

# Anand Deopurkar | Curriculum Vitae

Mathematical Sciences Institute, The Australian National University

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## Positions

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<b>Australian National University (ANU)</b> <i>Senior Lecturer</i>	<b>Canberra, Australia</b> 2020–
<b>Australian National University (ANU)</b> <i>Lecturer</i>	<b>Canberra, Australia</b> 2018–2019
<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

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<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

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- *Spherical objects and stability conditions on CY2 quiver categories.*  
Pre-print.
- *The Thurston compactification of the space of stability conditions: some rank 2 cases*  
(with Asilata Bapat, Anthony Licata).  
Pre-print.
- *Anticanonical tropical cubic del Pezzos contain exactly 27 lines* (with María Angélica Cueto).  
Pre-print, arXiv:1906.08196.
- *Ramification divisors of general projections* (with Eduard Duryev, Anand Patel).  
Documenta Mathematica, to appear.
- *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

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- Discovery Early Career Researcher Award (DECRA), 2018–2021.  
*Funded by the Australian Research Council.*
- AMS-Simons Travel Grant, 2016–2018.  
*Funded by the American Mathematical Society and the Simons Foundation.*
- American Institute of Mathematics Workshop Funding, 2016.  
*Joint 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 family 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

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- Zongpu Zhang, *Honours*, MSI, ANU, 2021, expected.
- Donghoon Shin, *Honours*, MSI, ANU, 2021, expected. (Joint with Danesh Jogia (Australian Signals Directorate)).
- Ben Leedom, *Honours*, MSI, ANU, 2020, expected.
- Diclehan Erdal, *Masters*, MSI, ANU, 2019.
- Adwait Sengar, *Masters*, MSI, ANU, 2019. (Joint with Uri Onn).
- Sean Carroll, *Summer Research Scholar*, MSI, ANU, 2018. (Joint 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. (Joint with Alex Isaev).
- Likun Yao, *Honours*, MSI, ANU, 2018. (Joint with Amnon Neeman).

## Teaching

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

- Foundations of Algebraic Geometry (Schemes), 2020.
- Algebraic Geometry (Algebra 3), 2019.
- Reading course on *Elliptic curves and modular forms* by Neil Koblitz, 2018–2019.
- Special topics course on Computational Polynomial Algebra (with Markus Hegland), 2018.

- Reading course on *Algebraic curves and Riemann surfaces* by Rick Miranda, 2018.

#### **At the University of Georgia**.....

- Math 1113 (Precalculus), 2017.
- Math 8320 (Algebraic curves), 2017.
- Math 2260 (Calculus 2), 2017.
- Math 2250 (Calculus 1), 2016.

#### **At Columbia University**.....

- Analysis and optimization, 2016.
- Young tableaux in algebra and geometry, 2015.
- Calculus 1, 2015.
- Moduli of curves, 2014.
- Calculus 1, 2014.
- Modern algebra 2, 2014.
- Modern algebra 1, 2013.
- Calculus 3, 2013.
- Calculus 2, 2012.

#### **At Harvard University**.....

- Linear algebra, 2012.
- Algebraic curves (teaching assistant), 2011.
- Calculus 2, 2010.
- Calculus 1, 2009.

## **Invited Talks and Presentations**

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#### **In conferences or workshops**.....

- Max Plank institute f"ur Mathematics, Bonn, 2021.  
*A Thurston compactification of the space of stability conditions.*
- Topology session, AustMS 2020, 2020.  
*A Thurston compactification for categories.*
- Workshop on triangulated categories in geometry and representation theory, Sydney, 2019.

*Groups, spherical twists, and stability conditions.* (Part of a series 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 the Australian Mathematical Society's annual meeting (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, Institute for Computational and Experimental Research in Mathematics (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.....**

- Tata Institute of Fundamental Research, India, 2021.  
*A Thurston compactification of the space of stability conditions.*
- Jagiellonian University, Poland, 2021.  
*A Thurston compactification of the space of stability conditions.*
- Seminario nacional de geometria algebraica, Mexico, 2020.  
*Apparent boundaries of projective varieties.*  
Online joint seminar of multiple universities in Mexico
- Seminario nacional de geometria algebraica, Mexico, 2020.  
*Apparent boundaries of projective varieties.*  
Online joint seminar of multiple universities in Mexico
- 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 minimal model program 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 European Mathematical Society*, *Journal of Differential 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*, *European Journal of Mathematics*.
- Reviewed for American Mathematical Society's *Mathematical Reviews*.
- Co-organizing the algebra and topology special year at the MSI at ANU (with James Borger, Martin Helmer, and Amnon Neeman), 2022.
- Co-organizing the workshop *Trends in the classification of algebraic varieties and their sheaves* at the Banff International Research Station, Oaxaca, Mexico (with Jarod Alper and Cesar Lozano Huerta), 2021.
- Served on the thesis committee of Abhishek Bharadwaj at ANU, 2020.
- Served on the *Future research talent* selection committee at the MSI at ANU, 2019.
- Served on the director search committee at the MSI at ANU, 2019.
- Served on the formal liaison committee at the MSI at ANU, 2019.
- Served on the award committee for the *BH Neumann Prize* for best student talk in AustMS, 2018.
- Co-organised the workshop *Polynomial Algebraic Developments in Optimisation and Computation* at ANU (with Markus Hegland), 2018.
- Conducted training sessions in algebraic geometry at the *D21 Workshop* at the Australian Signals Directorate, 2018.
- Co-organised the workshop *Stability and moduli spaces* at the American Institute of Mathematics (with Maksym Fedorchuk, Ian Morrison, and Xiaowei Wang), 2017.
- Co-organised the *Summer workshop in algebraic geometry* at the University of Georgia (with Angela Gibney and Nicola Tarasca), 2016.
- Organised the *Fairly informal reading seminar and tea (FIRST)* at the University of Georgia, 2016.
- Co-organised the graduate student algebraic geometry seminar at Columbia University (with Johan de Jong), 2016.
- Conducted the Putnam competition preparation sessions at Columbia University, 2015.



- Lectured in the *Workshop on birational geometry and stability of moduli stacks and spaces of curves* in Hanoi, Vietnam, 2014.
- Served on the thesis committees of Natasha Potashnik, Zachary Maddock, and Xuanyu Pan at Columbia University, 2012–2016.
- Co-organised the poster session at the *Algebraic Geometry North-Eastern Series (AGNES)* conference in Boston College (with Anand Patel), 2013.
- Organised the student algebraic geometry seminar at Harvard/MIT, 2010–2011.

## References

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- Joseph Harris, Harvard University.
- Brendan Hassett, Brown University.
- Johan de Jong, Columbia University.
- Daves Maulik, MIT.
- Patrick Gallagher, Columbia University (Teaching).