

## David Gepner

Department of Mathematics  
Purdue University  
West Lafayette, IN 47907  
USA

## Curriculum Vitae

Phone: (765) 494-1956  
Fax: (765) 494-0548  
Email: [dgepner@purdue.edu](mailto:dgepner@purdue.edu)  
<http://www.math.purdue.edu/~dgepner>

## Education

Ph.D. in Mathematics, University of Illinois Urbana-Champaign, 2006  
THESIS ADVISOR: Matthew Ando

B.A. in Mathematics, Reed College, 1999  
THESIS ADVISOR: Raymond Mayer

## Employment

Associate Professor, Purdue University, August 2017 to present

Assistant Professor, Purdue University, August 2013 to August 2017

Academischer Rat, Universität Regensburg, September 2010 to August 2013

Research Assistant Professor, University of Illinois at Chicago, September 2008 to September 2010

Research Associate, University of Sheffield, November 2005 to September 2008

## Research Interests

I study algebraic topology. More specifically, homotopy theory and its interactions with algebraic geometry, algebraic K-theory, and higher category theory.

## Published papers

1. *On the motivic spectra representing algebraic cobordism and algebraic K-theory*, with V. Snaitch. *Documenta Mathematica*, Vol. 14 (2009), 359-396.  
<http://arxiv.org/abs/0712.2817>
2. *Twists of K-theory and Tmf*, with M. Ando and A. Blumberg, in “Superstrings, Geometry, Topology, and  $C^*$ -algebras”, *Proceedings of Symposia in Pure Mathematics*, Vol. 81, AMS, Providence, 2010.  
<http://arxiv.org/abs/1002.3004>
3. *A universal characterization of higher algebraic K-theory*, with A. Blumberg and G. Tabuada. *Geometry and Topology* 17 (2013), 733-838.  
<http://arxiv.org/abs/1001.2282>
4. *Parametrized spectra, units and Thom spectra via  $\infty$ -categories*, with M. Ando, A. Blumberg, M.J. Hopkins and C. Rezk. *Journal of Topology* (2013).  
<http://arxiv.org/abs/1403.4325>
5. *Actions of Eilenberg-MacLane spaces on K-theory spectra and uniqueness of twisted K-theory*, with B. Antieau and J. Gómez. *Trans. Amer. Math. Soc.* 366 (2014), no. 7, 3631-3648.  
<http://arxiv.org/abs/1106.5099>

6. *Units of ring spectra, Thom spectra, and orientations via rigid infinite loop space theory*, with M. Ando, A. Blumberg, M.J. Hopkins and C. Rezk, 2009. *Journal of Topology* (2014).  
<http://arxiv.org/abs/1403.4320>
7. *Uniqueness of the multiplicative cyclotomic trace*, with A. Blumberg and G. Tabuada. *Advances in Mathematics* 260 (2014), 191-232.  
<http://arxiv.org/abs/1103.3923>
8. *Brauer groups and étale cohomology in derived algebraic geometry*, with B. Antieau. *Geometry and Topology* 18 (2014), no. 2, 1149-1244.  
<http://arxiv.org/abs/1210.0290>
9. *Enriched  $\infty$ -categories via generalized nonsymmetric  $\infty$ -operads*, with R. Haugseng. *Advances in Mathematics* 279 (2015), 575-716.  
<http://arxiv.org/abs/1312.3178>
10. *Universality of multiplicative infinite loop space machines*, with M. Groth and T. Nikolaus. *Algebraic & Geometric Topology* 15 (2015) 3107-3153.  
<http://arxiv.org/abs/1305.4550>
11. *K-theory of endomorphisms via noncommutative motives*, with A. Blumberg and G. Tabuada. *Trans. Amer. Math. Soc.* 368 (2016) 1435-1465.  
<http://arxiv.org/abs/1302.1214>
12. *Univalence in locally cartesian closed  $\infty$ -categories*, with J. Kock. To appear in *Forum Mathematicum*.  
<http://arxiv.org/abs/1208.1749>
13. *Lax colimits and free fibrations in  $\infty$ -categories*, with R. Haugseng and T. Nikolaus. To appear in *Documenta Mathematica*.  
<http://arxiv.org/abs/1501.02161>
14. *On localization sequences in the algebraic K-theory of ring spectra*, with B. Antieau and T. Barthel. To appear in *Journal of the European Mathematical Society*.  
<http://arxiv.org/abs/1412.4041>
15. *Parametrized spectra, multiplicative Thom spectra, and the twisted umkehr map*, with M. Ando and A. Blumberg. To appear in *Geometry and Topology*.  
<http://arxiv.org/abs/1112.2203>
16. *Differential function spectra, the differential Becker-Gottlieb transfer, and applications to differential algebraic K-theory*, with U. Bunke. To appear in *Memoirs of the American Mathematical Society*.  
<http://arxiv.org/abs/1306.0247>

