Angela Gibney

Curriculum Vitae

Education

Ph.D Thesis **Fibrations of $\overline{\mathcal{M}}_{g,n}$**, *Advisor: Sean Keel*.

2000 **PhD**, *University of Texas*, Austin.

1994 **Bachelor of Science, Mathematics**, *The University of California*, Santa Barbara.

1993 **Alg Geom Study Abroad**, *Mathematics Research Institute*, Utrecht, Netherlands.

1992 **Budapest Semesters in Mathematics**, *Eötvös University*, Budapest, Hungary.

Experience

2021–Present **Presidential Professor**, *University of Pennsylvania*, Philadelphia.

2017–2021 **Professor**, *Rutgers University*, New Brunswick.

2009–2017 **Assistant, Associate, Professor**, *University Of Georgia*, Athens.

2004–2008 **Assistant Professor**, *University of Pennsylvania*, Philadelphia.

2003–2004 **Gibbs Assistant Professor**, *Yale University*, New Haven.

2000–2003 **VIGRE Assistant Professor**, *University of Michigan*, Ann Arbor.

Research Interests

Algebraic geometry and representation theory: In particular moduli of curves and their generalizations, vector bundles, and representations of vertex operator algebras.

Funding

2025 NSA - awarded, then canceled- (Summer Research Institute in Algebraic Geometry)

2025 NSF DMS-2430657 (Summer Research Institute in Algebraic Geometry)

2022-25 NSF DMS-2200862 (personal award)

2019-22 NSF DMS-1902237 (personal award)

2016-19 NSF DMS-1601909 (personal award)

2012-16 NSF DMS-1201268 (personal award)

2005-09 NSF DMS-0509319 (personal award)

2014-19 NSF DMS-1344994 (RTG)

2019-23 NSF DMS-1937370 (AGNES)

2015-18 NSF DMS-1522813 (GAGS)

2015 NSF DMS - 1500652 (Bootcamp for Alg Geom Summer Research Institute)

2015 NSA - 141006 (Bootcamp for Alg Geom Summer Research Institute)

2010 Spruce Street – Philadelphia, PA 19103
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http://www.angelagibney.org

Publications and Preprints

- *Morita equivalences of Zhu's associative algebra and mode transition algebras* (with Damiolini and Krashen) submitted,
  https://arxiv.org/abs/2403.11855

- *Conformal blocks on smoothings via mode transition algebras* (with Damiolini and Krashen) Communications In Mathematical Physics, to appear
  https://arxiv.org/abs/2307.03767

- *Factorization presentations* (with Damiolini and Krashen)
  Higher dimensional algebraic geometry-a volume in honor of Shokurov,
  London Math. Soc. Lecture Note Ser., Vol 489, $163 - -191$, 2025
  https://arxiv.org/pdf/2207.05110.pdf

- *On factorization and vector bundles of conformal blocks from vertex algebras* (with Damiolini and Tarasca), Annales Scientifiques de l Ecole Normale Superieure, , no 1, 241-292, (2024)
  https://arxiv.org/pdf/1909.04683.pdf

- *On an equivalence of divisors on $\overline{M}_{0,n}$ from Gromov-Witten theory and conformal blocks* (with Chen, Heller, Kalashnikov, Larson, and W. Xu) Transformation Groups 29, no. 2, 561-590, (2024)
  https://doi.org/10.1007/s00031-022-09752-6

- *Oberwolfach Report : Algebraic structures on moduli of curves from vertex operator algebras*
  on my website bit.ly/3rpTCZh

- *On global generation of vector bundles on the moduli space of curves from representations of vertex operator algebras* (with Damiolini)
  to appear in Algebraic Geometry, and on the arxiv https://arxiv.org/abs/2107.06923v2

- *Vertex algebras of CohFT-type* (with C. Damiolini, and N. Tarasca),
  Facets of algebraic geometry. Vol. I, 164–189, London Math. Soc. Lecture Note Ser., 472, Cambridge Univ. Press, Cambridge, 2022. https://arxiv.org/abs/1910.01658

- *Conformal blocks from vertex algebras and their connections on $\overline{\mathcal{M}}_{g,n}$*
  (with Damiolini and Tarasca), Geometry & Topology 25 (2021) 2235?2286
  https://arxiv.org/abs/1901.06981

