

John Bergdall

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Department of Mathematics
Park Science Building
Bryn Mawr College
Bryn Mawr, PA 19010-2899

Email: jbergdall@brynmawr.edu
Office: Park 334
Phone: 610-526-5356

Employment

2018– **Bryn Mawr College**, Assistant Professor.
2017–18 **Michigan State University**, Visiting Assistant Professor.
2014–17 **Boston University**, NSF Postdoctoral Research Fellow.
2013–14 **Boston University**, Postdoctoral Faculty Fellow.

Education

2008–13 **Brandeis University**, Ph.D.
2003–08 **University of Minnesota**, B.S.

Other academic positions

2017 **Max-Planck-Institut für Mathematik**, Visitor (3 months).
Institut des Hautes Études Scientifiques, Visitor (2 months).

Research articles

- * [Upper bounds for constant slope \$p\$ -adic families of modular forms](#)
*To appear in *Selecta Mathematica*.*
- * [Smoothness of definite unitary eigenvarieties at critical points](#)
*To appear in *J. reine angew. Math. (Crelle's Journal)**
- * [Slopes of modular forms and the ghost conjecture, II](#) (joint with Robert Pollack)
Trans. Amer. Math. Soc., 372 (2019), no. 1, 357–388.
- * [Slopes of modular forms and the ghost conjecture](#) (joint with Robert Pollack)
Int. Math. Res. Not. (IMRN) 2019, no. 4, 1125–1244.
- * [An adjunction formula for the Emerton–Jacquet functor](#) (joint with Przemyslaw Chojecki)
Israel J. Math. 223 (2018), no. 1, 1–52.
- * [A remark on non-integral \$p\$ -adic slopes for modular forms](#) (joint with Robert Pollack)
C. R. Math. Acad. Sci. Paris 355 (2017), no. 3, 260–262.
- * [Paraboline variation of \$p\$ -adic families of \$\(\varphi, \Gamma\)\$ -modules](#)
Compos. Math. 153 (2017), no. 1, 132–174.
- * [Arithmetic properties of Fredholm series for \$p\$ -adic modular forms](#) (joint with Robert Pollack)
Proc. Lon. Math. Soc., (3) 113 (2016), no. 4, 419–444.
- * [Ordinary modular forms and companion points on the eigencurve](#)
J. Number Theory 134 (2014), 226–239.

Submitted articles

- * [Reductions of some two-dimensional crystalline representations via Kisin modules](#) (joint with Brandon Levin)
Submitted (2019).
- * [On \$p\$ -adic \$L\$ -functions for Hilbert modular forms](#) (joint with David Hansen)
Submitted (2017).

Grants and awards

2019	Mellon Tri-College Seed Grant (\$1,500)
2014	NSF Mathematical Sciences Postdoctoral Research Fellowship (\$150,000)

Conference presentations

2019	“Constant slope families of p -adic modular forms” AMS special session on special values of L-functions and arithmetic invariants in families Hartford, CT “Constant slope families of p -adic modular forms” 33rd Automorphic Forms Workshop Pittsburgh, PA
2017	“Upper bounds for constant slope p -adic families of modular forms” AMS special session on p-aspects of arithmetic geometry Buffalo, NY “Geometric properties of p -adic families of automorphic forms (and an application)” p-adic methods for Galois representations and modular forms Barcelona, Spain
2016	“Some questions about slopes of modular forms.” AMS special session on p-adic analysis in number theory Minneapolis, MN “Geometric properties of p -adic families of automorphic forms and applications” Conn. summer school in number theory (conference on elliptic curves and modular forms) Storrs, CT “Slopes of modular forms and the ghost series” The p-adic Langlands program and related topics Bloomington, IN
2015	“Slopes of modular forms and the ghost conjecture” Boston University/Keio University joint workshop in number theory Boston, MA “Arithmetic properties of Fredholm series ” p-adic methods in the theory of classical automorphic forms Montréal, QC
2014	“Ordinary representations on $U(3)$ and a conjecture of Breuil and Herzig” Fourth annual upstate New York number theory conference Buffalo, NY
2013	“Parabolizations over families of trianguline representations” Modular forms, p-adic L-functions and Selmer groups Oriahovitza, Bulgaria

