

Colleen Ackermann

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EDUCATION

- PhD in Mathematics from University of Illinois at Urbana-Champaign Expected May 2016
Dissertation Title: Quasiconformal Mappings on Planar Surfaces
Advisors: Jeremy Tyson and Aimo Hinkkanen
- Master of Science in Mathematics from University of Illinois at Urbana-Champaign May 2012
- Bachelor of Science in Mathematics summa cum laude from Virginia Tech May 2010

RESEARCH INTERESTS

I am interested in complex and geometric analysis. Currently I am studying geometric definitions of quasiconformal mappings in the complex plane, and quasiconformal mappings in the Grushin plane and other sub-riemannian spaces.

TEACHING EXPERIENCE

The following are various programs I have taught for at the University of Illinois:

- **Merit Program**

The Merit Program was created to support students who have competitive high school grade point averages and test scores, but belong to demographic groups with low retention rates in STEM fields. During Merit discussion sections, students develop a support group by working together on problems designed to lead to a deeper understanding of lecture material.

- **Allen Hall Unit One**

Allen Hall Unit One was designed to create a small college environment within the larger university. To help foster a living-learning community, residents of Allen Hall are able to take classes together in their dormitory.

- **Division of General Studies Program**

The Division of General Studies helps students who are unsure of their major or have many interests. I taught underrepresented and underprepared students in the Division of General Studies who were interested in pursuing degrees in STEM fields.

This is a list of all the courses I have taught at the University of Illinois:

- Pre-Calculus Merit Discussion Section for the Division of General Studies Program Fall 2015
- Pre-Calculus Merit Discussion Section Spring 2015
- Calculus III Discussion Section Spring 2015
- Calculus I Merit Discussion Section Fall 2014
- Theory of Arithmetic Lab Section (a math class for future elementary school teachers) Spring 2014
- Calculus III Discussion Section (head teaching assistant) Fall 2013
- Calculus III Discussion Section as part of Allen Hall Unit One Spring 2013
- A Mathematical World Sole Instructor (a math class for liberal arts majors) Fall 2012
- Calculus II Merit Discussion Section Spring 2012
- Calculus II Discussion Section Fall 2011
- Calculus I Discussion Section Spring 2011
- Fundamental Mathematics Grader (an introduction to writing mathematical proofs) Fall 2010
- Calculus I Discussion Section Fall 2010

RESEARCH EXPERIENCE

- **Research Assistantship** **Summer 2015**
Worked on joint paper with Aimo Hinkkanen and Peter Haïssinsky entitled "Quasiconformal Mappings and Equilateral Triangles".
- **Research Assistantship** **Spring 2013 and 2014**
Researched quasiconformal mappings in the Grushin plane with Jeremy Tyson.
- **Research Experience for Graduate Students funded by NSF** **Summer 2011-2014**
Complex and geometric analysis research projects with John D'Angelo, Jeremy Tyson and Aimo Hinkkanen.
- **George Mason University REU funded by NSF** **Summer 2009**
Research project joint with William Hardesty, Evelyn Sander and Thomas Wanner. See presentations.

PUBLICATIONS

- "Quasiconformal Mappings and Equilateral Triangles" a joint paper with Aimo Hinkkanen and Peter Haïssinsky in progress.
- "An Approach to Studying Quasiconformal Mappings on Generalized Grushin Planes," *Annales Academiæ Scientiarum Fennicæ Mathematica*, vol. 40 pp. 305-320, 2015.

PRESENTATIONS

Invited talks are indicated with a *.

