

Francesca Balestrieri

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Nationality: Italian

EMPLOYMENT

- **Assistant Professor, The American University of Paris** 2020–
- **Marie Curie Fellow, IST Austria** 2019–2020
Mentor: Prof Tim Browning
- **Post-Doc Fellow, Max-Planck-Institut für Mathematik** 2017–2019
Mentor: Prof Yuri I Manin
- **Stipendiary Lecturer in Pure Mathematics, Pembroke College, University of Oxford** 2016–2017
- **Freelance Editor, Oxford University Press** 2015–2016

EDUCATION

- **Artificial Intelligence Professional Program, Stanford University** 2020–2022
Courses taken: XCS229i Machine Learning; XCS221 Artificial Intelligence: Principles and Techniques; XCS234 Reinforcement Learning; XCS224N: Natural Language Processing with Deep Learning.
- **Laurea Magistrale in Scienze Filosofiche, Università Ca' Foscari** 2018–2020
Result: 110/110 cum laude
Supervisor: Prof Cecilia Rofena
- **DPhil in Arithmetic Geometry, University of Oxford** 2013–2017
Research Interests: Number Theory, Arithmetic Geometry
Supervisor: Prof E Victor Flynn
- **MSc Mathematics and the Foundations of Computer Science, University of Oxford** 2012–2013
Result: Distinction
- **BA (Hons) Mathematical Tripos, University of Cambridge** 2009–2012
(Upgraded to MA in 2016)
Result: Class I (each year)

ACADEMIC VISITS

- **Institut Henri Poincaré, Paris, France** Apr–Jul 2019
Participating in the thematic trimester *À la redécouverte des points rationnels*
- **Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany** Dec 2018
Collaborating with Prof Valentijn Karemaker
- **University of Washington, Seattle, USA** Sep–Dec 2015
Visiting Prof Bianca Viray

MATHEMATICAL PREPRINTS AND PUBLISHED ARTICLES

- **Degrees of closed points on hypersurfaces**
Mathematische Nachrichten, 297 (2024), no. 5, 1831–1837.
- **Campana points on diagonal hypersurfaces**
(with J. Brandes, M. Kaesberg, J. Ortman, M. Pieropan, R. Winter)
To appear in *WINE IV: Research Directions in Number Theory*.
- **Descent and étale-Brauer obstructions for 0-cycles**
(with J. Berg)
International Mathematics Research Notices, 2024 (2024) no. 16, pp. 11712–11748.
- **First-order theory of a field and its Inverse Galois Problem**
(with J. Park, A. Shlapentokh)
Preprint, 2022.
- **Explicit uniform bounds for Brauer groups of singular K3 surfaces**
(with A. Johnson, R. Newton)
Annales de l'Institut Fourier, 73 (2023) no. 2, pp. 567–607.
- **Average Bateman-Horn for Kummer polynomials**
(with N. Rome)
Acta Arithmetica, 207 (2023), 315–350.

- **Some remarks on strong approximation and applications to homogeneous spaces of linear algebraic groups**
Proceedings of the AMS, 151 (2023), 907–914.
- **Arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces**
(with R. Newton)
International Mathematics Research Notices, 2021 no. 6 (2021), 4255–4279.
- **Brauer-Manin obstruction and families of generalised Châtelet surfaces over number fields**
International Journal of Number Theory, 15 no. 2 (2019), 289–308.
- **Elliptic fibrations on covers of the elliptic modular surface of level 5**
(with J. Desjardins, A. Garbagnati, C. Maistret, C. Salgado)
WINE II: Contributions to Number Theory and Arithmetic Geometry, AWM Springer Series 11 (2018), 159–197.
- **Iterating the algebraic étale-Brauer set**
Journal of Number Theory, 182 (2018), 284–295
- **Obstruction sets and extensions of groups**
Acta Arithmetica, 173 (2016), 151–181.
- **Insufficiency of the Brauer-Manin obstruction for rational points on Enriques surfaces**
(with J. Berg, M. Manes, J. Park, B. Viray)
Directions in Number Theory: Proceedings of the 2014 WIN3 Workshop, AWM Springer Series 3 (2016), 1–32.

