MATH ALLIANCE
Building a New American Community in the Mathematical and Statistical Sciences

Math Alliance News

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Upcoming Events:

Topological Data Analysis
Research Triangle Park, NC
February 3-7, 2014

Undergraduate Workshop
Research Triangle Park, NC
February 20-21, 2014

Statistical Inference in Sparse High-dimensional Models: Theoretical and Computational Challenges Workshop
Research Triangle Park, NC
February 24-26, 2014

SIDIM XXIX
Pontifical Catholic University of Puerto Rico in Ponce, Puerto Rico
February 28- March 1, 2014

2014 Fostering Diversity in Biostatistics Workshop
Baltimore, MD
March 16, 2014

USTARS 2014
UC Berkeley
April 11-13, 2014

Recruiting and Retaining Graduate Students in the Statistical Sciences and Applied Mathematics
Research Triangle Park, NC
June 5-6, 2014

Poisson 2014
The University of Illinois at Urbana– Champaign
August 4-8, 2014

Field of Dreams Conference
Phoenix, AZ*
***Note Location Change**
November 7-9, 2014

Research Experience for Undergraduates (REU)

Every summer, hundreds of students from across the country participate in mathematics REUs (Research Experiences for Undergraduates) and similar programs. At Grand Valley State University, we've had the privilege of working with more than 100 students in our **NSF-funded REU**, which is entering its 14th year this summer. Whether at GVSU or one of the many other outstanding programs hosted by institutions throughout the United States, the benefits of participating in an REU are numerous. First and foremost, students have the opportunity to work closely with peers and faculty conducting original research in mathematics. In doing so, they develop a better understanding of what it means to do mathematics and to be a mathematician. REUs often provide students the opportunity to develop their written and oral communication skills by writing about and presenting their work to various audiences. In addition, REUs allow students to build lasting professional relationships—and many times friendships—with students and faculty outside their home institutions.

Many students who participate in REUs go on to graduate school and consider their REU experiences to be an invaluable part of their preparation for advanced study in mathematics. As an example, here are just a few comments from past participants in GVSU's REU:

- "The program helped me develop mathematical writing and speaking skills that I have found useful, especially now that I am in graduate school."
- "This summer definitely helped me make some decisions about my future. I am now more motivated and have determined that I would like to go to graduate school and possibly on to a doctorate. I would then be the first in my family, and I feel like this goal is more achievable than I had viewed it in the past."
- "[The GVSU REU] gave me a much better appreciation of how different parts of mathematics connect, as well as insight into the excitement of delving into a topic."

REUs come in many shapes and sizes, and you can learn a lot about an REU by browsing their web site. Doing a web search for "mathematics REU" will return dozens of results, including the NSF's list of mathematics REU sites. A list of National Alliance affiliated REUs can be found **here** as well as on page 3 of this issue of *Math Alliance News*.

— Jonathan K. Hodge, Ph.D.
Chair of the Department of Mathematics & co-director of the Summer Mathematics REU at Grand Valley State University

Click here to learn more about the Summer Mathematics REU at Grand Valley State University.

Application deadline is February 21, 2014.

National Alliance for Doctoral Studies in the Mathematical Sciences

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Math Alliance Research Study:

Descriptive Statistics and Initial Findings from the Student Survey

MATH ALLIANCE RESEARCH STUDY

The Math Alliance Research Study (MARS) is currently investigating the structures of the National Alliance for Doctoral Studies in the Mathematical Sciences (hereafter, "the Alliance") that promote success in diversifying the mathematical sciences and whether these structures are replicable to other disciplines. Data collection, which began in August 2013 and will continue through the summer of 2014, includes surveys, campus visits, focus groups, interviews, and observations at the Alliance's annual Field of Dreams conference. This **brief** introduces the basic design and purpose of the student survey, reports basic demographics of the participating students, and highlights initial findings that will be investigated further in future work by the MARS team. **Please click here** to read the latest brief.

Summer Program in Mathematical Problem Solving

This summer change the lives of talented 7th-grade students from underserved backgrounds: teach them what mathematics really is.

