

# CURRICULUM VITA OF DAVID HANSEN

June 8, 2018

## Personal data

Date of birth: 3 March, 1988  
U.S. Citizen

## Employment

**University of Notre Dame, 2018-**  
Assistant Professor

**Columbia University, 2014-2018**  
J.F. Ritt Assistant Professor

**Institut de Mathématiques de Jussieu, 2013-2014**  
Postdoctoral Researcher

## Education

**Boston College, Ph.D. in Mathematics, 2013**  
Thesis: *Overconvergent cohomology: theory and applications*  
Advisor: Avner Ash

**Brown University, B.A. in Mathematics with Honors, 2010**

## Papers and preprints

(All papers and preprints available at <http://www.math.columbia.edu/~hansen>)

1. *Remarks on nearby cycles of formal schemes*, preprint
2. *Vanishing and comparison theorems in rigid analytic geometry*, preprint
3. *A primer on reflexive sheaves*, appendix to *On the Kottwitz conjecture for local Shimura varieties* by T. Kaletha and J. Weinstein, preprint
4. *On  $p$ -adic  $L$ -functions for Hilbert modular forms*, with J. Bergdall, preprint

5. *Line bundles on rigid varieties and Hodge symmetry*, with S. Li, preprint
6. *Degenerating vector bundles in  $p$ -adic Hodge theory*, preprint
7. *Extensions of vector bundles on the Fargues-Fontaine curve*, with C. Birkbeck, T. Feng, S. Hong, Q. Li, A. Wang and L. Ye, preprint
8. *Moduli of local shtukas and Harris's conjecture, I*, preprint
9. *Period morphisms and variations of  $p$ -adic Hodge structure*, preprint
10. *Quotients of adic spaces by finite groups*, to appear in *Math. Res. Letters*
11. *On the  $\mathrm{GL}_n$ -eigenvariety and a conjecture of Venkatesh*, with J. Thorne, *Selecta Math.* Vol. 23 Issue 2, pp. 1205-1234
12. *Iwasawa theory of overconvergent modular forms, I: Critical-slope  $p$ -adic  $L$ -functions*, preprint
13. *Overconvergent modular forms and perfectoid Shimura curves*, with P. Chojecki and C. Johansson, *Documenta Math.* Vol. 22, pp. 191-262
14. *Universal eigenvarieties, trianguline Galois representations, and  $p$ -adic Langlands functoriality*, *J. reine angew. Math.* Vol. 2017 Issue 730, pp. 1-64
15. *Minimal modularity lifting for  $\mathrm{GL}_2$  over an arbitrary number field*, to appear in *Math. Res. Letters*
16. *Shimura lifts of half-integral weight modular forms arising from theta functions*, with Y. Naqvi. *The Ramanujan Journal* Vol. 17, No. 3.

### Some papers in preparation

1. *The one-point compactification of a scheme*, with A. J. de Jong
2. *Completed and overconvergent cohomology*, with C. Johansson
3. *Sheafiness criteria for Huber rings*, with K. Kedlaya
4. *A user's guide to diamonds*, with J. Weinstein

### Awards and grants

- Junior Faculty Teaching Excellence Award, Columbia University Math Department, 2016
- Donald J. White Teaching Excellence Award, Boston College, 2012
- David Howell Premium for Excellence in Mathematics, Brown University, 2010
- Josephine de Kármán Foundation Fellow, 2009-2010
- Barry M. Goldwater Scholar, 2008-2010

## Talks and events

### Invited Talks In Seminars and Colloquia:

2018: MSU, Columbia, Stony Brook  
2017: Harvard, McGill (QVNTS), UMichigan, Harvard/MIT Algebraic Geometry, Notre Dame, UIC  
2016: UCSC, Stanford, BU, Columbia, Northwestern, UChicago, BC, UCSD  
2015: Cambridge, UNC, Brown, Columbia, Brandeis, Princeton/IAS, Harvard  
2014: Columbia, ENS Lyon, King's College London, Oxford, Essen, BU, Johns Hopkins  
Pre-2014: Queen's University, BC, Harvard, KU