- *Basepoint free cycles on $\overline{\mathcal{M}}_{0,n}$ from Gromov-Witten theory*
  (with Belkale), Int. Math. Res. Not. IMRN (2021), no. 2, 855?884.
  https://doi.org/10.1093/imrn/rnz184

- *On finite generation of the section ring of the determinant of cohomology line bundle*
  (with Belkale), Trans. Amer. Math. Soc. 371 (2019)
  https://www.ams.org/journals/tran/0000-000-00/S0002-9947-2018-07564-X/

- *Scaling of conformal blocks and generalized theta functions over* $\overline{\mathcal{M}}_{g,n}$
  (with Belkale and Kazanova), Math. Z. 284 (2016), no. 3-4, 961?987.;
  http://link.springer.com/article/10.1007/s00209-016-1682-1

- *Nonvanishing of conformal blocks divisors on* $\overline{M}_{0,n}$ (with Belkale and Mukhopadhyay),
  Transformation Groups, Volume 21, Issue 2, 329-353, 2016
  https://link.springer.com/article/10.1007/s00031-015-9357-2

- *On higher Chern classes of vector bundles of conformal blocks*
  (with Mukhopadhyay) https://arxiv.org/abs/1609.04887

- *Vanishing and identities of conformal blocks divisors on* $\overline{M}_{0,n}$
  (with Belkale and Mukhopadhyay),
  Algebraic Geometry, Volume 2, Issue 1, 62-90, 2015
  https://algebraicgeometry.nl/Content/6.html

- *Higher level conformal blocks divisors on* $\overline{\mathcal{M}}_{0,n}$
  (with Alexeev and Swinarski)
  Proc. Edinb. Math. Soc. (2), Volume 57, Number 1, 7–30, 2014
  https://doi.org/10.1017/S0013091513000941

- *Veronese quotient models of* $\overline{M}_{0,n}$ *and conformal blocks*
  (with Jensen, Moon, and Swinarski)
  Michigan Math. J. Volume 62, Number 4, 721– 751, 2013
  https://projecteuclid.org/euclid.mmj/1387226162

- *Conformal blocks divisors and the birational geometry of* $\overline{M}_{g,n}$
  Oberwolfach Reports, Moduli Spaces in Algebraic Geometry, 2013
  https://www.mfo.de/document/1306b/OWR_2013_06.pdf

- sl_n *level 1 conformal blocks divisors on* $\bar{M}_{0,n}$ (with Swinarski, Stankewicz and Arap)
  Int. Math. Res. Not., Number 7, 1634-1680, 2012
  https://academic.oup.com/imrn/article-abstract/2012/7/1634/757371

- *Lower and upper bounds for nef cones* (with Maclagan)
  Int. Math. Res. Not., Number 14, 3224–3255, 2012
  https://doi.org/10.1093/imrn/rnr121

- *The cone of type A, level one conformal blocks divisors*, (with Giansiracusa)
  Adv. Math. Volume 231, Number 2, 798–814, 2012
  https://doi.org/10.1016/j.aim.2012.05.017

- *On extensions of the Torelli map*
  Geometry and arithmetic, EMS Ser. Congr. Rep., Eur. Math. Soc., Zürich, 2012
  https://www.ems-ph.org/qsearch.php

- *Equations for Chow and Hilbert Quotients* (with Maclagan),
  Algebra and Number Theory, Volume 4, Number 7, 855–885, 2010
  https://msp.org/ant/2010/4-7/p03.xhtml

- *Numerical criteria for a divisor in $\overline{\mathcal{M}}_g$ to be ample*,
  Compos. Math., Volume 145, Number 5, 1227–1248, 2009; https://doi.org/10.1112/S0010437X09004047

- *Pointed trees of projective spaces*, (with Chen and Krashen)
  J. Algebraic Geom., Volume 18 , Number 3, 477–509, 2008
  https://doi.org/10.1090/S1056-3911-08-00494-3

- *Mori cones of moduli spaces of curves of small genus*, (with Farkas)
  Trans Amer Math Soc, Volume 355, Number 3, 1183–1199, 2003 https://doi.org/10.1090/S0002-9947-02-03165-3

- *Towards the ample cone of $\overline{\mathcal{M}}_{g,n}$*, (with Keel and Morrison)
  Journal of the American Mathematical Society, Volume 15, Number 2, 273–294, 2002
  https://doi.org/10.1090/S0894-0347-01-00384-8

