

CURRICULUM VITAE

JOHN CHRISTIAN OTTEM

Contact Information

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Academic positions

2020– Professor, University of Oslo
2016–2019 Associate Professor, University of Oslo
2013–2016 Postdoctoral Research Associate, DPMMS, University of Cambridge
2013–2016 Junior Research Fellow, King’s College, Cambridge

Education

2010–2013 **University of Cambridge**, PhD in Mathematics
Thesis: *Ample subschemes and line bundles and partially positive line bundles*
Advisor: Prof. Burt Totaro

2007–2010 **University of Oslo**, MSc in Mathematics
Thesis: *Cox rings of Projective Varieties*
Advisor: Prof. Kristian Ranestad

2004–2007 **University of Oslo**, BSc in Mathematics

Extended academic visits: Isaac Newton Institute, Cambridge (2020), College de France (Spring 2019), MSRI Berkeley (Winter 2019), University of Bonn (Fall 2015), MPIM Bonn (Fall 2014), UCLA (Spring 2013), Paris 6 Jussieu (Winter 2013), MIT (Spring 2012).

Research Interests

Algebraic geometry, birational geometry, Calabi–Yau manifolds, Hodge theory

Publications

1. *Planes in cubic fourfolds* (with A. Degtyrarev and I. Itenberg) (2021)
2. *An \mathcal{O} -acyclic variety of even index* (with F. Suzuki and an appendix by O. Wittenberg) (2020)
3. *A refinement of the motivic volume, and specialization of birational types* (with J. Nicaise)
Rationality of algebraic varieties. Progress in Mathematics, Vol. 342, 335–366

4. *Two Coniveau filtrations* (with O. Benoist) (2020).
Duke Mathematical Journal (to appear).
5. *Tropical degenerations and stable rationality* (with J. Nicaise) (2019)
6. *A pencil of Enriques surfaces with non-algebraic integral Hodge classes* (with F. Suzuki) (2019)
Mathematische Annalen 377 (2020), 183–197.
7. *On deformations of quintic and septic hypersurfaces* (with S. Schreieder)
Journal de Mathématiques Pures et Appliquées 135 (2020) 140-158.
8. *Remarks on the positivity of the cotangent bundle of a K3 surfaces* (with F. Gounelas)
Épjournal de Géométrie Algébrique 4 (2020).
9. *Curve classes on irreducible holomorphic symplectic varieties* (with G. Mongardi).
Communications in Contemporary Mathematics (to appear)
10. *Failure of the integral Hodge conjecture for threefolds of Kodaira dimension zero* (with O. Benoist).
Commentarii Mathematici Helvetici 95 (2020) 27-35.
11. *A counterexample to the birational Torelli problem for Calabi-Yau threefolds* (with J. V. Rennemo).
Journal of the London Mathematical Society 97 (2018), 427-4402
12. *Positivity of the diagonal* (with B. Lehmann).
Advances in Mathematics 335 (2018), 664-695.
13. *Effective cones of cycles on blow-ups of projective space* (with I. Coskun, J. Lesieutre).
Algebra and Number Theory 10 (2016) 1983-2014.
14. *Nef cycles on some hyperkähler fourfolds*.
Facets of Algebraic Geometry: A Collection in Honor of William Fulton’s 80th Birthday.
London Mathematical Society Lecture Note Series **472** (2022)
15. *Curves disjoint from a nef divisor* (with J. Lesieutre).
Michigan Mathematical Journal 65 (2016) 321–332.
16. *On subvarieties with ample normal bundle*.
Journal of the European Mathematical Society 18 (2017) 2459–2468
17. *Birational geometry of hypersurfaces in products of projective spaces*.
Mathematische Zeitschrift 280 (2015) 135–148
18. *Quartic spectrahedra* (with K. Ranestad, B. Sturmfels, C. Vinzant).
Mathematical Programming 151 (2015) 585–612
19. *Ample subvarieties and q -ample divisors*.
Advances in Mathematics 229 (2012), 2868–2887.
20. *Algebraic boundaries of Hilbert’s SOS cones* (with G. Blekherman, J. Hauenstein, K. Ranestad, B. Sturmfels).
Compositio Mathematica 148 (2012), 1717–1735.
21. *Components of the Hilbert scheme of space curves on quartic surfaces* (with J. O. Kleppe).
International Journal of Mathematics 26(2) (2015)
22. *Partially ample line bundles on toric varieties* (with N. Broomhead, A. Prendergast-Smith)
Glasgow Mathematical Journal 58 (2016) 587-598.
23. *Cox rings of K3 surfaces with Picard number 2*.
Journal of Pure and Applied Algebra 217 (2013), 709–715.
24. *On the Cox ring of \mathbb{P}^2 blown up in points on a line*.
Mathematica Scandinavica 9, (2011), 21–31.