BOOKS

- F. Balestrieri, L. Balestrieri, **Tecnologie dell’Impero** (2024) Luiss University Press.
- F. Balestrieri, L. Balestrieri, **Guerra Digitale** (2019) Luiss University Press.

FELLOWSHIPS, SCHOLARSHIPS, AND PRIZES

- | | |
|---|----------------|
| • Junior Fellowship , Institut Mittag-Leffler (Declined) | Mar – Apr 2021 |
| • Marie Skłodowska-Curie Actions Individual Fellowship , European Commission (€174000) | 2019–2021 |
| • IST Plus Fellowship , IST Austria (Declined) | 2019–2021 |
| • Post-Doctoral Fellowship , Max-Planck-Institut für Mathematik | 2017–2019 |
| • EPSRC Studentship, fees & maintenance , Mathematical Institute, University of Oxford | 2013–2017 |
| • Jex-Blake Scholarship , LMH, University of Oxford | 2013–2014 |
| • Academic Development Grant (Ginsberg Fund) , LMH, University of Oxford | 2013 |
| • Anne Jemima Clough Prize , Newnham College, University of Cambridge | 2012 |
| • Chadburn Third-Year Scholarship , Newnham College, University of Cambridge | 2011–2012 |
| • Marjorie Stewart Tunnicliffe Prize , Newnham College, University of Cambridge | 2011 |
| • Anne Jemima Clough Prize , Newnham College, University of Cambridge | 2011 |
| • Mathilde Blind Second-Year Scholarship , Newnham College, University of Cambridge | 2010–2011 |
| • Jane Dora Archibald Prize , Newnham College, University of Cambridge | 2010 |

TEACHING (THE AMERICAN UNIVERSITY OF PARIS)

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|---|-------------|
| • CS/MA3050 Research and Writing in CS and Mathematics , Lecturer. | Fall 2024 |
| • MA2041 Linear Algebra , Lecturer. | Fall 2024 |
| • MA1030 Calculus I , Lecturer. | Fall 2024 |
| • DS/MA1020 Applied Statistics I , Lecturer. | Spring 2024 |
| • MA1030 Calculus I , Lecturer. | Spring 2024 |
| • CS/MA3050 Research and Writing in CS and Mathematics , Lecturer. | Fall 2023 |
| • MA3005 Probability , Lecturer. | Fall 2023 |
| • MA2041 Linear Algebra , Lecturer. | Fall 2023 |
| • MA1005 Math for Life , Lecturer. | Summer 2023 |
| • MA1020 Applied Statistics I , Lecturer. | Summer 2023 |
| • MA2041 Linear Algebra , Lecturer. | Fall 2022 |
| • MA1030 Calculus I , Lecturer. | Fall 2022 |
| • Directed Studies in Linear Algebra , Lecturer. | Spring 2022 |
| • MA1020 Applied Statistics I , Lecturer. | Spring 2022 |
| • MA1030 Calculus I , Lecturer. | Spring 2022 |
| • MA3005 Probability , Lecturer. | Fall 2021 |
| • MA1099 Mathematics as structure and its limits , Lecturer. | Fall 2021 |
| • MA1020 Applied Statistics I , Lecturer. | Spring 2021 |
| • MA1030 Calculus I , Lecturer. | Spring 2021 |

- MA1005 Math for Life, Lecturer. Fall 2020
- MA1020 Applied Statistics I, Lecturer. Fall 2020

TEACHING (UNIVERSITY OF OXFORD)

