

Andrea T. Ricolfi

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ArXiv

EMPLOYMENT HISTORY & EDUCATION

Postdoc at Max-Planck Institut für Mathematik (Bonn)	11/2017-10/2018
PhD in Mathematics at University of Stavanger (Norway)	9/2013-10/2017
Thesis: <i>Local Donaldson–Thomas invariants and their refinements</i>	
Trial Lecture: <i>Symmetric obstruction theories and Joyce’s perverse sheaves</i>	
Advisors: Proff. Martin Gulbrandsen, Lars Halle.	
M.S. in Mathematics (ALGANT Program)	10/2010-7/2012
Università di Padova and Université Bordeaux I	
Thesis: <i>Bertini’s theorem on generic smoothness</i> . Advisor: Prof. Qing Liu	

VISITS AND SCHOLARSHIPS

Imperial College London Visiting PhD (P.I. Prof. Richard Thomas)	2/2015-6/2015
University of Copenhagen 4 short term visits (P.I. Prof. Lars Halle)	2015-17
SISSA : Research Scholarship	6/2013

RESEARCH INTERESTS

• Enumerative geometry of *moduli spaces of sheaves* (in a broad sense: motivic/refined/K-theoretic/enumerative invariants) • Hilbert and Quot schemes, Donaldson–Thomas invariants, virtual classes, virtual localisation • Moduli stacks of sheaves and of quiver representations, Joyce’s d-critical loci • Grothendieck rings of varieties, Hall algebras, • Cohomology of moduli spaces of curves, tautological relations, compactified universal Jacobians

SUPERVISION

PhD students: Solomiya Mizyuk (SISSA), co-supervised with Barbara Fantechi.

GRANTS

SISSA : Dipartimenti di Eccellenza travel grant: 9000 €	2018-21
Stavanger : UiS Travel Grant: the equivalent of around 5000 € per year	2013-17

PUBLICATIONS

Articles

1. *Framed sheaves on projective space and Quot schemes*, with A. CAZZANIGA. *Mathematische Zeitschrift* (2021). [\[Journal\]](#)
2. *Framed motivic Donaldson–Thomas invariants of small crepant resolutions*, with A. CAZZANIGA. To appear in *Mathematische Nachrichten*. DOI: 10.1002/mana.202100068. [\[Preprint 2020\]](#)
3. *Higher rank K-theoretic Donaldson–Thomas theory of points*, with N. FASOLA and S. MONAVARI. *Forum Math. Sigma*, Vol. 9 E15, 1–51. DOI: 10.1017/fms.2021.4 [\[Journal\]](#)
4. *The equivariant Atiyah class*. *C. R. Math. Acad. Sci. Paris*. Volume 359, issue 3 (2021) 257–282. [\[Journal\]](#)
5. *On the motive of the Quot scheme of finite quotients of a locally free sheaf*. *Journal de Mathématiques Pures et Appliquées*, Volume 144, 2020, Pages 50–68. [\[Journal\]](#)
6. *Virtual classes and virtual motives of Quot schemes on threefolds*. *Advances in Mathematics*, 369 (2020) 107182. [\[Journal\]](#)
7. *The local motivic DT/PT correspondence*, with B. DAVISON. *Journal of the London Mathematical Society* (2021). DOI: 10.1112/jlms.12463 [\[Journal\]](#)
8. *Virtual counts on Quot schemes and the higher rank local DT/PT correspondence*, with S. BEENTJES. To appear in *Mathematical Research Letters*. [\[Preprint 2018\]](#)
9. *Pullbacks of universal Brill–Noether classes via Abel–Jacobi morphisms*, with N. PAGANI and J. VAN ZELM. *Mathematische Nachrichten*, Vol. 293, Issue 11 (2020), 2187–2207. [\[Journal\]](#)
10. *The Hilbert scheme of hyperelliptic Jacobians and moduli of Picard sheaves*. *Algebra & Number Theory* 14-6 (2020), 1381–1397. [\[Journal\]](#)
11. *Jet bundles on Gorenstein curves and applications*, with L. GATTO. *Journal of Singularities*, Volume 21 (2020), 50–83. [\[Journal\]](#)
12. *The DT/PT correspondence for smooth curves*. *Mathematische Zeitschrift* 290 (2018), no. 1-2, 699–710. [\[Journal\]](#)
13. *On coherent sheaves of small length on the affine plane*, with R. MOSCHETTI. *Journal of Algebra*, 516 (2018), pp. 471–489. [\[Journal\]](#)

14. *Local contributions to Donaldson–Thomas invariants*.
Int. Math. Res. Not. IMRN, 2018 (2018), no. 19, 5995–6025. [[Journal](#)]
15. *The Euler characteristic of the generalized Kummer scheme of an Abelian threefold*, with M. GULBRANDSEN.
Geometriae Dedicata, 182 (2016), Issue 1, pp. 73–79. [[Journal](#)]
16. **PhD Thesis** *Local Donaldson–Thomas invariants and their refinements*.
ISBN: 978-82-7644-734-7 ISSN: 1890-1387 PhD thesis no. 363. Available [here](#).

