

# EMRE CAN SERTÖZ

## CURRICULUM VITAE

### PROFESSIONAL EXPERIENCE

**Postdoctoral Researcher**, 2021-09-01 (3 year position)

*Employer:* Leibniz University Hannover, Hannover, Germany

*Mentor:* Matthias Schütt

**Postdoctoral Researcher**, 2020-10-01 to 2020-08-31

*Employer:* Max Planck Institute for Mathematics, Bonn, Germany

*Mentor:* Daniel Huybrechts

**Postdoctoral Researcher**, 2020-04-01 to 2020-09-30

*Employer:* Leibniz University Hannover, Hannover, Germany

*Mentor:* Matthias Schütt

**Postdoctoral Researcher**, 2017-05-01 to 2020-03-31

*Employer:* Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany

*Mentors:* Bernd Sturmfels, Mateusz Michałek

### EDUCATION

**Ph.D. in Mathematics**, Humboldt University of Berlin, Germany, 2013-12-06 to 2017-09-25

*Title:* Enumerative geometry of double spin curves

*Advisor:* Gavril Farkas

*Co-advisor:* Gerard van der Geer

**M.Sc. in Mathematics**, Humboldt University of Berlin, Germany, 2011-10-01 to 2013-11-05

*Title:* Hurwitz numbers

*Advisor:* Gavril Farkas

**B.Sc. in Mathematics**, Bilkent University, Turkey, 2007-09-01 to 2011-06-16

*Title:* Fubini–Study Metric and the Fermat Quintic

*Advisor:* Sema Salur

### SCHOLARSHIPS AND AWARDS

*Seal of Excellence*, Marie Skłodowska-Curie actions 2019.

*Research fellowship*, Space-Time-Matter, 2016-11-01 to 2016-12-31.

*Scholarship of the International Research Training Group*, GRK 1800, 2013-11-01 to 2016-10-31.

*International Fulbright Science & Technology Award 2011*, Turkey's candidate, ranked as No.1 Offered a Fulbright fellowship. I chose to complete my studies in Humboldt with Prof. Farkas.

*Scholarship of the Berlin Mathematical School (BMS)*, Phase I, 2011-10-01 to 2013-09-30.

*Merit Scholarship*, Bilkent University, Top 1%, Full Scholarship, 2008 to 2011.

*Orhan Alisbah Fellowship Award*, Bilkent University 2010,  
Awarded by the Department of Mathematics of Bilkent to the most successful undergraduate student.

## WORK IN PROGRESS

1. *Arithmetic self-intersections and canonical limit mixed Hodge structures* with Spencer Bloch and Robin de Jong.
2. *Periods of unipotent extensions and higher L-values of elliptic curves* with Albrecht Klemm and Vasily Golyshev.

## PUBLICATIONS

1. *Separation of periods of quartic surfaces*, with P. Lairez.  
Submitted. arXiv:2011.12316.
2. *Deep Learning Gauss–Manin Connections*, with K. Heal, A. Kulkarni.  
Submitted. arXiv:2007.13786.
3. *Effective obstruction to lifting Tate classes from positive characteristic*, with E. Costa.  
To appear in “Arithmetic geometry, number theory, and computation,”  
Simons Symposia, Springer. arXiv:2003.11037.
4. *An octanomial model for cubic surfaces*, with M. Panizzut, B. Sturmfels.  
Le Matematiche, 75(2), 517–536, 2020. arXiv:1908.06106.
5. *On reconstructing subvarieties from their periods*, with H. Movasati.  
Rendiconti del Circolo Matematico di Palermo, II. Series (2020) arXiv:1908.03221.
6. *A numerical transcendental method in algebraic geometry*, with P. Lairez.  
SIAM Journal on Applied Algebra and Geometry, 3 (4), 559–584, 2019. arXiv:1811.10634.
7. *Prym varieties of genus four curves*, with N. Bruin.  
Transactions of the American Mathematical Society 373 (2020) 149–183. arXiv:1808.07881.
8. *Certifying reality of projections*, with J. Hauenstein, A. Kulkarni, S. Sherman.  
Lecture Notes in Computer Science, 10931, 200–208, 2018. arXiv:1804.02707.
9. *Computing periods of hypersurfaces*.  
Mathematics of Computation 88 (320), 2987–3022, 2019. arXiv:1803.08068.
10. *Computing images of polynomial maps*, with C. Harris and M. Michalek.  
Advances in Computational Mathematics 45 (2019) 2845–2865. arXiv:1801.00827.
11. *A compactification of the moduli space of multiple-spin curves*.  
Submitted. arXiv:1701.02303. Substantially revised in April 2019.

12. *Enumerative geometry of double spin curves*. PhD Thesis.  
Published electronically by HU library, 2017.

## TEACHING EXPERIENCE

1. *Computational Algebraic Geometry*, Hannover, Fall 2021,  
Designing my own lecture material and preparing it to be viewed online.  
Publicly available on YouTube.
2. *Calculus for Engineers II (in German)*, Hannover, Spring 2020,  
Conducted tutorial sessions and prepared final exam.
3. *Hodge theory and periods of varieties*, MPI MiS, Spring 2019, lecturer.
4. *Representation theory and complex geometry*, MPI MiS, Fall 2017, lecturer (joint with J. Torres).
5. *Intersection Theory*, Fall 2013, Humboldt University, tutor for exercise sessions.
6. *Intersection Theory*, Fall 2012, Humboldt University, frequent substitute for main lecturer.
7. *Multivariable Calculus*, Fall 2010, Bilkent University, tutor for exercise sessions.

