# Ekin Özman

ekin.ozman@boun.edu.tr

Bogazici University

Department of Mathematics

## EDUCATION

**University of Wisconsin-Madison, WI** 2010
PhD in Mathematics
Advisor: Professor Jordan Ellenberg
Thesis Title: Rational Points on Twists of Modular Curves

**University of Wisconsin-Madison, WI** 2006
MS, Mathematics

**Middle East Technical University, Ankara, Turkey** 2004
BS, Mathematics

## EMPLOYMENT

| **Bogazici University** | Istanbul, Turkey |
|---|---|
| Professor | 2022 - present |
| Associate Professor | 2017 - 2022 |
| Assistant Professor | 2014 - 2016 |

| **University of Texas-Austin** | TX, USA |
|---|---|
| Postdoctoral Instructor | 2011 - 2014 |

| **CRM/IHES/MPIM** | Barcelona,Spain/Paris,France/Bonn,Germany |
|---|---|
| European Postdoctoral Institutes Lauréate | 2010 - 2011 |

| **University of Wisconsin-Madison** | WI, USA |
|---|---|
| Teaching Assistant | 2005 - 2010 |

***Other Affiliations***

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|---|---|
| · Abdus Salam International Centre for Theoretical Physics(ICTP), Italy Regular Associate | 2022 - 2027 |
| · University of Texas at Austin, USA, Visiting Researcher (during sabbatical) | 2021 - 2022 |

## RESEARCH INTERESTS

Arithmetic Geometry, Algebraic Number Theory

Rational Points on Curves, Brauer-Manin obstruction, Modular Curves

Invariants of Curves over Algebraically Closed Fields of Characteristic $p$

# PUBLICATIONS

### Preprints

- *Monodromy Groups of a PCF Quadratic non-polynomial Map*, with O. Ejder and Y. Kara, submitted

### Articles

- *Computing Quadratic Points on Modular Curves $X_0(N)$*, with N. Adžaga, T. Keller, P. Michaud-Jacobs, F. Najman, and B. Vukorepa, Mathematics of Computation, 2023
- *On Ternary Diophantine Equations of Signature $(p, p, 3)$ over Number Fields*, with E. Isik and Y. Kara, Canadian Journal of Mathematics, 75(4), 1293-1313, 2022.
- *The boundary of the p-rank 0 stratum of the moduli space of cyclic covers of the projective line*, with R. Pries and C. Weir, Nagoya Math. J. 248, 865–887, 2022.
- *S -Unit Equations and the Asymptotic Fermat Conjecture over Number Fields*, with S. Siksek, Number theory, 83–104, De Gruyter Proc. Math., De Gruyter, Berlin, Proceedings of the Journees Arithmetiques XXXI, 2022.
- *The Hasse Norm Principle in Global Function Fields*, with A. Mânzățeanu, R. Newton, N. Sutherland, R.G. Uysal, Women in Numbers Europe III, Research Directions in Number Theory, 2021.
- *On Ternary Diophantine Equations of Signature (p, p, 2) over Number Fields*, with E. Isik and Y. Kara, in Turkish J. Math. 44, no. 4, 1197–1211, 2020.
- *A bound on the primes of bad reduction for CM curves of genus 3*, with P. Kilicer, K. Lauter, E. Lorenzo-Garcia, R. Newton and M. Streng, in Proc. Amer. Math. Soc. 148, no. 7, 2843–2861, 2020.
- *Asymptotic Generalized Fermat's Last Theorem over Number Fields*, with Yasemin Kara, in International Journal of Number Theory 16, no. 5, 907–924, 2020.
- *Rational Points On Twisted Modular Curves*, in Automorphic Forms and Related Topics edited by Anni et al, Contemporary Mathematics, Volume 732, AMS, 2019.
- *Quadratic Points on Modular Curves*, with S. Siksek, Mathematics of Computation, Volume 88, Number 319, Pages 2461–2484, 2019.
- *On the existence of ordinary and almost ordinary Prym varieties*, with R. Pries, Asian Journal of Mathematics, Vol. 23, No. 3, pp. 455-478, 2019.
- *Non-ordinary curves with a Prym variety of low p -rank*, with TO. Celik, Y. Elias, B. Gunes, R. Newton, R. Pries and L. Thomas, Women in Numbers Europe 2, Research Directions in Number Theory, Association for Women in Mathematics Series Vol. 11, Springer, 2018.
- *RLWE Cryptography for the Number Theorist*, with Y. Elias, K. Lauter and K. Stange, Directions in Number Theory,Association for Women in Mathematics Series, Volume 3, Springer, 2016.
- *The distribution of $\mathbb{F}_q$-Points on cyclic $\ell$-Covers of genus g*, with A. Bucur, C. David, B. Feigon, N. Kaplan, M. Lalin and M. Wood, International Math Research Notices, No. 14, pp. 4297-4340, 2016.
- *Unramified Brauer classes on cyclic covers of the projective plane*, with C. Ingalls, A. Obus and B. Viray with an appendix by H. Thomas, Proc. of Brauer groups and obstruction problems, 115-153, Birkhauser, 2016.
- *Provably weak instances of Ring-LWE*, with Y. Elias, K. Lauter and K. Stange, Advances in Cryptology-CRYPTO2015, 63-92, Springer, 2015.
- *Bad reduction of genus-3 curves with complex multiplication*, with I. Bouw, J. Cooley, K. Lauter, E. Garcia,M. Manes, R. Newton, Women in Numbers Europe, Research Directions in Number Theory, Association for Women in Mathematics Series, Volume 2, Springer, 2015.
- *Local - global trace questions*, with M. Ciperiani, Proc. Amer. Math. Soc. 143, 3815-3826, 2015.
- *On Polyquadratic Twists of $X_0(N)$*, Journal of Number Theory, Volume 133, pp. 3325-3338, 2013.
- *Newton and Hodge polygons for a variant of the Kloosterman family*, with R. Bellovin, S. Garthwaite, R. Pries, C. Williams and J. Zhu. AMS/CRM Contemp. Math. Women in Numbers 2: Research Directions in Number Theory, Amer. Math. Soc., Providence, RI, 2013

