Curriculum Vitae

Christopher M. Judge

Education

- PhD. in Mathematics, University of Maryland, 1993

Faculty positions

- 1993-1994, Postdoctoral Fellow, Institute for Advanced Study
- 1994-1995, Lecturer, University of Southern California
- 1995-1996, NSF Postdoctoral Fellow, Stanford University
- 1996-2002, Assistant Professor of Mathematics, Indiana University
- 2002-2011, Associate Professor of Mathematics, Indiana University
- 2011-Present, Professor of Mathematics, Indiana University

Visiting research positions

- Université de Nantes, May 2007
- Université de Nantes,, June 2009
- Université Joseph Fourier, September-October 2009
- École Polytechnique Federal de Lausanne, Dec 2009
- Hausdorff Institute of Mathematics, June-July 2010
- Université d'Orleans, July 2015
- Université d'Orleans, May-June 2018
- Fields Institute, Augsust 2018
- Institut Henri Poincaré, May 2023
- University of Reading, Sep 2024 - March 2025

Research fellowships and grants

- US National Science Foundation Postdoctoral Fellowship, (1995-98)
- US National Science Foundation DMS 9972425, (1999-2004)
- US National Science Foundation DMS 0406174, (2004-2005)
- Simons Foundation Collaboration Grant (2012-2018)
- US National Science Foundation DMS 1430485, (2014-2016)
- Simons Foundation Collaboration Grant (2018-2023)
- US National Science Foundation DMS 1854608 (2019-2021)
- Simons Foundation Collaboration Grant (2024-2028)
- Leverhulme Trust Visiting Professorship (UK) (2024-2025)

Editorships

- Indiana University Mathematics Journal, Managing Editor (2013-2017)
- Indiana University Mathematics Journal, Editor (2017-present)

Research interests

- Spectral analysis of domains and manifolds
- Teichmüller theory
- Automorphic forms

Selected publications

- *On the existence of Maass cusp forms on hyperbolic surfaces with cone points*, Journal of the American Mathematical Society, **8** (1995), p. 715-759.
- *The geometry and arithmetic of translation surfaces with applications to polygonal billiards* (with Eugene Gutkin), Mathematical Research Letters **3** (1996), 391-403.
- *Dissolving cusp forms in the presence of multiplicities* (with Ralph Phillips). Duke Mathematical Journal **88** 2 (1997), 267-280.
- *Conformally converting cusps to cones*. Conformal Geometry and Dynamics **2** (1998), 107-113.
- *Heating and stretching Riemannian manifolds*. 'Spectral Problems in Geometry and Arithmetic', Thomas Branson, ed., Contemporary Mathematics **237**, American Math Society, 1999.

- *Affine mappings of translation surfaces: geometry and arithmetic* (with E. Gutkin). Duke Mathematical Journal **103** (2000), 191-213.
- *Tracking eigenvalues to the frontier of moduli space I: Convergence and spectral accumulation*. Journal of Functional Analysis **184** (2001), 273-290.
- *Tracking eigenvalues to the frontier of moduli space II: Limits for eigenvalue branches*. Geometric and Functional Analysis **12** (2002), 93-120.
- *Determinants of Laplacians and isopolar metrics on surfaces of infinite area* (w/ D. Borthwick and P. Perry), Duke Mathematical Journal, **118** (2003), 61-102.
- *Selberg's zeta function and the spectral geometry of geometrically finite hyperbolic surfaces* (w/ D. Borthwick and P. Perry). Commentarii Mathematici Helvetici **80**, 2005, 483-515.
- *Small eigenvalues and maximal laminations on complete surfaces of negative curvature*, Contemporary Mathematics **432**, 2007, 93-106.
- *Generic simplicity of polygons*, (with Luc Hillairet). Proceedings of the American Mathematical Society, **137**, 2009, 2139-2145.
- *The eigenvalues of the Laplacian on a domain with small slits*. (with Luc Hillairet). Transactions of the American Mathematical Society **362**, 2010, 6231-6259.
- *Spectral simplicity and asymptotic separation of variables* (with Luc Hillairet). Communications in Mathematical Physics, **302**, 2011, 291-344
- *Ellipses in translation surfaces* (with Allen Broughton). Geometriae Dedicata 157 (2012), 111-151.
- *The nodal set of a finite sum of Maass cusp forms is a graph.* in 'Spectral geometry', 237–241, Proceedings of Symposia in Pure Mathematics, Volume 84, AMS, 2012.
- *Pushing points on pillowcase covers* in 'In the tradition of Ahlfors-Bers VI', 77–86, Contemp. Math., **590**, AMS, 2013.
- *Geodesic and nodal sets for hyperbolic manifolds* (with Sugata Mondal). Proc. Amer. Math. Soc. 145 (2017), 4543–4550
- *Hyperbolic triangles without embedded eigenvalues.* (with Luc Hillairet) Annals of Mathematics. (2) 187 (2018), no. 2, 301–377.