Other Publications

- *Introduction of schemes* (with G. Ellingsrud) Lecture notes for the algebraic geometry courses at the University of Oslo. ~380 pages (2017)
- *Positivity of the diagonal*, Oberwolfach reports (2017)
- *Mori dream hypersurfaces*, Oberwolfach reports (2014)
- *Ample subschemes and partially positive line bundles*, PhD thesis, Cambridge 2013.
- *Cox rings of projective varieties*. Master's thesis, Oslo, 2009.

Teaching

- 2016– University of Oslo – Lecturer
MAT4210 – Algebraic geometry I (Spring 2021)
MAT4215 – Algebraic geometry II (Spring 2021)
MAT4230 – Algebraic geometry III (Fall 2020)
MAT1110 – Calculus and Linear algebra (Spring 2020)
MAT4200 – Algebraic geometry II (Spring 2020)
MAT4200 – Commutative algebra (Fall 2019)
MAT1110 – Calculus and Linear algebra (Exercise sessions) (Spring 2019)
MAT4230 – Algebraic geometry III (Fall 2018)
MAT4215 – Algebraic geometry II (Spring 2018)
MAT2410 – Complex analysis (Fall 2017)
MAT4215 – Algebraic geometry II (Spring 2017)
MAT4230 – Algebraic geometry III (Fall 2016)
MAT4215 – Algebraic geometry II (Spring 2016)
- 2014–2015 University of Cambridge – Lecturer
Designed and lectured the following courses:
‘Topics in combinatorial algebraic geometry’ (Winter 2015)
‘Moduli spaces of curves’ (Spring 2014)
- 2011–2015 University of Cambridge – Supervisor/Instructor
Differential Geometry (Winter 2015),
Algebraic Geometry (Winter 2011, 2012),
Linear Algebra (Spring 2014)
- 2006–2010 University of Oslo – Teaching Assistant
MAT4200 – Commutative Algebra (four lectures 2009),
MAT1120 – Linear Algebra, (Fall 2008), MAT1110 – Calculus and Linear Algebra.
(Spring 2007, 2008, 2009, 2010), MAT1100 – Calculus (Fall 2006, 2007)

Postdocs

Seckin Adali (2016–2018)
Claudio Onorati (2019–2021)
Jørgen Vold Rennemo (2017–2021)

PhD Students

Bernt-Ivar Nødland. (2016–2019)
Bjørn Skauli (2018–)
Elisa Cazzador (2018–) (co-advisor)
Martin Helsø (2017–) (co-advisor)
Simen Westbye Moe (2020–) (co-advisor)
Ola Sande (2020–) (co-advisor)

Master Students

- Simen Westbye Moe. *Degenerations and stable rationality*. Oslo, 2019–2020.
Søren Gammelgaard. *Cubic hypersurfaces, their Fano schemes, and special subvarieties*. Oslo, 2017–2018.
Bjørn Skauli. *The Cone Conjecture for Some Calabi-Yau Varieties*. Oslo, 2016–2017
Magnus Vodrup. *The Geometry of the Space of Curves of Genus 2*. Oslo, 2015–2016
Tom Oldfield. *Hilbert Schemes of Points in Projective Varieties*. Cambridge, 2014–2015.
Kristina Kubiliūtė. *Surfaces in $\mathbb{P}^1 \times \mathbb{P}^1 \times \mathbb{P}^1$* . Cambridge, 2014–2015.
Erik Paemurru. *Surfaces in $\mathbb{P}^1 \times \mathbb{P}^1 \times \mathbb{P}^1$* . Cambridge, 2014–2015.

