

# Anne-Sophie Kaloghiros

Flat 47, Salisbury Mansions  
St Ann's Rd  
London N15 3TP

Email: askaloghiros@gmail.com  
Webpage: <http://people.brunel.ac.uk/~mastaak/>  
Telephone: +44 (0)7766 914 249

## Research Interests

Algebraic geometry, higher dimensional birational geometry. Properties of varieties covered by rational curves, explicit birational geometry of Fano 3-folds, geometry of Calabi-Yau and hyperkähler manifolds. Interactions of birational geometry with mirror symmetry and derived categories.

## Education

2003–2007 PhD in Algebraic Geometry, *The topology of terminal quartic 3-folds*  
Queens' College, University of Cambridge

2002–2003 Certificate of Advanced Studies in Mathematics, Part III (Distinction)  
Queens' College, University of Cambridge

2000–2003 Degree of the Ecole Centrale Paris

2000–2001 Licence (BA) in Pure Mathematics (Honours)  
Université d'Orsay, Paris XI

1998–2000 Classes Préparatoires Mathématiques supérieures et spéciales  
Lycée Joffre, Montpellier

## Employment

Sep 2014–present Lecturer in Mathematics at Brunel University London  
Maternity Leave November 2016–April 2017

Mar 2014–Aug 2014 Research Associate at Imperial College London

Mar 2011–Mar 2014 EPSRC Postdoctoral Fellow  
Project: *Birational Geometry and Topology of Singular Fano 3-folds*  
Jan 2012–Mar 2014: Research Associate at Imperial College London  
Aug 2011–Dec 2011: Visiting Scholar at the University of Illinois at Chicago  
Mar 2011–Dec 2011: Postdoctoral Fellow at the University of Cambridge

Nov 2009–Apr 2010 JSPS Postdoctoral Fellow, RIMS, Kyoto, Japan

Jan 2009–May 2009 Postdoctoral Fellow, MSRI, Berkeley, USA

Oct 2007–Aug 2011 Junior Research Fellow, Trinity Hall, University of Cambridge

## Research Grants

2017–2019	EPSRC First Grant <i>Calabi-Yau Pairs and Mirror Symmetry for Fano Varieties</i> , £91,852
2017–2018	Athena Swan Research Award, Brunel University, £12,500
Jan 2014–Apr 2014	Hausdorff Research Institute for Mathematics Membership Junior Trimester Program in Algebraic Geometry Project: <i>Birational and Hyperkähler Geometry</i> (with D. Greb, V. Lazić and C. Xu)
2011–2014	EPSRC Postdoctoral Research Fellowship <i>Birational Geometry and Topology of Singular Fano 3-folds</i> , £231,682
2009–2010	JSPS Short Term Visiting Fellowship. ¥2,078,500

## Scholarships and studentships

2003–2007	Munro Studentship, Queens' College; Sims Fund Scholarship; Allen, Meek and Read Scholarship; Cambridge European Trust Scholarship
2003	Foundation Scholarship, Queens' College, Cambridge

## Selected Invited Talks

### Conferences and workshops

- *3-fold Calabi–Yau pairs*

Workshop “Mutations: Mirror Symmetry, Deformations, and Combinatorics”, BIRS, Banff, 2019 (upcoming)

Conference VBAC 2019 “GIT, Wall-crossings and Moduli Spaces”, Aarhus, 2019 (upcoming)

British Mathematical Colloquium 2019, Geometry session, Lancaster, 2019 (upcoming)

Workshop “Higher Dimensional Complex Geometry”, Saarbrücken, 2019 (upcoming)

Workshop “Constructions and Obstructions in Birational Geometry”, ICMS, Edinburgh, 2018

Workshop on “Birational Geometry and Moduli Spaces”, INdAM, Rome, 2018

- *The Sarkisov program for Mori fibred Calabi–Yau pairs*

Workshop “Algebraic geometry: Old and new”, Clay Mathematics Institute, Oxford, 2016

Workshop on the Minimal Model Program, Leibniz Universität Hannover, 2016

Workshop on Birational geometry, University of Warwick, 2016

Workshop on higher dimensional algebraic geometry, IMPA, Rio de Janeiro, Brazil, 2015