Faculty Positions

The Summer Program in Mathematical Problem Solving, a project of the Art of Problem Solving Foundation, is seeking instructors for a program that gives everyone a chance to excel in mathematics. Faculty design and teach their own courses to bright but underserved middle school students. Courses can be pure math (such as number theory, combinatorics, graph theory, etc.); applied math (such as circuit design, astrophysics, or programming); or problem solving (both contest-based and more general). Our students have tremendous potential and a strong ability for abstract reasoning, but because of their schools and backgrounds they often have not had the same training as more affluent peers. They are devoted, doing seven hours of math per day (and loving it).

We seek:

- college or university professors (or outstanding graduate students) who want to give back and expand the mathematics pipeline,
- outstanding school teachers with strong mathematics backgrounds,
- professionals with a strong background and an interest in sharing their work.

All instructors must be available July 3 through July 30 and must be available to prepare their classes prior to the program. We will provide mentorship, textbooks, and other resources as needed.

The program runs at Bard College, a beautiful, secluded campus in Annandale-on-Hudson, NY (about two hours north of NYC). Food, housing, transportation, and a stipend is provided.

Counselor/TA Positions

The Summer Program in Mathematical Problem Solving, a project of the Art of Problem Solving Foundation, is seeking undergraduate students or recent graduates to be counselors and TAs for a summer program that gives everyone a chance to excel in mathematics. The program will take place at Bard College in summer 2014 and counselors will live with the students in Bard dorms. You'll create a vibrant social experience for kids who are discovering for the first time that there are other people who like doing mathematics. As a counselor, you'll have both an academic and a non-academic role:

- Be a role model and mentor to the students,
- Supervise students and run activities each day for them to relax and socialize,
- Assist in mathematics courses: guide students through challenging problems, assist instructors, and help give feedback to students on their work.

We're looking for counselors who have a lot of initiative and maturity, who will inspire the students to do better, and who are good at math. The camp's academics will be challenging to everyone, with courses on topics such as combinatorics, number theory, problem solving, graph theory, game theory, and more, so you'll get plenty of chance to stretch your mathematical muscles. (You do not need to know these specific topics to come.)

All counselors must be available July 3 through July 30. You will have a chance to take time off, but this is a very intense experience and you should be prepared for it!

The program runs at Bard College, a beautiful, secluded campus in Annandale-on-Hudson, NY (about two hours north of NYC). Food, housing, transportation, and a stipend is provided.

For more information and the application, contact spmps@artofproblemsolving.org or visit their website: http://www.artofproblemsolving.org/spmps

Ask | Rolando

Hey, everyone. My name is Rolando and Dr. Kutzko believes that I am someone who can be a good role model. My close friends heard that I would be giving advice to possible grad students; they worried for the future of mathematics. As with any advice you receive, get a second opinion.

Let's begin with a bit about myself. I have just begun my first year as a graduate student at The University of Iowa (you might have heard of it once or twice at the Field of Dreams conference), but I never intended on going into graduate school. Hell, there's even a point when I was giving up on getting a bachelors. If it weren't for a close friend, I wouldn't have applied to Iowa. That being said, I still feel like this was the best fit for me. But let's save those stories for another time.

So what's the vision with this article? As I am a bit of a narcissist I will begin with some facts about myself that led me to graduate school, followed by answering some of your questions. Yes, they are secondary. This is "Ask Rolando" so I get to make the rules. Now, let's begin with our first question:

Question: *What is your experience with conferences? How often do you get to attend and present your work/ research at conferences and professional events?*

This question could not have come at a better time as I am typing this from the Joint Mathematics Meetings (JMM) in Baltimore. I will first answer how often I get to present my work/research. I'm lucky to have had the opportunity to share my work at several conferences including the JMM as well as several colloquia/seminars at various universities. When I first started research and the results were fruitful, I was giving a talk about every other month. That changed significantly as I was preparing myself for graduate school. While I get invitations to give talks or to simply attend I haven't had the time to get new results since starting grad school. It would be easy to give the same presentation 2 years in a row, but I don't think that would fly with the organizers.

