Lucas A. David-Roesler

Contact Information

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Research Interests

Representation theory; specifically tilting theory, derived categories, and cluster algebras.

Education

University of Connecticut (UConn), Storrs, Connecticut, USA

Ph.D., Mathematics, May 2012

- Dissertation Topic: "Algebras from surfaces and their derived equivalences"
- Advisor: Dr. Ralf Schiffler

M.S., Mathematics, May 2009

Central Connecticut State University (CCSU), New Britain, Connecticut, USA

B.S., Mathematics, May, 2007

Honors and Awards

UConn: Connie Strange Service Award, 2010; Predoctoral Fellowship, Spring 2011

CCSU: graduated Magna Cum Laude, Departmental Honors in Mathematics, Honors Program, 2007

Papers

[1] L. David-Roesler. *The AG-invariant for m-angulations*, submitted, available online: arXiv:1210.6087.

[2] L. David-Roesler. *Derived Equivalence in Surface Algebras via Graded Equivalence*, 30 pages, to appear in Algebr. Represent. Theory. doi:10.1007/s10468-012-9384-9.

[3] L. David-Roesler and R. Schiffler. *Algebras from surfaces without punctures.* J. Algebra **350** (2012). pp. 218-244. doi:10.1016/j.jalgebra.2011.10.034.

Conference Presentations

Representation theory using surfaces. Cluster Algebras and Related Topics session at the CMS Summer Meeting, Regina, Saskatchewan, Canada, June 2,2012.

Algebras from surfaces. Tropical Geometry and Cluster Algebras: Spring School in Paris at the Institut de mathématiques de Jussieu, Paris, France, April 16 – 27, 2012. (Poster presentation)

Constructing algebras from partially triangulated surfaces. Commutative Algebra and Its Interactions with Algebraic Geometry, Representation Theory, and Physics, Pan-American Advanced Studies Institute at Centro de Investigación en Matemticas, Guanajuato, Mexico, May 21,2012.

On algebras from surfaces without punctures. The XXIIIrd Meeting on Representation Theory of Algebras, Bishops University, Sherbrooke, Canada, August 2011.

On algebras from surfaces without punctures. Cluster Algebra Summer Workshop, Mathematical Sciences Research Institute, Berkeley, California, August 2011. **Video available** at `http://www.msri.org/web/msri/online-videos/-/video/showVideo/13726` (approx. 20 minutes)

On algebras from surfaces without punctures. Maurice Auslander Distinguished Lectures and International Conference, Woods Hole, Massachusetts, April 2010.

The Importance of Cantor's Diagonal Argument and Implications for Education. Mathematical Association of America Northeastern Section Meeting, Boston University, Boston, MA, June 2006.

Seminar Presentations

A gentle introduction to quivers. Graduate Seminar, Wesleyan University, CT, February 16, 2012.

Representation theory via pictures. Colloquium, CCSU, February 3, 2012.

On Algebras from Surfaces 2: Properties and Derived Equivalence. Reading seminar on Cluster Algebras, UConn, February 1, 2012.

What is a quiver? SIGMA seminar, UConn, January 27, 2012.

On Algebras from Surfaces 1: Definitions. Reading seminar on Cluster Algebras, UConn, January 25, 2012.

Computer, Hello Computer: A brief introduction to Sage. SIGMA seminar, UConn, August 23, 2011.

On algebras from surfaces without punctures. Algebra Seminar, UConn. March 29, 2011.

QP-interpretation of g-vectors and F-polynomials, part II. Reading Seminar on Cluster Algebras, UConn. March 16, 2011.

QP-interpretation of g-vectors and F-polynomials, part I. Reading Seminar on Cluster Algebras, UConn. March 9, 2011.

Derived equivalences, part II. Reading Seminar on Cluster Algebras, UConn. October 27, 2010.

Derived equivalences, part I. Reading Seminar on Cluster Algebras, UConn. October 20, 2010.

Counting, Infinity, and Cantor. Math Club, UConn. February 16, 2011.

An Introduction to Quivers. SIGMA seminar, UConn. November 12, 2010.

Hensel's Lemma. p-adic seminar, UConn. January 2008.