## Papers submitted for publication

1. *Brauer groups and Galois cohomology of commutative ring spectra*, with T. Lawson. Preprint, 2016, submitted for publication.  
<http://arxiv.org/abs/1607.01118>
2. *On the theorem of the heart in negative K-theory*, with B. Antieau and J. Heller. Preprint, 2016, submitted for publication.  
<https://arxiv.org/abs/1610.07207>

## Preprints

1. *Homotopy topoi and equivariant elliptic cohomology*, Ph.D. thesis, 2006.  
<http://www.ideals.illinois.edu/handle/2142/86859>
2. *Homotopy theory of orbispaces*, with A. Henriques, 2007.  
<http://arxiv.org/abs/math/0701916>

## Selected Teaching Experience

Topology	Fall 2017
Homotopy theory	Fall 2015
Algebraic Topology	Spring 2015
Linear Algebra	Fall 2014
Derived algebraic geometry	Spring/Summer 2013
Algebraic K-theory of schemes	Fall/Winter 2012
Algebraic K-theory of spaces	Spring/Summer 2012
Introduction to stable homotopy theory	Spring/Summer 2011
Twisted cohomology (joint with Professor U. Bunke)	Fall/Winter 2010
Abstract algebra	Spring 2010
Calculus I (two sections)	Fall 2009
Calculus III (two sections)	Spring 2008
Differential geometry of curves and surfaces	Fall 2007
Calculus III, accelerated sequence	Spring 2001
Calculus II, accelerated sequence	Fall 2000/Spring 2001
Calculus I, accelerated sequence	Fall 2000

## Selected Invited Lectures

Summer school on motives and derived algebraic geometry, Essen <i>Lecture series on derived algebraic geometry</i>	4-6 May 2016
Mid-Atlantic topology conference, Johns Hopkins University <i>On the stable homotopy theory of stacks and elliptic cohomology</i>	12-14 March 2016
Summer school on algebraic K-theory and trace methods, Regensburg <i>Lectures on noncommutative motives, localization, and trace methods</i>	3-7 August 2015
Mathematics of the 21st century: the vision of Alexander Grothendieck, Montpellier <i>On localization sequences in algebraic K-theory and a conjecture of Rognes</i>	15-19 June 2015
Colloquium, Universität Osnabrück <i>Chromatic homotopy theory and algebraic K-theory</i>	10 June 2015

Geometry and Quantum Theory Colloquium, Utrecht <i>Integral representation theorems for DQ-modules</i>	4–5 June 2015
K-theory: future directions, Ohio State University <i>On localization sequences in algebraic K-theory and a conjecture of Rognes</i>	11–16 May 2015
Massachusetts Institute of Technology <i>On localization sequences in algebraic K-theory and a conjecture of Rognes</i>	31 March 2015
Homotopy theory, Oberwolfach <i>On localization sequences in algebraic K-theory and a conjecture of Rognes</i>	13 March 2015
CUNY Graduate Center <i>Lecture series on parametrized homotopy theory and differential cohomology</i>	5–10 February 2015
Workshop on differential cohomology, CUNY Graduate Center <i>Differential algebraic K-theory</i>	13 August 2014
Reimaging the foundations of algebraic topology, MSRI <i>Thom spectra and twisted Umkehr maps</i>	11 April 2014
University of Copenhagen <i>Stable homotopy functors</i>	14 January 2014
University of Edinburgh <i>Derived algebraic geometry</i>	7 January 2014
Midwest topology seminar, Wayne State University <i>Stable homotopy functors</i>	6 October 2013
Summer school on regulators and differential K-theory, Universität Freiburg <i>Lecture series on higher category theory</i>	July 22–26 2013
Universität Bonn <i>Moduli stacks of modules for associative ring spectra</i>	16 July 2013
Combinatorial structures in algebra and topology, Universität Osnabrück <i>Moduli of objects in linear <math>\infty</math>-categories</i>	6 July 2013
Radboud Universitat Nijmegen <i>Moduli of objects in stable <math>\infty</math>-categories</i>	25 June 2013
Algebra seminar, UCLA <i>K-theory and noncommutative motives</i>	5 April 2013
Barcelona topology workshop, CRM <i>Algebraic K-theory and noncommutative geometry</i>	1 December 2012
Geometric perspective of topological modular forms, University of Tokyo <i>Mini-course on elliptic cohomology and derived algebraic geometry</i>	14 November 2012
Modern perspectives in homotopy theory mini-school, University of Swansea <i>Mini-course on <math>\infty</math>-categories</i>	10–13 April 2012
Northwestern University <i>Brauer groups of commutative ring spectra</i>	9 January 2012
University of Chicago <i>Brauer groups of commutative ring spectra</i>	3 January 2012