As for my experience with conferences, usually the work is way over my head. I have found myself nodding simply because I recognize a few key words in someone's work. That is normal. You are viewing the work of people who put in copious amounts of time doing specialized research and looking for insight to come up with the results that they present in 30 minutes. But it gets better. Sometimes other people's work gives me some insight into my own research. Each time I attend a conference there is a bit more that I understand and when you get the chance to present, it will be your work that goes over someone's head.

If we were to focus on just the talks, then we would be missing out on an important part of conferences: socializing. Odds are you are in a different city with people who have similar interests. Just about every small conference I have attended has an unofficial dinner/drinks planned. Go. Are you at a large conference? Grab some friends and make your own plans. This is where you have a chance to get to know people at the conference and explore the town. Last night I had dinner with people who were the main motivation for the research that I did as a Masters student. If you haven't yet, you will notice that there is a certain amount of nepotism in academia. Tonight I am going to the same bar where (supposedly) Edgar Allen Poe spent his last night before his death.

To summarize, I enjoy all that conferences have to offer.

If you have a question for Rolando please email it to mathalliance@uiowa.edu. You might see your question answered in an upcoming issue of *Math Alliance News*!

Alliance Affiliated Research Experiences for Undergraduates

It's that time to begin thinking about a 2014 Summer Research Experience. Below is a list of Alliance Affiliated REU programs each linked for more information. Please note that many of the deadlines are mid-February, a few sooner, so you should be applying now if interested!

Summer Programs for Undergraduates

Arizona State University
Mathematical & Theoretical Biology Summer Program
June 4 - July 25, 2014

Brown University
SUMMER@ICERM
June 16 - August 8, 2014

California State University, Northridge
Preparing Undergraduates through Mentoring toward PhD's (PUMP)
July 6 - August 1, 2014

Grand Valley State University
The REU Program in Mathematics
June 15 - August 10, 2014

Harvey Mudd College
EDGE: A Mathematics Program for Women
June 2 - 27, 2014

Harvard School of Public Health
Summer Program in Quantitative Sciences
June 15 - July 26, 2014

Kansas State University
Summer Undergraduate Mathematics Research (SUMaR)
May 27 - July 22, 2014

Mathematical Sciences Research Institute (MSRI)
MSRI-UP Summer Program
June 21 - August 03, 2014

Mathematical Biosciences Institute (MBI)
Undergraduate Summer Research Program
June 2, 2014 - August 15, 2014

North Carolina State University
REU in Modeling & Industrial Applied Mathematics
May 27 - August 1, 2014

North Carolina State University
REU+ program for under-represented undergraduate students
May 19 - August 1, 2014

North Carolina State University
Summer Institute for Training in Biostatistics
June 9 - July 18, 2014

University of Iowa
Iowa Summer Institute in Biostatistics (ISIB)
May 31 - July 18, 2014

University of Nebraska-Lincoln
Nebraska IMMERSE
June 9 – July 18 (Pre-grads)
May 28 – July 18 (Graduate students, early-career faculty)

Valparaiso University
The Valparaiso Experience in Research by Undergraduate Mathematicians (VERUM)
May 28 - July 30, 2014

Williams College
SMALL Undergraduate Research Project
June 16 - August 15, 2014

Winthrop University
Winthrop University REU: Bridging Applied & Theoretical Mathematics
May 27 - July 25, 2014

Summer Programs for Graduates

North Carolina State University
Research for Early Graduate Students (REG) Program
May 27 – August 1, 2014

Mathematical Biosciences Institute (MBI)
Joint 2014 MBI-CAMBAM-NIMBioS Summer Graduate Program
July 7-18, 2014

Post-baccalaureate Programs

Smith College
Center for Women in Mathematics Post-Baccalaureate Program

Change of Location 2014 Field of Dreams

Please take note of the location change for the 2014 Field of Dreams Conference. Because of hotel conflicts we will not be able to have New Orleans host the 2014 conference. We are pleased to go back to Phoenix this November for another great conference!