Publications and Preprints: Editorial

- *Our Early Career, looking back*
  Notices of the American Math. Soc., Jan 2022
  https://bit.ly/37gBI0R

- *The Early Career and the pandemic*
  Notices of the American Math. Soc., Jan 2021
  https://www.ams.org/journals/notices/202101/rnoti-p56.pdf

- *In the Early Career*
  Notices of the American Math. Soc., Jan 2020
  https://www.ams.org/journals/notices/202001/rnoti-p56.pdf

- *Introducing the Early Career Section*
  Notices of the American Math. Soc., Jan 2018
  https://www.ams.org/journals/notices/201901/rnoti-p28.pdf

- Surveys on Recent Developments in Algebraic Geometry
  (editor, with I. Coskun, T. de Fernex, and M. Lieblich),
  Proc of Symposia in Pure Mathematics, American Math. Soc., Jul 2017
  https://bookstore.ams.org/pspum-95/

- *Proceedings of the 2010 conference at the University of Georgia, Athens,*
  (editor, with V. Alexeev, E. Izadi, E. Looijenga, J. Kollár)
  Contemporary Mathematics, American Math. Soc., Volume: 564, 2011

https://www.ams.org/books/conm/564/

Editorial Service

ongoing **Contemporary Mathematics, JPAA, Manuscripta Mathematica, Moduli, arXiv monitor**

past **AMS Notices**

InvitedTalks

2001-05 (15 lectures); 2006-10 (12 lectures); 2011-19 (40 lectures);

Select talks since 2020:

2025 *Institute for Advanced Study*, Special Year on Algebraic and Geometric Combinatorics, April 8;
Columbia University, Informal Mathematical Physics Seminar, April 21;
Supersymmetric Quantum Field Theories, VOAS, and Geometry, SCGP, 3 lectures April 14-18.

2024 *COMOC, Combinatorics of Moduli of Curves*, Banff, July 28-Aug 4.
Recent Advances in VOAs, Fall Eastern Sectional Meeting at SUNY-Albany, Albany NY, October 19-20.
Western Algebraic Geometry Symposium, University of Arizona, Tucson, Arizona November 16-17.
Vertex algebras and related topics, RIMS, Kyoto University, September 9-13.
A panorama of moduli spaces,, Goethe University, Frankfurt. Feb 26 - Mar 1.
Workshop on New Directions in Conformal Field Theory, Fields Institute, CA Mar 18-22.

2023 Algebraic Geometry Seminar, Stony Brook, Wednesday, Mar 22
Conference: Recent trends in algebraic geometry, Oberwolfach, June 19
Lie group and quantum mathematics seminar, Rutgers, Oct 6,
Algebraic geometry and moduli seminar ETH, Zurich November 18
Stanford Algebraic Geometry Seminar, December 8,

2022 *Physical Mathematics of Quantum Field Theory*, UMass, Amherst, Aug 1–5, 4 lectures
Bundles and Conformal Blocks with a Twist at the ICMS, June 13-17, Edinburgh, UK (online)
University of Utah's AWM summer conference, June 7-10, 3 lectures
Georgia Algebraic Geometry Seminar, Emory University April 1-3
Kyoto Representation Theory Seminar on Zoom, February 2

2021 Algebraic Geometry seminar, UC Davis, November 9th
Colloquia at UPenn and UT Austin

2020 Madison Moduli Weekend (online), (September 26-27th)
Topics in refined theories and beyond at ETH-ITS, Zurich (online) (April 15)
JMM 2020, Cohomological Field Theories and Wall Crossing (January 15)

Courses taught

Penn	*(1700) Ideas in Mathematics*, (3150) Advanced Linear algebra, (6240) Algebraic Geometry, (8100) VOA Reading, (7250) Conformal Field Theory, Moduli of curves*
Rutgers	*(250) Intro to Linear Algebra, (350) Linear Algebra, (428) Graph Theory, (436) History of Math, (535) Graduate Algebraic Geometry, (552) Graduate Algebra 2*
UGA	*(2250, 2260) Calculus I II (3000) Linear Algebra, (4010/6010) Modern Algebra and Geometry, (7005/9005) Mock AMS Conference, (8000) Graduate Algebra, (8310) Geometry of Schemes, (8330) Toric Varieties, (8330) Quantum Cohomology, (8330) Conformal Blocks, (8330) Moduli of Curves*
Penn	*(103) Calculus, (370, 371) Algebra I and II, (312/402) Linear algebra, (624, 625) Algebraic geometry I and II, (724) Topics: Introduction to moduli spaces, Moduli of stable maps, 240 Linear algebra and differential equations*
Yale	*(480b) Introduction to Algebraic Geometry, (115a) Calculus II*
Michigan	*(115, 116) Calculus II and III, (216) Intro to Diff Equations, (731) Moduli of Curves*

