

# Padmavathi Srinivasan

## Employment

- 2022–current **Senior Research Associate, Simons Collaboration on Arithmetic Geometry, Number Theory, and Computation**, *Institute of Computational and Experimental Research in Mathematics*, Providence, RI.
- 2019–2022 **Limited Term Assistant Professor**, *University of Georgia*, Athens, GA.
- 2016–2019 **Hale Visiting Assistant Professor**, *Georgia Institute of Technology*, Atlanta, GA.

## Education

- 2011–2016 **PhD in Mathematics**, *Massachusetts Institute of Technology*, Cambridge, MA.  
Advisor: Bjorn Poonen
- 2009–2011 **MSc in Mathematics**, *Chennai Mathematical Institute*, Chennai, India.
- 2006–2009 **BSc (Honours) in Physics**, *Chennai Mathematical Institute*, Chennai, India.

## Preprints and Publications

- 1 Finiteness of reductions of Hecke orbits (with Mark Kisin, Yek Hay Joshua Lam and Ananth N. Shankar), *To appear in Journal of the European Mathematical Society*, arxiv:2109.05147.
- 2 Explicit minimal embedded resolutions of divisors on models of the projective line (with Andrew Obus), *Research in Number Theory*. Apr 2022., arxiv:2105.03030, doi:10.1007/s40993-022-00323-y.
- 3 Surface bundles and the section conjecture (with Wanlin Li, Daniel Litt and Nick Salter), *Mathematische Annalen*. Jul 2022., arxiv:2010.07331, doi:10.1007/s00208-022-02421-9.
- 4 An arithmetic count of the lines meeting four lines in  $\mathbb{P}^3$  (with Kirsten Wickelgren), *Transactions of the AMS*, 2021., arxiv:1810.03503, doi:10.1090/tran/8307.
- 5 A virtually ample field that is not ample, *Israel Journal of Mathematics*. Oct 2019. 1-8., arxiv.org:1810.05184, doi:10.1007/s11856-019-1934-y.
- 6 Zeta functions of a class of Artin-Schreier curves with many automorphisms (with Irene Bouw, Wei Ho, Beth Malmskog, Renate Scheidler and Christelle Vincent), *Association for Women in Mathematics Series*, 3. 2016. 87-124. arxiv:1410.7031, doi:10.1007/s118978-3-319-30976-7<sub>4</sub>.
- 7 Quadratic enrichment of the logarithmic derivative of the zeta function (joint with Margaret Bilu, Wei Ho, Isabel Vogt and Kirsten Wickelgren), arXiv:2210.03035.
- 8 p-adic adelic metrics and Quadratic Chabauty (joint with Amnon Besser and J.Steffen Mueller), arxiv:2112.03873.
- 9 Group-theoretic Johnson classes and a non-hyperelliptic curve with torsion Ceresa class (with Dean Bisogno, Wanlin Li and Daniel Litt), *Submitted*, arxiv:2004.06146.

- 10 Conductor-discriminant inequality for hyperelliptic curves in odd residue characteristic (with Andrew Obus), *Submitted*, arxiv:1910.02589.
- 11 Conductors and minimal discriminants of hyperelliptic curves: a comparison in the tame case, *Submitted*, arxiv:1910.08228.
- 12 Explicit computation of Tamagawa numbers and sizes of component groups of Neron models of Jacobians using Matrix-Tree theorems, Thesis, Chapter 4.
- 13 Conductors and discriminants of hyperelliptic curves with rational Weierstrass points, *Submitted*, arxiv:1508.05172.

## Work in preparation

- 1 Certifying non-triviality of Ceresa classes of curves (joint with Jordan Ellenberg, Adam Logan and Akshay Venkatesh), *In preparation*.
- 2 Conductor-discriminant inequality for tamely ramified cyclic covers (joint with Andrew Obus), *In preparation*.
- 3 Computing non-surjective primes associated to Galois representations of genus 2 curves (joint with Barinder S. Banwait, Armand Brumer, Hyun Jong Kim, Zev Klagsbrun, Jacob Mayle and Isabel Vogt), *In preparation*.