### Invited Talks At Conferences:

*Michael Rapoport 70th birthday conference*, Bonn, October 2018\*  
*Galois representations*, Heidelberg, July 2018\*  
*Spring lecture series & conference*, University of Arkansas, April 2018  
*Summer school on modular forms*, Padova, September 2017†  
*p-adic methods for Galois representations and modular forms*, Barcelona, February 2017  
*Automorphic forms and arithmetic*, AMS Special Session at the Joint Meetings, January 2017  
*Shimura varieties, representation theory, and related topics*, Kyoto University, November 2016  
*Arithmetic geometry*, Oberwolfach, August 2016  
*The p-adic Langlands program and related topics*, Indiana University, May 2016  
*Southern California number theory day*, UCSD, February 2016  
*Non-archimedean geometry and applications*, Oberwolfach, December 2015  
*Analytic number theory and its applications*, Thessaloniki, July 2014  
*p-adic variation in number theory*, BU, June 2014  
*Atkin memorial conference*, UIC, May 2014  
*Journee arithmetique a Villeteneuse*, Paris 13, February 2014  
*L-functions and Galois representations*, UCLA, May 2013

### Other invited events:

*Arithmetic of Shimura varieties*, Oberwolfach, January 2019\*  
*p-adic cohomology and arithmetic applications*, Banff, October 2017  
*Arizona Winter School on perfectoid spaces*, Tucson, March 2017  
*Arbeitsgemeinschaft on geometric Langlands*, Oberwolfach, April 2016†

\*Upcoming †Unable to attend due to personal or family illness

## Teaching

### At Columbia:

Spring 2018: Honors Math B; Number Theory and Cryptography (+2 independent reading courses)  
Fall 2017: Honors Math A (+1 independent reading course)  
Spring 2017: Honors Math B (+1 independent reading course)  
Fall 2016: Honors Math A;  $p$ -adic Hodge theory (+1 independent reading course)  
Spring 2016: Number Theory and Cryptography (+3 independent reading courses)

Fall 2015: Calculus II; Intro to Higher Math (+1 independent reading course)  
Spring 2015: Number Theory and Cryptography (+1 independent reading course)  
Fall 2014: Two sections of Calculus I

**At BC:**

Fall 2011-Spring 2013: Four sections of Calculus I/II

**Additional activities**

- Co-organizer for the Student Number Theory Seminar at Columbia, Spring 2015-Spring 2018. This is a learning seminar for graduate students focused on one important paper or topic each semester; we covered Scholze’s Berkeley course (Spring 2015),  $p$ -adic  $L$ -functions (Fall 2015), the paper of Caraiani-Scholze (Spring 2016), Kato’s Euler system (Fall 2016), Faltings’s proof of the Mordell conjecture (Spring 2017), Hida theory (Fall 2017), and the local Langlands conjectures (Spring 2018).
- Committee member for Columbia Ph.D. defense of Raju Krishnamoorthy (Advisor: Johan de Jong), April 2016
- Committee member for Columbia Ph.D. defense of Daniel Gulotta (Advisor: Eric Urban), March 2018
- Advisor for the senior honors thesis of Columbia undergraduate Thomas Alexander (“Sander”) Mack-Crane, Spring 2015
- Advisor for an REU project at Columbia (students: Kevin Choi, David Hamann, Srikar Varadaraj, Xin Xu), Summer 2015
- Referee for Alg. & Num. Theory, Ann. Sci. Math. Quebec, Compositio Math., Inventiones Math., J. London Math. Soc., J. reine angew. Math., Paris Book Project, Ramanujan J., etc.

**References**

- Avner Ash, Boston College (ashav@bc.edu)
- Johan de Jong, Columbia University (dejong@math.columbia.edu)
- Michael Harris, Columbia University (harris@math.columbia.edu)
- Barry Mazur, Harvard University (mazur@math.harvard.edu)
- Michael Thaddeus, Columbia University (mt324@columbia.edu) (teaching reference)
- Peter Scholze, Universität Bonn (scholze@math.uni-bonn.de)
- Glenn Stevens, Boston University (ghs@math.bu.edu)