

# Andrea Petracci

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| CONTACT INFORMATION  | Università di Bologna<br>Dipartimento di Matematica<br>Piazza di Porta San Donato 5<br>40126 Bologna<br>Italy  | andrea.petracci@alumni.sns.it ( <i>permanent</i> )<br>a.petracci@unibo.it<br><a href="https://www.unibo.it/sitoweb/a.petracci/en">https://www.unibo.it/sitoweb/a.petracci/en</a><br><a href="https://www.dm.unibo.it/~andrea.petracci3/">https://www.dm.unibo.it/~andrea.petracci3/</a> |
| PERSONAL INFORMATION | I am an Italian citizen.   |   |
| EMPLOYMENT           | <b>Università di Bologna</b><br>• Tenure-track assistant professor (RTD-B)<br>• Assistant professor (RTD-A)  | Bologna, Italy<br>October 2022 – present<br>October 2021 – October 2022   |
|                      | <b>Freie Universität Berlin</b><br>Wissenschaftlicher Mitarbeiter<br>in the research group of Klaus Altmann  | Berlin, Germany<br>October 2018 – September 2021  |
|                      | <b>University of Nottingham</b><br>Research Associate<br>in the research group of Alexander Kasprzyk   | Nottingham, UK<br>October 2017 – September 2018   |
|                      | <b>Imperial College London</b><br>Research Assistant<br>in the research group of Tom Coates  | London, UK<br>April 2017 – September 2017   |
| EDUCATION            | <b>Imperial College London</b><br>Doctor of Philosophy in Mathematics<br>– Thesis title: On Mirror Symmetry for Fano varieties and for singularities<br>– Advisor: Alessio Corti<br>– Examiners: Alessandro Chiodo, Richard Thomas | London, UK<br>October 2013 – September 2017   |
|                      | <b>Scuola Normale Superiore</b><br>Diploma in Mathematics<br>– Assessment: 70/70   | Pisa, Italy<br>October 2010 – May 2013  |
|                      | <b>University of Pisa</b><br>Master of Science in Mathematics<br>– Thesis title: The hyperelliptic locus in the moduli stack of curves of given genus<br>– Advisor: Angelo Vistoli<br>– Assessment: 110/110 cum laude              | Pisa, Italy<br>October 2010 – March 2013  |
|                      | <b>University of Pisa</b><br>Bachelor degree in Mathematics<br>– Thesis title: Il teorema della sezione iperpiana di Lefschetz<br>– Advisor: Rita Pardini<br>– Assessment: 110/110 cum laude                                       | Pisa, Italy<br>October 2007 – July 2010   |
| HABILITATIONS        | Italian habilitation for associate professor (II fascia), valid from the 25th of January   |   |

2023 to the 25th of January of 2033

HONORS, GRANTS  
AND AWARDS

Won the ‘Federigo Enriques’ prize from Unione Matematica Italiana, September 2019

Awarded a grant from Heilbronn Institute for Mathematical Research to organise a workshop about cluster algebras (£7,500), April 2018

Won the Doris Chen PhD Award in the academic year 2016-2017 from the Department of Mathematics of Imperial College London

Awarded the ‘Roth Studentship’ of the Department of Mathematics of Imperial College London, October 2013

Won a full scholarship at Scuola Normale Superiore di Pisa after selective examination, September 2010

PUBLISHED  
PAPERS

A. Petracci, *On deformation spaces of toric singularities and on singularities of  $K$ -moduli of Fano varieties*, Transactions of the American Mathematical Society 375 (2022), no. 8, 5617-5643.

Y. Liu, A. Petracci, *On  $K$ -stability of some del Pezzo surfaces of Fano index 2*, Bull. London Math. Soc. 54 (2022), no. 2, 517-525.

S. Felten, A. Petracci, *The logarithmic Bogomolov–Tian–Todorov theorem*, Bull. London Math. Soc. 54 (2022), no. 3, 1051-1066.

A.-S. Kaloghiros, A. Petracci, *On toric geometry and  $K$ -stability of Fano varieties*, Transactions of the American Mathematical Society, Series B (2021), Volume 8, 548-577.

A. Corti, M. Filip, A. Petracci, *Mirror Symmetry and smoothing Gorenstein toric affine 3-folds*, In: Facets of Algebraic Geometry: A Collection in Honor of William Fulton’s 80th Birthday (2022), London Mathematical Society Lecture Note Series, pp. 132-163, Cambridge University Press.

A. Petracci, *On deformations of toric Fano varieties*, In: A.M. Kasprzyk, B. Nill (eds), Interactions with Lattice Polytopes, Springer Proceedings in Mathematics & Statistics, vol 386, pp. 287-314, Springer.