Universität Osnabrück <i>Algebraic K-theory via noncommutative motives</i>	8 November 2011
École Polytechnique Fédérale de Lausanne <i>Brauer groups of commutative ring spectra</i>	11 October 2011
Mathematical Institute of the University of Bonn <i>Multiplicative transformations of additive invariants and the uniqueness of the cyclotomic trace</i>	5 July 2011
Massachusetts Institute of Technology <i>Delooping the space of units of a commutative ring spectrum</i>	3 May 2010
Johns Hopkins University <i>Algebraic K-theory and additive functors</i>	15 February 2010
Motivic homotopy theory, Universität Münster <i>Orientations of the motivic multiplicative group, with a view towards motivic elliptic cohomology</i>	30 July 2009
Homotopy Theory and Applications, University of Nebraska <i><math>\mathbb{E}_n</math>-structures and module categories</i>	4 April 2009
Stanford University <i>Cartesian fibrations and straightening</i>	8 December 2008
Workshop on Topological and Differentiable Stacks, CRM <i>Orbivariant homotopy theory</i>	3 April 2008
New Topological Contexts for Galois Theory and Algebraic Geometry, BIRS <i>Introduction to <math>\infty</math>-categories</i>	12 March 2008
Transpennine Topology Triangle Seminar, University of Sheffield <i>Algebraic cobordism and algebraic K-theory as localized group-ring spectra</i>	23 October 2007
Midwest Topology Seminar, University of Illinois Urbana Champaign <i>On the structure of the motivic spectra representing algebraic cobordism and algebraic K-theory</i>	13 October 2007
Universitat Autònoma de Barcelona <i>Lecture series on <math>\infty</math>-categories</i>	23 February 2007
Transpennine Topology Triangle Seminar, University of Leicester <i>Homotopy theory of orbispaces and elliptic cohomology</i>	26 October 2006
Utrecht Day on Orbifolds, Universiteit Utrecht <i>Homotopy theory of orbispaces</i>	30 May 2006
University of Münster <i>Orbivariant elliptic cohomology</i>	1 December 2005
Johns Hopkins University <i>Equivariant elliptic cohomology and homotopy topoi</i>	2 February 2005
University of Chicago <i>The Thom isomorphism in equivariant elliptic cohomology</i>	25 January 2005

## Service

- Coorganizer, Summer School on Trace Methods in Algebraic K-theory, 7 – 11 August 2017
- Organizer, Midwest Topology Seminar, Purdue University, 18 – 19 September 2016
- Organizer, Topology Seminar, Purdue University, Spring 2015
- Coorganizer, Biannual Joint IU/PU/IUPUI Topology Seminar, IUPUI, Fall 2014 – present
- Organizer, Topology Seminar, Purdue University, Fall 2014
- Organizer, Topology Seminar, Purdue University, Fall 2013
- Coorganizer, Chromatic Homotopy Theory Seminar, Universität Regensburg, Winter 2012
- Coorganizer, String Orientation Seminar, Universität Regensburg, Summer 2012
- Coorganizer, Higher Category Theory Seminar, University of Sheffield, 2007 – 2008
- Coorganizer, 22nd British Topology Meeting, University of Sheffield, 10 – 12 September 2007
- Organizer, Chromatic Homotopy Theory Seminar, University of Sheffield, 2006 – 2007

## Grants

- \$185,375 (estimated) NSF grant DMS-1714273, *Derived geometry, elliptic cohomology, and loop stacks*, June 2017 – May 2020
- \$150,270 NSF grant DMS-1406529, *Motives, geometry, and higher category theory*, June 2014 – May 2017
- €7,200 Deutsche Forschungsgemeinschaft grant GE 2504/1-1, March 2012 – August 2013
- £5,000 LMS grant to support the 22nd annual British Topology Meeting, September 2007

## Honors

- Nominated for Departmental Teaching Award, 2001
- Included in “Incomplete List of Teachers Ranked as Excellent by Their Students”, 2001