Bachelor Students

- Nikolai Thode Opdan, *Rational and irrational hypersurfaces* (2020).
Camilla Marie Baastad. *Fermat's Last Theorem modulo p* (2018).
Elias Fåkvam. *The Ax–Grothendieck theorem and model theory* (2018).
Lucas Schnubel. *The Combinatorial Nullstellensatz* (2018).

Academic Service

Departmental service

- 2020–2021 Section leader for Section 5 – Algebra, Geometry and Topology
2020– Forskningsutvalget

Conference organization

- Moduli and Algebraic Cycles*. Research programme at the Mittag-Leffler institute, Fall 2021.
Arithmetic and Geometry of varieties with trivial canonical bundle, Oslo, Dec 1 - 3, 2020.
Combinatorics and Hodge theory. June 18th–22nd, 2018, Sophus Lie Conference Center Nordfjordeid, Norway.
Enumeration and Moduli. A conference celebrating the work of Geir Ellingsrud on the occasion of his 70th birthday. December 13–16th, 2018, University of Oslo, Norway.
Geometry of Moduli The Abel Symposium. August 7–11, 2017, Lofoten, Norway.
Polar geometry. A conference celebrating the work of Ragni Piene on the occasion of her 70th birthday. January 26–28, 2017, University of Oslo.
Stability conditions on triangulated categories and geometric applications. Nordfjordeid Summer School. June 13–17, 2016, Sophus Lie Conference Center, Nordfjordeid, Norway.

Invited Lecture Series

- ‘10th Swiss-French workshop in Algebraic Geometry’ 13 - 17 January 2020, in Charmey (near Gruyères, Fribourg, Switzerland) (January 2021).
‘The integral Hodge conjecture’, GaEL Loughborough, UK. Four lectures covering material on the integral Hodge conjecture and birational geometry for PhD students and post docs (July 2021).
‘Positivity in higher codimension’, Vieland, Netherlands. Four lectures covering material on higher codimension cycles and birational geometry for PhD students and post docs. (2017)
‘Higher codimension cycles’ RTG winter school. University of Illinois, Chicago. Four lectures (2016).
‘Positivity’ (with I. Coskun and M. Hering). Loughborough. Covering material on higher codimension cycles and birational geometry for PhD students and post docs. Six lectures. (2014)

Research memberships

Motivic Geometry, CAS, Oslo, 2021.

'K-theory, algebraic cycles and motivic homotopy theory', Newton Institute, Cambridge, 2020.

'Birational geometry and moduli spaces'. MSRI, Winter 2019.

'Tropical geometry, amoebas, and polytopes'. Mittag-Leffler, Spring 2018.

Grants, Honors & Awards

2020	Viggo Brun prize, Norwegian Mathematical Society
2020	Research programme at the Mittag-Leffler institute, 'Moduli and algebraic cycles', Fall 2021
2016–2021	Young Research Talents. 4 year research grant from the Research Council of Norway
2013	Research Fellowship, King's college, Cambridge
2013	St Catharine's College Prize for Distinction in Research.
2012	Rayleigh-Knight-Smith Prize, University of Cambridge.
2010	Gates Cambridge Scholarship. An highly competitive full scholarship for PhD studies at Cambridge
2010–2015	Various Research and Travel grants from the Cambridge Philosophical Society.
2009	NR Prize for best master's thesis, University of Oslo.
2009	McKinsey&Co Scholarship, Oslo.
2006, 2010	Fulbright Scholarship.

