

## *Ninth Annual*

# Nebraska Conference for **Undergraduate Women** in Mathematics

*All talks are open to the entire UNL Community*

### **Plenary Speakers:**

- [Ruth Charney](#) (Brandeis University)
- [Barbara Lee Keyfitz](#) (Fields Institute and University of Houston)

### **Guests:**

- Sue Geller ([Texas A & M University](#))
- Ellen Maycock ([American Mathematical Society](#))
- Peter March ([National Science Foundation](#))
- Carol Meyers: 2000 NCUWM alumna, 2006 PhD from MIT, now at Lawrence Livermore National Labs
- Rachel Pries: 2000 PhD at Penn, now at [Colorado State University](#)
- Betseygail Rand: 2000 NCUWM alumna, 2006 PhD from University of Texas-Austin, now at Texas Lutheran University
- Suzanne Sindi: 2001 NCUWM alumna, 2006 PhD from University of Maryland, now at Brown University
- Michelle D. Wagner ([National Security Agency](#))

### **Invited Graduate Students:**

- Maia Averett (University of California-San Diego)
- Sharon Garthwaite (University of Wisconsin)
- Kristina Lund (University of Nebraska-Lincoln)
- Christine Kraft (Clemson University)
- Nishali Mehta (Ohio State University)
- Rebecca Roberts (University of Michigan)
- M. Shel Swenson (University of Texas-Austin)

- Andrea Watkins (Duke University)

- Panel**           • Careers Using Mathematics  
**Discussions:** • Choosing a Mathematics Graduate Program

The Organizing Committee gratefully acknowledges generous support from the National Science Foundation (through our [Mentoring Through Critical Transition Points](#) grant) and the National Security Agency.

All sessions will be in the Nebraska Union on the [City Campus](#) unless otherwise stated.

## Friday, February 9, 2007

### 2:30 - 3:30

Welcome and Registration, lobby near the Centennial Room  
 Soft drinks and snacks, Regency Room Fischer Lounge

### 3:30 - 3:45

Opening Session, Auditorium  
*Welcome:* Judy Walker, University of Nebraska-Lincoln  
*Remarks:* Richard Hoffmann, Dean of Arts and Sciences, University of Nebraska-Lincoln

### 3:45 - 4:35

Plenary Session I, Auditorium  
 Barbara Lee Keyfitz, Fields Institute and University of Houston  
*Three Ways To Look At Conservation Laws*

### 4:45 - 6:10

Small Group Discussions, Ballroom (groups A through D) and Centennial Room (groups E through J)

*What is Research?*  
*Balancing Career and Family*  
*Jumping From a Small College to Graduate School*  
*Preparing To Be a Graduate Student*

### 7:00

Banquet, Holiday Inn  
Panel Discussion:  
*How to Benefit from NCUWM*

Panelists: Carol Meyers, Lawrence Livermore National Labs

Betseygail Rand, Texas Lutheran University

Suzanne Sindi, Brown University

Moderator: Judy Walker, University of Nebraska-Lincoln

## Saturday, February 10, 2007

**8:00 - 8:30**

Continental Breakfast, Food Court Meeting Rooms

**8:30 - 9:25**

**Session 1 - Presentations by Undergraduate Participants**

**8:30 - 8:45**

**Centennial Room left**

Megan Logue, Jacksonville University  
*Minimum coverings with fish*

**Centennial Room right**

Irina Kareva, University of Maryland  
*The role of myeloid cells in cancer-immune system interactions*

**Regency Room**

KyLynn Whipple, University of Wisconsin-Stout  
*Demonstrating eigenvalues and eigenvectors using linear transformation*

**8:50 - 9:05**

**Centennial Room left**

Megan Patnott, Hope College  
*Graph pebbling*

**Centennial Room right**

Nicole Sims, Agnes Scott College  
*A network approach to the gene expression puzzle*

