

## Francesc Castella

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### Academic Positions

- 2017–present     Instructor, **Princeton University**
- 2016–2017       Associate Research Scholar, **Princeton University**
- 2013–2016       Hedrick Assistant Professor, **University of California, Los Angeles**

### University Degrees

- 2013              Ph.D. in Mathematics, **McGill University** (advisor: Henri Darmon)
- 2009              M.Sc. in Mathematics, **BarcelonaTech** (advisor: Victor Rotger)
- 2008              B.Sc. in Mathematics, **BarcelonaTech**

### Awards and Honors

- 2016              Distinguished Teaching Award, UCLA
- 2016              Vicent Caselles Award, BBVA Foundation–Royal Spanish Mathematical Society
- 2008              Évariste Galois Prize, Institut d’Estudis Catalans

### Grants and Fellowships

- 2016–2018       AMS–Simons Travel Grant
- 2011              ISM Graduate Scholarship, Institut des Sciences Mathématiques
- 2010, 2012       Schulich Graduate Fellowship, McGill University

### Publications and Preprints

17. **Indivisibility of Heegner points and arithmetic applications**, with A. Burungale and C.-H. Kim. In preparation.
16. **Class groups and local indecomposability for non-CM forms**, with C. Wang-Erickson. In preparation.
15. **Elliptic curves of rank two and nonvanishing of generalised Kato classes**, with M.-L. Hsieh. In preparation.
14. **On Howard’s horizontal nonvanishing conjecture**, with C. Skinner. Preprint (2017).
13. **Rankin–Eisenstein classes, big Heegner points, and main conjectures**, with X. Wan. Preprint (2017).
12. **On the Iwasawa main conjectures for modular forms at non-ordinary primes**, with M. Çiperiani, C. Skinner, and F. Sprung. Preprint (2017).
11. **Perrin-Riou’s main conjecture for elliptic curves at supersingular primes**, with X. Wan. [arXiv:1607.02019](https://arxiv.org/abs/1607.02019), submitted.

10. **On the  $p$ -part of the Birch–Swinnerton–Dyer formula for multiplicative primes.**  
*Cambridge Journal of Mathematics*, to appear.
9.  **$p$ -adic heights of Heegner points and Beilinson–Flach classes.**  
*Journal of the London Mathematical Society* **96** (2017), no. 1, 156–180.
8. **On the  $p$ -adic variation of Heegner points.**  
*Journal de l’Institut Mathématique de Jussieu*, to appear.
7. **Variation of anticyclotomic Iwasawa invariants in Hida families**, with C.-H. Kim and M. Longo.  
*Algebra & Number Theory*, to appear.
6. **Heegner cycles and  $p$ -adic  $L$ -functions**, with M.-L. Hsieh.  
*Mathematische Annalen*, to appear.
5. **On the exceptional specializations of big Heegner points.**  
*Journal de l’Institut Mathématique de Jussieu*, to appear.
4. **A geometric perspective on  $p$ -adic properties of mock modular forms**, with L. Candelori.  
*Research in the Mathematical Sciences* **4:5** (2017), 15 pp.
3. **Big Heegner points and special values of  $L$ -series**, with M. Longo.  
*Annales Mathématiques du Québec* **40** (2016), no. 2, 303–324.
2. **Heegner cycles and higher weight specializations of big Heegner points.**  
*Mathematische Annalen* **356** (2013), no. 4, 1247–1282.
1.  **$p$ -adic  $L$ -functions and Euler systems: a tale in two trilogies**, with M. Bertolini, H. Darmon, S. Dasgupta, K. Prasanna, and V. Rotger.  
*Automorphic Forms and Galois Representations*, LMS Lecture Note Series **414** (2014), 52–101.

### Invited Talks

- UCSD, Mathematics Colloquium November 2017
- Purdue University, Automorphic Forms Seminar November 2017
- Princeton University/IAS Number Theory Seminar, Princeton October 2017
- Conference: “Special Cycles on Shimura Varieties and Iwasawa Theory”, EPFL August 2017
- Workshop: “Euler Systems and Special Values of  $L$ -functions”, EPFL (3 lectures) August 2017
- Jornadas de Teoría de Números, Lleida (plenary speaker) June 2017
- Conference: “ $p$ -adic Methods for Galois Representations and Automorphic Forms”, Barcelona February 2017
- UCSD, Mathematics Colloquium January 2017
- Montréal–Toronto Workshop in Number Theory, Montréal December 2016
- Columbia University, Arithmetic and Automorphic Forms Seminar December 2016
- University of Pennsylvania, Algebra Seminar October 2016
- BIRS Workshop: “New Directions in Iwasawa Theory”, Banff June 2016
- UCSD, Number Theory Seminar May 2016
- Morningside Center of Mathematics, Beijing (2 lectures) March 2016
- University of Arizona, Special Mathematics Colloquium January 2016
- Workshop: “Arithmetic of Euler Systems”, Benasque August 2015
- University of Chicago, Number Theory Seminar April 2015