- Stipendiary Lectureship, Pembroke College. 2016–2017
- M1 Groups and group actions. First year course. Trinity Term 2017
- A.SO Group Theory. Second year course. Trinity Term 2017
- A4 Integration. Second year course. Hilary Term 2017
- M1 Groups and group actions. First year course. Hilary Term 2017
- M2 Analysis II: Continuity and Differentiability. First year course. Hilary Term 2017
- A0 Linear Algebra. Second year course. Michaelmas Term 2016
- A2 Metric Spaces and Complex Analysis. Second year course. Michaelmas Term 2016
- M2 Analysis I: Sequences and Series. First year course. Michaelmas Term 2016
- A.SO Graph Theory, Tutor for New College. Second year course. Trinity Term 2016
- C2.6 Introduction to Schemes, Consultation Sessions Tutor. Trinity Term 2016
- C2.6 Introduction to Schemes, Class Tutor. Fourth year/graduate course. Hilary Term 2016
- A.SO Graph Theory, Tutor for New College. Second year course. Trinity Term 2015
- B3.4 Algebraic Number Theory, Consultation Sessions Tutor. Trinity Term 2015
- C3.7 Elliptic Curves, Consultation Sessions Tutor (2 Sets). Trinity Term 2015
- B3.4 Algebraic Number Theory, Class Tutor. Third year course. Hilary Term 2015
- C3.7 Elliptic Curves, Class Tutor (2 Sets). Fourth year/graduate course. Hilary Term 2015
- C3.4 Algebraic Geometry, Class Tutor. Fourth year/graduate course. Michaelmas Term 2014
- B3.1 Galois Theory, TA (2 sets). Third year course. Michaelmas Term 2014
- B9b Algebraic Number Theory, TA. Third year course. Hilary Term 2014
- C9.1b Elliptic Curves, TA. Fourth year/graduate course. Hilary Term 2014
- C9.2a Analytic Number Theory, TA. Fourth year/graduate course. Michaelmas Term 2013

TEACHING (UNIVERSITY OF WASHINGTON)

- Algebraic Number Theory, 2 lectures (substituting Prof Viray). Graduate course. Fall Quarter 2015

UNDERGRADUATE STUDENTS SUPERVISED (THE AMERICAN UNIVERSITY OF PARIS)

- Quin Kepler, *A computational language sentiment analysis* 2024
- Angelina Zagaynova, *Counting 2×2 matrices with trace m modulo ℓ* 2023
- Gideon Vicini, *Ramsey theory and cycles* 2022

COMMITTEES AND SERVICE

- Member of the hiring committee for an *Assistant Professor* position, The American University of Paris. 2022–2023
- Teaching and Learning Centre Fellow, The American University of Paris. 2021–
- Reviewer for the Mathematical Reviews of the AMS. 2017–
- Peer-reviewer for *Tunisian Journal of Mathematics, Advances in Mathematics, Compositio Mathematica, Transactions of the AMS, IMRN, Journal of Number Theory, Acta Arithmetica, Manuscripta Mathematica, Research in Number Theory.* 2017–
- Organiser of the Junior Number Theory seminar, University of Oxford. 2015–2016
- Undergraduate admissions interviewer at New College, University of Oxford. Michaelmas Term 2014
- Organiser of the Young Researchers in Mathematics 2015 conference, University of Oxford. 2013–2015
- Undergraduate admissions interviewer at New College, University of Oxford. Michaelmas Term 2013
- Facilitator for the Good Practices Steering Group, Mathematical Institute, University of Oxford. 2013–2017

INVITED TALKS

- *Descent and étale-Brauer obstructions for 0-cycles* 10 Mar 2023
Séminaire “Variétés Rationnelles”, Sorbonne Université, Paris, France.
- *Descent and étale-Brauer obstructions for 0-cycles* 8 Feb 2023
Symposium on Arithmetic Geometry and its Applications, CIRM, Luminy, France.
- *Descent and étale-Brauer obstructions for 0-cycles* 2 Feb 2022
Number Theory Seminar, University of Groningen, The Netherlands. (Online)
- *Uniform bounds and effectivity results for singular K3 surfaces* 26 Apr 2021
Mittag-Leffler Seminar, KTH Royal Institute of Technology, Sweden. (Online)

