Nickolas Andersen   CURRICULUM VITAE

CONTACT	BYU Mathematics Department 210 TMCB Provo, UT 84604	email `nick@math.byu.edu` url `www.math.byu.edu/~nick`

EMPLOYMENT

Brigham Young University   July 2019 – Present
Assistant Professor

University of California Los Angeles   July 2016 – June 2019
Assistant Adjunct Professor (postdoc), Mentor: William Duke

Mathematical Sciences Research Institute (MSRI)   Spring 2017
Postdoctoral Fellow, Analytic Number Theory Program, Mentor: Philippe Michel

EDUCATION

University of Illinois at Urbana-Champaign
Ph.D., Mathematics, Advisor: Scott Ahlgren   May 2016
Thesis: *Arithmetic of Maass forms of half-integral weight*

Brigham Young University
B.S., Mathematics, Advisors: Paul Jenkins and Darrin Doud   April 2011

RESEARCH INTERESTS

Analytic number theory, especially the relationship between automorphic forms (modular forms, Maass forms, mock modular forms, etc.) and quadratic number fields, hyperbolic geometry, L-functions, elliptic curves, and additive number theory

PUBLICATIONS

24. *Asymptotic distribution of traces of singular moduli*
    with W. Duke, submitted, `arXiv:2011.02064`

23. *Odd, spoof perfect factorizations*
    with the BYU Computational Number Theory Group, submitted,
    `arXiv:2006.10697`

22. *Zeros of GL_2 L-functions on the critical line*
    with J. Thorner, Forum Math., to appear, `arXiv:2004.03581`

21. *On a theorem of Davenport and Schmidt*
    with W. Duke, Acta Arith., to appear, `arXiv:1905.05236`

20. *The Minkowski chain and Diophantine approximation*
    with W. Duke, J. Théor. Nombres Bordeaux 32 (2020), no. 2, 503–524,
    `arXiv:1908.06157`

19. *Modular invariants for real quadratic fields and Kloosterman sums*
    with W. Duke, Algebra Number Theory 14 (2020), no. 6, 1537–1575,
    `arXiv:1801.08174`.

18. *Markov spectra for modular billiards*
    with W. Duke, Math. Ann. 373 (2019), no. 3-4, 1151–1175, `arXiv:1803.05096`.

17. *Level reciprocity in the twisted second moment of Rankin-Selberg L-functions*
    with E. M. Kiral, Mathematika 64 (2018), no. 3, 770-784, `arXiv:1801.06089`.

16. *Shifted polyharmonic Maass forms for* $\mathrm{PSL}(2, \mathbb{Z})$
    with J. Lagarias and R. Rhoades, Acta Arith. 185 (2018), 39-79,
    `arXiv:1708.01278`.

15. *A polyharmonic Maass form of depth 3/2 for* $\mathrm{SL}_2(\mathbb{Z})$
    with S. Ahlgren and D. Samart, J. Math. Anal. Appl. 468 (2018), no. 2,
    1018-1042, `arXiv:1707.06117`.

14. *Kloosterman sums and Maass cusp forms of half integral weight for the modular
    group*, with S. Ahlgren, International Mathematics Research Notices (IMRN) 2018,
    no. 2, 492–570. `arXiv:1510.05191v2`.

13. *Images of Maass-Poincaré series in the lower half-plane*
    with K. Bringmann and L. Rolen, *L*-functions and automorphic forms, Contrib.
    Math. Comp. Sci. 10, Springer 2017, `arXiv:1612.00051`.

12. *Vector-valued modular forms and the seventh order mock theta functions*
    Analytic number theory, modular forms and q-hypergeometric series, 11-23,
    Springer Proc. Math. Stat., 221, Springer, Cham, 2017.

11. *Singular invariants and coefficients of weak harmonic Maass forms of weight* 5/2
    Forum Mathematicum 29(1): 7–29, 2017, `arXiv:1410.7349`.

10. *Vector-valued modular forms and the mock theta conjectures*
    Research in Number Theory, 2(32), 14 pages, 2016, `arXiv:1604.05294v1`.

9. *Algebraic and transcendental formulas for the smallest parts function*
   with S. Ahlgren, Advances in Mathematics 289:411–437, 2016,
   `arXiv:1504.02500v2`.

8. *Periods of the j-function along infinite geodesics and mock modular forms*
   Bulletin of the London Mathematical Society 47(3):407–415, 2015,
   `arXiv:1410.7337`.

7. *Euler-like recurrences for smallest parts functions*
   with S. Ahlgren, Ramanujan Journal 36(1-2):237–248, special issue in memory of
   Basil Gordon, 2015, `arXiv:1402.5366`.