- Northwestern University, Number Theory Seminar April 2015
- Workshop: “ $p$ -adic Methods in the Theory of Classical Automorphic Forms”  
Montréal March 2015
- Joint Mathematics Meetings, Special Session: “Selmer Groups”, San Antonio January 2015
- University of California Irvine, Number Theory Seminar October 2014
- Columbia University, Arithmetic and Automorphic Forms Seminar September 2014
- ICM Satellite Conference: “Automorphic Forms and Arithmetic”, Pohang August 2014
- $p$ -adic Variation in Number Theory (Glenn Stevens’ 60th), Boston University June 2014
- Caltech, Number Theory Seminar May 2014
- National Taiwan University (3 lectures) February 2014
- IAS Program: “Special Cycles and  $p$ -adic  $L$ -functions”, Hong-Kong January 2014
- Princeton University, Number Theory Seminar November 2013
- UCLA, Number Theory Seminar October 2013
- Workshop: “Effective Methods for Darmon Points”, Benasque August 2013
- FRG/RTG mini-Conference: “ $p$ -adic Modular Forms,  $L$ -functions and Galois  
Representations”, UCLA May 2013
- University of Texas at Austin, Number Theory Seminar April 2013
- Workshop: “Iwasawa Theory and  $p$ -adic Families of Automorphic Forms”, Kyoto  
University (4 lectures) April 2013
- CMS Winter Meeting, Special Session: “Algebraic Number Theory”, Montréal December 2012
- Workshop: “ $p$ -adic Langlands Program: Recent Developments and Applications”,  
Fields Institute, Toronto April 2012

## Teaching Experience

### Princeton

- 2017 Fall · Class Field Theory (MAT 511)
- 2017 Spring · Multivariable Calculus for Economics (MAT 175)
- 2016 Fall · Multivariable Calculus for Economics (MAT 175)

### UCLA

- 2016 Spring · Complex Analysis for Applications (Math 132)
- 2016 Winter · Complex Analysis for Applications (Math 132)
- 2015 Fall · Complex Analysis for Applications (Math 132)
- Linear Algebra and Applications (Math 33A)
- 2015 Spring · Algebra for Applications (Math 117)
- 2015 Winter · Algebra (Math 110A)
- Integration and Infinite Series (Math 31B)
- 2014 Fall · Topics in Number Theory (Math 207A)
- 2014 Spring · Linear Algebra and Applications (Math 33A)
- 2013 Fall · Linear Algebra (Math 115A)
- Differential and Integral Calculus (Math 31A)

## Mentoring Experience

- 2018 Spring · Projects assistant of Christopher Skinner at the Arizona Winter School 2018.
- 2017 Summer · Ishan Levy, Princeton '19. “Stark’s conjectures and  $p$ -adic analogues”
- Samuel Marks, Princeton '19. “Stark’s conjectures and  $p$ -adic analogues”
- 2016 Spring · Jaehoon Lee, UCLA \*19. Graduate reading course on Euler Systems
- 2015 Fall · Van Latimer, UCLA '16. Project: “2-adic modular forms and Maeda’s conjecture”
- 2014 Spring · Yishu Gong, UCLA '16. “Towards a  $p$ -adic theory of mock modular forms”
- Ziyi Zhuang, UCLA '15. “ $p$ -adic properties of Taylor coefficients of modular forms”
- 2013 Fall · Mohammed Zuhair, UCLA \*17. Graduate reading course on Algebraic Geometry

## Service

- Reader/examiner for the senior thesis of Miranda Moore, Princeton '17.
- Co-organizer, UCLA Number Theory Seminar (2013–2016).
- Referee for: American Journal of Mathematics, Annales de l’Institut Fourier (Grenoble), Annals of Mathematics, Canadian Journal of Mathematics, Commentarii Mathematici Helvetici, Compositio Mathematica, Documenta Mathematica, Duke Mathematical Journal, Forum of Mathematics II, Forum Mathematicum, IMRN, Indiana University Mathematics Journal, Journal für die Reine und Angewandte Mathematik (Crelle’s Journal), Kyoto Journal of Mathematics, Mathematische Zeitschrift, Springer, Transactions of the AMS.
- Regular contributor to MathSciNet (2009–present).

## References

Professor Henri Darmon  
[henri.darmon@mcgill.ca](mailto:henri.darmon@mcgill.ca)

Professor Christopher Skinner  
[cmcls@math.princeton.edu](mailto:cmcls@math.princeton.edu)

Professor Haruzo Hida  
[hida@math.ucla.edu](mailto:hida@math.ucla.edu)

Professor Victor Rotger  
[victor.rotger@upc.edu](mailto:victor.rotger@upc.edu)

Professor James Ralston (teaching)  
[ralston@math.ucla.edu](mailto:ralston@math.ucla.edu)

Professor Mirela Çiperiani  
[mirela@math.utexas.edu](mailto:mirela@math.utexas.edu)

## Personal

- Birthdate: July 28, 1986
- Citizenship: Spanish