Summer REU programs, Annotated by William Yslas Vélez

Information about summer REU programs are available at the NSF website:
http://www.nsf.gov/crssprgm/reu/list_result.cfm?unitid=5044

and also on the AMS website:
http://www.ams.org/programs/students/undergrad/emp-reu

Most of these programs are for students in their junior year who have completed at least one proof-intensive course and at least some upper division course work in algebra, analysis or linear algebra.

I have read over the descriptions of the proposed activities for the REU sites. I have commented on programs that fit certain needs of undergraduates. In particular, I looked for those programs that students who had not started upper division courses could apply to. Many REU sites do not list the minimum prerequisites or I may have overlooked some so please look carefully at both websites.

Most of the summer REU programs require some computing background, so I will not list it separately as a requirement. This computing requirement may consist of either programming skills in some language or facility with some computational package.

Some summer programs that do not appear on the NSF website

1. Brown University, ICERM (http://icerm.brown.edu/summerug_2014)
2. Illinois Institute of Technology (http://math.iit.edu/~openscholar/meshfree/event/reu-iit)
3. Miami University (http://www.units.miamioh.edu/sumsri/)
4. USC Viterbi (http://gapp.usc.edu/sure)

Assist High School students

1. PROMYS (http://www.promys.org/program/counselors). This is a program for gifted high school students and math majors apply to be counselors to work with these high school students.

For Secondary Mathematics Education Majors

1. Illinois State University (http://math.illinoisstate.edu/reu/) will recruit eight undergraduate mathematics education majors. As of January 20, 2014, the website indicated it had not yet hear about funding for 2014.

For students who have completed two semesters of calculus

1. Arizona State University (http://mtbi.asu.edu/summer-program), Mathematical and Theoretical Biology Institute: The site says that students who have completed at least their sophomore year and have completed two semesters of calculus are eligible to apply.
2. Michigan State University (http://www.lymanbriggs.msu.edu/SURIEM/). The website states that students should have completed the first course in calculus.

For students who have completed three semesters of calculus and linear algebra

1. Central Michigan University (http://www.smcm.edu/mathcs/reu.html). Does not require third semester calculus.

2. Grand Valley State University (http://www.gvsu.edu/mathreu/). Does not require third semester calculus.
3. Rice University (http://www.stat.rice.edu/~jrojo/) As of January 20, 2014, this website was not updated and does not have information about the summer 2014 program.

For students who have completed three semesters of calculus, differential equations, and linear algebra

1. Kansas State University (http://www.math.ksu.edu/reu/sumar/index.html). The description states that they will accept some students early in their careers.

For most of these summer REU programs, students do not receive undergraduate college credit. However, for some students, obtaining such credit can be useful. There are a few programs that offer such credit.

Programs where students earn undergraduate credit for participating.

1. Boise State (http://math.boisestate.edu/reu/). Three units of undergraduate credit are received.
2. University of Wisconsin, Summer Institute for Training in Biostatistics (SIBS), (http://www.biostat.wisc.edu/Education/SIBS/index.htm). Students earn 6 units of credit. No mention of stipends was made.
3. University of Maryland, Baltimore County (http://www.umbc.edu/hpcreu/). Fully transferable three-credit course *Math 447 Introduction to Parallel Computing* using C with MPI.

Industrial Mathematics

1. Worchester Polytechnic Institute (http://www.wpi.edu/Academics/Depts/Math/CIMS/REU/)
2. Institute for Pure and Applied Mathematics (http://www.ipam.ucla.edu/programs/rips2014/default.aspx). Research in Industrial Projects. There is an international component in Hong King. Students who graduate in May can apply. International students can also apply.
3. Institute for Mathematics and its Applications (http://www.ima.umn.edu/2013-2014/SW6.9-7.18.14/). Problems will be posed in fields outside of mathematics.
4. Brown University, Integrating Dynamics and Stochastics (http://www.dam.brown.edu/people/sandsted/rtg/jobs.php)