Recent colloquium & seminar presentations († indicates colloquium)

2019	Univ. of Notre Dame† Inst. for Advanced Study	“Explicit problems in the p -adic theory of modular forms” “Upper bounds for constant slope p -adic families”
2018	Harvard Univ. Univ. of Pennsylvania Univ. of Arizona	— — —

2018	Haverford Coll. [†] Purdue Univ. Florida Atlantic Univ. [†] Univ. of Maine [†] Univ. Mich.-Dearborn [†] Wayne State Univ. [†] Bryn Mawr Coll. [†]	"Approximating roots: from Newton to the ghost conjecture" "Upper bounds for constant slope p -adic families" " p -adic L -functions and arithmetic" — — — — "Algebra and number theory from the p -adic perspective"
2017	Univ. of Michigan Michigan State Univ. Max Planck Inst. Max Planck Inst. [†] Univ. Paris-Sud IHÉS Concordia Univ. [†] Univ. of Arizona [†]	"Critical p -adic L -functions for Hilbert modular forms" "Introduction to the arithmetic of modular forms" (3 talks) "Slopes of modular forms and the ghost conjecture" " p -adic variation of Hecke eigenforms" "On p -adic L -functions for Hilbert modular forms" — "Families of modular forms" —
2016	Boston Univ. UC-Santa Cruz Harvard Univ. Univ. of Connecticut Indiana Univ. Boston Univ. [†]	"On p -adic L -functions for finite slope modular forms" "Slopes of modular forms and the ghost conjecture" "Slopes of modular forms and the ghost conjecture" — — "Aspects of the Langlands program arising in families of modular forms"
2015	Univ. of Chicago Northwestern Univ. Boston Univ. Oxford Univ.	"Arithmetic properties of Fredholm series" — "On the mod p reduction of Fredholm determinants for modular forms" —
2014	MIT Amherst Coll. Brandeis Univ.	"Smoothness in families of p -adic automorphic forms" "Representations appearing in the cohomology of definite unitary groups" —
2013	Columbia Univ. Boston University Boston University	"Overconvergent companion forms" "Overconvergent companion forms via the eigencurve" "The variation of (φ, Γ) -modules over eigenvarieties"

Teaching experience

2018–	Bryn Mawr College , Instructor MATH 303-4: Algebra I,II MATH 317: Elliptic curves
2017–18	Michigan State University , Instructor MTH 132-3: Calculus I,II
2013–17	Boston University , Instructor MA 841: Topics in number theory MA 123: Calculus I MA 341: Elementary Number Theory MA 541: Abstract algebra (undergraduate)
2015	PROMYS , Instructor Complex analysis in number theory (advanced high school students)
2010–11	Brandeis University , Teaching fellow MATH 10a/b: Techniques of calculus
2007–08	University of Minnesota , Teaching assistant MATH 2243: Linear algebra and differential equations MATH 1053: Precalculus I

Organizational activities

- 2019– Organizer: [Bi-College Math Colloquium](#)
2019– Co-organizer: [Philadelphia area number theory seminar](#)
2013–17 Co-organizer: [Boston University number theory seminar](#)
2015 Co-organizer: [BU-Keio workshop](#)
2014–15 Organizer: Boston Univ. graduate student learning seminars
Topics: [The local Langlands conjectures](#), [\$p\$ -adic Hodge theory](#)

Research advising

- 2019 Summer Science Research (Bryn Mawr College)
Students: Sandy Chen, Sophia Schein
2016 PROMYS research project (Boston University)
Students: David Amirault, Vanshika Jain, Roshan Padaki, and Sabir Shaik.
Title: "Slopes of Newton polygons"
2015–16 Boston University Academy thesis advisor (high school)
Student: Alexander Peraire-Bueno.
Title: "Counting with partitions"

Teaching, mentoring, and student service

- 2019 MA thesis second reader
Students: Aisha Mechery, Sichen Zhang, Lindsay Dever
2008–10 Brandeis University graduate student tutor.

Professional service

- 2016, Panelist on professional development seminar(s): Boston University, Boston College,
2018–19 Bryn Mawr College, Temple University
2010–11 Brandeis University graduate student council representative.

Professional membership

- 2008–13, American Mathematical Society
2016–