Colloquium GRIFGA, Brescia, Italy, 2015

British algebraic geometry conference, University of Warwick, 2014

- *Non-rigid quartic 3-folds*

COW meeting, Loughborough University, 2014

EDGE days, University of Edinburgh, 2013

Higher dimensional Algebraic Geometry, Taipei, Taiwan, 2013

- *Relations in the Sarkisov program*

Birational geometry and derived categories, Vienna, Austria, 2012

Birational and affine geometry, Moscow, Russia, 2012

- *The Sarkisov program, geography of models*

Workshop on moduli and birational geometry, Busan, Korea, 2012

ANR Workshop on Birational and affine geometry, Toulouse, France, 2012

- *The Nakayama-Zariski decomposition, finite generation and the MMP*

Computational aspects of birational geometry, Daejeon, Korea, 2011

- *The topology of singular Fano 3-folds*

COE-COW Workshop, Tokyo, Japan, 2008

ANR Workshop on Birational Geometry of higher dimensional varieties, Grenoble, France, 2008

### Seminars

- *Birational geometry of Calabi–Yau pairs, 2014–2015*

University of Cambridge, University of Nottingham

- *Relations in the Sarkisov program, 2011–2012*

Imperial College, Université Pierre et Marie Curie, King’s College, University of Illinois at Chicago, Stony Brook University, University of Washington, University of Notre Dame

- *The Nakayama-Zariski decomposition, finite generation and the MMP, 2010–2011*

University of Cambridge, University of Edinburgh, University of Warwick

- *The divisor class group of Fano 3-folds and rationality questions, 2009–2010*

University of Tokyo, University of Kyoto, University of Glasgow

- *The defect of Fano 3-folds, 2008–2009*

MSRI, University of Illinois at Chicago, Freie Universität Berlin, Oxford Mathematical Institute, University of Cambridge, University of Glasgow, University of Edinburgh, University of Warwick

## Teaching Experience

### Postgraduate teaching

Lecturer, *Birational geometry* intensive course, London Taught Course Centre, May 2016

Lecturer, Winter school *Birational methods in hyperkähler geometry*, University of Bonn, 2014

Lecturer, *Probability theory and stochastic calculus*, Financial Mathematics Msc course, Brunel University, 2014–2019

Lecturer, *Algebraic curves*, Structured Master's course, African Institute in Mathematical Sciences (AIMS), Limbe, Cameroon, January 2015

Lecturer, *Hodge theory*, Examinable Part III course, University of Cambridge, 2010–2011

Instructor, *Differential geometry*, Problem classes, Examinable Part III course, University of Cambridge, 2008–2009

### PhD supervision

K. Kubiliute, London School of Geometry and Number Theory (LSGNT), started 2016 (co-supervised with A. Corti)

### Postgraduate research supervision

PhD project *Birational geometry of hyperkähler varieties*, F. Bernasconi, Y. Li, and M. Mauri, LSGNT, 2016 (co-supervised with P. Cascini)

PhD project *Explicit volume preserving Sarkisov links in dimension 2 and 3*, K. Kubiliute, LSGNT, 2016 (co-supervised with A. Corti)

Part III essay (Master's thesis) *Mori Dream Spaces*, T. Ducat, University of Cambridge, 2011

### Undergraduate teaching

Final year project supervision, Mathematics, Brunel University, (2014–2015: 2 students, 2015–2016: 5 students, 2017–2018: 4 students, 2018–2019: 3 students)

Lecturer, *Probability and Statistics*, 1st year course, Mathematics, Brunel University, 2017–2019

Lecturer, *Analytical methods and skills*, 1st year course, Mechanical Engineering, Brunel University, 2015–2017

Lecturer, *Algebraic curves*, 3rd year course, Imperial College London, 2012–2014

Instructor, *Linear algebra*, Example Classes, 2nd year course, Queens' College, Cambridge, 2006–2007

Small-group teaching (supervising), University of Cambridge, 2003–2009

1st year courses: *Analysis I*, *Metric and topological spaces*; 2nd year courses: *Analysis II*, *Linear algebra*, *Geometry*; 3rd year courses: *Riemann surfaces*, *Algebraic topology*, *Differentiable manifolds*, *Number theory*, *Galois theory*

## Professional Experience

### Workshop Organisation

*British Algebraic Geometry meeting*, University of Liverpool, with P. Cascini (Imperial College), N. Pagani (Liverpool) and J. Ross (UIC), April 2019

*EDGE days*, University of Edinburgh, with I. Cheltsov (Edinburgh), June 2015

*Birational geometry and foliations*, Hausdorff Research Institute for Mathematics, Bonn, with C. Xu (Beijing), D. Greb (Bochum) and V. Lazić (Bonn), February 2014

### Seminar Organisation

Member of the COW seminar steering group (Cambridge, Oxford, Warwick, Bath, and Imperial College joint seminar in Algebraic Geometry), January 2018–present

