

# Anand Deopurkar | Curriculum Vitae

Mathematical Sciences Institute, The Australian National University

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## Positions

<b>Australian National University</b> <i>Lecturer</i>	<b>Canberra, Australia</b> 2018–
<b>University of Georgia</b> <i>Assistant Professor (Limited Term)</i>	<b>Athens, GA</b> 2016–2017
<b>Columbia University</b> <i>J. F. Ritt Assistant Professor</i>	<b>New York, NY</b> 2012–2016

## Education

<b>Harvard University</b> <i>Ph.D., Advisor: Joseph Harris</i>	<b>Cambridge, MA</b> 2008–2012
<b>Massachusetts Institute of Technology (MIT)</b> <i>S.B., Mathematics with Computer Science</i>	<b>Cambridge, MA</b> 2004–2008

## Publications and pre-prints

- Anticanonical tropical cubic del Pezzos contain exactly 27 lines (with MarĀna AngĀllica 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).  
*Pre-print, arXiv:1807.08413.*
- 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

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- 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 (with Maksym Fedorchuk, Ian Morrison, Xiaowei Wang), 2016.
- Award for excellence in teaching, 2014. *Columbia departmental award*.
- Jon A. Bucsela prize, 2006. *MIT departmental award given to the top graduating mathematics major*.
- Rogers prize, 2006. *MIT departmental award for summer research*.
- William Lowell Putnam competition, 2004 (Rank 16–25), 2005 (Honorable mention), 2007 (Honorable mention).
- International Mathematical Olympiad, 2004 (Silver), 2003 (Bronze).

## Teaching

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### At the Australian National University.....

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

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- [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.....

- 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

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- Refereed for the Journal of the EMS, Algebra and Number Theory, Crelle, Manuscripta mathematica, and Advances in geometry.
- Co-organized the workshop “Stability and moduli spaces” at the American Institute of Mathematics. January 2017
- Co-organized the Summer Workshop in Algebraic Geometry at the University of Georgia. August 2016
- Organized the Fairly Informal Reading Seminar and Tea (FIRST) at the University of Georgia. Fall 2016
- Co-organized the graduate student algebraic geometry seminar at Columbia. Spring 2016
- Conducted Putnam preparation sessions at Columbia. Fall 2015
- Supervised an undergraduate independent reading course (“Generatingfunctionology”) at Columbia. Fall 2015
- Gave expository sessions for graduate students in the “Workshop on birational geometry and stability of moduli stacks and spaces of curves” in Hanoi, Vietnam. January 2014
- Served on the thesis defense committees of Natasha Potashnik, Zachary Maddock, and Xuanyu Pan at Columbia.
- Co-organized the poster session at AGNES at Boston College. 2013
- Organized the student algebraic geometry seminar at Harvard/MIT. 2010, 2011

## References

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### ◦ Joseph Harris

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### ◦ Brendan Hassett

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### ◦ Johan de Jong

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### ◦ Daves Maulik

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### ◦ Angela Gibney

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### Teaching.....

### ◦ Patrick Gallagher

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