A. Petracci, *An example of Mirror Symmetry for Fano threefolds*, Birational Geometry and Moduli Spaces (2020), Springer, pp. 173-188.

A. Petracci, *Some examples of non-smoothable Gorenstein Fano toric threefolds*, Mathematische Zeitschrift (2020), no. 295, 751-760.

A. Petracci, *Homogeneous deformations of toric pairs*, Manuscripta Mathematica (2021), no. 166, 37-72.

A. Oneto, A. Petracci, *On the quantum periods of del Pezzo surfaces with  $\frac{1}{3}(1, 1)$*

*singularities*, Adv. Geom. 18 (2018), no. 3, 303-336.

M. Akhtar, T. Coates, A. Corti, L. Heuberger, A. Kasprzyk, A. Oneto, A. Petracci, T. Prince, K. Tveiten, *Mirror Symmetry and the Classification of Orbifold del Pezzo Surfaces*, Proc. Amer. Math. Soc. 144 (2016), no. 2, 513-527.

ACCEPTED PAPERS S. Felten, A. Petracci, S. Robins, *Deformations of log Calabi–Yau pairs can be obstructed*, preprint arXiv:2109.00420, to appear in Math. Res. Lett.

PREPRINTS A. Corti, P. Hacking, A. Petracci, *Smoothing toric Fano 3-folds*, in preparation.

L. Heuberger, A. Petracci, *On  $K$ -moduli of Fano threefolds with degree 28 and Picard rank 4*, preprint arXiv:2303.12562

A. Grassi, G. Gugiatti, W. Lutz, A. Petracci, *Reflexive polygons and rational elliptic surfaces*, preprint arXiv:2302.05751

H. Abban, I. Cheltsov, A. Kasprzyk, Y. Liu, A. Petracci, *On  $K$ -moduli of quartic threefolds*, preprint arXiv:2210.14781

A. Petracci,  *$K$ -moduli of Fano 3-folds can have embedded points*, preprint arXiv:2105.02307

A. Petracci, *A 1-dimensional component of  $K$ -moduli of del Pezzo surfaces*, preprint arXiv:2102.13510

COLLOQUIA Algebra, Geometry and Combinatorics colloquium May 2021  
McMaster University, Canada — online

Geometry and TACoS April 2021  
University of Florence — online  
<https://youtu.be/bQx4ohtn1oQ>

MINICOURSES Minicourse “Toric geometry, deformation theory and applications to  $K$ -moduli of Fano varieties”, 4 hours and 30 minutes, in the SinG School in Geometry “ $K$ -stability of Fano varieties and birational invariants”, Trento (Italy), January 2023

INVITED TALKS AT CONFERENCES “Explicit moduli problems in higher dimensions” workshop March 2023  
BIRS, Banff, Canada

Edge days 2022 workshop November 2022  
“Birational Geometry and  $K$ -stability of Fano Varieties”  
Edinburgh, UK

“Toric degenerations and Mirror Symmetry” workshop October 2022  
Kumamoto, Japan

Conference “Group actions in algebraic geometry” July 2022  
Cetraro, Italy

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| Symplectic versus algebraic geometry workshop<br>University of Warwick, UK and online  | May 2022       |
| Workshop “Toric Geometry”<br>Oberwolfach, Germany  | March 2022     |
| EDGE workshop “Explicit K-stability and moduli problems”<br>Edinburgh, UK  | November 2021  |
| Newton–Okounkov bodies and Fanosearch workshop<br>Levico Terme, Italy  | October 2021   |
| EDGE workshop “Explicit K-stability and moduli problems”<br>Edinburgh, UK — online   | December 2020  |
| Workshop “Toric Fano Varieties and Beyond”<br>Palermo, Italy — online  | December 2020  |
| 3CinG Workshop 2020 “Algebraic and tropical geometry”<br>London, UK — online   | September 2020 |
| Workshop “Superpotentials in Algebra and Geometry”<br>Oberwolfach, Germany   | February 2020  |
| North German Algebraic Geometry Seminar<br>Leibniz Universität Hannover  | January 2020   |
| Einstein Workshop on Polytopes and Algebraic Geometry<br>Freie Universität Berlin  | December 2019  |
| Workshop “Toric Geometry”<br>Oberwolfach, Germany  | September 2019 |
| Workshop “Mutations: Mirror Symmetry, Deformations”<br>BIRS, Banff, Canada   | August 2019    |
| Workshop “Del Pezzo surfaces and Fano varieties”<br>Universität Düsseldorf   | July 2019      |
| Workshop “Young perspectives in deformation theory”<br>Università di Torino  | November 2018  |
| Conference “Giornate di Geometria Algebrica e argomenti correlati”<br>Università di Genova   | June 2018      |
| Workshop on moduli spaces of curves and mirror symmetry<br>Institut Mittag-Leffler, Stockholm<br><i>Mirror Symmetry and Fano varieties</i> | March 2018     |
| Mirror Symmetry and applications conference<br>Higher School of Economics, Moscow  | December 2017  |