6. *Weak harmonic Maass forms of weight 5/2 and a mock modular form for the
   partition function*, with S. Ahlgren, Research in Number Theory 1(10), 16 pages,
   2015, `arXiv:1312.1943v3`.

5. *Classification of congruences for mock theta functions and weakly holomorphic
   modular forms*, Quarterly Journal of Mathematics 65(3):781–805, 2014,
   `arXiv:1307.0169`.

4. *Hecke grids and congruences for weakly holomorphic modular forms*
   with S. Ahlgren, Contemporary Mathematics 627:1–16, 2014, `arXiv:1305.7455`.

3. *Effective congruences for mock theta functions*
   with H. Friedlander, J. Fuller, and H. Goodson, Mathematics 1(3):100-110, 2013,
   `arXiv:1304.3136`.

2. *Hecke-type congruences for two smallest parts functions*
   International Journal of Number Theory 9(3):713–728, 2013, `arXiv:1209.4009`.

1. *Divisibility properties of coefficients of level p modular functions for genus zero
   primes*, with P. Jenkins, Proceedings of the American Mathematical Society
   141(1):41–53, 2013, `arXiv:1106.1188`.

GRANTS	BYU College of Physical and Mathematical Sciences FAST Grant for the Computational Number Theory Group, $20 000, with M. Griffin, P. Jenkins, and P. Nielsen	2020–Present
	National Science Foundation grant DMS-2005654: *Workshop on Automorphic Forms and Related Topics*, $14 000, PI, with co-PIs D. Doud, M. Griffin, and P. Jenkins	2019–2021
	National Science Foundation grant DMS-1701638: *New directions in the theory of automorphic forms*, $410 000, co-PI with W. Duke	2017–2021
	Illinois ARCS Graduate Scholar Research Award, $20 000	2014–2016
	Arnold O. Beckman grant, with S. Ahlgren	2013–2014
RESEARCH AWARDS AND HONORS	Postdoctoral plenary speaker, Palmetto Number Theory Series	2017
	Graduate student plenary speaker, Texas-Oklahoma Representations and Automorphic Forms	2016
	Bateman Prize for outstanding research in number theory	2016
	Dissertation Completion Fellowship	2015–2016
	Bateman Fellowship for outstanding research in number theory	2015
	NSF Graduate Research Fellowship, Honorable Mention	2011
TEACHING AWARDS AND HONORS	UCLA Mathematics Department Distinguished Teaching Award	2018
	UIUC Campus Award for Excellence in Undergraduate Teaching	2016
	UIUC College of LAS Award for Excellence in Undergraduate Teaching	2016
	UIUC Mathematics Department TA Instructional Award	2015
	List of teachers ranked as excellent by their students	Fall 2014, Spring 2013, Fall 2012, Spring 2012, Fall 2011
PROFESSIONAL SERVICE	Co-organizer, BYU Computational Number Theory Seminar	2019 – Present
	Co-organizer, UCLA Number Theory Seminar	2017 – 2018
	Organizer, MSRI Analytic Number Theory Postdoc Seminar	Spring 2017
	Chair, UIUC Math Dept TA Teaching Awards Committee	Fall 2015
	Instructor, UIUC Math Dept TA Training Program	Summer 2015
	Co-organizer, Midwest Number Theory Conference for Graduate Students and Recent PhDs	Summer 2014
	Organizer, UIUC Graduate Student Seminars on *Fermat's Last Theorem* and *Class Field Theory*	Spring 2014 and Spring 2015
	Referee for *Advances in Mathematics*, *Forum Mathematicum*, *Forum of Mathematics: Sigma*, *Hamburg Abhandlungen*, *International Journal of Number Theory*, *Internamtional Mathematics Research Notices*, *Journal of the European*	

*Mathematical Society, Journal of Number Theory, Journal of Mathematical
Analysis and Applications, Pacific Journal of Mathematics, Ramanujan Journal,
Research in Number Theory, Research in the Mathematical Sciences*
Reviewer for Mathematical Reviews