## Other writing

- 1 Practical Suggestions for Mathematical Writing. (With Renee Bell, Borys Kadets, Nicholas Triantafillou, and Isabel Vogt.) *Notices of the AMS, Volume 68, Number 6, 930-934.*, Available [here](#).
- 2 Thinking Positive: Arithmetic Geometry in Characteristic  $p$ . (With Renee Bell, Julia Hartmann, Valentijn Karemaker, and Isabel Vogt.) *Notices of the AMS, Volume 66, Number 2, 239-241.*, Available [here](#).

## Mentoring, leadership, and invited lecture series

- October 2022 Lecturer for virtual course on Heights in Diophantine Geometry. Enrolment: 97 undergraduate and graduate students worldwide. **Preliminary Arizona Winter School**
- Spring 2022 Supervised two honors projects in Linear Algebra at the University of Georgia
- June 2020 ICERM Workshop **Arithmetic Geometry, Number Theory, and Computation** (Co-led with Isabel Vogt) *Topic: Galois representations of abelian surfaces*

## Past conferences that I have helped organize

- May 2022 **ADDING: Anabelian Days Down IN Georgia** (Co-organized with Borys Kadets, Daniel Litt, and Nicholas Triantafillou.)
- Mar 2022 AMS Special Session on **Curves, Jacobians, and Abelian Varieties** at the AMS Spring Southeastern Sectional Meeting (Co-organizing with Andrew Obus and Tony Shaska) (Cancelled due to COVID)
- Sep and Dec 2020 **PAJAMAS: Palmetto Joint Arithmetic, Modularity, and Analysis Series** (Co-organized with Jenny Fuselier, Arindam Roy, Frank Thorne and David Zureick-Brown.)
- June 2019 AMS Mathematical Research Communities, **Explicit methods in arithmetic geometry in characteristic  $p$**  (Co-organized with Renee Bell, Julia Hartmann, Valentijn Karemaker and Isabel Vogt)
- Mar 2019 **GATTACA: GeorgiA Tech Tropical, Arithmetic and Combinatorial Algebraic geometry** (Co-organized with Matt Baker, Philipp Jell, and Yoav Len.)

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## Upcoming talks and visits

- Jan 2022 Joint Mathematics Meetings, AMS Special Session on Arithmetic Geometry Informed by Computation, Wednesday, January 4, 5:00 P.M.
- Jan 2022 Joint Mathematics Meetings, AMS Special Session on Complex and arithmetic dynamical systems, Thursday, January 5, 2:00 P.M.
- Jan 2022 Joint Mathematics Meetings, AMS Special Session on Arithmetic Statistics, Friday, January 6, 11:30 A.M.
- Jan 2022 Joint Mathematics Meetings, AMS Special Session on Excursions in Arithmetic Geometry, Saturday, January 7, 2:30 P.M.
- Oct 2022 Boston University, Algebra seminar
- Oct 2022 Brown University, Algebra seminar

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## Visiting Positions

- July 2022 **Research Program**, *Park City Mathematics Institute: Number Theory Informed by Computation*, Park City, UT.
- May 2022 **Collaborate@ICERM**, *Institute of Computational and Experimental Research in Mathematics*, Providence, RI.
- July 2019 **Research in pairs**, *Mathematisches Forschungsinstitut Oberwolfach (MFO, Oberwolfach Research Institute for Mathematics)*, Oberwolfach, Germany.

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## Awards

- 2019–2021 **AMS Simons Travel Grant**.
- May-July 2022 **Simons fellowship for attending thematic programme “K-theory, algebraic cycles and motivic homotopy theory”** at Isaac Newton Institute, Cambridge UK (declined due to visa reasons).