- "A New Characterization of Planar Quasiconformal Mappings," *Math Department Colloquium*, Northern Illinois University, IL, 2015. *
- "Quasiconformal mappings," *Graduate Student Colloquium*, University of Illinois, Urbana-Champaign, IL, 2015.
- "Using Equilateral Triangles to Show Mappings are Quasiconformal," *Central Fall American Mathematical Society Sectional Meeting*, Loyola University Chicago, Chicago, IL, 2015. *
- "Using equilateral triangles to prove quasiconformality," *Graduate Student Analysis Seminar*, University of Illinois, Urbana-Champaign, IL, 2015.
- "Quasiconformal and quasisymmetric mappings on the Grushin plane", *Research Term on Analysis and Geometry in Metric Spaces*, ICMAT, Madrid, Spain, 2015.
- "Quasiconformal mappings on generalized Grushin planes," *New York Regional Graduate Mathematics Conference*, Syracuse University, Syracuse, NY, 2015. *
- "What are quasiconformal mappings?," *Graduate Student Analysis Seminar*, University of Illinois, Urbana-Champaign, IL, 2015.
- "Conformal mappings on the Grushin plane," *Midwest Women in Mathematics Symposium*, Notre Dame University, South Bend, IN, 2014.
- "Quasiconformal mappings on generalized Grushin planes," *Graduate Student Analysis Seminar*, University of Illinois, Urbana-Champaign, IL, 2014.
- "A definition of quasiconformality involving only squares," *Graduate Student Analysis Seminar*, University of Illinois, Urbana-Champaign, IL, 2014.
- "Quasiconformal mappings on planar surfaces," *Women in Mathematics Seminar*, University of Illinois, Urbana-Champaign, IL, 2015.
- "Nucleation and spinodal decomposition in ternary-component alloys," *Joint Mathematics Meetings of the AMS and MAA*, San Francisco, CA, 2010. (Presented jointly with William Hardesty.)

ADDITIONAL CONFERENCES

- Modern Aspects of Complex Geometry: A Conference in Honor of Taft Professor David Minda, University of Cincinnati, Cincinnati, OH, 2015.
- Joint Mathematics Meetings of the AMS and MAA, San Antonio, TX, 2015.
- A Quasiconformal Life: Celebration of the Legacy and Work of F.W. Gehring, University of Helsinki, Helsinki, Finland, 2013.
- XXIInd Rolf Nevanlinna Colloquium, University of Helsinki, Helsinki, Finland, 2013.
- Midwest Women in Mathematics Symposium, University of Illinois at Chicago, Chicago, IL, 2013.

PROFESSIONAL ACTIVITIES

- **Co-organizer of Mathematics Department Teaching Assistant Workshop** **August 2015**
Designed role-playing scenarios to help teaching assistants anticipate difficult situations in the classroom.
Led discussions to help experienced teaching assistants share ideas with new teaching assistants.
- **Auditor of Education Department Course *Discourse in STEM Classrooms*** **Spring 2015**
Learned about various issues contributing to the effectiveness of student and teacher discourse.
Learned how choices in discourse can particularly affect minority students' ability to succeed.
- **Co-organizer of Graduate Student Analysis Seminar** **2014-2015 school years**
Created a low pressure environment for graduate students of all levels to practice talks.
- **Mathematics Department Teaching Assistant Mentor** **2014-2015 school years**
Watched new teaching assistants teach and offered advice suited to their strengths.
- **Research Term on Analysis and Geometry in Metric Spaces** **Summer 2015**
Attended two weeks of courses and a week long workshop.
- **Member of Mathematics Undergraduate Affairs Committee** **2013 school year**
- **Session leader at Sonia Math Day for high school girls** **November 2013**
Taught a magic trick involving binary numbers.
- **Officer of the Virginia Tech Math Club**
 - President** **2008-2009 school years**
 - Vice president** **2007 school year**
 - Freshman representative** **2006 school year**Organized speakers and social events to support undergraduate mathematics majors.
Organized outreach activities to support the local community.

PROFESSIONAL SOCIETIES

- American Mathematical Society
- Mathematical Association of America
- Association for Women in Math

AWARDS AND HONOR SOCIETIES

- Pi Mu Epsilon
- Phi Beta Kappa
- Overall Outstanding Senior Award from the Virginia Tech Mathematics Department

REFERENCES

- Professor Aimo Hinkkanen (advisor), (217) 244-7306, aimo@math.uiuc.edu.
- Professor Jeremy Tyson (advisor), (217) 244-4132, tyson@illinois.edu.
- Professor Peter Haïssinsky (co-author), phaissin@math.univ-toulouse.fr.

- Jennifer McNeilly (director of Merit program), (217) 244-1659, jrmcneil@illinois.edu.
- Alison Reddy (supervisor for "A Mathematical World" course), (217) 244-2361, ared@illinois.edu.