- *Points on Quadratic Twists of Modular Curves*, Acta Arithmetica, Volume 152, Number 4, pages 323-348, 2012.
- *Semi-direct product Galois covers of curves in characteristic p*, with L.Gruendken, L.Hall-Seelig, B. Im, R. Pries and K. Stevenson, Fields Inst. Commun., 60, Amer. Math. Soc., Providence, RI, 2011.

### Volumes Edited

- 2018 Women in Numbers Europe 2, Research Directions in Number Theory, AWM Series, Volume 11, Springer (co-editor)

### Popular Math Articles

- Gizemli Matematiksel Köprüde Çığır Açıcı Gelişme(A breakthrough in the mysterious mathematical bridge), Bilim ve Teknik 2022 with I. Sezer Celik
- Kadın Matematikçiler Komitesi(Commitee for Women Mathematicians), Matematik Dünyası 2022
- Düzgün Asallar (Regular Primes), Matematik Dünyası 2021-I
- Keşiflere Açılan Kapı: Hatalar (The door to discoveries: mistakes), Matematik Dunyası 2014-I with A. Bassa
- A4 kağıt, Pentagon ve Arşimet'in Sığırları (The A4 paper, Pentagon and Bulls of Archimedes), Matematik Dünyası 2014-II with A. Bassa
- Sır Vermeden Kanıtlamak (Proving without revealing), Matematik Dünyası 2014-IV with A. Bassa
- Sayıların Geometrisi (The geometry of numbers), Matematik Dünyası 2014-II
- Matematiksel Origami (Mathematical Origami), Bilim ve Teknik 2006

## RESEARCH GRANTS, SCHOLARSHIPS, AWARDS AND HONORS

### Research Project Grants

As project PI:

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|---|---|
| · Effective Solutions of Diophantine Equations <br> Funded by The Scientific and Technological Research Council of Turkey <br> (TUBITAK 1001) | 2023 - 2026 |
| · Solving Diophantine Equations: A Modular Approach <br> Funded by The Scientific and Technological Research Council of Turkey <br> (TUBITAK 1001) | 2017 - 2020 |
| · Algebraic Curves and Associated Abelian Varieties <br> Funded by Bogazici University Scientific Research Projects | 2015 - 2017 |

As researcher:

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| · Curves over Finite Fields, their Jacobians and Abelian Varieties <br> Bosphorus Joint Project: Cofunded by The Scientific and Technological Research <br> Council of Turkey and French Ministry of Foreign Affairs <br> (TUBITAK 2509) | 2018 - 2020 |

As Supervisor:

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|---|---|
| · Co-Funded Brain Circulation Scheme: Low Degree Points on Modular Curves <br> Cofunded by The Scientific and Technological Research Council of Turkey and EU <br> (TUBITAK 2236) | 2020 - 2022 |

### Research Fellowships and Scholarships

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|---|---|
| · Turkish Scientific Research Council International Postdoctoral Research Fellowship <br> (TUBITAK 2219) | 2021 - 2022 |
| · Turkish Scientific Research Council Reintegration Fellowship <br> (TUBITAK 2232) | 2014 - 2016 |

· Bing Fellowship in Mathematics (University of Texas)                                   2012 and 2013
· Elizabeth S. Hirschfelder Scholarship (UW-Madison)                                      2010

### Grants and Scholarships for Short Scientific Visits

· Max Planck Institute for Mathematics, Bonn, Germany(6 months)[1]                        2022
· Max Planck Institute for Mathematics, Bonn, Germany                     January 1-31, 2020
· Max Planck Institute for Mathematics, Bonn, Germany                     August 1-31. 2014
· AWM-NSF Mentoring Travel Grant                                                          2013
· Colorado State University, Fort Colins, USA                             August 3-24, 2012
· IHES, Bures-Sures-Yvette, France                                       June 1-July 31, 2012
· CRM, Barcelona, Spain                                                   March 14-21, 2011
· AWM-NSF Travel Grant                                                                    2011

### Grants for Conference Organization

· Turkish Math Society (co-PI)                                                            2018
  Antalya Algebra Days
· NTF, Compositio Foundation, Clay Mathematics Institute, Microsoft Research (co-PI)      2016
  Women in Numbers Europe 2

### Awards and Honors

· Science Academy Young Scientist Award(BAGEP)                                            2016
· Bogazici University Academic Accomplishment Award                                       2016
· Selected participant of Heidelberg Laureate Forum                                       2014
· UT-Austin Services for Students with Disabilities Clock Award                           2012
· UW-Madison Mathematics Department Best TA award                                 2008 and 2009
· University Housing's Honored Instructor Award(UW)                                       2008

## TALKS

### Conference and Workshop

72. Modular curves and Galois representations, Zagreb, (*Invited Speaker*)               2023

71. Density problems in Arithmetic, CIRM (*Invited Speaker*)                             2023

70. Journée Alain, Paris (*Invited Speaker*)                                             2023

69. Front Range Number Theory Day, Colorado (*Invited Speaker*)                          2022

68. CMS Winter Meeting, Algebraic Number Theory Session (online) (*Invited Speaker*)     2021

67. FGC-IPM Joint Number Theory Meeting (online) (*Invited Speaker*)                     2021

66. Women and Mathematics: Number Theory, Istanbul (*Invited Speaker*)                   2020

65. Journeés Arithmétiques XXXI (*Pleanary Speaker*)                                     2019

64. Women and Mathematics: Applied Math, Memorial of Mehpare Bilhan (*Invited Speaker*)  2019

63. Arithmetica Izmir-2 (*Invited Speaker*)                                              2019

62. 25th Number Theory in Flanders: Spring Meeting, Leuven, Belgium (*Invited Speaker*)  2018

61. National Mathematics Symposium of Turkey (*Pleanary Speaker*)                        2018

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[1]had to be turned down for personal reasons

