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Jon William Short

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Current Position

Associate Professor of Mathematics

Education

Doctor of Philosophy in Mathematics
Saint Louis University, December 2000

Dissertation Title: *Weakened Lie Groups and Their Locally Isometric Completions*

Dissertation Advisor: Dr. T. Christine Stevens

Master of Science in Mathematics
Oklahoma State University, May 1996

Bachelor of Science in Mathematics
Oklahoma State University, December 1992

Research Areas Topological Groups/Lie Groups; General Topology

Professional Experience

Sam Houston State University (SHSU) (2008-present)
Associate Professor of Mathematics. Program coordinator for mathematics (term ended). Serve on the Basic Library List Committee of the MAA (term ended). Refereed papers for various journals. Published peer reviewed paper. Many department committees including textbook, hiring, and curriculum.

Sam Houston State University (SHSU) (2007-2008)
Associate Professor of Mathematics and advisor for MS program in Mathematics. Duties as below, but also served on various university and professional society committees including the Faculty Research Council and Poster Session Judge for MAA.

Sam Houston State University (SHSU) (2001-2007)
Assistant Professor of Mathematics and advisor for MS program in Mathematics. Taught many courses including: college mathematics, calculus sequence, trigonometry, introduction to proof, analysis, topology, and transformational geometry (for teachers). Lecture, group-work, and one-on-one formats. Graphing calculators utilized in calculus sequence. Published research articles, served on various departmental committees, advised students, and serve as Pi Mu Epsilon chapter advisor.

Exxon-Mobile Project NExT Fellow (2002-2003)
New Experiences in Teaching (NExT) Fellowship. Competitive fellowship that creates a network among junior faculty concerned with both research and teaching. The original fellowship included support for attending meetings and workshops. Other workshops are available at

each MathFest and Joint Meeting of the AMS and MAA and address timely trends and new ideas in education and research.

Indiana University (IU) (2000-2001)
Visiting Assistant Professor. Taught Finite Mathematics. This course included probability and topics in statistics. Large classes with lecture format predominant. Participated in topology research group.

Indiana University-Purdue University Indianapolis (IUPUI) (1999-2000)
Associate Faculty. Taught combined College Algebra and Trigonometry. Medium to large sized classes with a large population of "nontraditional" students. Lecture and group-work formats.

Saint Louis University (SLU) (1996-1999)
Teaching Assistant. Taught College Algebra, Trigonometry, and Survey of Calculus. Assisted in Calculus I taught for medical students in a "reformed style." Graphing calculators were required in several of these courses and teaching utilized this technology. Classes were relatively small and allowed for integration of lectures, group work, and student presentations of homework problems.

Oklahoma State University (OSU) (1993-1995)
Teaching Assistant and math lab tutor. Taught Intermediate Algebra , College Algebra, Trigonometry, and Survey of Calculus. Large classes with lecture format predominant.

Computer Skills

Proficient in usage of Macintosh and PC computers and TI graphing calculators. Knowledge of software packages Mathematica, Maple, and Derive. Experience with Pascal and Unix programming.

Honors, Fellowships, and Awards

Sigma Xi, Project NExT Fellowship, Kerr Research Fellowship, Mathematics Professor Emeritus Award, Pi Mu Epsilon, Phi Beta Kappa Honor Society, Phi Kappa Phi Honor Society, AFROTC 4 Year Scholarship, American Legion Award for Scholastic Excellence, President's and Dean's Honor Roll, Graduate Teaching Assistantships

Personal

Date of Birth: January 9, 1970	Married: Patricia Short, M.D.
Children: three	Citizenship: United States

Research Interests

My research interests lie at the boundary between topology and algebra. In particular, I am mainly interested in topological groups. My current research is investigation the relationship between the arc component of the identity A in a topological group (G, τ) and the entire group G. Here τ is the topology on G. In this situation, I seek conditions that will guarantee that G equals the τ-closure $\bar{A}$ of A. This question is interesting from a topological perspective but in a broader sense is related to describing Lie groups of transformations and to recognizing when a group of transformations is in fact Lie. Interestingly, the question also involves studying nonproduct group topologies on product groups. A significant part of my research is devoted to developing and understanding these "weakenings," and my published and submitted papers deal with this issue. (A more detailed discussion of my research is included in a separate statement.)

Refereed Publications

- Jon W. Short, *Duals of weakened Lie groups*, (research in progress)
- Jon W. Short, *Quotients of weakened Lie groups*, (research in progress)
- Jon W. Short and T. Christine Stevens, *Comparing locally isometric topologies for* $\mathbb{R}^n$. Topology Proc. **37**, (2011), pp. 349-366. (online version 2010)
- Jon W. Short, *Completions of altered topological subgroups of* $\mathbb{R}^n$, Int. J. Pure Appl. Math. **30**, no. 4, (2006), pp. 547-560.
- Jon W. Short, *Dense arc components in weakened topological groups*, Topology Proc. **29**, no. 1, (2005), pp. 343-359.
- Jon W. Short and T. Christine Stevens, *Weakened Lie groups and their locally isometric completions*, Topology Appl. **135**, (2004), pp. 47-61.

