2017)
- Dynamical Systems Seminar, Boston University (Fall 2017)
- Geometric Analysis Colloquium, The Fields Institute (Spring 2017)
- Joint Mathematics Meetings, Atlanta (Spring 2017)
- FRG Conference, MIT (Fall 2016)
- Calderón-Zygmund Analysis Seminar, University of Chicago (Spring 2016)

Teaching Experience

University of North Carolina at Chapel Hill, Chapel Hill, NC **2021-Present**

- Math 753: Measure and Integration (Fall 2024)
- Math 521: Advanced Calculus I (Spring 2024)
- Math 891: Introduction to Spectral Theory (Spring 2024)
- Math 656: Complex Analysis (Spring 2023)
- Math 523: Functions of a Complex Variable with Applications (Fall 2022)
- Math 232: Calculus of Functions of One Variable II (Spring 2022)
- Math 523: Functions of a Complex Variable with Applications (Fall 2021)

Massachusetts Institute of Technology, Cambridge, MA **2018-2021**

- Course 18.102/18.1021: Introduction to Functional Analysis (Spring 2021)
- Course 18.1001/18.100A: Real Analysis (Fall 2020)
- Course 18.1001/18.100A: Real Analysis (Fall 2019)
- Course 18.1002/18.100B: Real Analysis (Spring 2019)

University of Chicago, Chicago, IL **2011-2017**

- Math 162: Honors Calculus II (Spring 2017)
- Math 161: Honors Calculus I (Fall 2016)
- Math 153: Calculus III (Fall 2015)
- Vectors and Linear Transformations (Collegiate Scholars Program) (Summer 2015)
- Math 196: Linear Algebra (Fall 2014)
- Calculus (CAAP program) (Summer 2014)
- Algebra for Elementary School Teachers (SESAME program) (Spring 2014)
- Math 132: Elementary Functions and Calculus II (Spring 2014)
- Math 131: Elementary Functions and Calculus I (Fall 2013)

Mentoring

University of North Carolina at Chapel Hill, Chapel Hill, NC

- Postdoctoral researchers:
  - Govanni Granados (2024-Present)
  - James Rowan (2024-Present)
- Graduate students:
  - Doctoral advisor for Corbin Balitactac (2023-Present)
  - Research Playground organizer for seven first- and second-year graduate students (2022-2023, 2024-2025)
- Undergraduate and high school students:
  - Research adviser for undergraduate student Maria Tyurina (2023)
  - Research adviser for high-school student Liam Buttita (2022-2023)

Massachusetts Institute of Technology, Cambridge, MA

- Undergraduate Research Opportunities Program (UROP) mentor for Zachary Hunsucker (2020-2021)

University of Chicago, Chicago, IL

- Summer Bootcamp in Analysis mentor (directed by Wilhelm Schlag, 2016)
- University of Chicago Summer School in Analysis mentor (2016)
- University of Chicago REU mentor (directed by Peter May, 2011-2015)

Professional Service

University of North Carolina at Chapel Hill, Chapel Hill, NC

- Graduate Studies Committee member (2024-Present)
- Co-organizer for the Analysis and PDE Seminar (2021-Present)
- Co-organizer of informal lunches between seminar speakers and graduate AWM chapter (2023-Present)
- Department Webmaster (2023-Present)
- Co-organizer for the UNC Undergraduate Research Seminar (2022-2024)
- Colloquium Committee member (2023-2024)
- Co-organizer for the UNC Analysis and PDE Mini-School (2024)
- Linker Award Committee member (2023, 2024)
- Hiring Committee member for postdoctoral job search (2022, 2023)
- Hiring Committee member for tenure-track job search (2021, 2023)
- Undergraduate Studies Committee member (2021-2023)
- Alfred T. Brauer Lectures organizer (2023)
- Potential Chair Nomination Survey Committee member (2022-2023)
- Faculty advisor for the UNC Achordants (2021-2022)

Massachusetts Institute of Technology, Cambridge, MA

- Co-organizer for the MIT PDE/Analysis Seminar, MIT (2018-2021)
- Organizer for "Mentoring Dinners": organized informal dinners to foster interaction between junior faculty and postdocs, MIT (2018-2020)
- Undergraduate math double-major advisor, MIT (2017-2021)
- Organizer for the MIT PDE/Analysis Reading Seminar, MIT (2017-2021)
- Diversity and Community Building Committee member, MIT (2017-2021)