**Regency Room**

Mutiara Sondjaja, Harvey Mudd College  
*Strongly taut restricted block monoid over  $Z$*

**9:10 - 9:25**

**Centennial Room left**

Linda Hoffmann, Newman University  
*Bending a soccer ball*

**Centennial Room right**

Danielle Schroeder, Texas A&M University  
*Molecular evolution of male pregnancy genes in *Sygnathidae**

**Regency Room**

Cynthia Flores, California State University-Northridge  
*Dressing Actions*

**9:35 - 10:20**

Panel Discussion, Auditorium  
*How to Get Money Thrown At You For Math*

Panelists: Peter March, National Science Foundation

Ellen Maycock, American Mathematical Society

Michelle D. Wagner, National Security Agency

Moderator: John Meakin, Chair of Department of Mathematics, University of Nebraska-Lincoln

**10:20 - 10:40**

Break

**10:40 - 11:55**

**Session 2 - Presentations by Undergraduate Participants**

**10:40 - 10:55**

**Centennial Room left**

Jolie Baumann, Ithaca College  
*Counting dominating configurations of kings*

**Centennial Room right**

Amanda Moore, Denison University  
*Classifying projections of  $(n,k)$ -frames*

**Regency Room**

Amanda Taylor, U. Maine at Farmington & Christy Hediger, Muhlenberg College  
*Reformulating san gaku problems in spherical geometry*

**11:00 - 11:15**

**Centennial Room left**

Melissa Geddes, Bates College  
*The traveling salesman problem*

**Centennial Room right**

Debbie Witczak, Benedictine University  
*Existence of regular stick numbers of torus knots*

**Regency Room**

Lisa Morales, California State Polytechnic University-Pomona  
*Properties of segments in the Hausdorff metric geometry*

**11:20 - 11:35**

**Centennial Room left**

Keona Padgett, Ashland University  
*Googling Markov and a presidential failure*

**Centennial Room right**

Katherine Field, The College of William and Mary  
*Counting lower Hessenberg matrices*

**Regency Room**

Laura Feys, Calvin College  
*Modeling the hyperbolic plane*

**11:40 - 11:55**

**Centennial Room left**

Jessica Belanger, Fitchburg State College  
*Fiction and higher dimensions*

**Centennial Room right**

Kelly Houston, University of Louisville  
*On two functional equations and their solutions*

## Regency Room

Jennifer Johnson, Saint Mary's University of Minnesota  
*The isoperimetric surfaces in  $T^2[0, 1] \times R$*

**12:00-12:15**

Group Photo, fountain outside north door

***If you did not sign a photo release statement, please do not participate in the group photo.***

**12:15 - 1:30**

Lunch, Wick Alumni Center, 1520 R Street (corner of 16th & R)

*Note:* The plenary speakers, panelists, invited graduate students, and members of the organizing committee have agreed to sit at assigned tables so that participants can have an opportunity to talk with them informally. Check the packet of bios for table assignments.

**1:30 - 2:20**

Plenary Session II, Auditorium  
Ruth Charney, Brandeis University  
*The Geometry of Groups*

**2:30 - 3:05**

## Session 3 - Presentations by Undergraduate Participants

**2:30 - 2:45**

### Centennial Room left

Jennifer Crouse, Fitchburg State University  
*Pascal's triangle in secondary education*

### Centennial Room right

Elizabeth Martin, University of Tennessee  
*A model for the peopling of the Americas*

## Regency Room

Sara Reynolds, Nazareth College of Rochester  
*Conformal mappings in the analysis of leaf structure*

**2:50 - 3:05**

### Centennial Room left

Jillian Cavanna, Ithaca College  
*Geometry in culture: mathematical explorations of infinite patterns*

