

# FRANCESCA BALESTRIERI, MA (CANTAB), MSc (OXON), DPhil (OXON)

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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
- **DPhil in Number Theory, 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 Dr Valentijn Karemaker
- **American University of Beirut, Beirut, Lebanon** Sep 2018  
Visiting Prof Kamal Khuri-Makdisi
- **University of Washington, Seattle, USA** Sep–Dec 2015  
Visiting Prof Bianca Viray

## PREPRINTS AND PUBLISHED ARTICLES

- **Descent and étale-Brauer obstructions for 0-cycles**  
(with J. Berg)  
Submitted, 2022.
- **First-order theory of a field and its Inverse Galois Problem**  
(with J. Park, A. Shlapentokh)  
Submitted, 2022.
- **Explicit uniform bounds for Brauer groups of singular K3 surfaces**  
(with A. Johnson, R. Newton)  
*Annales de l'Institut Fourier*, Online first, 41 pages.
- **Average Bateman-Horn for Kummer polynomials**  
(with N. Rome)  
Submitted, 2022.
- **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, **Guerra Digitale** (2019) Luiss University Press. (In Italian.)

## FELLOWSHIPS, SCHOLARSHIPS, AND PRIZES

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

## TEACHING (THE AMERICAN UNIVERSITY OF PARIS)

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|---|-------------|
| • <b>MA2041 Linear Algebra</b> , Lecturer.                          | Fall 2022   |
| • <b>MA1030 Calculus I</b> , Lecturer.                              | Fall 2022   |
| • <b>Directed Studies in Linear Algebra</b> , Lecturer.             | Spring 2022 |
| • <b>MA1020 Applied Statistics I</b> , Lecturer.                    | Spring 2022 |
| • <b>MA1030 Calculus I</b> , Lecturer.                              | Spring 2022 |
| • <b>MA3005 Probability</b> , Lecturer.                             | Fall 2021   |
| • <b>MA1099 Mathematics as structure and its limits</b> , Lecturer. | Fall 2021   |
| • <b>MA1020 Applied Statistics I</b> , Lecturer.                    | Spring 2021 |
| • <b>MA1030 Calculus I</b> , Lecturer.                              | Spring 2021 |
| • <b>MA1005 Math for Life</b> , Lecturer.                           | Fall 2020   |
| • <b>MA1020 Applied Statistics I</b> , Lecturer.                    | Fall 2020   |

## TEACHING (UNIVERSITY OF OXFORD)

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|---|----------------------|
| • <b>Stipendiary Lectureship</b> , Pembroke College.                              | 2016–2017            |
| <b>M1 Groups and group actions</b> . First year course.                           | Trinity Term 2017    |
| <b>A.S.O Group Theory</b> . Second year course.                                   | Trinity Term 2017    |
| <b>A4 Integration</b> . Second year course.                                       | Hilary Term 2017     |
| <b>M1 Groups and group actions</b> . First year course.                           | Hilary Term 2017     |
| <b>M2 Analysis II: Continuity and Differentiability</b> . First year course.      | Hilary Term 2017     |
| <b>A0 Linear Algebra</b> . Second year course.                                    | Michaelmas Term 2016 |
| <b>A2 Metric Spaces and Complex Analysis</b> . Second year course.                | Michaelmas Term 2016 |
| <b>M2 Analysis I: Sequences and Series</b> . First year course.                   | Michaelmas Term 2016 |
| • <b>A.S.O Graph Theory</b> , Tutor for New College. Second year course.          | Trinity Term 2016    |
| • <b>C2.6 Introduction to Schemes</b> , Consultation Sessions Tutor.              | Trinity Term 2016    |
| • <b>C2.6 Introduction to Schemes</b> , Class Tutor. Fourth year/graduate course. | Hilary Term 2016     |

• <b>A.SO Graph Theory</b> , Tutor for New College. Second year course.	Trinity Term 2015
• <b>B3.4 Algebraic Number Theory</b> , Consultation Sessions Tutor.	Trinity Term 2015
• <b>C3.7 Elliptic Curves</b> , Consultation Sessions Tutor (2 Sets).	Trinity Term 2015
• <b>B3.4 Algebraic Number Theory</b> , Class Tutor. Third year course.	Hilary Term 2015
• <b>C3.7 Elliptic Curves</b> , Class Tutor (2 Sets). Fourth year/graduate course.	Hilary Term 2015
• <b>C3.4 Algebraic Geometry</b> , Class Tutor. Fourth year/graduate course.	Michaelmas Term 2014
• <b>B3.1 Galois Theory</b> , TA (2 sets). Third year course.	Michaelmas Term 2014
• <b>B9b Algebraic Number Theory</b> , TA. Third year course.	Hilary Term 2014
• <b>C9.1b Elliptic Curves</b> , TA. Fourth year/graduate course.	Hilary Term 2014
• <b>C9.2a Analytic Number Theory</b> , TA. Fourth year/graduate course.	Michaelmas Term 2013