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## Honours

- CMI Medal of Excellence**, MSc in Mathematics, top of class
- CMI Medal of Excellence**, BSc (Honours) in Physics, top of class

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## Research talks and presentations

- Oct 2022 Topology and Arithmetic over Global Fields, Madison
- Oct 2022 Oregon State University, Number Theory seminar
- Sep 2022 BATMOBILE: Biannual Algebraic and Tropical Meetings at Brown and Institutions Located in its Environs, Amherst
- Jul 2022 Park City Mathematics Institute, Number Theory Informed by Computation, Research seminar
- Mar 2022 Joint Mathematics Meetings, AWM Workshop: Women in Algebraic Geometry (WiAG), I
- Jan 2022 Purdue University, Colloquium
- Jan 2022 University of Notre Dame, Colloquium
- Dec 2022 University of Wisconsin, Madison, Colloquium
- Dec 2022 University of Oklahoma, Colloquium
- Dec 2021 Simon Fraser University, Vancouver, Number Theory and Algebraic Geometry seminar

Nov 2021 Emory University, Algebra and Number Theory seminar  
 Oct 2021 Ohio State University, Columbus, Arithmetic Geometry seminar  
 May 2021 Rational Points and Galois Representations, University of Pittsburgh  
 May 2021 University of Wisconsin, Madison, Number Theory seminar  
 Jan 2021 Joint Mathematics Meetings, AMS Special Session on Branching Out: Ramification Invariants in Algebra and Geometry  
 Jan 2021 Joint Mathematics Meetings, AMS Special Session on Algebraic and Arithmetic Geometry  
 Dec 2020 Jerusalem - Be'er Sheva Algebraic Geometry Seminar  
 Dec 2020 VANTAGE, Virtual seminar on open conjectures in Number Theory and Arithmetic Geometry  
 June 2020 Chennai Mathematical Institute, CMI Online Seminar Series  
 Mar 2020 AGONIZE, Arithmetic Geometry is ONline In Zoom, Everyone  
 Feb 2020 Duke university, Algebraic Geometry seminar  
 Feb 2020 University of Pittsburg, Algebra seminar  
 Jan 2020 Joint Mathematics Meetings, AMS Special Session on Rational Points on Algebraic Varieties: Theory and Computation  
 Nov 2019 Front Range Number Theory Day, Colorado State University  
 Nov 2019 MAAIM-Modular forms, Arithmetic, and Women, Emory university  
 Sep 2019 MANTIS: Michigan Algebra and Number Theory Intercity Symposium, University of Michigan  
 Sep 2019 AMS Fall Central Sectional Meeting, University of Wisconsin-Madison, Special Session on Geometry and Topology in Arithmetic  
 Aug 2019 University of Georgia, Oberseminar  
 July 2019 University of Groningen, Number theory seminar  
 June 2019 Arithmetic of Low-Dimensional Abelian Varieties, ICERM, Lightning talk  
 Apr 2019 AMS Spring Eastern Sectional Meeting, University of Connecticut Hartford, Special Session on Mathematical Cryptology, University of Connecticut Hartford  
 Mar 2019 AMS Spring Central and Western Joint Sectional Meeting, University of Hawai'i at Mānoa, Special Session on Algebraic Points  
 Feb 2019 Braids, Resolvent Degree and Hilbert's 13th Problem, IPAM, Lightning talk  
 Feb 2019 Stanford university, Algebraic geometry Seminar  
 Jan 19 Joint Mathematics Meetings, AMS Special Session on Number Theory, Arithmetic Geometry, and Computation  
 Dec 2018 Brown university, Algebra seminar  
 Nov 2018 University of Washington (Seattle), Number theory seminar  
 Nov 2018 University of Pennsylvania, Galois seminar  
 Oct 2018 Northwestern university, Number theory seminar  
 Mar 2018 AMS Central Sectional Meeting, Columbus, Ohio, Special Session on Algebraic and Combinatorial Aspects of Tropical Geometry  
 Feb 2018 Georgia Algebraic Geometry Symposium, Georgia Institute of Technology  
 Sep 2017 AMS Central Sectional Meeting, Denton, Texas, Special Session on Numbers, Functions, Transcendence, and Geometry

