

# Louis Esser

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## EDUCATION

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University of California, Los Angeles

PhD, Mathematics

Advisor: Burt Totaro

Los Angeles, California

Sep. 2018-present

University of Pennsylvania

BA Mathematics, Physics (Astrophysics Concentration)

Honors: *summa cum laude* (GPA 4.0/4.0)

Philadelphia, Pennsylvania

Aug. 2014-May 2018

## RESEARCH INTERESTS

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Algebraic geometry, birational geometry.

## PUBLICATIONS AND PREPRINTS

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4. M. Chen, L. Esser, C. Wang. On explicit birational geometry for minimal  $n$ -folds of canonical dimension  $n - 1$ . *Submitted*. E-print: [arxiv:2201.08966](https://arxiv.org/abs/2201.08966)
3. L. Esser, B. Totaro, C. Wang. Varieties of general type with doubly exponential asymptotics. *Submitted*. E-print: [arxiv:2109.13383](https://arxiv.org/abs/2109.13383).
2. L. Esser, T. Tao, B. Totaro, C. Wang. Optimal sine and sawtooth inequalities. *Journal of Fourier Analysis and Applications*, to appear. E-print: [arxiv:2107.11058](https://arxiv.org/abs/2107.11058).
1. L. Esser. Non-torsion Brauer groups in positive characteristic. *Proc. Amer. Math. Soc.*, in revision. E-print: [arxiv:2102.01799](https://arxiv.org/abs/2102.01799).

## TALKS

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Conference & Visiting Seminar Talks

- "Varieties of general type with large canonical dimension," Mar. 2022  
University of Washington Algebra and Algebraic Geometry Seminar, online
- "Varieties of general type with doubly exponential asymptotics," Dec. 2021  
Valley Geometry Seminar at UMass Amherst
- "Varieties of general type with doubly exponential asymptotics," Dec. 2021  
Stanford Algebraic Geometry Seminar, online
- "Varieties with small volume," Oct. 2021  
Algebraic Geometry Northeastern Series Showcase (AGNES) poster session, online
- "Non-torsion Brauer groups," Mar. 2021  
American Graduate Student Algebraic Geometry Seminar (AGSAGS), online

Home Department Seminar Talks (UCLA)

- " $p$ -adic integration and Batyrev's theorem," Motivic Integration Seminar, Jan. 2022
- "Varieties of general type with doubly exponential asymptotics," Algebra Seminar, Oct. 2021
- "Solvable groups, nilpotent groups, and quotients," Algebraic Groups Seminar, July 2021
- "Introduction to algebraic groups," Algebraic Groups Seminar, June 2021

- "Abelian varieties and rationality problems," Abelian Varieties Seminar, *May 2021*
- "Endomorphisms and decomposition," Abelian Varieties Seminar, *May 2021*
- "Singularities of toric varieties," Toric Varieties Seminar, *Feb. 2021*
- "Hypersurfaces in projective space," Stable Rationality Seminar, *Nov. 2020*
- "Algebraic groups, representations, and linear reductivity," GIT Seminar, *Oct. 2020*
- "The boson-fermion correspondence," Algebra Seminar, *Apr. 2020*
- "Derived and triangulated categories," Algebra Seminar, *Jan. 2020*
- "Surfaces with genus 0 and first Betti number positive," Algebra Seminar, *Nov. 2019*
- "Derived functors on the étale site," Étale Cohomology Seminar, *Oct. 2019*
- "Intersection theory and Riemann-Roch for surfaces," Algebra Seminar, *Oct. 2019*
- "Algebraic curves and the Riemann-Roch theorem," Summer Algebra Seminar, *Aug. 2019*
- "The Poincaré lemma of sheaf cohomology," Summer Algebra Seminar, *July 2019*
- "The trace and norm functions," Local Fields Seminar, *June 2019*

Home Department Seminar Talks (University of Pennsylvania)

- "Geometry and topology of complex matrix spaces," Penn Topology Seminar, *Oct. 2017*

## CONFERENCE AND SEMINAR ORGANIZING

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- Introduction to Algebraic Groups (UCLA Summer Algebra Seminar) *June-Aug. 2021*

## AWARDS & HONORS

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- Horn-Moez Prize for Excellence in First-Year Graduate Studies (UCLA) *2019*
- University of Pennsylvania Undergraduate Mathematics Research Award *2018*
- University of Pennsylvania Mathematics Good Teaching Award *2017*
- Benjamin Franklin Scholar *2014-2018*

## TEACHING

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### Teaching Assistantships at the University of California, Los Angeles

- Precalculus *2021*
- Calculus Laboratory *2020*
- Linear Algebra *2019-2021*
- Calculus for Life Sciences Parts I, II, III *2018-2022*

### Teaching Assistantships and Tutoring at the University of Pennsylvania

- Linear Algebra and Differential Equations (TA) *2016*
- Introductory Calculus, Differential Equations, Linear Algebra (tutoring) *2015, 2016*

## SERVICE

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### UCLA Mathematics Directed Reading Program

**Los Angeles, California**

*Board member, mentor*

*Jan. 2019-present*

- Organized the directed reading program (DRP), including the application, pairing process, and student colloquium
- Developed research projects for multiple students in algebraic geometry, category theory, and topology
- Coordinated the DRP with other mathematics organizations and boosted participation by under-represented groups in mathematics

**Explore Your Universe UCLA****Los Angeles, California***Volunteer**Sep. 2018-present*

- Created hands-on mathematics activities geared towards kids of various age groups
- Worked with elementary, middle, and high school students to foster mathematics enthusiasm

**University of Pennsylvania Abuse and Sexual Assault Prevention****Philadelphia, Pennsylvania***Education Chair**Aug. 2017-May 2018*

- Planned and executed curricula for weekly meetings and events
- Organized collaborations with other campus student and advocacy groups
- Engaged in dialogue with university staff on issues of interpersonal violence

**Junior Jump Start****Philadelphia, Pennsylvania***College Coach**Jan. 2016-May 2016*

- Prepared an 11th grade student for college applications in one-on-one sessions
- Collaborated on a project to improve the program

**West Philadelphia Tutoring Project****Philadelphia, Pennsylvania***Tutor**Sep. 2014-May 2015*

- Instructed 5th grade students individually in mathematics and reading
- Developed lesson plans tailored to students' needs
- Assisted teachers in elementary school classrooms

## SKILLS

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**Languages:** English, Tamil**Programming Languages:** Magma, Python, Macaulay2, Java, MATLAB**Technical Skills:** LaTeX, Loggerpro, Microsoft Office