

JAKUB WITASZEK

EDUCATION

- 2014– 2018 **Imperial College London**, PhD (Supervisor: Prof. Paolo Cascini), Mathematics
2012– 2014 **Bonn University, Germany**, MSc (Supervisor: Prof. Daniel Huybrechts), Mathematics
2009 – 2012 **Warsaw University, Poland**, BSc (Supervisor: Prof. Jaroslaw Wisniewski), Mathematics

APPOINTMENTS

- 2022 – NOW **Princeton University**, Tenure-track Assistant Professor
2019 – 2022 **University of Michigan, Ann Arbor**, D.J. Lewis Postdoctoral Assistant Professor
JAN/2019 – MAY/2019 **Mathematical Sciences Research Institute, Berkeley**, Postdoctoral Fellow
2018 – 2019 **Institute for Advanced Study, Princeton**, Postdoctoral Fellow (Member)

MAJOR ACHIEVEMENTS, SCHOLARSHIPS, AND GRANTS

- 2021–2024 **NSF Research Grant**, *The Minimal Model Program in Positive and Mixed Characteristics*
2018 **Doris Chen Award**, Imperial College London
2012–2014 **Bonn International Graduate School scholarship**
2011–2012 **Scholarship of the Minister of Science and Higher Education**, Poland
2009 **50th International Mathematics Olympiad**, Bremen – bronze medal
2009 **60th Polish Mathematics Olympiad** – 4th place, silver medal

PUBLICATIONS

- 2022 **The Du Bois complex of a hypersurface and the minimal exponent**
[Duke Mathematical Journal](#), to appear (Mustata-Olano-Popa-Witaszek)
2022 **An analog of adjoint ideals and PLT singularities in mixed characteristic**
[Journal of Algebraic Geometry](#), to appear (Ma-Schwede-Tucker-Waldron-Witaszek)
2021 **Keel’s base point free theorem and quotients in mixed characteristic**
[Annals of Mathematics](#) (Witaszek)
2021 **Tamely ramified morphisms of curves and Belyi’s theorem in positive characteristic**
[International Mathematics Research Notices](#) (Kedlaya-Litt-Witaszek)
2021 **The Minimal Model Program for threefolds in characteristic five**
[Duke Mathematical Journal](#) (Hacon-Witaszek)

- 2021 **Global Frobenius Liftability II: Surfaces and Fano threefolds**
[Annali della Scuola Normale Superiore di Pisa](#) (Achinger-Witaszek-Zdanowicz)
- 2021 **On the canonical bundle formula and log abundance in positive characteristic**
[Mathematische Annalen](#) (Witaszek)
- 2021 **On the relative Minimal Model Program for threefolds in low characteristics**
[Peking Mathematical Journal](#) (Hacon-Witaszek)
- 2021 **Global Frobenius Liftability I**
[Journal of the European Mathematical Society](#) (Achinger-Witaszek-Zdanowicz)
- 2019 **On the rationality of Kawamata log terminal singularities in positive characteristic**
[Algebraic Geometry](#) (Hacon-Witaszek)
- 2018 **Klt del Pezzo surfaces which are not globally F-split**
[International Mathematics Research Notices](#) (Cascini-Tanaka-Witaszek)
- 2017 **On log del Pezzo surfaces in large characteristic**
[Compositio Mathematica](#) (Cascini-Tanaka-Witaszek)
- 2017 **On the base point free theorem and Mori dream spaces for log canonical threefolds over the algebraic closure of a finite field**
[Mathematische Zeitschrift](#) (Nakamura-Witaszek)
- 2017 **Effective bounds on singular surfaces in positive characteristic**
[Michigan Mathematical Journal](#) (Witaszek)
- 2015 **On the basepoint-free theorem for log canonical threefolds over the algebraic closure of a finite field**
[Algebra and Number Theory](#) (Martinelli-Nakamura-Witaszek)
- 2015 **The degeneration of the Grassmannian into a toric variety and the calculation of the eigenspaces of a torus action**
[Journal of Algebraic Statistics](#) (Witaszek)

PREPRINTS

- 2022 **Quasi-F-splittings in birational geometry**
[arXiv](#) (Kawakami-Takamatsu-Tanaka-Witaszek-Yobuko-Yoshikawa)
- 2022 **Lifting globally F-split surfaces to characteristic zero**
[arXiv](#) (Bernasconi-Brivio-Kawakami-Witaszek)
- 2021 **On the relative Minimal Model Program for 4-folds in positive and mixed characteristic**
[arXiv](#) (Hacon-Witaszek)
- 2021 **Relative semiampleness in mixed characteristic**
[arXiv](#) (Witaszek)