Invited Talks

2021	GAeL Loughborough, Projective and birational higher dimensional geometry, Università di Trieste (via Zoom) Séminaire de topologie, géométrie et algèbre, Nantes/Algers Tropical Geometry in Zoom TGiZ ('TGIF') Frankfurt algebraic geometry seminar
2020	Hannover algebraic geometry seminar Séminaire "Variétés Rationnelles", Paris 13 Chalmers/Göteborg AG & NT seminar IMPANGA algebraic geometry seminar 'Riposte armonie': Algebraic Geometry in Ventotene, Ciro Ciliberto 60 Stanford Algebraic geometry seminar 'Rationality', Simons center, New York (cancelled) Iskovskikh algebraic geometry seminar, HSE Moscow (online) ZAG Algebraic Geometry seminar (online) 'Variétés Rationnelles', Jussieu (Sorbonne Université, Paris) (cancelled) 'K-theory, algebraic cycles and motivic homotopy theory', Newton institute, Cambridge
2019	Geometry and topology seminar, Imperial College, London The geometry of algebraic varieties (Olivier Debarre's 60th), CIRM, Luminy Fudan University, Workshop on algebraic geometry, China College de France, Paris 'Positivity and Vanishing theorems III, Lille University HSE Moscow, Workshop on birational geometry, Algebraic geometry seminar, University of Oslo MSRI, Berkeley, Algebraic geometry seminar
2018	Mapping problems and complex manifolds in projective spaces, Oslo ICMS, Edinburgh, 'Constructions and obstructions in birational geometry' Leibniz Universität Hannover, Workshop on cubic hypersurfaces LMU Munich, Algebraic geometry seminar

- ‘Positivity in algebraic geometry’, IBS Center for Geometry and Physics. Seoul, Korea
 University of Milan, Workshop on algebraic geometry
 ‘Tropical geometry, amoebas and polytopes’. Mittag–Leffler Institute, Stockholm
 Max Planck Institute, Bonn, Algebraic geometry seminar
 ‘Sheaves, Curves and Moduli’, Workshop, Stavanger
- 2017
 Geometry, Physics, and Representation Theory Seminar. Northeastern University.
 Columbia University, Algebraic geometry seminar
 Workshop on Periods and Ricci flat manifolds, Banach Center, Warsaw
 Humboldt-Universität zu Berlin, Algebraic Geometry Seminar
 ICMS conference on Positivity, Edinburgh
 University of Georgia, Athens, Algebraic geometry seminar
 UCLA Algebraic geometry seminar
- 2016
 UIC Chicago Workshop on positive cycles
 British Algebraic Geometry Meeting, University of Edinburgh
 AIM Workshop on positive cycles, San Jose.
 Belgian-Dutch Algebraic Geometry Seminar, KU Leuven
 ‘Toric geometry’, Oberwolfach
 Nordic Congress of Mathematicians, KTH Stockholm
 ‘Positivity and Vanishing theorems’, Lille University
 Algebraic Geometry Satellite Conference of the ECM, Leibniz Universität Hannover
 ETH, Zürich, Algebraic geometry seminar
 University of Bergen, Algebraic geometry seminar
- 2015
 Imperial College Algebraic geometry seminar
 HSE Moscow, ‘Projective algebraic geometry’, Fyodor Zak’s 65th birthday conference
 EDGE days, University of Edinburgh
 ‘Minimal free resolutions, Betti numbers, and Combinatorics’, ICMS, Edinburgh
 Stony Brook University, NY, Algebraic geometry seminar,
 Workshop on ‘Recent developments on linear series’, University of Padova.
 University of Cambridge. Algebraic geometry seminar.
- 2014
 Albert-Ludwigs-Universität Freiburg, Algebraic geometry seminar
 Max Planck Institute, Bonn, Algebraic geometry seminar
 Mittag-Leffler Institute, Stockholm. Conference dedicated to Dan Laksov
 Rice University. Algebraic geometry seminar
 EDGE days, University of Edinburgh
 University of Cambridge. Algebraic geometry seminar.
 Workshop on positivity and vanishing theorems. University of Lille
 Hausdorff Institute, Bonn. Algebraic geometry Seminar
 ‘Negative curves on surfaces’, Oberwolfach
 University of Milan–Bicocca. Algebraic geometry workshop
- 2013
 Humboldt-Universität zu Berlin. Algebraic geometry seminar
 University of Bayreuth. Algebraic geometry seminar
 University of Edinburgh. Algebraic geometry seminar
 Paris VI, Jussieu. Algebraic geometry seminar.
 University of Strasbourg. Algebraic geometry seminar
 UCLA. Algebraic geometry seminar
 University of Cambridge. Algebraic geometry seminar.
- 2012
 Stanford University. Algebraic geometry seminar.
 Imperial College. CALF seminar.
 ‘Classical Algebraic Geometry’, Oberwolfach
 Harvard/MIT Algebraic geometry seminar, Harvard University.
 Harvard University. BAGS Seminar,
 University of Warwick. Warwick Algebraic Geometry Seminar,
- 2011
 Université Paris VI. Algebraic Geometry Seminar.
 University of Oxford. CALF seminar,