#### TEACHING (UNIVERSITY OF WASHINGTON)

• <b>Algebraic Number Theory</b> , 2 lectures (substituting Prof Viray). Graduate course.	Fall Quarter 2015
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#### COMMITTEES AND SERVICE

• Reviewer for the Mathematical Reviews of the AMS.	2017–
• Peer-reviewer for <i>Tunisian Journal of Mathematics</i> , <i>Advances in Mathematics</i> , <i>Compositio Mathematica</i> , <i>Transactions of the AMS</i> , <i>Springer's "Proceedings of WINE3"</i> , <i>IMRN</i> .	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

• <i>Descent and étale-Brauer obstructions for 0-cycles</i> Number Theory Seminar, University of Groningen, The Netherlands. (Online)	2 Feb 2022
• <i>Uniform bounds and effectivity results for singular K3 surfaces</i> Mittag-Leffler Seminar, KTH Royal Institute of Technology, Sweden. (Online)	26 Apr 2021
• <i>The arithmetic of zero-cycles on products of K3 surfaces and Kummer varieties</i> VaNTAGe Math Seminar (Online)	9 Mar 2021
• <i>Strong approximation for homogeneous spaces of linear algebraic groups</i> WORKing Seminar (Online)	25 Feb 2021
• <i>Strong approximation for homogeneous spaces of linear algebraic groups</i> Number Theory Seminar, University of Warwick, UK. (Online)	26 Oct 2020
• <i>Strong approximation for homogeneous spaces of linear algebraic groups</i> Séminaire Théorie des Nombres, Institut de Mathématiques de Bordeaux, France. (Online)	2 Oct 2020
• <i>On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces</i> Algebra and Geometry seminar, KTH Royal Institute of Technology, Sweden.	20 Nov 2019
• <i>On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces</i> “Reinventing rational points” seminar, Institut Henri Poincaré, France.	25 Apr 2019
• <i>On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces</i> Dutch Mathematical Congress 2019, Veldhoven, Netherlands.	23 Apr 2019
• <i>On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces</i> Number Theory Seminar, University of Pennsylvania, USA.	5 Apr 2019
• <i>On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces</i> Intercity Number Theory Seminar, Utrecht University, Netherlands.	15 Mar 2019
• <i>On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces</i> Groups, Arithmetic and Algebraic Geometry Seminar, EPFL, Switzerland.	14 Nov 2018
• <i>On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces</i> Number Theory Seminar, IST Austria, Austria.	18 Sep 2018
• <i>On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces</i> CAMS/MATH Seminar, American University of Beirut, Lebanon.	4 Sep 2018
• <i>On the arithmetic of rational points and zero-cycles on products of Kummer varieties and K3 surfaces</i> Rational Points on Schiermonnikoog, Netherlands.	2 Jul 2018
• <i>Arithmetic of rational points and 0-cycles of degree 1 on Kummer varieties</i> Number Theory Lunch Seminar, Max-Planck-Institut für Mathematik, Bonn, Germany.	28 Mar 2018
• <i>Categorie: un cambiamento di paradigma in matematica</i> (in Italian)	7 Dec 2017

- Seminario di Logica, Università Ca' Foscari, Venice, Italy. 26 Oct 2017
- *Studying arithmetic properties of rational points on varieties* MPI-Oberseminar, Max-Planck-Institut für Mathematik, Bonn, Germany. 19 May 2017
- *Iterating the algebraic étale-Brauer obstruction* Number Theory Seminar, University of Cambridge, UK. 15 Mar 2017
- *When do rational points on varieties exist?* Pure Mathematics Seminar, University of Reading, UK. 17 Feb 2017
- *Iterating the algebraic étale-Brauer obstruction* RTG Lectures in Arithmetic Geometry at Rice, Rice University, Houston, USA. 22 Dec 2016
- *Iterare l'insieme di étale-Brauer algebrico* (in Italian) Algebraic Geometry and Representation Theory in Rome, Università Sapienza, Rome, Italy. 27 Oct 2016
- *Iterating the algebraic étale-Brauer obstruction* Number Theory Seminar, University of Manchester, UK. 12 Oct 2016
- *Iterating the algebraic étale-Brauer obstruction* Linfoot seminar, Bristol University, UK. 13 Jun 2016
- *Obstructions to the existence of rational points on Enriques surfaces* GAeL XXIV, Nesin Mathematics Village, Turkey. 23 May 2016
- *Iterating the algebraic étale-Brauer obstruction* Leibniz Universität Hannover, Hannover, Germany. 25 Apr 2016
- *Modular methods for Diophantine equations* Junior Number Theory seminar, University of Oxford, UK. 25 Jan 2016
- *Iterating the algebraic étale-Brauer obstruction* Junior Number Theory seminar, University of Oxford, UK. 17 Nov 2015
- *Iterating the algebraic étale-Brauer obstruction* AGNT Seminar, Rice University, Houston, USA. 12 Nov 2015
- *Belyi's Theorem* Dessins d'enfants seminar, University of Washington, Seattle, USA. 10 Nov 2015
- *Iterating the algebraic étale-Brauer obstruction* UW Number Theory Seminar, University of Washington, Seattle, USA. 19 Aug 2015
- *Obstructions: a dictionary* 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

- **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.