International Opportunities or Programs Open to International Students

1. DIMACS (http://dimacs.rutgers.edu/REU/). "A small number of REU participants are selected to participate in an extension of the research experience. These students will travel to DIMATIA, at Charles University in Prague, Czech Republic, and will participate in the Midsummer Combinatorial Workshop as well as additional REU program activities."
2. Institute for Pure and Applied Mathematics (Institute for Pure and Applied Mathematics (http://www.ipam.ucla.edu/programs/rips2014/default.aspx). There is an international component in Hong King. Students who graduate in May can apply. International students can also apply.
3. Arizona State University (http://mtbi.asu.edu/summer-program), Mathematical and Theoretical Biology Institute: "International students are accepted, but on a *very* limited basis."
4. Institute for Mathematics and its Applications (http://www.ima.umn.edu/2013-2014/SW6.9-7.18.14/). The website state that there are funds for up to three international students.

5. SMALL Undergraduate Research Project (http://math.williams.edu/small). Funding is available for a limited number of students who are not US citizens or permanent residents.
6. PROMYS (http://www.promys.org/program/counselors). This is a program for gifted high school students and math majors apply to be counselors to work with these high school students. International students can apply to be counselors as long as they have permission to work in the U.S.

Mathematics and the Biological Sciences

1. Cold Spring Harbor Laboratory (http://www.cshl.edu/education/urp/nsf-sponsored-reu-in-bioinformatics-and-computational-biology). Bioinformatics and Computational Biology.
2. Dordt College (http://www.dordt.edu/academics/programs/math/statgen/program_details.shtml) Biostatistics and Statistical Genetics.
3. Emory University (http://www.sph.emory.edu/cms/departments_centers/bios/bios_training/sibs.html). Biostatistics.
4. University of Pittsburgh, School of Medicine (http://www.tecbioreu.pitt.edu/) Computational Biology
5. Boise State (http://math.boisestate.edu/reu/). Genome Biology.
6. Winthrop University (http://www.birdnest.org/wureu/) Mathematical Biology

Programs for Women

1. The Carleton College Summer Mathematics Program for Women (http://www.math.carleton.edu/smp/index.html). This program requires second semester calculus and linear algebra.
2. Summer EDGE program (http://www.edgeforwomen.org/). For women who have graduated and plan to pursue graduate studies in mathematics.
3. Institute for Advanced Study Program for Women (http://www.math.ias.edu/wam/2014)

Programs with a focus on under-represented students

1. MSRI-UP (http://www.msri.org/web/msri/education/for-undergraduates/msri-up)
2. Committee on Institutional Cooperation (http://www.cic.net/Home/Students/SROP/Home.aspx)
3. MSRI-UP (http://www.msri.org/web/msri/education/for-undergraduates/msri-up)
4. University of Wisconsin, Computational Biology and Biostatistics (http://www.biostat.wisc.edu/Education/CBB/index.htm)
5. Miami University (http://www.units.miamioh.edu/sumsri/)
6. Pacific Undergraduate Experience in Mathematics Program (http://www2.hawaii.edu/~pure/PURE_Math/Welcome_files/PURE%20flyer%206-1.pdf)

Almost all REU programs are for students who are undergraduates. I did find some for students who graduate in May 2013.

Programs where graduates can apply

1. Summer EDGE program (http://www.edgeforwomen.org/). For women who have graduated and plan to pursue graduate studies in mathematics.

2. Institute for Pure and Applied Mathematics (Institute for Pure and Applied Mathematics (http://www.ipam.ucla.edu/programs/rips2013/default.aspx). There is an international component in Hong King. Students who graduate in May can apply. International students can also apply.

Many of the national labs have internship programs. These internship programs can be for the summer or for a semester. As examples look at the following.

National labs

1. Argonne National Labs (http://www.dep.anl.gov/p_undergrad/)
2. Lincoln Laboratory, MIT (http://www.ll.mit.edu/college/summerprogram.html)
3. Homeland Security (http://www.orau.gov/dhseducation/internships/index.html)
4. National Cancer Institute (http://icbp.nci.nih.gov/education-and-outreach/summer)
5. National Institute for Mathematical Biological Synthesis (http://www.nimbios.org/sre/)
6. NIST (http://www.nist.gov/surfgaithersburg/elig.cfm)