Montclair State University

Department of Mathematical Sciences Newsletter
Spring 2002

Succeeding in the Doctoral Program in Pedagogy of Mathematics Education

by Gideon Weinstein

So you're thinking of enrolling in Montclair's Ed.D. degree? Congratulations! You are demonstrating your commitment to teaching and your dedication to earning the highest possible level of professional certification. Learning about what it will take to succeed can be accomplished by discussing the entrance requirements. The official requirements are documented on the Web at the URLs http://www.montclair.edu/crc/COP/EdD.html, http://www.montclair.edu/pages/gradschool/htm and in print materials available from the Department of Mathematical Sciences and the School of Education, so this discussion is an unofficial interpretation of the explicit requirements and an informal discussion of the implicit requirements.

1. You need to be a practicing middle school or high school mathematics teacher – preferably with several years of experience. Our program is scheduled for evenings and summers to accommodate those who are teaching. Our teaching assumes that you have a classroom to go back to and try out the things you are learning. This is a practitioner's doctorate, not a research degree, so you need access to a classroom.

2. You need to have a strong mastery of mathematics commensurate with the level of your teaching. While different teachers may come with different academic backgrounds in mathematics, we will expect all teachers to have a profound understanding of the meaning, underlying structure, connections, and applications of the mathematics that they teach. Several of our required courses seek to deepen this pedagogical understanding of math content. If appropriate, ordinary mathematics or statistics courses can serve to deepen and broaden your content knowledge.

3. You need to have the potential for excellence in writing. The essence of scholarship is the inscription of thoughts and practices into the permanent knowledge database of humanity – the written record. The work you will do for our course papers, portfolio requirements, and dissertation will be this kind of scholarship – you'll need to be able to (or learn to be able to) communicate your pedagogical practices and philosophical ideas in writing that is accessible, informative, and engaging to mathematics teachers and mathematics education faculty.

4. You need to be dedicated to your learning commitment. If everything goes perfectly – you successfully complete all the classes when required, finish a satisfactory portfolio on time, defend your dissertation proposal speedily, and finally write and defend your thesis – it will take five years to finish the degree. During those five years, you will be extremely busy. This will be and intense period of professional growth. However, after those five years, you will have the tools to flourish as a leader in mathematics education in your district, state, and even beyond.

And there you have it. To succeed in the program, you need to be a deeply committed teacher who not only has a mastery of mathematics, but the potential to write well about teaching and learning it.

Suggestions for taking the MS Comprehensive Exam in Mathematics
by William Parzynski (Graduate Coordinator)

The MS Comprehensive Exam is given twice a year, usually in November and April. If the student has completed all the appropriate course work, he or she should watch the bulletin boards around the Math offices for the date of the exam and the deadline for applying to take the exam.

After the student has turned in the application, the graduate coordinator will send the student study guides for each section the student has selected. Usually the study guide contains an outline of topics, suggested references and sample questions.

A complete review of the study guide is a good starting point for preparation. In addition the student should study from the text and the notes from his or her classes.

One particular problem is when the student has taken the course several years before taking the comprehensive exam. The text and part of the content may have changed over the years. In this case the student should find out the most recent text and most recent instructor of the course. A meeting with this instructor could be beneficial.

Study groups can be very helpful in reviewing a subject. Students who study together tend to motivate each other. Trying to explain a concept to someone else is a good way to reinforce it in your mind.

Finally, if the student has any questions he or she should not hesitate to contact the graduate coordinator. Often a brief visit can avoid any misconceptions.

Student Achievements

This is a summary of a few of our students' outstanding achievements.

Bonnie Montgomery, a mathematics graduate student, was awarded the CSAM outstanding graduate student award. She is currently employed at Morris Knolls High School in Denville, NJ. Bonnie is very active as a lead teacher and presenter for Advanced Placement teachers of statistics. She has also co-authored an AP Statistics Review book with **Dr. Piccolino**.

Bonnie spent the summer of 1999 as an invited participant studying statistics at the North Carolina School of Science and Mathematics. The following summer, the participants of the program were invited back to work on materials designed to assist AP Statistics teachers in the instruction of AP Statistics. The document Bonnie helped design can be found at the URL http://courses.ncssm.edu/math/Stat_Inst2001/Intro/Introduction.htm by choosing 3. The solutions she designed include the possible errors students may make and parts of the solutions students may leave out. The material was written with two other participants. They worked with a team of statisticians, including Roxy Peck, chief Reader for the AP Statistics Exam, who proofread everything for statistical accuracy.