Other Projects/Papers

- Amanda Hoffman and Ashley Moses *Naive derivatives*, (advisor for the student research)
- Jon W. Short, *Weakened Lie groups and their locally isometric completions*, Ph.D. dissertation. (2000)
- Jon W. Short, *The Iwasawa decomposition for* $GL(n, \mathbb{C})$, MS thesis. (1996)

Talks and Presentations

- *Weakening the topology of a Lie group by forcing a sequence to converge to zero,* 24th Summer Conference on Topology and Its Applications, Brno, Czech Republic. (2009) (T. Christine Stevens presenter)
- *Topologies that are defined by forcing sequences of real numbers to converge to zero,* Joint AMS MAA meeting, Washington, D.C. (2009) (T. Christine Stevens presenter)
- *Topological isomorphisms of weakened Lie groups,* Departmental Colloquium, Sam Houston State University. (2008)
- *Completions of altered topological subgroups of* $\mathbb{R}^n$, Joint AMS MAA meeting, New Orleans, LA. (2007)
- *Completions of altered topological subgroups of* $\mathbb{R}^n$, Departmental Colloquium, Sam Houston State University. (2006)
- (with T. Christine Stevens) *When do locally isometric topologies for the real numbers yield isomorphic topological groups?*, Joint AMS MAA meeting, San Antonio, TX. (2006)
- *Local structure of the completion of a weakened topology on* $\mathbb{Z}$, Joint AMS MAA meeting, Atlanta, GA. (2005)
- *Teaching College Mathematics*, Texas Project NExT sectional meeting, Sam Houston State University, TX. (2004)

- *Weakened Lie groups in which the arc component of the identity is dense*, Joint AMS MAA meeting, Phoenix, AZ. (2004)
- *Unusual properties of weakened Lie groups*, Departmental Seminar, Sam Houston State University. (2003)
- *Weakened Lie groups and their locally isometric completions*, Spring Topology and Dynamics Conference, University of Texas, Austin, TX. (2002)
- *Weakened Lie groups and their locally isometric completions*, Joint AMS MAA meeting, San Diego, CA. (2002)
- *Something about topological groups*, Departmental Seminar, Sam Houston State University. (2001)
- *Isometries of weakened Lie groups*, Departmental Colloquium, Sam Houston State University, Huntsville, TX, February (2001)
- *Local properties of weakened Lie groups*, Departmental Colloquium, Murray State University, Murray, KY. (2001)
- *Weakened group topologies and locally isometric completions,* Joint AMS MAA meeting, New Orleans, LA. (2001)
- *Weakened analytic groups with locally isometric completions,* Departmental Seminar, Indiana University, IN. (2000)
- *Group topologies on the subgroups and quotient groups of $\mathbb{R}^\omega$ that make the arc component of the identity dense,* Fifteenth Summer Conference on Topology and Applications, Miami University, OH. (2000)
- *Examples of connected topological groups with no arcs,* Departmental Seminar, Saint Louis University. (1999)
- *Perfect Sets and a paper by F. B. Jones,* Departmental Seminar, Saint Louis University. (1999)
- *The Iwasawa Decomposition for $Gl(n, \mathbb{C})$*, Departmental Colloquium, Saint Louis University. (1996)

Conferences and Workshops Attended

- Joint AMS MAA meeting, San Antonio, TX. (2015)
- Joint AMS MAA meeting, New Orleans, LA. (2010)
- Joint AMS MAA meeting, New Orleans, LA. (2007)
- Legacy of R.L. Moore Conference, Austin, TX. (2006)
- Joint AMS MAA meeting, San Antonio, TX. (2006)
- Joint AMS MAA meeting, Atlanta, GA. (2005)
- Legacy of R.L. Moore Conference, Austin, TX. (2005)
- Texas Topology and Geometry Conference, Texas A&M University, TX. (2004)
- Joint AMS MAA meeting, Phoenix, AZ. (2004)
- MAA MathFest, University of Colorado, Boulder, CO. (2003)

- Joint AMS MAA meeting, Baltimore, MD. (2003)
- MAA MathFest, University of Vermont, Burlington, VT. (2002)
- Spring Topology and Dynamics Conference, University of Texas, Austin, TX. (2002)
- Joint AMS MAA meeting, San Diego, CA. (2002)
- Joint AMS MAA meeting, New Orleans, LA. (2001)
- (TOPO 2000) Fifteenth Summer Conference on Topology and Applications, Miami University-Ohio, Miami, OH. (2000)
- Fourteenth Summer Conference on Topology and Applications, C.W. Post Campus, Long Island University, Long Island, NY. (1999)
- Reformed Calculus Seminars and Workshops, Oklahoma State University, Stillwater, OK. (1993, 1994)
- Joint AMS MAA meeting, San Antonio, TX. (1993)