Brunel organiser for the COW seminar, 2014–present

Cambridge organiser for the COW seminar, 2008–2011

Cambridge organiser for the CALF (Junior COW seminar), 2003–2005

### Refereeing

*Proceedings of the LMS, Transactions of the AMS, Advances in Mathematics, Geometriae Dedicata, European Journal of Mathematics, Compositio Mathematica and International Mathematics Research Notices*

**Reviewing** *Zentralblatt MATH, Mathscinet*

### Cambridge Admissions Interviews

Interviews and admission board decisions for Trinity Hall (2007–2010) and Sidney Sussex (2008) undergraduate mathematics

**Media** Interview *La classification des formes géométriques, La Recherche* (N.453)

### Outreach

Lecturer at the African Institute for Mathematics, Limbe, Cameroon, January 2015

Volunteer for the Teach First foundation (2011–present). Preparation of Year 13 pupils for university admission interviews and Sixth Term Examination Paper in Mathematics

Volunteer for the Nuffield Foundation (2012–2014). Mentor in a Programme designed to support gifted students from disadvantaged backgrounds through Years 12 and 13

Mathematics Subject Lead for the Higher Education Access Programme, Teach First Foundation (2010–2011). University-level Mathematics “taster” course for Year 12 pupils

## Referees

- Professor Alessio Corti  
Department of Mathematics, Imperial College London, 180, Queen's Gate, London SW7 2AZ  
a.corti@imperial.ac.uk; *Tel:* +44 (0)2075 941 870; *Fax:* +44 (0)20 7594 8517
- Professor Miles Reid, FRS  
Warwick Mathematics Institute, University of Warwick, Coventry CV4 7AL  
miles.reid@warwick.ac.uk; *Tel:* +44 (0)2476 523 491; *Fax:* +44 (0)2476 524 182
- Professor Ivan Cheltsov  
School of Mathematics, University of Edinburgh, Mayfield Rd, Edinburgh EH9 3JZ  
i.cheltsov@ed.ac.uk; *Tel:* +44 (0)131 650 4881; *Fax:* +44 (0)131 650 6553
- Professor James McKernan, FRS  
Department of Mathematics, UC San Diego, 9500 Gilman Dr., La Jolla, CA 92093 USA  
jmckernan@math.ucsd.edu; *Tel:* +1 858 534 6347; *Fax:* +1 858 534 5273

## Publications and Preprints

### Publications

1. *Some examples of Calabi-Yau pairs with maximal intersection and no toric model*, to appear in Proceedings of the INdAM Workshop BGMS, Rome June 2018, Springer INdAM series
2. *The Sarkisov program for Mori fibred Calabi-Yau pairs* (with A. Corti), *Algebraic Geometry*, 3 (2016), no. 3, 370–384
3. *Non-rigid quartic 3-folds* (with H. Ahmadinezhad), *Compositio Mathematica*, 152 (2016) no. 5, 955–983
4. *Finite generation and geography of models* (with A. Küronya and V. Lazić), in *Minimal models and extremal rays*, *Advanced Studies in Pure Mathematics*, vol. 70 (2016) 215–246
5. *Relations in the Sarkisov program*, *Compositio Mathematica*, 149 (2013) no. 10, 1685–1709
6. *The defect of Fano 3-folds– Errata*, *J. Algebraic Geom.* 21 (2012), no. 2, 397–399
7. *A classification of terminal quartic 3-folds and rationality questions*, *Math. Annalen* 354 (2012), no. 1, 263–296
8. *Introduction to the MMP and the existence of flips* (with A. Corti and V. Lazić), *Bull. London Math. Soc.* 43 (2011), no. 3, 415–448
9. *The defect of Fano 3-folds*, *J. Algebraic Geom.* 20 (2011), no. 1, 127–149

### Reports

- (i) *Birational geometry and mirror symmetry of Calabi–Yau pairs*, Mathematisches Forschungsinstitut Oberwolfach Report No.28/2018 (2018)

### Preprints

- (a) *3-fold Calabi-Yau pairs* (with A. Corti), in preparation (expected 2019)
- (b) *Volume preserving maps of tori and mutations* (with A. Corti), in preparation (expected 2019)
- (c) *Birational rigidity of quartic hypersurfaces with  $cA1$  points* (with H. Ahmadinezhad), in preparation (expected 2019)
- (d) *The topology of terminal quartic 3-folds*, University of Cambridge PhD thesis, arXiv:0707.1852