Anand Deopurkar | Curriculum Vitae

Mathematical Sciences Institute, The Australian National University

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Positions

Australian National University — **Canberra, Australia**
Lecturer — *2018–*

University of Georgia — **Athens, GA**
Assistant Professor (Limited Term) — *2016–2017*

Columbia University — **New York, NY**
J. F. Ritt Assistant Professor — *2012–2016*

Education

Harvard University — **Cambridge, MA**
Ph.D., Advisor: Joseph Harris — *2008–2012*

Massachusetts Institute of Technology (MIT) — **Cambridge, MA**
S.B., Mathematics with Computer Science — *2004–2008*

Publications and pre-prints

- The Thurston compactification of the space of stability conditions: the A_2 case (with Asilata Bapat, Anthony Licata).
  In preparation.
- Anticanonical tropical cubic del Pezzos contain exactly 27 lines (with María Angélica Cueto).
  Pre-print, arXiv:1906.08196.
- Ramification divisors of general projections (with Anand Patel, Eduard Duryev).
  Pre-print, arXiv:1901.01513.
- Stable log surfaces, admissible covers, and canonical curves of genus 4 (with Changho Han).
  Transactions of the AMS, to appear.
- Vector bundles and finite covers (with Anand Patel).
  Pre-print, arXiv:1608.01711.
- Syzygy divisors on Hurwitz spaces (with Anand Patel).
  Contemporary Mathematics, vol. 703, 209–222, 2018.
- The canonical syzygy conjecture for ribbons.
  Mathematische Zeitschrift, 288(3), 1157–1164, 2018.
- Covers of stacky curves and limits of plane quintics.
  Transactions of the AMS, 371, 549–588.
- The Picard rank conjecture for the Hurwitz spaces of degree up to five (with Anand Patel).
  Algebra and Number Theory, 9(2):459–492, 2015.
- Groebner techniques for ribbons (with Maksym Fedorchuk, David Swinarski).
  Albanian Journal of Mathematics, 8(1):55–70, 2014.

- Toward GIT stability of syzygies of canonical curves (with Maksym Fedorchuk, David Swinarski).
  Algebraic Geometry (Foundation Compositio Mathematica), 3:1–22, 2016.
- Class of the Hodge eigenbundle using orbifold Riemann-Roch.
  Appendix to Cyclic covering morphisms on $\overline{M}_{0,n}$ by Maksym Fedorchuk.
- Sharp slope bounds for sweeping families of trigonal curves (with Anand Patel).
  Mathematical Research Letters, 20(3):868–884, 2013.
- Modular compactifications of the space of marked trigonal curves.
  Advances in Mathematics, 248(0):96–154, 2013.
- Compactifications of Hurwitz spaces.
  International Mathematical Research Notices, 2014(14):3863–3911, 2013.
- Alternate compactifications of Hurwitz spaces.
  Thesis, Harvard, 2012.

Grants and awards

- Discovery Early Career Researcher Award (DECRA), 2018–2021 (funded by the Australian Research Council).
- AMS-Simons Travel Grant, 2016–2018.
- American Institute of Mathematics Workshop Funding, 2016 (with Maksym Fedorchuk, Ian Morrison, Xiaowei Wang).
- Award for excellence in teaching, 2014 (departmental award at Columbia University.).
- Jon A. Bucsela prize, 2006 (departmental award at MIT for the top graduating mathematics major).
- Rogers prize, 2006 (Departmental award at MIT for summer research.).
- William Lowell Putnam competition, 2004 (Rank 16–25), 2005 (Honorable mention), 2007 (Honorable mention).
- International Mathematical Olympiad, 2004 (Silver), 2003 (Bronze).

Supervision

- Donghoon Shin, *Honours*, MSI, ANU, 2021 (expected) (with Danesh Jogia (ASD)).
- Ben Leedom, *Honours*, MSI, ANU, 2020 (expected).
- Diclehan Erdal, *Master of Mathematical Sciences*, MSI, ANU, 2019.
- Adwait Sengar, *Master of Mathematical Sciences*, MSI, ANU, 2019 (with Uri Onn).
- Sean Caroll, *Summer Research Scholar*, MSI, ANU, 2018 (with Asilata Bapat).
- Dhruva Kelkar, *Future Research Scholar*, MSI, ANU, 2019.
- Sridhar Venkatesh, *Future Research Scholar*, MSI, ANU, 2019.
- Kyle Broder, *Honours*, MSI, ANU, 2018 (with Alex Isaev).
- Likun Yao, *Honours*, MSI, ANU, 2018 (with Amnon Neeman).