Research advising of graduate students and postdocs

2024 - PhD students: Avik Chakravarty, Daebeom Choi, Colton Griffin, and Xiangrui Liu, UPenn
2024 - Jianci Liu, postdoctoral advisor, University of Pennsylvania
2023 - Xiangrui Liu, masters, University of Pennsylvania
2018 - Chiara Damiolini, postdoctoral advisor, Rutgers University
2017-19 Nicola Tarasca, postdoctoral advisor, UGA and Rutgers University
2016-17 Anand Deopokur, postdoctoral co-advisor with V. Alexeev, UGA
Michael Schuster, postdoctoral advisor, UGA
2012-17 Natalie Hobson, PhD Advisor, UGA
2013-16 Anna Kazanova, postdoctoral advisor, UGA
2011-13 Gulden Cinar, Masters Advisor, UGA
Han-Bom Moon, postdoctoral advisor, UGA
2008-11 David Swinarski, postdoctoral Co-advisor with V. Alexeev, UGA

On a thesis committee for

2023 Xiangrui Liu, MS, University of Pennsylvania
2019 Carl Lian, PhD, Columbia University
Chengxi Wang, PhD, Rutgers University
2017 Luca Schaffler, PhD, UGA
2015 Xiayan Hu, PhD, UGA
2011 Noah Giansiracusa, PhD, Brown University
2010 Paul Larsen, PhD, Humboldt University, Berlin
2008 David Swinarski, PhD, Columbia University
2005 Damiano Testa, PhD, MIT

Service as a conference co-organizer

2024-2025 Summer Research Institute in Algebraic Geometry
(with G. Farkas, C. Hacon, K. Smith, B. Poonen, and C. Xu)

2024 Algebraic Geometry Northeast Sectional (AGNES) (with R. Donagi, J. Hartmann, and D.Krashen)

2023 Abramorama (with K Ascher, D Bejleri, Q Chen, B Hassett, S Marcus, and J Wise)

2022 Algebraic Geometry Northeast Sectional (AGNES) (with L.Borisov, A. Buch, and D.Krashen)

2017 The Georgia Algebraic Geometry Symposium
(with V. Alexeev, B. Bakker, D. Krashen, and D. Lorenzini)
The Georgia Summer Workshop in Algebraic Geometry at UGA
(with A. Deopurkar, J. Kass, and N. Tarasca);

2016 Combinatorial Moduli Spaces and Intersection Theory, The Fields Institute
(with D. Abramovich, I. Coskun, G. Smith, and M. Stillman)
The Georgia Summer Workshop in Algebraic Geometry at UGA
(with A. Deopurkar, J. Kass, and N. Tarasca)

2015 The graduate student 'Bootcamp' for the Algebraic Geometry Institute
Salt Lake City, Utah, (with I. Coskun, T. DeFernex, and M. Lieblich)
AWM Research Symposium, Special Session in Algebraic Geometry, UM (with L. Chen)

2014 The Georgia Algebraic Geometry Symposium
(with V. Alexeev, N. Giansiracusa, and D. Krashen)

2013 The Georgia Algebraic Geometry Symposium
(with V. Alexeev, E. Izadi, and D. Krashen)

2012 VIGRE Summer School and Georgia Algebraic Geometry Symposium
(with V. Alexeev and E. Izadi, and D. Krashen)

2010 Mathematical Research Communities Workshop, Snowbird, Utah
(with D. Abramovich, I. Coskun, J. McKernan and T. deFernex)
The Compact Moduli and Vector Bundles Conference at UGA
(with V. Alexeev and E. Izadi)

2009 The Connections Workshop at MSRI
(with D. Maclagan and J. Sidman)

2007 Combinatorial Algebraic Geometry, (AMS meeting, Hoboken, NJ) (with D. Maclagan)

2002 Curves and their Moduli, (AMS meeting, Ann Arbor, MI) (with G. Farkas and R. Lazarsfeld)

Activities promoting graduate education

2022 - 4 lectures, school on *Physical Mathematics of Quantum Field Theory*, UMass, Amherst, Aug 1–5
3 lectures, AWM summer school at University of Utah, June 7–10

2021 - Zoom lecture on applying for graduate school, at the UP GRADe Workshop, October 30.