- *The arithmetic of zero-cycles on products of K3 surfaces and Kummer varieties* 9 Mar 2021
VaNTAGe Math Seminar (Online)
- *Strong approximation for homogeneous spaces of linear algebraic groups* 25 Feb 2021
WORKing Seminar (Online)
- *Strong approximation for homogeneous spaces of linear algebraic groups* 26 Oct 2020
Number Theory Seminar, University of Warwick, UK. (Online)
- *Strong approximation for homogeneous spaces of linear algebraic groups* 2 Oct 2020
Séminaire Théorie des Nombres, Institut de Mathématiques de Bordeaux, France. (Online)
- *On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces* 20 Nov 2019
Algebra and Geometry seminar, KTH Royal Institute of Technology, Sweden.
- *On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces* 25 Apr 2019
“Reinventing rational points” seminar, Institut Henri Poincaré, France.
- *On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces* 23 Apr 2019
Dutch Mathematical Congress 2019, Veldhoven, Netherlands.
- *On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces* 5 Apr 2019
Number Theory Seminar, University of Pennsylvania, USA.
- *On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces* 15 Mar 2019
Intercity Number Theory Seminar, Utrecht University, Netherlands.
- *On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces* 14 Nov 2018
Groups, Arithmetic and Algebraic Geometry Seminar, EPFL, Switzerland.
- *On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces* 18 Sep 2018
Number Theory Seminar, IST Austria, Austria.
- *On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces* 4 Sep 2018
CAMS/MATH Seminar, American University of Beirut, Lebanon.
- *On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces* 2 Jul 2018
Rational Points on Schiermonnikoog, Netherlands.
- *Arithmetic of rational points and 0-cycles of degree 1 on Kummer varieties* 28 Mar 2018
Number Theory Lunch Seminar, Max-Planck-Institut für Mathematik, Bonn, Germany.
- *Categorie: un cambiamento di paradigma in matematica* (in Italian) 7 Dec 2017
Seminario di Logica, Università Ca’ Foscari, Venice, Italy.
- *Studying arithmetic properties of rational points on varieties* 26 Oct 2017
MPI-Oberseminar, Max-Planck-Institut für Mathematik, Bonn, Germany.
- *Iterating the algebraic étale-Brauer obstruction* 19 May 2017
Number Theory Seminar, University of Cambridge, UK.
- *When do rational points on varieties exist?* 15 Mar 2017
Pure Mathematics Seminar, University of Reading, UK.
- *Iterating the algebraic étale-Brauer obstruction* 17 Feb 2017
RTG Lectures in Arithmetic Geometry at Rice, Rice University, Houston, USA.
- *Iterare l’insieme di étale-Brauer algebrico* (in Italian) 22 Dec 2016
Algebraic Geometry and Representation Theory in Rome, Università Sapienza, Rome, Italy.
- *Iterating the algebraic étale-Brauer obstruction* 27 Oct 2016
Number Theory Seminar, University of Manchester, UK.
- *Iterating the algebraic étale-Brauer obstruction* 12 Oct 2016
Linfoot seminar, Bristol University, UK.
- *Obstructions to the existence of rational points on Enriques surfaces* 13 Jun 2016
GAeL XXIV, Nesin Mathematics Village, Turkey.
- *Iterating the algebraic étale-Brauer obstruction* 23 May 2016
Leibniz Universität Hannover, Hannover, Germany.
- *Modular methods for Diophantine equations* 25 Apr 2016
Junior Number Theory seminar, University of Oxford, UK.
- *Iterating the algebraic étale-Brauer obstruction* 25 Jan 2016
Junior Number Theory seminar, University of Oxford, UK.
- *Iterating the algebraic étale-Brauer obstruction* 17 Nov 2015
AGNT Seminar, Rice University, Houston, USA.
- *Belyi’s Theorem* 12 Nov 2015
Dessins d’enfants seminar, University of Washington, Seattle, USA.
- *Iterating the algebraic étale-Brauer obstruction* 10 Nov 2015
UW Number Theory Seminar, University of Washington, Seattle, USA.
- *Obstructions: a dictionary* 19 Aug 2015