• <b>Rational Points 2017</b> Franken-Akademie Schloss Schney, Schney, Germany.	2–8 Jul 2017
• <b>RTG Lectures in Arithmetic Geometry at Rice</b> Rice University, Houston, USA.	17–19 Feb 2017
• <b>Algebraic Geometry and Representation Theory in Rome</b> Università Sapienza, Rome, Italy.	22 Dec 2016
• <b>Women In Numbers Europe 2</b> Lorentz Center, Leiden, Netherlands.	25–30 Sep 2016
• <b>GAeL XXIV</b> Nesin Mathematics Village, Turkey.	13–17 Jun 2016
• <b>Fundamental groups in Arithmetic Geometry</b> Institut Henri Poincaré, Paris, France.	26 May – 3 Jun 2016
• <b>Explicit Methods in Number Theory (in honour of John Cremona’s 60th Birthday)</b> University of Warwick, UK.	4–8 Apr 2016
• <b>Sage Days 71: Explicit p-adic methods in number theory</b> University of Oxford, UK.	20–24 Mar 2016
• <b>Oxford Cryptography Day</b> University of Oxford, UK.	17 Mar 2016
• <b>Western Algebraic Geometry Symposium</b> University of Washington, Seattle, USA.	17–18 Oct 2015
• <b>LMS-CMI summer school on Diophantine Equations</b> Wales, UK.	15–19 Sep 2015
• <b>Young Researchers in Mathematics 2015</b> University of Oxford, UK.	17–20 Aug 2015
• <b>Rational Points 2015</b> Franken-Akademie Schloss Schney, Schney, Germany.	28 Jun – 5 Jul 2015
• <b>Rational Points/ Pontos Racionais</b> IMPA, Rio de Janeiro, Brazil.	25–29 May 2015
• <b>Elliptic Curves, Modular Forms and Iwasawa Theory</b> In honour of J Coates’ 70th Birthday, University of Cambridge, UK.	25–27 Mar 2015
• <b>Arizona Winter School 2015: Arithmetic and Higher-Dimensional Varieties</b> The Southwest Center for Arithmetic Geometry, University of Arizona, USA.	14–18 Mar 2015
• <b>Algebraic Geometry and Representation Theory in Rome</b> Università Roma 3, Rome, Italy.	18–19 Dec 2014
• <b>Comptage d’objets arithmétiques (rangs des courbes elliptiques)</b> CRM, Université de Montréal, Canada.	10–14 Nov 2014
• <b>Analytic Number Theory</b> Clay Research Conference and Workshops, University of Oxford, UK.	29 Sep – 3 Oct 2014
• <b>Bounded Gaps Between Primes</b> LMS-CMI Research School, University of Oxford, UK.	22–26 Sep 2014
• <b>Arithmetic of Hyperelliptic Curves</b> NATO Advanced Study Institute, Ohrid, FYROM.	25 Aug – 5 Sep 2014
• <b>Young Researchers in Mathematics 2014</b> University of Warwick, UK.	30 Jun – 3 Jul 2014
• <b>Women in Numbers 3</b> Banff International Research Station, Canada.	20–25 Apr 2014
• <b>Model theory and its interactions with NT and arithmetic geometry</b> MSRI, University of California, Berkeley, USA.	10–11 Feb 2014
• <b>Introductory Workshop: Model Theory, Arithmetic Geometry and NT</b> MSRI, University of California, Berkeley, USA.	3–7 Feb 2014
• <b>Number Theory and Physics</b> Clay Research Conference and Workshops, University of Oxford, UK.	29 Sep – 4 Oct 2013
• <b>Rational Points - Geometric, Analytic and Explicit Approaches</b> EPSRC Warwick Number Theory Symposium, University of Warwick, UK.	27–31 May 2013
• <b>Women in Mathematics</b> Organised by the LMS. Newton Institute, University of Cambridge, UK.	18–19 Apr 2013
• <b>Foundations of Mathematics: What are they and what are they for?</b> Department of Philosophy, University of Cambridge, UK.	10–12 Jul 2012

## OTHER RESEARCH EXPERIENCES

- **Research Assistant in Numerical Analysis**

Summer 2012

DAMTP, University of Cambridge.

Undergraduate summer research project funded by MathWorks.

Supervisors: Prof A Iserles, Dr C-B Schoenlieb, and Dr S J Cowley.

## LANGUAGES

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