PROJECT NExT

NEW EXPERIENCES IN TEACHING

2011-2012 FELLOWS

Workshop held in Madison, WI
July - August, 2012

A program of

THE MATHEMATICAL ASSOCIATION OF AMERICA

Project NExT: New Jobs, New Responsibilities, New Ideas
Program for the Workshop in Madison, WI
August 2012

Project NExT registration is in the **main lobby of Pyle Center**.

TUESDAY, JULY 31

8:00 - 10:00 pm   Social Event for 2011-2012 and 2012-2013 Project NExT Fellows and
presenters – **Smith Hall, Laines Lounge**

10:00 pm - ?   INFORMAL SOCIALIZING

WEDNESDAY, AUGUST 3

8:15 - 9:30 am   **TWO** concurrent sessions

A.   **8:15 am - 9:30 am**   *Mathematics Intensive Interdisciplinary Courses*
                                    Pyle 309
Panelists: Carl C Cowen, Indiana University-Purdue University Indianapolis
            Mary L. Garner, Kennesaw State University
            Jon L. Johnson, Elmhurst College
            Kimberly D. Kendricks, Central State University

Interdisciplinary courses (IDCs) are increasingly becoming a part of the undergraduate
education program. This session will address some issues instructors commonly face
when planning and teaching an IDC with a mathematics component. The panel members
-- whose experiences range from teaching first-year seminars with no mathematics
prerequisites to upper-level IDCs with students having a strong math background -- will
discuss the following points: choosing a course topic, managing the non-mathematical
content in the course design, successful techniques for evaluation, the pros and cons of
team teaching, and the benefits and drawbacks of teaching an IDC.

Organizers: Karen Bliss, US Military Academy
              Mindy Capaldi, Valparaiso University
              Angela L. Kohlhaas, Loras College
              Ryan Therkelsen, Bellarmine University

B. **8:15 am – 9:30 am** *Teaching an Introductory Linear Algebra Course*
Pyle DE335

Panelists: Sheldon Axler, San Francisco State University
Rob Beezer, University of Puget Sound
Caroline Haddad, State University of New York Geneseo
Christine Larson, Vanderbilt University

One of the more common entry-level courses required by undergraduate science programs is linear algebra. Creative approaches to teaching this course may include utilizing technology, creating student-centered activities, and implementing projects. However, putting such ideas into practice is not always easy. In this session, panelists will share their experiences in developing and teaching undergraduate linear algebra courses which meet the needs of their students, challenge those students with engaging and useful classroom activities and projects, and utilize appropriate technology and software. The discussion will also include common learning difficulties faced by students in a linear algebra course.

Organizers: Randall E. Cone, Virginia Military Institute
Louis Deaett, Quinnipiac University
Gulden Karakok, University of Northern Colorado
Nicole Seaders, Willamette University

9:35 – 10:05 am BREAK – **Pyle Prefunction Space, 3rd Floor East**

10:10 - 11:25 am TWO concurrent sessions

A. **10:10 – 11:25 am** *Assessing Classroom Effectiveness*
Pyle 309

Panelists: Mike Axtell, University of St. Thomas
Patrick Bahls, University of North Carolina, Asheville
Aimee Ellington, Virginia Commonwealth University
Angie Hodge, University of Nebraska Omaha

Regular self-assessment is an important part of our professional development. In particular, evaluating our own teaching is something we all do while we teach a course and when we plan to teach the same course again. How do we accurately assess our own teaching? As new professors, this is one of the most important and most difficult to answer questions we have. It is the question of whether we are awesome or just grade too leniently. In this session, the panel will discuss using quick writing and speaking assignments to check student learning and encourage reflection, making effective and efficient use of regular homework collection, assessing teaching through the scholarship of teaching and learning, designing projects to measure quantitative reasoning skills in introductory courses, and evaluating different approaches to teaching the same material.

Organizers: Eleanor Farrington, Massachusetts Maritime Academy
Timothy Goldberg, Lenoir-Rhyne University
Paige Rinker, John Carroll University
Rohit Thomas, University of Arizona

B.   **10:10 am - 11:25 pm** *Publishing with Undergraduates*
                    Pyle DE335
Panelists: Tom Langley, Rose-Hulman Institute of Technology
                Liz McMahon, Lafayette College
                Frank Morgan, Williams College
                Sarah Spence Adams, Franklin W. Olin College of Engineering

We aim to explore the process of writing and publishing articles with undergraduate students. The panel will discuss how to work with students to improve their writing either for undergraduate or professional mathematical audiences and what editors look for in considering articles on undergraduate research and student-faculty collaborations. Appropriate length and level of publishable material, how to deal with varying proportions of student/faculty involvement in the paper, and venues for publication on particular topics will also be discussed. The panel will present successful publishing experiences (and less-successful experiences!) in order to give examples to attendees.

Organizers: Catherine Buell, Bates College
                Joe Eichholz, Rose-Hulman Institute of Technology
                Zachary Kudlak, Mount Saint Mary College
                Kaisa Taipale, St Olaf College

11:30 am - 12:15 pm Small Group Discussions with other Project NExT Fellows
                    (This session is organized by area of research. Please attend the group that best fits your research interests.)

