Elizabeth (Liz) M. Lane-Harvard

Contact Information

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Research Interests

Finite Geometry, Ramsey Theory, Mathematics Education, Graph Theory

Education

Colorado State University, Fort Collins, Colorado USA

Ph.D., Mathematics (expected graduation date: Spring 2014)

- **Thesis Topic:** Constructions of New Strongly Regular Graphs
- **Advisor:** Professor Tim Penttila
- **Area of Study:** Algebraic Graph Theory

South Dakota State University, Brookings, South Dakota USA

M.S., Mathematics, July 2009

- **Thesis Title:** Disjunctive Rado Numbers for the Set of Equations $ax_1 + x_2 = x_3$ and $bx_1 + x_2 = x_3$
- **Advisor:** Professor Daniel Schaal
- **Area of Study:** Ramsey Theory

B.S., Mathematics, December 2007

- **Senior Seminar Advisor:** Professor Donna Flint
- **Area of Study:** Real Analysis, Sequences

Academic Experience

Colorado State University, Fort Collins, Colorado USA

Mathematics Graduate Student **August 2010 to present**

Mathematics Instructor

- Prepared class sessions, assigned homework, graded for all courses, and ran review sessions
- Non-coordinated teaching appointments are indicated with a (*); duties included determining topics covered, constructing appropriate syllabi, writing and scheduling exams, writing homework assignments
- Courses Taught:
  - Calculus for Physical Sciences I, F10
  - Calculus for Physical Sciences II, F11, S13
  - Calculus for Biological Scientists, S11
  - Algorithms in Maple, F13 (*)
  - Algorithms in Matlab, F13 (*)
  - Calculus in the Management Sciences, Su11 (*), S12, F12 (*)

Course Redesign of Calculus for Physical Sciences I

- Collected, analyzed, and interpreted SPSS data from old Calculus for Physical Sciences I exams, algebra quizzes, final grades, and students' high school backgrounds
- Proposed experimental course to meet five days a week based off various factors
- Supported by a grant from The Institute for Learning and Teaching at CSU

Placement Exam for Calculus for Physical Sciences II

- Created a list of primary topics to be taught and mastered in Calculus for Physical Sciences I
- Wrote a two-part placement exam for students to place into Calculus for Physical Sciences II
  - Part I: Multiple Choice
  - Part II: Written Exam/Show your work/Conceptual

Black Hills State University, Spearfish, South Dakota USA

Mathematics Instructor **August 2009 to May 2010**

- Primary Instructor
- Prepared class sessions and helped write exams
- Courses Taught:
  - Basic Algebra, F09, S10
  - Intermediate Algebra, F09, S10
  - College Algebra, F09, S10
- Facilitated course redesign/restructure for Basic and Intermediate Algebra

South Dakota State University, Brookings, South Dakota USA

Mathematics Graduate Student **January 2008 to July 2009**

Mathematics Instructor

- Primary instructor
- Prepared class sessions, assigned homework, graded for all courses, wrote exams, and ran review sessions
- Course Taught:
  - College Algebra, F08, S09

Math Help Center

- Tutored for the following Courses:
  - Basic, Intermediate, and College Algebra
  - Calculus-based Statistics
  - Calculus I-III

Awards

- Mathematics Department Summer Graduate Research Fellowship, 2013
- Outstanding Graduate Teaching Assistant: Mathematics Department, 2012-2013
- Nominated for Outstanding GTA in the College of Natural Sciences, 2012-2013
- Summer Research Fellowship (CIMS), 2011
- Second-Team All-District Academic Honors (ESPN), 2007

Publications

L. Lane-Harvard, D. Schaal, "Disjunctive Rado Numbers for $ax_1 + x_2 = x_3$ and $bx_1 + x_2 = x_3$." *Integers* **13** (2013), A62, 11 pp.

L. Lane-Harvard, T. Penttila, "Some strongly regular graphs with the parameters of Paley graphs." Submitted to Journal of Graph Theory.

L. Lane-Harvard, S. Payne, T. Penttila, "Strongly Regular Graphs, Arcs, and Generalized Quadrangles." In preparation.

L. Lane-Harvard, T. Penttila, "Flocks, ovoids, and strongly regular graphs." In preparation.

L. Lane-Harvard, T. Penttila, "Some new pseudo-geometric strongly regular graphs." In preparation.

L. Lane-Harvard, T. Penttila, "Some new two-weight ternary and quinary codes of lengths six and twelve." In preparation.

Talks

"Exploiting Connections Between Graph Theory and Finite Geometry" *Joint Mathematics Meeting*, Baltimore, MD, January 2014

"Finite Geometry in Graph Theory" *Greenslopes Graduate Seminar*, CSU, August 2013

"Constructions of Strongly Regular Graphs" *Rocky Mountain Mathematics Consortium: Algebraic Graph Theory*, University of Wyoming, June 2013

AMS Sectional Meeting, Iowa State University, April 2013

"Constructing Combinatorial Objects" *Mathematics Seminar*, Black Hills State University, January 2013

"New Strongly Regular Graphs" *Rocky Mountain Algebraic Combinatorics Seminar*, CSU, November 2012

Rocky Mountain Discrete Math Day, University of Denver, October 2012

"Disjunctive Rado Numbers" *Greenslopes Graduate Seminar*, CSU, October 2010

"Disjunctive Rado Numbers for $ax + y = z$ and $bx + y = z$" SDSU, July 2009

Conferences

Rocky Mountain Discrete Math Day, University of Wyoming, June 2013

AMS-Sectional Meeting, University of Nebraska, October 2011

Service

SIAM Conference on Applied Algebraic Geometry Volunteer **2013**

- Week-long conference held at CSU
- Helped with set up and provided A/V support

Math Circles Volunteer **2013**

- Week-long summer program for 8th and 9th grade students interested in mathematics
- Students attend various workshops all having a central theme: Notations of Shape and Space

MathCounts Volunteer **2013**

- Middle School competition open to schools in Northern Colorado

- Student compete on individual and team written exams in order to qualify for the state competition

Math Science Technology Day Volunteer **2012 to 2013**

- Grade school students from at-risk schools around Fort Collins participate in various workshops
- Workshops include presentations and activities to stimulate interest in math, science, and technology

Math Day Volunteer **2010 to 2012**

- High School competition open to schools in Colorado, Nebraska and Wyoming
- Students compete on individual written exams and group competitions for prizes offered from local and national donors

GEMS Volunteer **2006 to 2008**

- One day workshop exposing high school girls to careers in the fields of math, science, and technology
- Girls participate in three stations, each providing a glimpse as to why majoring in a STEM field can be rewarding and fruitful

Memberships

- Alpha Lambda Delta Honor Society
- SIAM

Interests

Coaching Soccer

- Holds National USSF D license
- Has coached players between the ages of 3 and 22

References

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