- Young Researchers in Mathematics 2015, University of Oxford, UK. 13 Apr 2015
- *Insufficiency of the Brauer-Manin obstruction for Enriques surfaces*
TCC Number Theory day, Imperial College, London, UK. 10 Apr 2015
- *Insuffisance de l'obstruction de Brauer-Manin pour les surfaces d'Enriques* (in French)
Séminaire "Variétés Rationnelles", Institut Henri Poincaré, Paris, France. 9 Feb 2015
- *Obstruction sets and extensions of groups*
Junior Number Theory seminar, University of Oxford, UK. 24 Nov 2014
- *Ranks of elliptic curves*
Junior Number Theory seminar, University of Oxford, UK. 2 Jul 2014
- *Obstructions!*
Young Researchers in Mathematics 2014, University of Warwick, UK. 25 Nov 2013
- *Obstructions to the Hasse principle*
Junior Number Theory seminar, University of Oxford, UK.

CONFERENCES AND WORKSHOPS

- **SAGA Symposium on Arithmetic Geometry and its Applications** 6–10 Feb 2023
CIRM, Luminy, France.
- **Women in Numbers Europe 4** 29 Aug–2 Sep 2022
University of Utrecht, Utrecht, Netherlands.
- **Arithmetic Statistics and Local-Global Principles** 20–24 Sep 2021
Erwin Schrödinger International Institute for Mathematics and Physics, Vienna, Austria.
- **Rational Points 2019** 14–20 Jul 2019
Franken-Akademie Schloss Schney, Schney, Germany.
- **Dutch Mathematical Congress** 23–24 Apr 2019
Veldhoven, Netherlands.
- **À la redécouverte des points rationnels** 15 Apr–12 Jul 2019
Institut Henri Poincaré, Paris, France.
- **Rational Points on Schiermonnikoog** 2–6 Jul 2018
Schiermonnikoog, Netherlands.
- **XIV Giornate di Geometria Algebrica ed Argomenti Correlati** 29 May–1 Jun 2018
Università di Genova, Genova, Italy.
- **Rational Points 2017** 2–8 Jul 2017
Franken-Akademie Schloss Schney, Schney, Germany.
- **RTG Lectures in Arithmetic Geometry at Rice** 17–19 Feb 2017
Rice University, Houston, USA.
- **Algebraic Geometry and Representation Theory in Rome** 22 Dec 2016
Università Sapienza, Rome, Italy.
- **Women In Numbers Europe 2** 25–30 Sep 2016
Lorentz Center, Leiden, Netherlands.
- **GAeL XXIV** 13–17 Jun 2016
Nesin Mathematics Village, Turkey.
- **Fundamental groups in Arithmetic Geometry** 26 May–3 Jun 2016
Institut Henri Poincaré, Paris, France.
- **Explicit Methods in Number Theory (in honour of John Cremona's 60th Birthday)** 4–8 Apr 2016
University of Warwick, UK.
- **Sage Days 71: Explicit p-adic methods in number theory** 20–24 Mar 2016
University of Oxford, UK.
- **Oxford Cryptography Day** 17 Mar 2016
University of Oxford, UK.
- **Western Algebraic Geometry Symposium** 17–18 Oct 2015
University of Washington, Seattle, USA.
- **LMS-CMI summer school on Diophantine Equations** 15–19 Sep 2015
Wales, UK.
- **Young Researchers in Mathematics 2015** 17–20 Aug 2015
University of Oxford, UK.
- **Rational Points 2015** 28 Jun–5 Jul 2015
Franken-Akademie Schloss Schney, Schney, Germany.
- **Rational Points/ Pontos Racionais** 25–29 May 2015
IMPA, Rio de Janeiro, Brazil.