60. The Second Romanian-Turkish Mathematics Colloquium (*Pleanary Speaker*) 2017

59. Arithmetic Aspects of Explicit Moduli Problems, BIRS, Canada 2017

58. Arithmetic and Low Dimensional Hyperbolic Spaces (*Pleanary Speaker*) 2016

57. Building Bridges Workshop on Automorphic Forms and Related Topics, Sarajevo 2016

56. Third Workshop of Association for Turkish Women in Maths (*Pleanary Speaker*) 2016

55. Antalya Algebra Days, (*Pleanary Speaker*) 2015

54. Arithmetic, Geometry, Cryptography and Coding Theory  Luminy, CIRM, France 2015

53. National Mathematics Symposium of Turkey (*Invited Speaker*) 2014

52. Workshop on Women in Number Theory, BIRS, Canada (*Invited Speaker*) 2014

51. SIAM Mini Symp. on Cohomology of Abelian Varieties (*Invited Speaker*) 2013

50. AMS Special Session on Number Theory and Geometry, San Diego (*Invited Speaker*) 2013

49. AWM-JMM Workshop on Number Theory, San Diego 2013

48. Special Number Theory Day, Sabanci University, Istanbul, Turkey (*Invited Speaker*) 2011

47. Noncommutative rings and their applications, University of Artois, Lans, France 2011

46. Algebra and Number Theory Symposium (in honor of Prof. Dr. Mehpare Bilhan) 2010

45. AMS Special Session on Arithmetic Geometry Session, San Francisco (*Invited Speaker* 2010

44. Women and Mathematics, IAS 2010

43. Midwest Number Theory Conference for Graduate Students V 2007

**Seminar and Colloquium**

42. Intercity Number Theory Seminar, Utrecht 2023

41. ODTU-Bilkent Algebraic Geometry Seminar 2023

40. Greek Algebra and Number Theory Seminar 2023

39. Number Theory Web Seminar 2022

38. Diophantine Geometry Seminar, Warwick, UK 2021

37. VaNTAGe Seminar Series (8th topic on Modular curves and Galois representations) 2021

36. MSGSU General Seminar 2019

35. Sabanci University Algebra Seminar 2018

34. Gebze Techical University Colloquium 2018

33. Scientific Colloquium of Croatian Mathematics Society, Zagreb, Croatia 2018

32. Galatasaray University Algebraic Geometry Seminar 2015

31. Max Planck Institute for Mathematics, Number Theory Seminar 2014

30. Colorado State University, Algebraic Geometry Seminar 2014

29. MSGSU General Seminar 2014

28. Bogazici University Colloquium 2013

27. Izmir Institute of Technology Departmental Seminar 2013

26. Rice University Algebraic Geometry Seminar                                         2012

25. University of Texas-Austin Number Theory Seminar                                   2011

24. Max Planck Institute for Mathematics Number Theory Seminar                         2011

23. Northwestern University Number Theory Seminar                                      2010

22. Centre de Recerca Mathematica(CRM) Barcelona                                       2010

21. University of Georgia-Athens Number Theory Seminar                                 2009

**Lecture/Mini Courses**

20. Introduction to SAGA, Symposium sur la géométrie arithmétique et ses applications, CIRM, 2023

19. TMD-Summer School on Algebraic Number Theory, Feza Gursey Science Center          2018

18. CIMPA-ICTP research school on Artin L-functions, Nesin Mathematics Village        2017

17. Diophantine Equations: A Modular Approach, Istanbul-Ankara Algebraic Geometry and Number Theory Meetings                                                                      2017

16. Reciprocity Laws (from Gauss to Shimura), Istanbul-Ankara Algebraic Geometry and Number Theory Meetings                                                                      2016

15. Koc University Mathematics Seminar                                                 2016

14. Arithmetic Statistics, Istanbul-Ankara Algebraic Geometry and Number Theory Meetings   2015

13. Disparity in Selmer Rank Seminar Series, IMBM                                      2015

12. Introduction to Geometry of Curves, Nesin Math Village Winter School              2015

11. Lectures on Abelian Varieties with Complex Multiplication, IMBM                   2015

**Popular Math/Outreach**

10. ICM Best Practices Towards a More Diverse and Inclusive Mathematical Community Panel 2022

 9. DRP Turkey                                                                          2022

 8. Women in Science Interview with Sinav Middle School (online)                       2021

 7. Academic Career Abroad, Gazi University Career Committe Panel (online)             2021

 6. Gender Gap in Science, IMBM                                                        2020

 5. 7th Spring Math Meeting for Students, Bogazici University                          2020

 4. Introduction of IMU-CWM Committee- WIN-E3, Rennes, France                          2019

 3. 3rd Spring Math Meeting for Students, Galatasaray University                       2018

 2. Fermat's Last Theorem, Bogazici University Math Society                            2016

 1. A modest Inroduction to Number Theory, AWM-student chapter of UT-Austin           2014

## TEACHING

**Instructor**

· Bogazici University:

Calculus I and II (Math 101 and 102), Calculus I fand II or Math Students(Math131 and 132), Discrete Mathematics(Math 162), Matrix Theory(Math201), Differential Equations(Math 202), Lineer Algebra(Math 221), Group Theory(Math 222),Rings Fields and Galois Theory(Math 323), Complex

Anaylsis I(Math 338), Projective Geometry(Math 477), Introduction to Algebraic Geometry(Math 48U), Cryptography(Math 462), Graduate Algebra I (Math 521), Graduate Algebra II (Math 522), Algebraic Number Theory(Math 525), Selected Topics in Algebra and Topology(Math 584), Elliptic Curves(Math 58Q), Arithmetic Geometry(Math 58C)

· <u>University of Texas at Austin:</u>

Algebraic Structures-I(M 373K), Algebraic Structures-I(M 373L), Elliptic Curves(M 390C), Sequences, Series, and Multivariable Calculus(M 408D), Differential and Integral Calculus(M 408C), Elementary Number Theory(IBL section)(M 328K), Elementary Number Theory(M 328K), Integral Calculus for Science (M 408S)

· <u>University of Wisconsin-Madison:</u>

Intermediate Algebra(Math 101)

**Advising and Mentoring**

· <u>Academic Advisor</u>

Class of 2020 and Class of 2028 at Bogazici University (50 Students each)

· <u>Directed Study</u>

Number Theory(UT-Austin, with undergraduates)

Class Field Theory(UT-Austin, with graduate students)

Rational Points on Elliptic Curves(UT-Austin and Bogazici University with undergraduates)

· <u>Undergraduate Thesis</u>

2020, Eray Karabiyik, *A first course on modular forms*

2020, Alper Cakan, *Class Group Computations in Quadratic Number Fields*

2020, Saliha Tokat, *Elliptic Curve Cryptography*

2019, Feyzanur Berksoy, *Basics in Quadratic Number Fields*

2018, Bartu Bingol, *A Brief Introduction to the Concepts of Algebraic Number Fields*

2017, Emre Gungor, *Extending Sets via Hilbert Symbol*

· <u>Graduate Thesis</u>

2017, Kubra Kaytanci(MSc), The Ordinary Component of $\ell$-isogeny Graph of Elliptic Curves

2017, Ilkiz Bildik, (MSc), Different Versions of the Modularity Theorem

2018, Eda Kirimli, (MSc), A Survey about Inverse Galois Problem

2019, Erman Isik, (MSc), Modular Approach to Diophantine Equations

2019, Tugce Koc (MSc), ABC conjecture and its implications

2019, Harun Kir (MSc), Class Number One Problem and Modular Curves

2022, Pinar Degirmenci (MSc), Monogenic Number Fields

ongoing, Omer Avci (MSc)

ongoing, Begum Gulsah Cakti (PhD)

· <u>Post-doctoral Researchers</u>

2020-2022 Ozlem Ejder (PhD, Southern California University)

2018-2020 Yasemin Kara (PhD, Cornell University)

· <u>Project Co-leader</u>

2019, *Failures of the Hasse norm principle in function fields* in Women in Numbers Europe-3 with co-leader R. Newton

2016, *p-ranks of Prym varieties over finite fields* in Women in Numbers Europe-2 with co-leader R. Pries

· <u>TA Mentoring</u>

2007 - 2009 *New International Math Teaching Assistant(ITA) Orientation Coordinator:* UW-Madison. Observing and giving feedback to new ITAs teaching and organizing activities to help them improve their teaching

· <u>K12 Mentoring</u>

2001 - 2005 Mentoring elementary and middle school students in several small villages of Turkey as a member of Educational Funds for Elementary Schools (Ilk Ogretim Okullarina Yardim Vakfi)

## PROFESSIONAL SERVICE

### Conference (Co)-organizer

2022, The World Meeting for Women in Mathematics(online)

2022, General CWM Ambassadors Meeting (online)

2021, Istanbul Center for Mathematical Sciences Number Theory Seminar(online)

2020, Women and Mathematics: Number Theory, Istanbul Center for Mathematical Sciences