- Jan 2017 Joint Mathematics Meetings, AMS Special Session on Minimal integral models of algebraic curves
- Dec 2016 Georgia Institute of Technology, Algebra seminar
- Nov 2016 Junior number theory days, Rutgers, Newark
- Nov 2016 Emory university, Algebra seminar
- Oct 2016 University of South Carolina, Algebraic geometry, arithmetic geometry and commutative algebra seminar
- Sep 2016 TAAAG: Topological approaches to algebra and arithmetic geometry
- Apr 2016 3rd Annual Graduate Student Math Conference in Algebra/Number Theory, Brown University
- Feb 2016 Ohio State University, Number theory seminar
- Feb 2016 University of Wisconsin, Madison, Number theory seminar
- Jan 2016 Joint Mathematics Meetings, AMS Special Session on Higher Genus Curves and Fibrations of Higher Genus Curves in Mathematical Physics and Arithmetic Geometry
- Oct 2015 Rice University, Algebraic geometry and number theory seminar
- Oct 2015 University of Georgia, Number theory and arithmetic geometry seminar
- Oct 2015 Young women in Algebraic Geometry, Universität Bonn, Bonn
- Sep 2015 University of Maine, Mathematics Colloquium and the Number theory seminar
- July 2015 Contributed talks, Week 3, 2015 Algebraic Geometry Summer Institute, Utah
- June 2015 Mathematics Colloquium, The Institute of Mathematical Sciences, Chennai

## Expository lectures

- Mar 2021 *Hodge-Tate theory*, Learning seminar on Abelian  $\ell$ -adic Representations and Elliptic Curves (SeZoom), University of Georgia learning seminar
- Sep 2020 *Simplest unlikely intersections in abelian varieties: the Manin-Mumford conjecture*, Zannier on Zoom (ZaZoom), University of Georgia learning seminar
- Oct 2017 *An introduction to dynamical analogues of Mazur's theorem and uniform boundedness conjecture for abelian varieties*, Random Algebra and Number Theory, Emory graduate student seminar
- Aug 2016 *Formal moduli for one-parameter formal Lie groups*, West Coast Algebraic Topology Summer School (WCATSS)
- May 2016 *A  $p$ -adic proof of the transcendence of  $\pi$* , Pure Mathematics Graduate Student Seminar (PuMaGraSS)
- Nov 2015 *Compactifications of the moduli space of abelian varieties*, Seminar on Topics in Arithmetic, Geometry, Etc.(STAGE)
- May 2015 *The Chabauty-Coleman method*, Seminar on Topics in Arithmetic, Geometry, Etc.(STAGE)
- Feb 2015 *Good reduction of abelian varieties*, Seminar on Topics in Arithmetic, Geometry, Etc.(STAGE)
- Dec 2014 *Mixed Tate motives over  $\mathbb{Z}$  and multi-zeta values*, Seminar on Topics in Arithmetic, Geometry, Etc.(STAGE)
- Sep 2014 *Tannakian Categories*, Seminar on Topics in Arithmetic, Geometry, Etc.(STAGE)
- Mar 2014 *The weight monodromy conjecture*, Seminar on Topics in Arithmetic, Geometry, Etc.(STAGE)
- Apr 2013 *Fermat's last theorem for regular primes*, Pure Mathematics Graduate Student Seminar (PuMaGraSS)

- Feb 2013 *Hodge Theory*, Seminar on Topics in Arithmetic, Geometry, Etc.(STAGE)
- Nov 2012 *Hilbert's irreducibility theorem*, Seminar on Topics in Arithmetic, Geometry, Etc.(STAGE)
- Oct 2012 *Rational points on curves*, 18.725 Guest lecture
- Apr 2012 *The fundamental group of an algebraic curve and the outer Galois action*, Seminar on Topics in Arithmetic, Geometry, Etc.(STAGE)
- Mar 2012 *The inverse Galois problem for  $\mathbb{C}(t)$* , Pure Mathematics Graduate Student Seminar (PuMa-GraSS)