*Quantum periods of orbifold del Pezzo surfaces*

Experimental Classification of Fano varieties workshop August 2017  
Universität Tübingen, Germany

*Quantum periods of orbifold del Pezzo surfaces and Mirror Symmetry*

Higher dimensional birational geometry workshop July 2017  
University of Warwick

*Deformations of toric singularities via Mirror Symmetry*

Postgraduate Conference in Complex Geometry September 2015  
University of Cambridge

*Mirror Symmetry of del Pezzo surfaces*

University of Cambridge, CALF Seminar December 2014  
*On the quantum periods of del Pezzo surfaces*

Summer School in Gromov–Witten Theory 2014 July 2014  
Pingree Park, Colorado (US)

*Quantum periods of del Pezzo surfaces with  $\frac{1}{3}(1, 1)$  singularities*

INVITED TALKS  
AT SEMINARS

Arithmetic and Algebraic Geometry seminar May 2023  
University of Amsterdam, Netherlands

Algebraic geometry seminar November 2022  
Center for Complex Geometry, Institute for Basic Sciences, Korea – online

Geometry seminar November 2022  
Università di Firenze, Italy

Algebraic geometry seminar November 2022  
Università di Roma Tor Vergata, Italy

Algebraic geometry seminar May 2022  
Università di Torino, Italy

Algebraic and Arithmetic Geometry Seminar February 2022  
Scuola Normale Superiore di Pisa, Italy

Geometry Seminar January 2022  
Università di Ferrara, Italy

Algebra and geometry seminar November 2021  
Università di Bologna, Italy

Algebraic geometry seminar October 2021  
École Polytechnique Fédérale de Lausanne, Switzerland

Algebraic geometry seminar July 2021  
Princeton University, US — online

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| Algebraic geometry seminar<br>University of Milan, Italy — online  | June 2021     |
| Algebra and Geometry seminar<br>Frankfurt, Germany — online  | May 2021      |
| Iskovskikh Seminar, Steklov Mathematical Institute<br>Moscow, Russia — online  | April 2021    |
| Algebra and Geometry seminar, University of Trieste<br>Trieste, Italy — online   | February 2021 |
| Online Algebraic Geometry Seminar<br>Nottingham, UK — online   | August 2020   |
| Séminaire d'algèbre et géométrie<br>Université de Versailles   | March 2019    |
| Università di Torino, Seminario di Geometria   | May 2018      |
| Seminar Algebraische Geometrie<br>Freie Universität Berlin<br><i>Mirror Symmetry, Fano varieties and deformations of toric varieties</i>   | April 2018    |
| EDGE Seminar<br>University of Edinburgh<br><i>Deformations of toric singularities and Mirror Symmetry</i>                                  | November 2017 |
| IMPA, Algebra seminar<br>Rio de Janeiro, Brazil<br><i>Deformations of toric Gorenstein singularities</i>                                   | February 2017 |
| Imperial College London, Junior Geometry Seminar<br><i>Toric stacks</i>  | January 2017  |
| Imperial College London, Junior Geometry Seminar<br><i>Elliptic curves</i>   | October 2015  |
| KTH & University of Stockholm, Algebra and Geometry Seminar<br><i>On the quantum cohomology of a particular type of Del Pezzo surfaces</i> | June 2014     |
| Imperial College London, Junior Geometry Seminar<br><i>An introduction to moduli of curves and algebraic stacks</i>                        | March 2014    |
| University of Pisa, Seminario di Geometria<br><i>The fundamental quandle of a knot</i>   | February 2012 |

#### TEACHING

at the University of Bologna

- Spring 2023: exercise classes of *Geometria 2* (topology for 2nd year students)

in maths, 1h per week, in total 12h, the main instructor is Giovanni Mon-  
gardi);

lectures (main instructor) of *Teoria degli schemi* (scheme theory for mas-  
ter students in maths, 4h per week, in total 48h, <https://www.dm.unibo.it/~andrea.petracci3/2023Schemi/>)