Kristie Prokop, a mathematics undergraduate student is currently student teaching in Paramus. She received a position beginning Fall 2002 at Mendam High School in Mendam, NJ.

Sarah Robinson received the Undergraduate Citation Award from the MSU alumni Association. She intends to be a high school mathematics teacher and has just applied to the Teacher Education Program. Sarah is part of the Big Sister program and teaches dance to children.

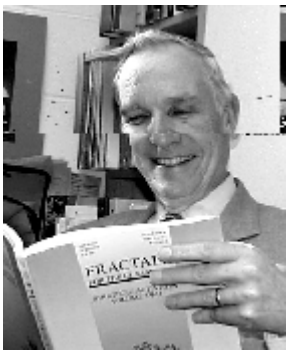
Sarah Robinson, Maggie Viz, and **Karin Weule** are the student representatives at MSU Day in Trenton, which will be held on March 25.

Lynn Vandemeulebroeke, an undergraduate mathematics major who completed her degree Spring 2001, has received offers with graduate assistantships from the University of Colorado and University of Montana. She has been accepted at the University of Vermont and Virginia Tech and is still being considered for assistantships at these universities.

Student Events and Opportunities

- Majors, come meet the faculty at the Spring Pizza Party on April 11, from 12-3 pm in RI-232.
- If you are considering going to graduate school next fall, please consider attending a Research Experience for Undergraduates (REU) or similar program during the summer. Some programs, such as the EDGE program at Bryn Mawr College, are specifically designed to help entering graduate students succeed. See the bulletin board in the hallway by RI-222 for more information.
- Do you have an email account to contact your professor? All current MSU students are eligible for a mail.montclair.edu account. This email account can be accessed through a web browser from any computer with an Internet connection. See http://www.montclair.edu/ for details.

MAA-NJ Distinguished Teaching Award Goes to Dr. Evan Maletsky



The prestigious Distinguished College or University Teaching of Mathematics in New Jersey award sponsored by the Mathematical Association of America's New Jersey Section was granted to our own Dr. Even Maletsky. Dr. Maletsky began teaching in 1956 at Pascack Valley Regional School. In 1957 he came to Montclair State University and has been here ever since.

Dr. Maletsky has been extremely active as a world-renowned speaker and as an author. He has been an invited speaker at the National Council of Teachers of Mathematics Conferences, Northwest Mathematics Conferences, and State Mathematics Conferences in 28 states! In addition, he has given talks in American Samoa, Austria, British Columbia, England, Germany and Lebanon.

Dr. Maletsky has coauthored the Springer-Verlag book, *FRACTALS for the Classroom - Strategic Activities,* Volumes 1, 2 and 3. He has also written *Harcourt Math, Grades 4, 5, 6* and *Math Advantage, Middle School I, II and III*.

Dr. Maletsky has published papers in *Math Notes, Student Math Notes, Mathematics Teacher, Arithmetic Teachers, New Jersey Mathematics Teacher* and the *Virginia Math Teacher.* He is also an editor for the *New Jersey Mathematics Teacher, Mathematics Teacher, Student Math Notes, Activities from the Mathematics Teacher*, and *Teaching with Student Math Notes Volume 1 and 2*.

Where Dr. Maletsky is most influential is undoubtedly in the classroom. Students at every level have attested to the motivation he has brought them to learn mathematics. The number of positive letters and comments by students are so numerous that placing them all here would fill pages. Dr. Maletsky's teaching can be summarized (if possible) by one students comment: "He is the rare kind of teacher that comes along every so often and changes the way you learn forever."

Upcoming Events and Important Dates

- Math Day: Tuesday, March 26, 2002, 9:30am – 2:00pm
- Pharm Fest: Thursday, March 28, 2002, 9:00am - 3:00pm
- Majors/Faculty Spring Pizza Party: RI-232, April 11, 12-3 pm.
- Sectional MAA-NJ Spring Meeting is at Monmouth University: Saturday, April 13, 2002.
- Sigma Xi Student Research Conference: May 4, 2002

Faculty Activities

Dr. Lora Billings presented "Exciting chaos with noise: unexpected dynamics in epidemic outbreaks" at Dynamics Days in January. This article was joint work with Ira Schwartz from the Naval Research Laboratory and appeared in the Journal of Math Biology in February. She also presented at the SIAM Life Sciences conference in Boston "Stochastic flux and emerging chaos-like structures," which will appear in Physical Review Letters. This is joint work with Ira Schwartz and Erik Bollt of the U.S. Naval Academy.