### Centennial Room right

Pamela Arbisi, Denison University  
*Links in  $K_7$*

**Regency Room**

Kim Meyer, University of Louisville  
*The Devil's Staircase*

**3:10 - 4:40**

Poster Session, Centennial hallway  
Snacks, Food Court Meeting Rooms

**4:45 - 5:20**

**Session 4 - Presentations by Undergraduate Participants**

**4:45 - 5:00**

**Centennial Room left**

Sandra Lacea, State University of New York at Brockport  
*Beyond the beauty of fractals*

**Centennial Room right**

Nicole Scholtz, Denison University  
*Orbital mechanics in the power system performance analysis of the international space station*

**Regency Room**

Naomi Brownstein, University of Central Florida  
*Transformation of variables in statistics: a simple way of saving trees*

**5:05 - 5:20**

**Centennial Room left**

Joan Zoellner, Humboldt State University  
*A characterization of curves in  $S^3$*

**Centennial Room right**

Crystal Lee, Seattle University  
*Mathematical models of water waves*

**Regency Room**

Jan Marie Andersen, Utah State University  
*Probabilistic analysis of a simple stochastic board game using a modified Monte Carlo algorithm*

**5:30 - 6:30**

Panel Discussion, Auditorium  
*Choosing a Graduate School*

Panelists: Maia Averett, University of California-San Diego

Ruth Charney, Brandeis University

Sue Geller, Texas A&M University

Kris Lund, University of Nebraska-Lincoln

Suzanne Sindi, Brown University

M. Shel Swenson, University of Texas-Austin

Moderator: Jim Lewis, University of Nebraska-Lincoln

**6:30**

Dinner (see Restaurant Guide)

**8:00**

Game Night, Holiday Inn

## **Sunday, February 11, 2007**

**8:00 - 8:30**

Continental Breakfast, Food Court Meeting Rooms

**8:30 - 9:45**

**Session 5 - Presentations by Undergraduate Participants**

***8:30 - 8:45***

**Centennial Room left**

Jenya Sapir, University of Chicago  
*Triangulations of sphere bundles over  $S^1$*

**Centennial Room right**

Pam Welch, Nazareth College of Rochester  
*Graph theory and the Konigsberg bridge problem*

**Regency Room**



Alla Shved, University of Massachusetts-Boston  
*A mathematical model for tightening and heat generation in self-tapping screws*

**8:50 - 9:05**

**Centennial Room left**

Liza Lawson, Randolph-Macon College  
*Real polynomials, imaginary critical points, and enchanting ellipses*

**Centennial Room right**

Christina Frederick, University of Maryland  
*Euler characteristics of graphs and triangulated planar polygons*

**Regency Room**

Peta-Gay McCarthy, Ithaca College  
*Fun with Chebyshev polynomials and connections*

**9:10 - 9:25**

**Centennial Room left**

Mary Wooters, Swarthmore College  
*Topological properties of reconfigurations of convex polygons*

**Centennial Room right**

Sarah Schmitt, Marquette University  
*An application of dominating sets*

**Regency Room**

Jessica Meixner, Texas Tech University  
*Modeling and simulation of the lens-waveguide system in a simple apposition compound eye*

**9:30 - 9:45**

**Centennial Room right**

Allison Davis, Muhlenberg College  
*Transformation of graphs, characteristic polynomials and spectra*

**Regency Room**

Pamela Reitsma, University of Maine  
*The dynamics of cigarette smoking among adolescents*

**9:45 - 10:00**

Break

**10:00 - 11:00**

Panel Discussion, Auditorium  
*Careers in Mathematics*

Panelists: Barbara Keyfitz, Fields Institute and University of Houston

Carol Meyers, Lawrence Livermore National Labs

Rachel Pries, Colorado State University

Betseygail Rand, Texas Lutheran University

Rebecca Roberts, University of Michigan

Michelle D. Wagner, National Security Agency

Moderator: Ellen Maycock, American Mathematical Society

**11:00**

Conference Wrap-up, Auditorium

Remarks: John Meakin, Chair of the UNL Department of Mathematics