2018 - Associate Editor of the Notices, in charge of the Early Career Section

2017-19 Professional development activities for grad students at Rutgers

2018 5 Lectures, school on Geometry of Moduli Spaces of Curves, ICTP, Trieste, IT

2017 4 Lectures, GAeL, Bath University, UK

2016 RTG Summer Coordinator for the RTG grant

Academic Year Coordinator for the RTG grant

2015 'Bootcamp' for the Algebraic Geometry Institute, Salt Lake City, Utah
(Co-Organizer with I. Coskun, T. DeFernex, and M. Lieblich)
Graduate Student Mock AMS Conference, UGA

2013 5 lectures, summer school on Conformal Blocks, Universita Sapienza, Rome, IT

2012 Algebraic Geometry Summer School at UGA (with V. Alexeev and D. Krashen)

2010 - 14 VIGRE Summer Program Coordinator
Graduate Student Mock AMS Conference, UGA

2010-11 M.A.T.H. Students program,

2010 Organized lunch and talk for students by David Saltman, director IDA
Topic: Nonacademic Math Jobs in the Defense Industry

2009 Connections Co-Organizer, with Diane Maclagan, MSRI

2007 Institute for Advanced Study, Women's program, Princeton, NJ

2005 mentor, 'Bootcamp', Summer Institute in Algebraic Geometry

2004 AMS Presentations By Young Researchers Conference,
MRC Program, led working group on moduli spaces, Snowbird, Utah

2002 Learning Stacks and Computational Methods through Problem Solving,
University of Illinois at Urbana Champagne

1998-00 Junior Geometry At UT Austin

Other activities

2022 3 lectures mini-course, University of Utah,
June 7-10, 2022 (organized by Christopher Hacon, Peter McDonald, and Carl Schwede)

2020-22 Group co-leader (with L. Chen), ICERM Algebraic Geometry workshop
(members: Lauren Heller, grad student, Berkeley; Elana Kalashnikov, postdoc, Harvard; Hannah Larson, grad student, Stanford; Weihong Xu, grad student, Rutgers);

2019 Speaker, Workshop On Math Advice and Networking at the UPenn

Panelist, High-school STEM Career Pathways Conference, S. Brunswick, NJ

2018 Speaker, workshop, Queen's Univ., CA

Speaker, Harvard/MIT Graduate workshop in Algebraic Geometry

2017 Speaker, supported by FEW Grant, University of Pennsylvania

EDGE Follow Up Mentor

2015 Co-organizer (with Linda Chen), Research Symposium

Algebraic Geometry Special Session, University of Maryland

2009 Co-organizer (with Diane Maclagan), Connections Conference, MSRI

2007 Speaker, IAS Science Program, Princeton, NJ

2005 EDGE Follow Up Mentor

Co-organizer (with A. Grassi), *Algebraic Geometry, Symplectic Geometry and Theoretical Physics:*

2002 Presenter, Expanding Your Horizons in Science and Engineering, University of Texas

Teaching Advisor to Postdocs

Franco Rota, Julian Rosen, Amber Russell, Jacob Hicks, Joshua Wood

Undergraduate and preliminary graduate advising to

K. Boe, K. A. Hoyt, E. Quinche, N. Mendrano D. McKenzie, M. Edwards, E. T. LaPaquette, A. McMillan, M. Turbow, G. Cinar, E. T. LaPaquette, G. Mabon, A. McMillan, T. Purvis, D. Harvey, B. Seilre, and E. Wang.

Activities for elementary, high-school, and undergrad students

2014, 16, 17, & 18 co-organized (with Krashen) UGA summer high-school MathCamp

2016 Co-organized talk for undergrads on jobs outside of academia

2010-11 co-organized (with D. Krashen) Mentoring and Advice for Talented HS Students

2009-10 lectured at the UGA Summer Stem Academy
presented at the Barrow Elementary School Career Day

2000-01 activities for 7th graders in Michigan

1999-00 ran Saturday Morning Math Group, activities for high-school students in Austin, TX

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