2021 **Resolution and alteration with ample exceptional divisor**

[arXiv](#) (Kollár-Witaszek)

2020 **Globally \pm -regular varieties and the MMP for 3-folds in mixed characteristic**

[arXiv](#) (Bhatt-Ma-Patakfalvi-Schwede-Tucker-Waldron-Witaszek)

PROFESSIONAL ACTIVITIES AND EDUCATIONAL OUTREACH

Outreach:

- Michigan Math and Science Scholars, *Cryptography and Number Theory* for high school students (Michigan, June 14 - July 2 in 2021)
- U(M) Undergraduate Math Club, talk: *Algebraic curves and classical geometry* (Michigan, 2019)
- Polish Children's Fund outreach program (Poland, 2010-2013)
 - volunteering, tutoring, and evaluating applications
 - holding week-long workshops: *Algebraic curves and Cayley-Bacharach theorem*, *Introduction to group theory*, *Vectors in geometry*
- *Stanisław Staszic High School* in Warsaw: teaching at a math circle and organising three, week-long, workshops in mathematics and computer science (Poland, 2008-2011)

Co-organising:

- learning seminar on Deligne-Du Bois singularities (Michigan, Autumn 2020)
- learning seminar on derived splinters and the direct summand conjecture (London, 2018)
- postgraduate school *New advances in Fano manifolds* (Cambridge, December 2017)

Non-research mentoring: three graduate students (Michigan, 2019-2021)

Referee: Algebraic Geometry, Compositio Mathematica, Duke Mathematical Journal, European Journal of Mathematics, Journal of Algebra, Journal of London Mathematical Society, Manuscripta Mathematica, Mathematische Annalen, Selecta Mathematica

Grant referee: European Research Council starting grant (EU), Panelist for National Science Foundation (US), National Science Centre (Poland)

Other activities during undergraduate and masters studies:

- Organising student reading seminars *Abelian varieties*, *Toric varieties* (Bonn University, 2012-2014)
- President of *Algebra and Category Theory Student Society*: organising weekly seminars and a school on *Elliptic Curves* (Warsaw University, 2011-2012)

TEACHING

- 2021 *Abstract Algebra*, inquiry-based learning instructor, Fall term, University of Michigan
- 2020 *Linear Algebra*, inquiry-based learning instructor, Fall term, University of Michigan
- 2020 *Algebraic Geometry 2*, for graduate students, lecturer, Winter term, University of Michigan
- 2019 *Linear Algebra*, inquiry-based learning instructor, Fall term, University of Michigan
- 2017 *Real analysis*, demonstrating and marking, Autumn trimester, Imperial College London
- 2016 *Algebra 2*, demonstrating and marking, Autumn trimester, Imperial College London
- 2016 *Real analysis*, demonstrating and marking, Autumn trimester, Imperial College London
- 2016 *Analysis*, demonstrating and marking, Spring trimester, Imperial College London
- 2015 *Linear algebra*, demonstrating, Autumn trimester, Imperial College London
- 2015 *Galois theory*, marking, Autumn trimester, Imperial College London
- 2015 *Analysis*, demonstrating, Spring trimester, Imperial College London
- 2015–2017 Invigilating and 2nd-marking, Imperial College London

INVITED RESEARCH TALKS

- 2022 Recent Advances in Classical Algebraic Geometry, ICM satellite conference, Cracow
Quasi-F-splittings
- 2022 Advances in Mixed Characteristic Commutative Algebra and Geometric Connections, Oaxaca
Quasi-F-splittings
- 2022 London Geometry and Topology seminar, Imperial College
Quasi-F-splittings
- 2022 Algebraic Geometry seminar, EPFL
Quasi-F-splittings
- 2022 MPS Conference on Higher Dimensional Geometry, Simons Foundation, NYC
Classification of algebraic varieties in positive and mixed characteristic
- 2022 Algebraic Geometry seminar, University of Michigan
Relative semiamplicity in mixed characteristic
- 2021 Algebraic Geometry seminar, Northwestern
Classification of algebraic varieties in positive and mixed characteristic, colloquium talk
- 2021 Special Month on Singularities and K-stability, University of Utah
Mixed characteristic vanishing theorems and application IV, part of lecture series
- 2021 Workshop on birational geometry, Moscow
Global \ast -regularity and the Minimal Model Program for arithmetic threefolds