Invited Workshops

Commutative Algebra and Its Interactions with Algebraic Geometry, Representation Theory, and Physics. Pan-American Advanced Studies Institute, Centro de Investigacin en Matemticas, Guanajuato, Mexico May 14 – 25, 2012.

Tropical Geometry and Cluster Algebras: Spring School in Paris. Institut de mathématiques de Jussieu, Paris, France, April 16 – 27, 2012.

Cluster Algebras and Cluster Combinatorics. Summer Graduate Workshop at Mathematical Sciences Research Institute, Berkeley, CA, USA, August 1 – 12, 2011.

Academic Experience

Lebanon Valley College, Annville, Pennsylvania, USA

Visiting Instructor in Mathematics, Mathematics Department **Fall 2012 – present**

Responsibilities include preparing classes, writing quizzes and exams, grading, holding regular office hours, and conducting review sessions.

- **Finite Mathematics** : Introduction to mathematical techniques used in quantitative analysis in business and economics. Topics include sets, linear relations, matrices, linear programming, probability and interest. Fall 2012.
- **Calculus 1** : A calculus sequence covering functions, limits, differentiation, integration and applications. Fall 2012 (2 sections).

University of Connecticut, Storrs, Connecticut, USA

Teaching Assistant, Mathematics Department **Fall 2007 – Spring 2012**

Responsibilities include preparing classes, writing quizzes and exams, grading, holding regular office hours, and conducting review sessions. Served as primary instructor of each course unless otherwise noted.

- **Discrete Mathematics** : Problem solving strategies, counting and probability, and graph theory for non-majors. Spring 2011 (coordinator for 6 sections, included writing common exams), Fall 2010, Fall 2008, Fall 2007.
- **Mathematical Modeling** : Use of algebraic functions to analyze quantitative relationships with an emphasis on applications, for non-majors. Winter 2010, accelerated semester.
- **Calculus Ia** : First part of a two semester sequence, covers differentiation with a strong algebra/precalc component, Fall 2011.
- **Calculus I** : First part of a three semester calculus sequence with pre-calculus incorporated Fall 2009 (recitation leader)
- **Calculus II** : Second semester calculus course for science and engineering majors. Spring 2010, Spring 2009 (recitation leader both years)
- **Business Calculus** : Second semester of a two semester math sequence for business and economics majors. Basic differential and integral calculus. Spring 2008

Tutor, Student Support Services **Summer 2009**

- Summer program for first generation college students and/or students of low income families. Individual and group tutoring.

Research Assistant

- Pedagogy in Large Lectures **Summer 2011, Summer 2012**

  The Provost General Education Course Enhancement Grant. Investigated the use of online videos and flashcards to improve learning in large lectures. Created content for as well as implementing and maintaining the web resources for displaying content and collecting survey data.
- Research Experience for Undergraduates, participant **Summer 2006**

  Worked with Dr. Kinetsu Abe to extend previous work on knots and surface reconstruction, which is known in dimensions 2 and 3, to higher dimensions.

Professional Experience

University of Connecticut (UConn), Storrs, Connecticut, USA

Mathematics Department **Winter 2008 – Summer 2012**

Web Development and Programming

- Basic web development. **Winter 2008**

  Created an auto-generated questionnaire used to determine graduate courses to offer and teaching preferences of faculty and teaching assistants. Created reusable secure HTML/PHP form elements.
- MySQL and PHP development **January 2010**

  Used MySQL and PHP to generate semester reports used to determine course offerings and the required number of faculty.
- MySQL and PHP development **Summer 2010**

  Used MySQL and PHP to develop administrative tools for department, specifically for scheduling and online student forms. Created extensive documentation for administrative tools.

Service

- Senator in the University of Connecticut Graduate Student Senate (GSS), Spring 2012, Fall 2011, Spring 2010, Fall 2009.
- GSS representative to the UConn Scholastic Standards committee, 2012, 2011.
- Founding member of GAMMA – a graduate student committee for addressing student concerns with the math department.
- Organizing the graduate student orientation.
- Organized weekly graduate social gathering.

- Graduate student mentor.

COMPUTER SKILLS

- Languages: PHP, MySQL, Python, Javascript, UNIX shell scripts.
- Applications: LaTeX, Sage.
- Operating Systems: UNIX/Linux, Mac OS X, Windows.