- **Elliptic Curves, Modular Forms and Iwasawa Theory** 25–27 Mar 2015
In honour of J Coates' 70th Birthday, University of Cambridge, UK.
- **Arizona Winter School 2015: Arithmetic and Higher-Dimensional Varieties** 14–18 Mar 2015
The Southwest Center for Arithmetic Geometry, University of Arizona, USA.
- **Algebraic Geometry and Representation Theory in Rome** 18–19 Dec 2014
Università Roma 3, Rome, Italy.
- **Comptage d'objets arithmétiques (rangs des courbes elliptiques)** 10–14 Nov 2014
CRM, Université de Montréal, Canada.
- **Analytic Number Theory** 29 Sep – 3 Oct 2014
Clay Research Conference and Workshops, University of Oxford, UK.
- **Bounded Gaps Between Primes** 22–26 Sep 2014
LMS-CMI Research School, University of Oxford, UK.
- **Arithmetic of Hyperelliptic Curves** 25 Aug – 5 Sep 2014
NATO Advanced Study Institute, Ohrid, FYROM.
- **Young Researchers in Mathematics 2014** 30 Jun – 3 Jul 2014
University of Warwick, UK.
- **Women in Numbers 3** 20–25 Apr 2014
Banff International Research Station, Canada.
- **Model theory and its interactions with NT and arithmetic geometry** 10–11 Feb 2014
MSRI, University of California, Berkeley, USA.
- **Introductory Workshop: Model Theory, Arithmetic Geometry and NT** 3–7 Feb 2014
MSRI, University of California, Berkeley, USA.
- **Number Theory and Physics** 29 Sep – 4 Oct 2013
Clay Research Conference and Workshops, University of Oxford, UK.
- **Rational Points - Geometric, Analytic and Explicit Approaches** 27–31 May 2013
EPSRC Warwick Number Theory Symposium, University of Warwick, UK.
- **Women in Mathematics** 18–19 Apr 2013
Organised by the LMS. Newton Institute, University of Cambridge, UK.
- **Foundations of Mathematics: What are they and what are they for?** 10–12 Jul 2012
Department of Philosophy, University of Cambridge, UK.

MACHINE LEARNING/DEEP LEARNING PROJECTS AND EXPERIENCES

- **Erdős Institute Data Science Boot Camp** May–June 2024
 - Worked with a team on a DL model whose objective was to guess the location of a given photo, exploiting country-specific human-made features when available. (The project was in the top 5 of all the boot camp projects.)
 - Github repo of the project: <https://github.com/hochfilzer/geo-locator>.
- **Erdős Institute Deep Learning Boot Camp** July–August 2024
 - Worked with Zack Bezemek on a nearly-live one-shot speech editing model, improving some of the state-of-the-art DL models available. (The project came 1st among all the boot camp projects.)
 - Github repo of the project: <https://github.com/bezemekz/RivusVoxEditor>
- **NewAtlantis Labs** July–August 2024
 - Under the mentorship of NewAtlantis Labs, worked with a team on predictive models for chlorophyll density in shallow waters from biogeochemical factors using ML and DL techniques.
 - Github repo of the project: <https://github.com/ingridasemenec/wonderpusoctopus>

IT SKILLS

- **Programming languages:** Python, C#, JavaScript
- **General softwares:** MS Office, L^AT_EX, Photoshop
- **Mathematical softwares:** MAGMA, Matlab, SageMath

LANGUAGES

- **Italian:** Native speaker
- **English:** Fluent
- **French:** Fluent
- **Modern Standard Arabic:** Intermediate