Teaching

At the Australian National University

- Algebraic Geometry (Algebra 3), Term 2, 2019.
- Reading course on Elliptic curves and modular forms by Neil Koblitz, Summer, 2018–2019.
- Special topics course on Computational Polynomial Algebra (with Markus Hegland), Term 2, 2018.
- Reading course on Algebaric curves and Riemann surfaces by Rick Miranda, Term 1, 2018.

At the University of Georgia

- Math 1113 (Precalculus), Fall 2017.
- Math 8320 (Algebraic curves), Fall 2017.
- Math 2260 (Calculus 2 for Science and Engineering), Spring 2017.
- Math 2250 (Calculus 1 for Science and Engineering), Fall 2016.

At Columbia University

- Analysis and optimization, Spring 2016. *A course about linear and non-linear optimization methods.*
- Young tableaux in algebra and geometry, Fall 2015. *Undergraduate seminar based on Fulton's book* Young Tableaux.
- Calculus 1, Spring 2015.
- Moduli of curves, Fall 2014. *Graduate (topics) course in algebraic geometry. The webpage has most of the course notes.*
- Calculus 1, Spring 2014.
- Modern algebra 2, Spring 2014. *Rings, fields, and Galois theory.*
- Modern algebra 1, Fall 2013. *Group theory.*
- Calculus 3, Spring 2013.
- Calculus 2, Fall 2012.

At Harvard University

- Linear algebra, 2012.
- Algebraic curves, 2011. *Course assistant for Joe Harris.*
- Calculus 2, 2010.
- Calculus 1, 2009.

Invited Talks and Presentations

In conferences or workshops

- Workshop on Triangulated Categories in Geometry and Representation Theory, Sydney, 2019. *Groups, spherical twists, and stability conditions (with Asilata Bapat and Anthony Licata).*
- Character Varieties and Topological Quantum Field Theory, Auckland, New Zealand, 2018. *Geometry of Hurwitz spaces.*
- Number Theory Session at AustMS 2018, Adelaide, 2018. *On the geometric Steinitz problem.*
- Algebraic surfaces and related topics, Xiamen, China, 2018. *Moduli of almost K3 log surfaces and curves of genus 4.*

- Workshop on Algebraic Geometry, Approximation, and Optimization, MATRIX, Creswick, Vic, 2018. *Quadrature and algebraic geometry.*
- Workshop on Topics in Algebraic Geometry, University of North Carolina, Chapel Hill, NC, 2017. *Vector bundles and finite covers.*
- Conference on Moduli and Birational Geometry, Korea, 2016. *Vector bundles and finite covers.*
- Workshop on Cycles on moduli spaces, Geometric Invariant Theory, and Dynamics, ICERM, Brown University, 2016. *Cycles on Hurwitz spaces.*
- Joint mathematics meetings, Seattle, WA (Higher genus curves and fibrations of higher genus curves in mathematical physics and arithmetic geometry II), 2016. *Picard groups of Hurwitz spaces.*
- Joint mathematics meetings, Seattle, WA (Moduli spaces in algebraic geometry I), 2016. *Limits of plane quintics via covers of stacky curves.*
- BC-Northeastern algebraic geometry conference, Boston, MA, 2015. *Limits of plane quintics via covers of stacky curves.*
- SIAM applied algebraic geometry conference, Daejeon, Korea, 2015. *Syzygies of canonical curves and the geometry of* $\overline{M}_g$.
- Mathematisches Forschungsinstitut Oberwolfach, Germany, 2015. *GIT stability of syzygies of curves (mini talk)..*
- Conference on moduli and birational geometry, Postech, Pohang, Korea, 2013. *Towards GIT stability of syzygies of canonical curves.*

In seminars

- University of California, San Diego, 2020. *Apparent boundaries of projective varieties.*
- Indian Institute of Science, Bengaluru, India, 2018. *What are ribbons and what do they tell us about Riemann surfaces.*
- Monash University, Melbourne, Vic, 2018. *What are ribbons and what do they tell us about Riemann surfaces.*
- Algebra and topology seminar, ANU, Canberra, ACT, 2018. *On the critical loci of finite maps.*
- University of Georgia, Athens, GA, 2017. *Vector bundles and finite covers.*
- Indian Institute of Science Education and Research, Pune, India, 2017. *Quivers and their representations.*
- Emory University, Atlanta, GA, 2017. *Vector bundles and finite covers.*
- Indian Institute of Science Education and Research (IISER), Pune, 2016. *Vector bundles and finite covers.*
- University of South Carolina, Columbia, SC, 2016. *Ribbons and Green's conjecture.*
- University of Georgia, Algebraic Geometry Seminar, 2016. *Ribbons and Green's conjecture.*
- University of Georgia, Oberseminar in Algebra, Geometry, and Number Theory, 2016. *The algebra of canonical curves and the geometry of their moduli space.*
- Purdue University, West Lafayette, IN, 2015. *Syzygies, GIT, and the moduli space of curves.*
- Ohio State University, Columbus, OH, 2015. *Limits of plane curves via stacky branched covers.*
- Harvard/MIT, Cambridge, MA, 2015. *Syzygies, GIT, and the log MMP for* $\overline{M}_g$.