She is also co-organizing the working group meeting "Analogies Between Computer Viruses and Immune Systems and Biological Viruses and Immune Systems" at the DIMACS program on Computational and Mathematical Epidemiology, scheduled for June. The other organizers are Stephanie Forrest of the University of New Mexico, Alun Lloyd of Institute for Advanced Study, and Ira Schwartz. This program was featured in the article "With math, they'll hunt for a pattern to terrorism" in the March 17th edition of the Star Ledger.

Dr. Billings and **Dr. Gideon Weinstein** have received a Sokol Faculty/Student Research Program award. They will be working with **Rajni Jain**, a computer science graduate student, on a "Survey of Multimedia Enhancements for Calculus." The review will focus on quality, relevance to the MSU curriculum, and ease of integration into faculty development and student learning practices.

Dr. Eileen Fernandez gave two presentations at the Joint Meetings of the American Mathematics Society and Mathematical Association of America: "Experimenting With Classroom Formats to Encourage Problem Solving" and "The Student Take on the Epsilon-Delta Definition of a Limit."

Dr. Michael Jones wrote an article with Maureen Carroll and Elyn Rykken that appeared in the December 2001 issue of Mathematics Magazine. The article is titled "The Wallet Paradox Revisited."

In addition he presented the article "Equitable, Envy-free, and Efficient Cake Cutting for Two People and Its Application to Discrete Goods" at the Joint Meetings of the American Mathematics Society and Mathematical Association of America. This article is scheduled to appear in the June 2002 issue of Mathematics Magazine.

He will be presenting the article "Forming Stable Coalitions: The Process Matters?" which is joint work with Steven J. Brams and D. Marc Kilgour at the 2002 Annual Meeting of the Public Choice Society, March 22-24, 2002 in San Diego, CA. This article is an extension of "Single-peakedness and Disconnected Coalitions" that will appear in the June 2002 issue of the Journal of Theoretical Politics.

Faculty Activities (continued)

Dr. Patricia Kenshaft presented two talks in San Diego, and presided at a panel on Environmental Mathematics in the Classroom as chair of the MAA Committee on Mathematics and the Environment. In addition, her book, "Mathematics for Human Survival," whose examples and exercises include only real numbers from applications to environmental, peace, and health issues, was just published by Whittier Publications, Inc.

As reported in the Fall newsletter, Dr. Kenshaft continues to run her live call-in radio show, Math Medley. She has had many mathematicians and mathematics educators as guests on the show. To access archived Math Medley shows, please visit the website http://webct.com/math.

Dr. Evan Maletsky traveled north to Anchorage, Alaska last October where he gave the luncheon address titled "The Changing View of Mathematics" at the Alaska State Mathematics and Science Conference. He has presented a talk titled "Creative and Motivating Geometric Activities and Visual Experiences at NCTM regional conferences in New Jersey and in Oklahoma and will be giving a similar address at the NCTM annual meeting next month in Las Vegas, Nevada. Last fall he spoke in Seattle, Washington at the Northwest Mathematics Conference on Connecting Mathematical Ideas through the Study of Fractals and offered a mini-course on fractals at the Rio Grande Valley Conference for Teachers of Mathematics at Pan American University in southern Texas. He also gave several addresses in California this past January at the annual meeting of the Greater San Diego Mathematics Council. Closer to home, Dr. Maletsky has conducted a variety of district in-service sessions with mathematics teachers and given visiting professor talks to third, sixth, seventh, and eighth grade mathematics classes.

Dr. Arup Mukherjee presented "Identification of conductivity imperfections: An asymptotic formula for imperfections of co-dimension 1" at the Joint Meetings of the American Mathematics Society and Mathematical Association of America. He has also been invited to participate in the IMA Special Workshop: Numerical Relativity, June 24-29, 2002. The organizers of the workshop are Douglas Arnold, Abhay Ashtekar, and Pablo Laguna. The web page for the workshop, which will be kept current, is http://www.ima.umn.edu/nr.

Dr. Diana M. Thomas presented "A Evolution Model for Phyto-remediation of Metals" at the Joint Meetings in January. This article was joint work with mathematics undergraduate student, Lynn Vandemeulebroeke. In addition, she was an invited presider at a panel on Discrete Dynamical Systems in the First Two Years.

Dr. Gideon Weinstein was an invited Project NexT panelist discussing "What mathematicians absolutely, positively, have to know about mathematics education research" at the Joint Meetings of the American Mathematics Society and Mathematical Association of America. He also presented "Resolving Conflicts Between Teachers' and Students' Beliefs About Mathematics" in the SIGMAA on Research on Undergraduate Mathematic Education.