- *The maximum number of systoles for genus two Riemann surfaces with abelian differentials.*
  Commentarii Mathemitci Helvetici. 94 (2019), no. 2, 399–437.
- *Upper bounds for the spectral function on homogeneous spaces via volume growth.*
  (with Russ Lyons)
  Revista Mathematica Iberoamericana. 35 (2019), no. 6, 1835–1858.
- *Euclidean triangles have no hot spots.* (with Sugata Mondal)
  Annals of Mathematics. 191 (2020) no. 1, 167–211.
- *Critical points of Laplace eigenfunctions on polygons.* (with Sugata Mondal)
  Communications in PDE. 47 (2022), no. 8, 1559–1590.
- *Haupt's theorem for strata of abelian differentials.*
  (with M. Bainbridge, C. Johnson, and I. Park)
  Israel Journal of Mathematics. 252 (2022), no. 1, 429–459.
- *Spectral multiplicity and nodal sets for generic torus-invariant metrics*
  (with D. Cianci, S. Lin, and C. Sutton)
  International Math. Research Notices (2023).

Invited lectures

- University of Michigan, Nevanlinna Colloquium, 7/93, conference
- University of Washington, AMS Spectral Geometry Conference, 7/93
- Centro de Investigaciones (CINVESTA), Mexico City, 7/93, seminar
- University of Pennsylvania, 12/93, seminar
- SUNY Stony Brook, 12/93, seminar
- UCLA, 11/94, seminar
- University of Arizona, 1/95, colloquium
- UC Santa Barbara, 2/95, colloquium
- University of Tennessee, 2/95, colloquium
- Rutgers University at Newark, 2/95, colloquium
- University of Maryland, 11/95, seminar
- University of Pennsylvania, 11/95, seminar
- Princeton University, 11/95, seminar
- Stanford University, 1/96, colloquium
- University of Southern California, 1/96, seminar

- AMS Annual Meeting, San Diego, 1/97, conference
- University of Chicago, 2 talks, 5/97, seminars
- Fields Instiute, University of Toronto, 11/97, conference
- Erwin Schrödinger Institute, Vienna, Austria, 6/98, conference
- University of Maryland, 11/98, seminar
- University of Southern California, 1/99, colloquium
- University of Utah, 8/99, AMS special session
- University of South Florida, New College, 1/00, conference
- Purdue University, 2/00, seminar
- University of Chicago, 3/00, seminar
- University of Kentucky, 6/00, conference
- Centro de Investigationes de Matematicas (CIMAT), Mexico, 1/01, conference
- Institute for Mathematics and it Applications, 7/01, conference
- Ohio State University, 9/01, AMS special session
- Geometry Day, Eastern Illinois University, 11/01, conference
- Notre Dame University, 12/01, seminar
- Penn State University, 3/02, seminar
- Dartmouth College, 11/02, colloquium
- Universidad Complutense, Madrid, 7/03, seminar
- Centre de Recherches Mathematiques, Montréal, 6/04, conference
- AMS-MAA-SIAM joint meetings, 1/05, special session
- Warwick University (UK), 9/06, conference
- Weslyan University (CT), 10/06, colloquium
- Centre International de Recontres Mathématiques (CIRM), Marseille, 2/07, invited/conference
- University of Arizona, 4/07, AMS special session
- Université de Montpellier III, 6/07, conference
- University of Illinois at Urbana-Champaign, 11/07, seminar

- Emory University, 12/07, seminar
- Wichita State University, 4/08, colloquium
- University of Chicago, 11/08, seminar
- University of Southern California, 2/09, seminar
- University of Illinois at Urbana-Champaign, 3/09, AMS special session
- Centre International de Recontres Mathématiques (CIRM), Marseille, 6/09, invited/conference
- Max-Planck Institut für Mathematik, Bonn, 7/09, seminar
- Institut Fourier, Grenoble, 10/09, seminar
- Université Aix-Marseille III, 10/09, seminar
- École Polytechnique Fédéral de Lausanne, 12/09, seminar
- University of Toronto, 4/10, seminar
- Central Connecticut State, 4/10, conference
- Hausdorff Institute of Mathematics, Bonn, 6/10, seminar
- Aarhus Universitet, Danmark, 6/10, seminar
- University of Maryland, 9/10, conference
- Princeton University, 11/10, seminar
- Rutgers University, 11/10, seminar
- Mathematisches Forschunginstitut Olberwolfach, 5/11, conference
- Purdue University, 10/11, colloquium
- Purdue University, 10/11, seminar
- ETH Zurich, 11/11, conference
- Joint Mathematical Meetings, Boston, 1/12, special session
- Université de Fribourg, Suisse, 5/12, colloquium
- Centre de Recherches Mathematiques, Montréal, 6/12, conference
- Joint Mathematical Meetings, San Diego, 1/13, special session
- Ben Gurion University, Israel, 2/13, informal
- Université de Fribourg, Suisse, 4/14, seminar