## External Teaching Assistantship

- Mar 2018 **Arizona Winter School,  $\mathbb{A}^1$ -enumerative geometry course by Kirsten Wickelgren.**  
Study group leader
- Feb 17-18, 2018 **Graduate Workshop in Algebraic Geometry for Women and Mathematicians of Minority Genders, Harvard and MIT.**  
Teaching assistant

## Teaching

- Spring 2022 **Math 3300: Linear algebra and its applications.**  
Instructor
- Fall 2021 **Math 1113: Precalculus.**  
Instructor
- Spring 2021 **Math 2260: Calculus II for science and engineering.**  
Instructor
- Fall 2020 **Math 1113: Precalculus.**  
Instructor
- Spring 2020 **Math 3300: Linear algebra and its applications.**  
Instructor
- Fall 2019 **Math 2250: Calculus for science and engineering.**  
Instructor
- Spring 2019 **Math 6122: Graduate algebra 2, Galois theory and algebraic number theory.**  
Instructor
- Fall 2018 **Math 1553: Introduction to linear algebra.**  
Instructor
- Spring 2018 **Math 4150: Elementary number theory and applications.**  
Instructor
- Fall 2017 **Math 1553: Introduction to linear algebra.**  
Instructor
- Spring 2017 **Math 6122: Graduate algebra 2: Introduction to algebraic number theory.**  
Instructor
- Fall 2016 **Math 1553: Introduction to linear algebra.**  
Instructor
- Fall 2014 **18.821: Project Laboratory in Mathematics.**  
Graduate student instructor

## Grading assignments and Directed Reading Program supervision

- Spring 2016 **18.726: Algebraic geometry II.**  
Grader
- Spring 2015 **18.786: Number theory II.**  
Grader
- Jan 2015 **Directed Reading Program.**  
Mentor. Text: A course in arithmetic, by Jean-Pierre Serre
- Spring 2014 **18.781: Introduction to the theory of numbers.**  
Teaching assistant
- Spring 2014 **18.726: Algebraic Geometry II.**  
Grader
- Spring 2013 **18.726: Algebraic Geometry II.**  
Grader
- Jan 2013 **Directed Reading Program.**  
Mentor. Text: The arithmetic of elliptic curves, by Joseph Silverman
- Fall 2012 **18.725: Algebraic Geometry I.**  
Grader
- Jan 2012 **Directed Reading Program.**  
Mentor. Text: Riemann surfaces, by Otto Forster

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## Service

- February 2022 NSF Grant Proposal Review, *Panelist*
- Fall 2019 Math 2250 calculus, *Rubric team*
- Fall 2018 Georgia Tech Algebra seminar, *Co-organizer*
- Fall 2018 Georgia Tech Algebra qualifying exam, *Cowriter*
- Feb 2018 Panel discussion at the Graduate Workshop in Algebraic Geometry for Women and Mathematicians of Minority Genders, Harvard and MIT, *Panelist*
- Fall 2017 Georgia Tech Algebra qualifying exam, *Cowriter*
- May 2016 Panel discussion for graduate students on Life after quals: learning to do research, *Organizer & moderator*
- Spring 2015 STAGE: Seminar on Topics in Arithmetic, Geometry, Etc., *Co-organizer*
- 2014–2015 MIT Friends of the Arts, *Co-organizer*
- Spring 2013, Fall 2013 MIT mathematics department Transfer Credit Examiner
- 2012–2013 PuMaGraSS: Pure Mathematics Graduate Student Seminar, *Co-organizer*

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## Miscellaneous

- Programming Python and Sage
- Languages Fluent in English, Tamil, Hindi