

# Paul Sobaje

## Curriculum Vitae

University of Georgia  
Department of Mathematics  
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### Education

- Aug. 2011 **Ph.D. in Mathematics**, *University of Southern California*.  
Thesis: Blocks of finite group schemes  
Advisor: Eric Friedlander
- Dec. 1998 **B.A. in Mathematics**, *University of California, Los Angeles*.

### Experience

#### Academic Positions

- 2015–2018 **Postdoctoral Associate**, *University of Georgia*.  
2014–2015 **Assistant Professor (NTT)**, *University of Southern California*.  
2011–2014 **Research Fellow**, *University of Melbourne*.  
2006–2011 **Graduate Assistant**, *University of Southern California*.

#### Non-Academic Positions

- 2000–2005 **Database Programmer/Research Analyst**, *STATS LLC/Fox Sports*, Los Angeles.

### Research Interests

Representation theory and structure of finite groups, algebraic groups, Lie algebras, quantum groups, and affine group schemes, particularly over fields of characteristic  $p$ . Study of the nilpotent and unipotent varieties of algebraic groups. Use of support varieties and other cohomological invariants in representation theory.

### Publications and Preprints

- Module invariants and blocks of finite group schemes, *Bull. London Math. Soc.* 45(1) (2013), pp. 213–224 .
- Support varieties for Frobenius kernels, *J. Pure and Appl. Algebra* 216 (2012), pp. 2657–2664.
- On exponentiation and infinitesimal one-parameter subgroups of reductive groups, *J. of Algebra* 385 (2013), pp. 14–26.

- Exponentiation of commuting nilpotent varieties, *J. Pure and Appl. Algebra* 219 (2015), no. 6, pp. 2206-2217.
- Springer isomorphisms in characteristic  $p$ , *Transformation Groups* 20 (2015), no. 4, pp. 1141-1153.
- On liftings of projective indecomposable  $G_{(1)}$ -modules, *J. of Algebra*, 475 (2017), pp. 61-79. (Sandy Green memorial issue)
- (with William Hardesty and Daniel Nakano) On the existence of mock injective modules for algebraic groups, to appear in *Bull. London Math. Soc.*
- (with Martina Lanini and Arun Ram) A Fock space model for decomposition numbers for quantum groups at roots of unity, to appear in *Kyoto J. of Mathematics*.
- On  $(p, r)$ -filtrations and tilting modules, to appear in *Proc. Amer. Math. Soc.*
- Varieties of  $G_r$ -summands in rational  $G$ -modules, submitted.  
[arxiv.org/abs/1605.06330](https://arxiv.org/abs/1605.06330).
- Unipotent elements and generalized exponential maps, submitted.  
[arxiv.org/abs/1708.04153](https://arxiv.org/abs/1708.04153).
- (with Christopher Bendel, Daniel Nakano, and Cornelius Pillen) On tensoring restricted simple  $G$ -modules with the Steinberg representation, in preparation.

## Teaching Experience

- Fall 2017 **Math for elementary teachers**, *University of Georgia*.
- Fall 2017 **Precalculus**, *University of Georgia*.
- Spring 2017 **Calculus II**, *University of Georgia*.
- Fall 2016 **Applied Linear Algebra**, *University of Georgia*.
- Fall 2016 **Algebraic Groups**, *University of Georgia*.
- Spring 2016 **Applied Linear Algebra**, *University of Georgia*.
- Fall 2015 **Calculus II**, *University of Georgia*.
- Spring 2015 **Calculus I**, *University of Southern California*.
- Fall 2014 **Topology**, *University of Southern California*.
- Fall 2014 **Precalculus**, *University of Southern California*.
- Fall 2013 **Calculus I**, *University of Melbourne*.

## Mentoring

- Spring 2015 **Nico Courts, undergraduate research**, *University of Southern California*.  
(currently Ph.D. student at University of Washington)

- 2015–2016 **William Hardesty, Secondary Doctoral Thesis Advisor**, *University of Georgia*.  
(currently postdoc at Louisiana State University)
- 2016–2017 **Postdoctoral Member, Vertical Research Group**, *University of Georgia*.

## Organization

- 2015–2018 **Algebra seminar organizer**, *University of Georgia*.  
 Jan. 2017 **AMS JMM Special Session Organizer**, *Atlanta, GA*.  
 March 2016 **AMS Southeastern Sectional Special Session Organizer**, *Athens, GA*.

## Selected Talks

- Sep. 2017 **Special Session Speaker**, *AMS Southeastern Sectional Meeting, Orlando*.  
 Jan. 2017 **Special Session Speaker**, *Joint Mathematics Meetings, Atlanta*.  
 Sep. 2016 **Algebra Seminar**, *University of Georgia*.  
 Aug. 2016 **Workshop on Geometric and Topological Aspects of the Representation Theory of Finite Groups**, *PIMS, Vancouver*.  
 March 2016 **Pure Mathematics Seminar**, *University of South Alabama*.  
 March 2016 **Colloquium**, *University of South Alabama*.  
 Jan. 2016 **Special Session Speaker**, *Joint Mathematics Meetings, Seattle*.  
 Oct. 2015 **Contributed talk**, *SE Lie Theory Workshop, Raleigh*.  
 Aug. 2015 **AGANT Oberseminar**, *University of Georgia*.  
 Aug. 2015 **Algebra Seminar**, *University of Georgia*.  
 Feb. 2015 **Special Colloquium**, *University of Oklahoma*.  
 Oct. 2014 **Special Session Speaker**, *AMS Western Sectional Meeting, San Francisco*.  
 Oct. 2014 **Special Session Speaker**, *AMS Western Sectional Meeting, San Francisco*.  
 Dec. 2013 **Algebra Seminar**, *University of Southern California*.  
 June 2013 **Special Session Speaker**, *Second Pacific Rim Mathematical Association (PRIMA) Congress, Shanghai*.  
 Sep. 2012 **Algebra Seminar**, *University of Sydney*.  
 May 2012 **Algebra, Geometry, and Topology Seminar**, *University of Melbourne*.  
 Feb. 2012 **Combinatorics, representations, and structure of Lie type**, *University of Melbourne*.  
 Sep. 2011 **Group-valued moment maps with applications to mathematics and physics**, *University of Adelaide*.  
 Nov. 2010 **Colloquium**, *California State University Long Beach*.  
 Oct. 2010 **Algebra and Combinatorics Seminar**, *Texas A&M University*.

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## Awards

- 2013 **Humboldt Research Fellowship**, *Germany*.  
(declined to take one-year position at USC)
- 2010 **Department Teaching Award**, *University of Southern California*.
- Spring 2009 **Department Merit Fellow**, *University of Southern California*.

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## Other Professional Activities

- Referee: **Proceedings of the London Math. Society, Journal of Algebra, J. Pure and Applied Algebra, Algebras and Representation Theory.**
- Trainer: **For incoming graduate assistants**, *University of Southern California, August 2008, 2009.*