- University of New Mexico, 4/14, special session
- University of New Mexico, 4/14, colloquium
- Princeton University, 4/14, colloquium
- University of North Carolina, 11/14, seminar
- Université d'Orleans, 7/15, colloquium
- Princeton University, 4/14, colloquium
- University of North Carolina, 11/14, seminar
- Université d'Orleans, 7/15, colloquium
- Centre International de Rencontres Mathematiques, 4/16, plenary
- Universidad Autonoma de Madrid, 5/16, seminar
- Dartmouth University, 11/16, colloquium
- Université de Luxembourg, 3/17, colloquium
- Universität Heidelberg, 3/17, conference
- Eastern Illionois University, 4/17, conference
- Université d'Orleans, 5/18, conference
- Institut Fourier, Université de Grenoble, 6/18, plenary
- Bucknell University, 2/20, colloquia (2)
- Queen's University, 10/20, seminar
- University of Maryland, 3/21, conference
- Centre International de Rencontres Mathematiques, 5/22, plenary
- Université d'Orleans, 5/22, colloquium
- University of Reading (UK), 5/23, seminar
- Oberwolfach Research Institute for Mathematics, 8/23, conference
- Texas A&M, 2/24, conference
- International Centre for Mathematical Sciences, 9/24, plenary
- University of Bristol, 10/24, seminar
- University of Durham, 12/24, colloquium
- University College London, 12/24, seminar

- Université de Fribourg, 2/25, colloquium
- ETH Zurich, 3/25, seminar
- Universität Oldenburg, 3/25, seminar
- Universität Bremen, 3/25, seminar
- University of Cardiff, 3/25, seminar
- Centre de Recherches Mathematiques, 5/25, GEMSTONE lectures

PhD students

- Kuo-Chiang Tan. (2013). *Codes for square-tiled surfaces.*
- Nikhil Gupta. (2016). *Spectral properties of the cutoff Laplacian in the presence of a unitary character on* $\Gamma(2)$.
- Neal Coleman (2017). *Laplace subspectrality*.
- Mengda Lei (2020). *The spectrum of a solenoid*.
- Tao Ma (2021). *The crookedness of curves and foliations on surfaces*.

Postdoctoral mentees

- Reza Chamanara (2002-2005).
- Lewis Bowen (2004-2007). (with Russ Lyons)
- Sugata Mondal (2015-2018).
- Chris Judge (2017-2019).
- Asilya Suleymanova (2018-2019).
- Josh Southerland (2022-2025).

Research Experiences for Undergraduates (REU) mentees

- Rajan Mehta (1998)
- Naomi Utgoff (2002)
- Kathleen Moriarty (2002)
- Ted Spaide (2008)
- Lindsay Martin (2012)
- Elizabeth Winkelman (2014)

- Kathryn Marsh (2014)
- Yvonne Chazal (2016)
- Kelly Chen (2019)
- Olti Myrtaj (2019)
- Tyler Chamberlain (2023)
- Alice Marchant (2025)

Conferences organized

- 1995 AMS Special Session, Los Angeles (with Eugene Gutkin)
- 2001 Bloomington Geometry Workshop (with Bruce Solomon)
- 2002 Bloomington Geometry Workshop (with Bruce Solomon)
- 2003 AMS Special Session, Bloomington (with Matthias Weber)
- 2004 Bloomington Geometry Workshop (with Bruce Solomon)
- 2005 Bloomington Geometry Workshop (with Bruce Solomon)
- 2011 Bloomington Geometry Workshop (with others)
- 2014 Bloomington Geometry Workshop (with others)
- 2017 AMS Special Session, Bloomington (with Sugata Mondal)
- 2019 Bloomington Geometry Workshop (with others)
- 2023 AMS Special Session (with Chris Johnson)

Selected service at Indiana University

- 2002-2004, Undergraduate Curriculem Committee, College of Arts and Sciences
- 2005-2008, 2014-2015, General Education Committee, campus.
- 2012-2014, Director of Graduate Studies, Department of Mathematics
- 2019-2022, Associate Chair, Department of Mathematics.
- 2023-2025, Graduate Faculty Council, multi-campus.

Curriculum development

- Coordinated switch to 'reform' calculus for business, social, and life science students. (2001-2002)
- Created new graduate course *Metric Geometry*. (2011)
- Coordinated and participated in the production of over 200 calculus instructional videos. See `https://www.youtube.com/user/CinemaM119`. (2013-2014)
- Coordinated experiment with 'flipped classroom' for calculus classes. (2014)
- Created a new undergraduate course: *Calculus for the Life Sciences*. (2015-2016)