2019, p–adic modular forms, A mini-satellite conference to Journées Arithmétiques XXXI, Istanbul Center for Mathematical Sciences

Mirzakhani Memorial(part of May 12 initiation), Istanbul Center for Mathematical Sciences

2018, Antalya Algebra Days, Nesin Mathematics Village

2018, Summer School on Effective Geometry and Arithmetic of Curves, Feza Gürsey Center for Physics and Mathematics and Istanbul Center for Mathematical Sciences

2018, TMD Summer School on Algebraic Number Theory, Feza Gürsey Center for Physics and Mathematics

2016, Women in Numbers Europe 2, Lorentz Center, Leiden

2007, Fifth Midwest Graduate Students Number Theory Conference

### Scientific Committees

· Introduction to SAGA Symposium on Arithmetic Geometry and its Applications
· Turkish Math Society Distinguished Math Colloquium Series organizing committee
· IMBM Mathematics Days organizing committee

### Editing

· Area editor of Hacettepe Journal of Mathematics and Statistics
· Editor of International Mathematics Union-Committee for Women in Mathematics Newsletter
· Member of editorial board of Matematik Dunyasi, popular math magazine of Turkish Math Society
· Member of Editorial Advisory Board of Bilim ve Teknik (ended in June 2020)

**Referee Work**

<u>Journals:</u> Proceedings of the American Mathematical Society, Journal of Number Theory, Mathematische Annalen(quick opinion), Mathematics of Computation, Turkish Journal of Mathematics, Hacettepe Journal of Mathematics and Statistics, Canadian Journal of Mathematics, Mathematika, Research in Number Theory, Proceedings of the London Mathematical Society(quick opinion), EMS Surveys in Mathematical Sciences, The Ramanujan Journal, Mathematics of Computation, International Journal of Number Theory.

<u>Conference Proceedings:</u> 26th Conference on Selected Areas in Cryptography, AMS Contemporary Mathematics Volume 732

<u>Grants:</u> European Commission, National Sciences and Engineering Research Council of Canada, The Scientific and Technological Research Council of Turkey

<u>K12 Research Projects:</u> TUBITAK(The Scientific and Technological Research Council of Turkey) Research Project Competition for Middle School Students, TUBITAK Research Project Competition for High School Students, Uskudar American College Academic Research Conference

**Professional Committees**

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|---|---|
| · International Mathematical Union-Committee for Women Mathematicians | 2018 - present |
| · Istanbul Center for Mathematical Sciences(IMBM) Management Committee | 2018 - present |
| · Member of Women In Numbers Steering Committee | 2016 - present |

**Departmental and University Service**

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|---|---|
| · Co-director, Istanbul Center for Mathematical Sciences(IMBM) | 2022 - present |
| · Vice-Chair, Mathematics Department, Bogazici Uni. | 2019 - 2022 |
| · Graduate Enterance Exam Committee, Mathematics Department, Bogazici Uni. | 2018 - present |
| · Board Member, Institute of Graduate Studies in Science and Engineering, Bogazici Uni. | 2018 - 2020 |
| · Committee Member, University Committee on Student Activities, Bogazici Uni. | 2016 - 2023 |

**Other Activities**

PhD qualifying committee member of:

Hamide Kuru (Sabanci University, 2021), Doga Can Sertbas (Koc University, 2018)
Sena Cebeci (ITU Informatics Insitute, 2017), Neslihan Girgin (Bogazici University, 2017)

**REFERENCES**

• Prof. Dr. Jordan Ellenberg (PhD Advisor)
ellenber@math.wisc.edu
Department of Mathematics
University of Wisconsin
Madison, WI 53706, USA

• Prof. Dr. Michael Starbird (teaching reference)
starbird @math.utexas.edu
University of Texas at Austin
Department of Mathematics
Austin, TX 78712-1202, USA

• Prof. Dr. Rachel Pries
pries @colostate.edu
Math Department,
Colorado State University,
Fort Collins CO 80523-1874, USA

• Prof. Dr. Samir Siksek
samir.siksek @gmail.com
Mathematics Institute
University of Warwick
Coventry, CV4 7AL, UK

• Prof. Dr. Irene Bouw
irene.bouw @uni-ulm.de
Universitat Ulm
89081, Ulm, Germany