## SUPERVISION

Advising the master's thesis of Kamillo Ferry (Leibniz University Hannover), 2022.

Advising the master's thesis of Samuele Pollaci (University of Bonn), 2021(–2022).

Advised the master's thesis of Rafael Mohr (Leipzig University), 2019–2020.

## EXTENDED RESEARCH VISITS (LASTING 2 WEEKS OR MORE)

Instituto de Matemática Pura e Aplicada (IMPA), Rio de Janeiro, Brazil

Visiting researcher, 2018-10-04 to 2018-10-22

Visiting researcher, 2019-05-24 to 2019-06-10

Notre Dame, South Bend, USA

Visiting researcher, 2018-02-02 to 2018-02-18

Trimester Program “Periods in Number Theory, Algebraic Geometry and Physics”

*Hausdorff Research Institute for Mathematics*, Bonn, 2018-02-25 to 2018-03-31

IRTG Exchange program, Visiting Graduate Student

*Korteweg-de Vries Institute for Mathematics*, Amsterdam, 2015-11-01 to 2016-05-01

## SELECTED TALKS (OUT OF 65)

1. *Arithmetic self-intersections and canonical limit mixed Hodge structures*, Conference on Arakelov Geometry, Regensburg/Germany, 2021-09-07.
2. *Separation of periods of quartic surfaces*, Oberwolfach workshop Explicit Methods in Number Theory, Oberwolfach/Germany, 2021-07-22.
3. *Separating periods of quartic surfaces*, Annual meeting of the German Mathematical Society (DMV), Chemnitz/Germany, 2020-09-17.
4. *Down to characteristic  $p$  and then back up again: computations with the  $p$ -adic obstruction map*, Non-linear Algebra Seminar Online (NASO), 2020-04-07.
5. *On reconstructing subvarieties from their periods*, Number Theory Seminar at MIT, Cambridge/USA, 2020-01-07.
6. *On reconstructing subvarieties from their periods*, Algebra and algebraic geometry seminar at UiO, Oslo/Norway, 2019-11-14.
7. *Computing transcendental invariants of hypersurfaces*, Minisymposium: “Numerical methods in algebraic geometry”, SIAM Conference on Applied Algebraic Geometry 2019, Bern/Switzerland, 2019-07-11.
8. *Computing periods of hypersurfaces*, Colloquium for “Periods, Moduli spaces and the Arithmetic of Algebraic Varieties”, Mainz/Germany, 2019-06-27.
9. *Numerical transcendental methods for computing Picard and Hodge groups*, Number Theory Seminar at MIT, Cambridge/USA, 2019-01-08.
10. *Numerical methods in transcendental algebraic geometry*, Seminar “Geometria Diferencial” at IMPA, Rio/Brazil, 2018-10-16.
11. *Computing periods of hypersurfaces*, Imperial College, London/UK, 2018-04-18.
12. *Computing periods of hypersurfaces*, Applied Math Seminar, Notre Dame/USA, 2018-02-06.
13. *Computing periods of hypersurfaces*, Seminar “Computations and Proofs”, Paris/France, 2017-11-20.
14. *Enumerative geometry of double spin curves*, in KTH & SU Algebra and Geometry Seminar, Stockholm/Sweden, 2017-11-08.
15. *Enumerative geometry of theta characteristics*, Summer School in Enumerative Geometry, Trieste/Italy, July 2017.
16. *Enumerative geometry of double spin curves*, ODTÜ–Bilkent Algebraic Geometry Seminar, Ankara/Turkey, October 2017.

## ORGANIZATIONAL EXPERIENCE

- Co-organizer for *Algebraic geometry through numerical computation*, ICMS 2020, 13–17 July 2020.
- Co-organizer for *Minisymposium on Riemann Surfaces*, SIAM, 9–13 July 2019, Bern/Switzerland.

Co-editor of “Special Issue on Twenty-Seven Questions about the Cubic Surface” in *Le Matematiche*, Vol 75 No 2 (2020).

Co-organizer for *Cubic surfaces event* in Oslo, 13 May 2019.

Master administrator for the *Cubic Surfaces Wiki* (<http://cubics.wikidot.com>).

Co-organizer for *Non-Linear Algebra Seminar*, December 2018 to May 2019, Leipzig/Germany.

Co-organizer for *Numerical Computing in Algebraic Geometry*, 13–17 August 2018, Leipzig/Germany.

Co-organizer for *Berlin Mathematical School Student Conference*, 2015-02-18/20, Berlin/Germany.

## SERVICE

In *Postdoc Hiring Committee* for Max Planck Institute MiS, Non-Linear Algebra Group, 2020.

Referee for *Collectanea Mathematica*, *Experimental Mathematics*, *Journal of Symbolic Computation*, *International Congress for Mathematical Software*, *International Symposium on Symbolic and Algebraic Computation*.

Student representative at *Berlin Mathematical School*, 2014.

## LANGUAGES

*Turkish*: Native.

*English*: Fluent.

*German*: Upper Intermediate, CEF B2 Level.

## COMPUTER SKILLS

*CAS*: Magma, Macaulay2, Mathematica, Maple, SageMath, MATLAB.

*OS*: Linux, MacOS, Windows.

*Other*: L<sup>A</sup>T<sub>E</sub>X, Java, Shell script, Vim.