Preprints

1. *Sur la lissité du schéma Quot ponctuel emboîté*, with S. MONAVARI (in French). [[Preprint 2021](#)]
2. *The d -critical structure on the Quot scheme of points of a Calabi–Yau 3-fold*, with M. SAVVAS [[Preprint 2021](#)]
3. *On the motive of the nested Quot scheme of points on a curve*, with S. MONAVARI. [[Preprint 2021](#)]
4. *Indecomposability of derived categories in families*, with F. BASTIANELLI, P. BELMANS and S. OKAWA. [[Preprint 2020](#)]
5. *Higher rank motivic Donaldson–Thomas invariants of \mathbb{A}^3 via wall-crossing, and asymptotics*, with A. CAZ-ZANIGA and D. RALAIVAOSAONA. [[Preprint 2020](#)]
6. *Moduli spaces of semiorthogonal decompositions in families*, with P. BELMANS and S. OKAWA. With an appendix coauthored with W. LOWEN [[Preprint 2020](#)]

Books

1. *Introduction to Enumerative Geometry – Classical and virtual techniques*. Submitted to Springer. Lecture notes based on two PhD courses on Enumerative Geometry and Donaldson–Thomas invariants I taught at SISSA in Fall 2019 and Spring 2021. A short (but not too short) version is available on my website.

TALKS AT INTERNATIONAL CONFERENCES AND WORKSHOPS

- *Virtual invariants of Quot schemes on 3-folds*
Bandoleros – Campinas Algebraic Geometry Summer Meeting 2021 (remote) 2/2021
- *Virtual classes and virtual motives of Quot schemes on 3-folds*
HMI Workshop on Gauge theory and virtual invariants (Dublin) 5/2019
- *A higher rank local DT/PT correspondence*
Workshop in Algebraic Geometry (Milan) 12/2018
- *A component of the Hilbert scheme of hyperelliptic Jacobians*
Algebraic Geometry and Foliations: in celebration of Israel Vainsencher’s 70th Birthday, (Belo Horizonte, Brazil) 11/2018
- *A motivic wall-crossing formula for sheaves on 3-folds*
Motives of Calabi–Yau manifolds (Kraków) 5/2018
- *Motivic local DT invariants*
IMPAN (Kraków) 3/2018
- *The DT/PT correspondence for smooth curves*
A Fall Meeting in Algebraic Geometry (Turin) 10/2017
- *Local contributions to DT invariants*
National Algebra Meeting (Oslo) 11/2016
- *Critical loci and their virtual motives*
National Algebra Meeting (Oslo) 11/2015
- *Partitions and generalized Kummer varieties*
Moduli Spaces and Derived Categories (Warwick) 2/2015
- *Motivic Donaldson–Thomas Invariants*
GAEL XXII (SISSA, Trieste) 6/2014
- *Limits of Special Weierstrass Points*
National Algebra Meeting (Oslo) 11/2013

INVITED SEMINAR TALKS

- *The d -critical structure on the Quot scheme of points on a 3-fold* (SISSA, Trieste) 5/2021
- *Refinements of higher rank DT invariants* (KIAS Seoul, remote) 3/2021
- *Higher rank motivic DT invariants* (SISSA, Trieste) 2/2021
- *Higher rank K-theoretic Donaldson–Thomas theory of points* (Kansas University, remote) 10/2020
- *Higher rank K-theoretic Donaldson–Thomas theory of points* (Bologna) 10/2020
- *A moduli space of semiorthogonal decompositions* (Rutgers New Jersey, remote) 9/2020
- *Higher rank K-theoretic Donaldson–Thomas theory of points* (UCSD San Diego, remote) 4/2020
- *Moduli of semiorthogonal decompositions* (Stavanger) 11/2019
- *A motivic DT/PT correspondence via Quot schemes* (Oxford) 11/2019
- *Virtual invariants of Quot schemes on 3-folds* (Copenhagen) 5/2019
- *A component of the Hilbert scheme of hyperelliptic Jacobians* (Rome) 4/2019