MENTORING & OUTREACH	BYU Graduate Student Research	
	• Clayton Williams (MS)	2020-Present
	BYU Mentored Undergraduate Research	
	• Gordon Bridge and Ethan Palenske	2020–Present
	• Zach Hacking and Amy Woodall	2019–Present
	Non-convex geometry of numbers and continued fractions, in preparation.	
	Mentor for UCLA Math 99 (student research program)	
	• Deepenti Shrestha: *Computing Class Numbers of Quadratic Fields*	Winter 2018
	Instructor for Los Angeles Math Circle	Fall 2017
	Instructor for Berkeley Math Circle	Spring 2017
	Mentor for UIUC Merit Fellows Scholarship Program	Fall 2015
	Orals Judge for ICTM high school mathematics competition	Spring 2015
	Agora days instructor (high school outreach)	
	• *Codebreaking 101*	Spring 2015
	• *To Infinity and Beyond*	Spring 2014
	Graduate mentor in Illinois Geometry Lab	Fall 2013
	UIUC Merit TA Mentor	Fall 2013, Spring 2014, Spring 2015
	UIUC TA Mentor	Fall 2013

TEACHING	**BYU**	
	Math 487: Number Theory	Winter 2021
	Math 371 (EMC2): Introduction to Abstract Algebra	Winter 2021
	Math 113: Calculus 2	Fall 2020
	Math 290 (EMC2): Fundamentals of Mathematics	Fall 2020
	Math 371 (EMC2): Introduction to Abstract Algebra	Winter 2020
	Math 290: Fundamentals of Mathematics	Winter 2020
	Math 290 (EMC2): Fundamentals of Mathematics	Fall 2019
	UCLA (primary instructor)	
	Math 205A: Analytic Number Theory	Fall 2018
	Math 31B: Integration and Infinite Series	Fall 2018
	Graduate Student Boot Camp: Linear Algebra	Summer 2018
	Math 132: Complex Analysis	Spring 2018
	Math 32A: Multivariable Calculus	Spring 2018
	Math 3B: Calculus for Life Sciences	Winter 2018
	Math 131A: Real Analysis	Fall 2017
	Math 33B: Differential Equations	Fall 2017
	Math 31B: Integration and Infinite Series	Fall 2016
	UIUC (primary instructor)	
	Math 221: Calculus I	Fall 2014

UIUC (teaching assistant)

Math 220: Calculus I*	Spring 2013
Math 241: Multivariable Calculus*	Spring & Fall 2012
Math 221: Calculus I	Fall 2011

*Merit discussion sections: active-learning format designed to help underrepresented minorities and students from small, rural high schools.

SELECTED CONFERENCE & SEMINAR TALKS

International Seminar on Automorphic Forms, TU Darmstadt (remote)	April 2020
Joint Mathematics Meetings, Denver CO	January 2020
SASTRA Ramanujan Conference, Kumbakonam, India	December 2019
AMS Western Sectional Meeting, U Hawaii	March 2019
Joint Mathematics Meetings 2019, Baltimore MD	January 2019
UW Madison Number Theory Seminar	Nov 2018
AMS Spring Western Sectional Meeting, Portland State U	April 2018
32nd Automorphic Forms Workshop, Tufts U	March 2018
Vanderbilt Mathematics Colloquium	Jan 2018
UCLA Number Theory Seminar	Jan 2018
Palmetto Number Theory Series XXVIII, U Tennessee	Sept 2017
AMS Central Fall Sectional Meeting, U North Texas	Sept 2017
Joint Mathematics Meetings, Atlanta, GA	Jan 2017
Analytic Number Theory Postdoc Seminar, MSRI	Apr 2017
UCLA Number Theory Seminar	Oct 2016
Connecticut Number Theory Conference, U Connecticut	Aug 2016
Texas-Oklahoma Representations and Automorphic Forms, U North Texas	Apr 2016
30th Automorphic Forms Workshop, Wake Forest University	Mar 2016
UIUC Number Theory Seminar	Oct 2015
Illinois Number Theory Conference, UIUC	Aug 2015
13th International Symposium on Orthogonal Polynomials, Special Functions, and Applications, NIST, Gathersburg, MD	Jun 2015
29th Automorphic Forms Workshop, U Michigan	Mar 2015
UCLA Number Theory Seminar	Jan 2015
UIUC Number Theory Seminar	Nov 2014
AMS Central Fall Sectional Meeting, U Wisconsin – Eau Claire	Sep 2014
US/EU Conference on Automorphic Forms and Related Topics, U Bristol	July 2014
Midwest Number Theory Conference, UIUC	Jun 2014
BYU Number Theory Seminar	Jan 2014
UIUC Number Theory Seminar	Dec 2013
Ramanujan 125, U Florida	Nov 2012
Midwest Number Theory Conference, UIUC	Oct 2012
25th Automorphic Forms Workshop, Oregon State U	Mar 2011
Western Number Theory Conference, Utah Valley U	Dec 2010

PROGRAMMING & MARKUP LANGUAGES

Natively fluent: Mathematica, LaTeX

Conversationally fluent: Sage & Python, Java, HTML & CSS

Tourist: Magma, C++, Haskell