- Spring 2022: exercise classes of *Geometria 2* (topology for 2nd year students in maths, 1h per week, in total 12h, the main instructor was Giovanni Mon-  
gardi);  
lectures (main instructor) of *Teoria degli schemi* (scheme theory for mas-  
ter students in maths, 4h per week, in total 48h, <https://www.dm.unibo.it/~andrea.petracci3/2022Schemi/>)
- Autumn 2021: some lectures of *Geometria e Algebra* (linear algebra for 1st  
year mechanical engineers, in total 19h, the main instructor was Stefano  
Francaviglia, [link](#))

at Freie Universität Berlin

- Summer Semester 2021: exercise classes of *Algebra II* (algebraic geometry for  
master students, 2h per week, the main instructor was Alexander Schmitt);  
seminar on algebraic surfaces (for master students, 2h per week, [https://  
www.dm.unibo.it/~andrea.petracci3/2021ForschungsmodulAlgebra/](https://www.dm.unibo.it/~andrea.petracci3/2021ForschungsmodulAlgebra/))
- Winter Semester 2020/21: lab course in *Computer Algebra* for undergradu-  
ates in maths (intensive class about implementing Berlekamp algorithm and  
Gröbner bases on computer algebra software, taught together with Karin  
Schaller, [link](#))
- Summer Semester 2020: lectures (main instructor) and exercise classes of  
*Funktionentheorie* (complex analysis in one variable, for undergraduates in  
maths, 6h per week, the teaching was done online and what I wrote during  
the lectures can be found at [https://www.dm.unibo.it/~andrea.petracci3/  
2020Complex/](https://www.dm.unibo.it/~andrea.petracci3/2020Complex/))
- Winter Semester 2019/20: lab course in *Computer Algebra* for undergradu-  
ates in maths (intensive class about implementing Berlekamp algorithm and  
Gröbner bases on computer algebra software, taught together with Alexan-  
dru Constantinescu)
- Summer Semester 2019: lectures (main instructor) and exercise classes of  
*Funktionentheorie* (complex analysis in one variable, for undergraduates in  
maths, 6h per week, [link](#))
- Winter Semester 2018/19: exercise classes of *Algebra I* (commutative algebra  
for master students, 4h per week, the main instructor was Klaus Altmann)

at Imperial College London

- In the academic year 2016/2017 I was a teaching assistant for the under-  
graduate courses *Real analysis* and *Metric spaces and Topology*
- In the academic year 2015/2016 I was a teaching assistant for the under-  
graduate course *Foundations of mathematical analysis*
- In the academic year 2014/2015 I was a teaching assistant for the under-  
graduate courses *Foundations of mathematical analysis* and *Algebraic topo-  
logy*

- In May 2014 I taught revision classes for the undergraduate courses linear algebra, real analysis, fundamentals of analysis.

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| STUDENT SUPERVISION   | At Freie Universität Berlin I co-supervised (together with Victoria Hoskins) the BSc thesis by Michael Mavroskoufis during the Summer Semester 2019 |                            |
| PROFESSIONAL SERVICE  | Referee for some international journals: <i>Compositio Mathematica</i> , <i>European Journal of Mathematics</i>                                     |                            |
|                       | Reviewer for <i>Mathscinet</i> and <i>zbMATH</i> .  |                            |
| ORGANISING ACTIVITIES | In October 2019 I co-organised the opening conference of the Einstein semester on Algebraic Geometry in Berlin                                      |                            |
|                       | In July 2018 I co-organised <i>Cluster algebras and algebraic geometry</i> workshop at the University of Nottingham                                 |                            |
|                       | In the academic year 2014/2015 I co-organised the <i>Junior Geometry Seminar</i> at Imperial College London.  |                            |
|                       | In April 2014 I co-organised <i>Traumatic Workshop: Birational Geometry and Fano Varieties</i> at Imperial College London.                          |                            |
| COMPUTER SKILLS       | I can use the following computer algebra softwares: MAGMA, Macaulay2, Singular  |                            |
| LANGUAGE SKILLS       | Italian (mother tongue), English (fluent), German (B2)  |                            |
| REFERENCES            | Alessio Corti (Imperial College London)   | a.corti@imperial.ac.uk     |
|                       | Klaus Altmann (Freie Universität Berlin)  | kaltmann@math.fu-berlin.de |
|                       | Antonella Grassi (Università di Bologna)  | antonella.grassi3@unibo.it |
|                       | Luca Migliorini (Università di Bologna)   | luca.migliorini@unibo.it   |
|                       | Richard Thomas (Imperial College London)  | rpwt@ic.ac.uk              |
|                       | Mark Gross (University of Cambridge)  | M.Gross@dpmms.cam.ac.uk    |

Bologna, 23rd March 2023

Andrea Petracchi