◦ <i>Le schéma de Hilbert d'une Jacobienne hypérelliptique</i> (Nancy)	10/2018
◦ <i>The DT/PT correspondence for smooth curves</i> (University of Edinburgh)	1/2018
◦ <i>Curve counting via Quot schemes</i> (Utrecht University)	12/2018
◦ <i>The DT/PT correspondence for smooth curves</i> (KTH, Stockholm)	11/2017
◦ <i>Counting rational curves on toric threefolds</i> (Copenhagen)	2/2016
◦ <i>Families of Abel–Jacobi curves</i> (Turin, Italy)	12/2015
◦ <i>Curve counting on threefolds</i> (Bergen, Norway)	10/2015
◦ <i>Introduction to Motivic Integration</i> (Imperial College London)	4/2015
◦ <i>Refined curve counting on Calabi–Yau threefolds</i> (KU Leuven)	3/2015
◦ <i>Localisation in Donaldson–Thomas theory</i> (UCL, London)	2/2015
◦ <i>A Hamilton's Principle in Algebraic Geometry</i> (Turin, Italy)	12/2014
◦ <i>Curve Counting and Box Counting</i> (Turin, Italy)	6/2014
◦ <i>Curve Counting Invariants and Euler Characteristics</i> (Bergen, Norway)	2/2014

SELECTED SCHOOLS AND WORKSHOPS

◦ Winter School on Enumerative Geometry and Modular Forms (Frankfurt)	2/2019
◦ Curves, Sheaves and Moduli (Stavanger)	4/2018
◦ Workshop on Complex Algebraic Geometry – Pirola 60th (Barcellona)	2/2018
◦ Enumerative Geometry Beyond Numbers (MSRI, Berkeley)	1/2018
◦ Modern Moduli Theory (Oxford)	9/2017
◦ British Algebraic Geometry (Cambridge)	9/2017
◦ Abel Symposium (Svolvær)	8/2017
◦ Stability conditions on triangulated categories and applications (Nordfjordeid)	6/2016
◦ Varieties of Calabi–Yau type (Warsaw)	4/2016
◦ Derived Categories and Moduli Spaces (Stavanger)	9/2015
◦ PRAGMATIC Summer school on Moduli of curves and line bundles (Catania)	7/2015
◦ GAeL 2015 (Leuven)	6/2015
◦ Motivic invariants related to K3 and Abelian geometries (Berlin)	2/2015
◦ Modern trends in Gromov–Witten theory (Hannover)	9/2014
◦ GAeL 2014 (Trieste)	6/2014
◦ Toric degenerations and Mirror Symmetry (Nordfjordeid)	6/2014

TEACHING

◦ <i>Localisation in Enumerative Geometry</i> ; PhD Course (SISSA Trieste)	Spring 2021
◦ <i>Techniques in Enumerative Geometry</i> ; PhD Course (SISSA, Trieste)	Fall 2019
◦ <i>Algebraic Geometry</i> MAT630 (Master course, University of Stavanger)	Spring 2017
◦ T.A. for <i>Mathematical Methods 2</i> MAT200 (Bachelor, University of Stavanger)	Spring 2016
◦ T.A. for <i>Linear Algebra</i> MAT110 (Bachelor, University of Stavanger)	Fall 2015
◦ <i>Discrete Mathematics</i> MAT120 (Bachelor, University of Stavanger)	Fall 2014
◦ T.A. for <i>Geometria e Algebra Lineare</i> (Politecnico di Torino)	Spring 2013

PhD COURSES ATTENDED

◦ <i>Deformation Theory</i> (following Sernesi's "Deformations of algebraic schemes")	2013-14
◦ <i>Mirror Symmetry</i> (following "Mirror Symmetry and Algebraic Geometry" by Cox–Katz)	2016

ORGANISATION OF EVENTS AND OTHER TASKS

◦ Been referee for 9 high level international journals	
◦ Co-organiser of the Algebraic Geometry seminar SISSA-University of Trieste	2020-21
◦ Co-organiser of the Algebraic Geometry seminar in SISSA/IGAP	2020-21
◦ Postdoc representative for the Mathematics area at SISSA, Trieste	2019-20
◦ Co-organiser of the Algebraic Geometry seminar joint between SISSA and ICTP	2019-20
◦ Local organiser of the Workshop <i>Derived Categories and Moduli Spaces</i> (Stavanger)	9/2015