- 2021 Zoom Algebraic Geometry Seminar
Relative semiampleness in mixed characteristic
- 2021 Algebraic geometry seminar, UC San Diego
Global $+$ -regularity and the Minimal Model Program for arithmetic threefolds
- 2021 Number theory seminar, UC Irvine
On applications of arithmetic geometry in commutative algebra and algebraic geometry
- 2021 Algebraic geometry seminar, Princeton University
Global $+$ -regularity and the Minimal Model Program for arithmetic threefolds
- 2020 Algebraic geometry seminar, Hannover
Relative four-dimensional Minimal Model Program in positive characteristic
- 2020 Algebraic geometry in East Asia
On the four-dimensional MMP for singularities and families in positive characteristic
- 2020 Algebraic geometry seminar, University of Michigan
Keel's base point free theorem and quotients in mixed characteristic
- 2020 Algebraic geometry seminar, Tokyo University
Keel's base point free theorem and quotients in mixed characteristic
- 2020 Singularities and Arithmetics conference, Tohoku University, Sendai
Adjunction for mixed characteristic singularities
- 2019 Western Algebraic Geometry Symposium, University of Utah
Keel's base point free theorem and quotients in mixed characteristic
- 2019 New postdoctoral researchers talks, University of Michigan
The geometry of mixed characteristic varieties
- 2019 Birational geometry and Moduli Spaces seminar, MSRI, Berkeley
Birational geometry in large and low characteristic
- 2018 Algebraic geometry seminar, John Hopkins University
On the Minimal Model Program in low characteristics
- 2018 Algebraic geometry seminar, Columbia University
Liftability of the Frobenius morphism and images of toric varieties
- 2018 Algebraic geometry seminar, Stony Brook University
Liftability of the Frobenius morphism and images of toric varieties
- 2018 Algebraic geometry seminar, Princeton University
On the Minimal Model Program in low characteristics
- 2018 New members talks, Institute for Advanced Study
Classification of algebraic varieties
- 2018 London-Tokyo workshop in birational geometry, Imperial College London
Log non-vanishing conjecture for threefolds in positive characteristic

- 2018 Algebraic geometry seminar, EPFL, Lausanne
On the canonical bundle formula in positive characteristic
- 2018 Algebraic geometry seminar, University of Warsaw
On the canonical bundle formula in positive characteristic
- 2017 Workshop on birational geometry, Higher School of Economics, Moscow
Liftability of the Frobenius morphism and images of toric varieties
- 2017 Geometry & Topology seminar, Imperial College London
Liftability of the Frobenius morphism and images of toric varieties
- 2017 Algebraic geometry seminar, University of Utah
Liftability of the Frobenius morphism and images of toric varieties
- 2016 Edge days, University of Edinburgh
Birational geometry over the algebraic closure of a finite field
- 2016 Tokyo-Princeton algebraic geometry conference, Princeton University
Global F -regularity of projective surfaces and liftability to the second Witt vectors
- 2016 Workshop on birational geometry, Warwick University
Frobenius splittings in birational geometry
- 2016 Oberseminar: Algebra, Zahlentheorie und Algebraische Geometrie, Freiburg University
Frobenius splittings in birational geometry
- 2016 Seminar IMPANGA, IMPAN, Warsaw
Frobenius splittings in birational geometry
- 2015 Seminar Algebra & Geometry, Basel University
Effective bounds on positive characteristic singular surfaces
- 2015 Postgraduate Conference in Complex Geometry, Cambridge University
Effective bounds on positive characteristic singular surfaces
- 2015 Géométrie Algébrique en Liberté, Leuven
Base point freeness of line bundles in positive characteristic
- 2014 Workshop in Birational Geometry and Fano Varieties, Imperial College London
On base point free theorem for log canonical threefolds over $\overline{\mathbb{F}}_p$
- 2014 University of Tokyo
The degeneration of the Grassmannian into a toric variety and the eigenspaces of a torus action

OTHER ACTIVITIES AND SKILLS

- 2012-2014 Experience in using *Mathematica*, *Magma*, *Macaulay2*, and *Sage*
- 2012 Undgraduate research school, Weizmann Institute of Science, Israel – eight weeks
- 2011 Internship at Google, *Software Engineer*, London – three months