2009 Lukecin, Poland. Conference ‘Algebraic Torus Actions’
 2006– Various AG seminars at the University of Oslo

Conferences Attended

2021 ‘Classical algebraic geometry’. Oberwolfach
 2020 WAGS, Pomona College (online)
 Derived, Birational, and Categorical Algebraic Geometry, BIRS
 WAGON (Western Algebraic geometry online)
 2019 ‘Birational geometry and moduli spaces’. MSRI
 2018 ‘Classical algebraic geometry’. Oberwolfach
 ‘Tropical geometry, amoebas and polytopes’, Mittag-Leffler institute, Stockholm
 2017 Birational Classification, Derived Categories, and Moduli Spaces. Oberwolfach
 Positivity in Higher-dimensional Geometry. Oberwolfach
 2016 Summer school on stability conditions, Nordfjordeid
 ‘Toric geometry’, Oberwolfach
 British Algebraic Geometry Meeting, ICMS, Edinburgh
 2015 Hopf Prize lectures, ETH.
 Algebraic geometry conference, Summer institute, Utah
 EDGE days, University of Edinburgh
 Stein Arild Strømme Memorial conference, University of Bergen
 Algebraic geometry Conference, Institute of Advanced Study, Princeton
 ‘New techniques in Birational geometry’, Stony Brook University
 2014 Birational geometry of hyperkahler manifolds, Bonn
 Conference for Young Researchers in Arithmetic and Algebraic Geometry, University of Bonn
 BrAG (British Algebraic Geometry Meeting), Warwick
 ‘Complex Analysis and Geometry’, Freiburg Institute for Advanced Studies
 ‘Asymptotic Aspects of Complex and Algebraic Geometry’, at Milano Bicocca.
 Conference on hyperkähler manifolds, Hausdorff Institute, Bonn.
 ‘Traumatic’, Algebraic geometry conference, Imperial College
 ‘Negative curves on surfaces’. Oberwolfach
 Algebraic geometry workshop, Milan
 Workshop on positivity and vanishing theorems, University of Lille
 2013 Foliation theory in algebraic geometry, Simons center, NYC
 Conference on algebraic geometry at the University of Amsterdam.
 Geometrie Algebrique en Liberte (GAeL), at KTH and Stockholm University.
 Southern California Algebraic Geometry Seminar, UC San Diego.
 Workshop on algebraic geometry, Imperial College.
 Dynamics of Groups and Rational Maps, UCLA.
 Characteristic p methods in algebraic geometry, Imperial College.
 2012 Southern California Algebraic geometry seminar, Caltech.
 Western Algebraic Geometry Seminar, University of Utah.
 Algebraic and Complex Geometry, Leibniz Universität Hannover.
 LMS Symposium on birational geometry, Durham University.
 Classical Algebraic Geometry, Oberwolfach.
 Geometry of Moduli spaces, Nordfjordeid.
 Workshop on Kähler geometry, University of Cambridge.
 2011 MEGA 2011: Effective Methods in Algebraic Geometry, Stockholm.
 Moduli Spaces, University of Cambridge.
 Derived Categories, University of Cambridge.
 2009 Algebraic Torus Actions, Lukecin, Poland.
 Moduli, conference and summer school, Humboldt-Universität zu Berlin.
 25th Nordic and 1st British-Nordic Congress of Mathematicians, University of Oslo.
 2007–2012 Various summer schools in algebraic geometry, Nordfjordeid.

2006–2008 KoMiN: Conference for mathematics students in Norway.