                    Group A: Algebra, Group Theory, Linear Algebra, **Pyle 220**
                    Group B: Algebraic Geometry, **Pyle DE232**
                    Group C: Analysis, **Pyle 111**
                    Group D: Combinatorics, Graph Theory, Discrete Math, **Pyle 226**
                    Group E: Number Theory, Mathematical Logic, **Pyle DE227**
                    Group F: Geometry, Topology, **Pyle 225**
                    Group G: Differential Equations, Dynamical Systems, **Pyle DE332**
                    Group H: Applied Math, Operations Research, **Pyle DE327**
                    Group I: Math Biology, **Pyle 313**
                    Group J: Mathematics Education, Probability, Statistics, **Pyle VandeBerg Auditorium 121**

12:15 – 1:30 pm   LUNCH – **Pyle Center Main Dining Room**

1:35 - 2:50 pm   **TWO** concurrent sessions

A. **1:35 pm - 2:50 pm** *Involving Undergraduates In Research*
         Pyle 309
Panelists: Timothy D. Comar, Benedictine University
     Leslie Hogben, Iowa State University and American Institute of Mathematics
     Kathryn Leonard, California State University Channel Islands
     Mark Pearson, Hope College
How does one involve undergraduates in meaningful mathematical research? Panelists will compare and contrast summer research experiences for undergraduates with academic-year undergraduate math research at a diverse group of institutions. Strategies for identifying appropriate research problems, both pure and applied, will be discussed, including approaches panelists have gleaned from the AIM's Research Experiences for Undergraduate Faculty program. Additionally, the panel will address issues of program funding and evaluation and share their views on effective mentoring.
Organizers: Dawn Archey, University of Detroit – Mercy
     Andrew Connor, Wake Forest University
     Debra Mimbs, Lee University
     Ursula Whitcher, University of Wisconsin – Eau Claire

B. **1:35 pm - 2:50 pm** *Teaching Introduction to Proofs Courses*
         Pyle DE335
Panelists: Connie Campbell, Millsaps College
      Carol Schumacher, Kenyon College
      Joseph Straight, SUNY Fredonia
      Ted Sundstrom, Grand Valley State University
Introduction to Mathematical Proofs (or Transition to Advanced Mathematics) courses are meant to develop the communication and thinking skills necessary for advanced mathematics. Most students arrive at college or university with little to no experience in reading, comprehending or producing mathematical proofs, and hence these courses play an essential role in a student's mathematical journey. In this session we take a closer look at such courses, while focusing on the following aspects: mathematical content, evaluating students' writing, finding and using resources, and incorporating inquiry-based-learning.
Organizers: Erin Bancroft, Grove City College
      Lisa Driskell, Colorado Mesa University
      Shay Fuchs, University of Toronto
      W. Andy Lorenz, Denison University

3:25 - 3:55 pm   BREAK -- **Pyle Prefunction Space, 3ʳᵈ Floor East**

3:55 - 5:25 pm   Closing Session – **Pyle 325/326**
        Recognition of 2011-12 Fellows
        Presentation: *Finding Your Niche in the Profession*
         Joseph Gallian, University of Minnesota Duluth

6:00 – 7:30 pm   Mathfest Opening Reception (cash bar) – **Level 1 of the Monona Terrace Convention Center**

7:30 - 9:30 pm   Mathfest Opening Banquet

9:30 pm - ?   INFORMAL SOCIALIZING

THURSDAY AND FRIDAY, AUGUST 2 AND 3

Project NExT Courses during the Mathfest: Four-hour courses meeting in the **Hilton Madison Monona Terrace** on Thursday and Friday, August 2 and 3.

A. *Teaching Mathematics for Future Teachers (With an Emphasis on K-8 Teacher Preparation)* – Beth Burroughs, Montana State University, 1-3 p.m., **Tenney, Hilton Madison Monona Terrace**

B. *Teaching Liberal Arts Mathematics Courses* – Dale Buske, St. Cloud State University, 1-3 p.m., **LaFollette, Hilton Madison Monona Terrace**

C. *Undergraduate Research—How to Make It Work* – Aparna Higgins, University of Dayton, 1-3 p.m., **Doty, Hilton Madison Monona Terrace**

D. *Using Inquiry to Teach Mathematics and Thinking* – Carol Schumacher, Kenyon College, 1-3 p.m., **Vilas, Hilton Madison Monona Terrace**

E. *When Life is Linear: Applications of Linear Algebra* – Tim Chartier, Davidson College, 3:15-5:15 p.m., **Tenney, Hilton Madison Monona Terrace**

F. *The World is More Random Than You Think: Big Ideas for Mathematicians Who Will Be Teaching Statistics* – Richard Cleary, Bentley College, 3:15-5:15 p.m., **LaFollette, Hilton Madison Monona Terrace**

G1. *Applying for Grants from the National Science Foundation* – Jennifer Slimowitz Pearl, National Science Foundation, Thursday; Getting *Your Research Off to a Good Start*, Joe Gallian – University of Minnesota, Duluth, Friday; both days 3:15-5:15 p.m., **in Doty, Hilton Madison Monona Terrace**

G2. *Getting Your Research Off to a Good Start*, Joe Gallian – University of Minnesota, Duluth, Thursday; *Applying for Grants from the National Science Foundation* – Jennifer Slimowitz Pearl, National Science Foundation, Friday; both days 3:15-5:15 p.m., **in Vilas, Hilton Madison Monona Terrace**

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We thank peach11 Project NExT Fellows Thomas Höft, Tufts University, and Melissa Stoner, Salisbury University, for coordinating the planning of the peach11 (2011-12) Fellows' sessions.

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Project NExT (New Experiences in Teaching) is a professional development program of the Mathematical Association of America for new or recent Ph.D.s in the mathematical sciences who are interested in improving the teaching and learning of undergraduate mathematics. It addresses the full range of faculty responsibilities in teaching, research, and service.