- Courant Institute, New York University, New York, NY, 2015. *Picard groups of Hurwitz spaces.*
- Indian Institute for Science Research and Education, Pune, India, 2015. *The birational geometry of* $\overline{M}_g$.
- Stony Brook University, Stony Brook, NY, 2015. *Syzygies of canonical curves and birational geometry of* $\overline{M}_g$.
- Yale University, New Haven, CT, 2014. *GIT stability of syzygies of canonical curves.*
- Boston College, Boston, MA, 2014. *Toward GIT stability of syzygies of canonical curves.*
- AMS sectional meeting, Philadelphia, PA (Geometry of algebraic varieties), 2013. *Toward GIT stability of syzygies of canonical curves.*
- Stanford University, Palo Alto, CA, 2013. *Alternate compactifications of Hurwitz spaces.*
- Princeton University, Princeton, NJ, 2013. *Compactifying spaces of branched covers.*
- Rice University, Houston, TX, 2012. *Alternate compactifications of Hurwitz spaces.*
- Harvard/MIT, Cambridge, MA, 2011. *Compactifications of Hurwitz spaces.*
- Columbia University, New York, NY, 2011. *Compactifications of Hurwitz spaces.*
- Stony Brook University, Stony Brook, NY, 2011. *Compactifications of Hurwitz spaces.*
- Brown University, Providence, RI, 2011. *Compactifications of Hurwitz spaces.*

Service

- Referee for the *Journal of the EMS*, *Journal of Differenital Geometry*, *Journal of Algebraic Geometry*, *Annales scientifiques de l'École normale supérieure*, *Algebra and Number Theory*, *Journal für die reine und angewandte Mathematik*, *Manuscripta mathematica*, *Advances in geometry*, *Mathematical Research Letters*.
- Reviewer for American Mathematical Society's *Mathematical Reviews*.
- Co-organizer of the algebra and topology special year at the MSI at ANU. 2022
- Co-organizer for the workshop *Trends in the classification of algebraic varieties and their sheaves* at the Banff International Research Station, Oaxaca, Mexico 2021
- Member of the thesis committee of Abhishek Bharadwaj at ANU. 2020
- Member of the *Future research talent* selection committee at the MSI at ANU. 2019
- Member of the director search committee at the MSI at ANU. 2019
- Member of the formal liaison committee at the MSI at ANU. 2019
- Member of the award committee for the *BH Neumann Prize* for best student talk in AustMS. 2019
- Co-organizer of the workshop *Stability and moduli spaces* at the American Institute of Mathematics. 2017
- Co-organizer of the *Summer workshop in algebraic geometry* at the University of Georgia. 2016
- Organizer of the *Fairly informal reading seminar and tea (FIRST)* at the University of Georgia. 2016
- Co-organizer of the graduate student algebraic geometry seminar at Columbia University. 2016

- Organizer and lecturer for the Putnam competition preparation sessions at Columbia University. 2015
- Lecturer in the *Workshop on birational geometry and stability of moduli stacks and spaces of curves* in Hanoi, Vietnam. 2014
- On the thesis committees of Natasha Potashnik, Zachary Maddock, and Xuanyu Pan at Columbia University. 2012–2016
- Co-organizer of the poster session at the *Algebraic Geometry North-Eastern Series (AGNES)* conference in Boston College. 2013
- Organizer of the student algebraic geometry seminar at Harvard/MIT. 2010–2011

References

- **Joseph Harris**
  Harvard University
  1 Oxford Street
  Cambridge, MA 02139, USA.
  Email: harris@math.harvard.edu
  Phone: (617) 495-2171.

- **Brendan Hassett**
  Brown University
  151 Thayer Street
  Providence, RI 02912, USA.
  Email: bhassett@math.brown.edu
  Phone: (401) 863-7961.

- **Johan de Jong**
  Columbia University
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  New York, NY 10027, USA.
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- **Davesh Maulik**
  Massachusetts Institute of Technology
  77 Massachusetts Avenue
  Cambridge MA 02142, USA.
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  University of Georgia
  Boyd Graduate Studies Research Center
  Athens, GA 30602, USA.
  Email: agibney@math.uga.edu
  Phone: (706)-542-2643.

Teaching

- **Patrick Gallagher**
  Columbia University
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  New York, NY 10027, USA.
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  Phone: (212) 854-4346.