

UNDERGRADUATE MATHEMATICS SEMINAR

Bookmark it! The seminar schedule, abstracts, and (sometimes) slides presented by a speaker can be found <http://www.math.union.edu/activities/seminars/student/welcome.html>.

The first seminar of the winter term will be:

DATE: **MONDAY, January 25th**

Time & **4:15pm** – Refreshments in the Math Common Room, **Bailey 204**

Location: **4:30pm** – Seminar in **Bailey 207**

In this seminar, Union College's **Professor Jue Wang** will deliver the following talk:

TITLE: Reconstruction of Ultrasound Imaging Information

ABSTRACT: Ultrasound imaging has great potential in helping physicians diagnose and treat medical conditions. It is quick, inexpensive, and boasts excellent soft tissue contrast. Spatial variations of attenuation across tissue layers can result in shadowing and enhancement in ultrasound B-scan images. These artifacts affect the underlying signal backscatter, which is the main component of ultrasound images and has clinical significance in detecting diseases and tumors. I will present a novel joint estimation method based on the variational principle to compensate for attenuation artifacts via functional minimization and regularization. Pair of pathological useful backscatter and attenuation fields is reconstructed along with segmented anatomic structures. We will compute the numerical solutions and discuss the applications in cancer radiation therapy.

Math – huh, What is it good for?

This month's issue of MAA Focus, The Newsmagazine of the Mathematical Association of America [a copy is in the Math Common Room, Bailey 204], contains an article entitled "A Degree in Mathematics Offers Many Career Options," by Candace Berschauer and Michael Pearson. In it, the authors mention the results of two recent studies, one concerning job satisfaction and another concerning high-earning college degrees. The common denominator of these two studies: mathematics!

The first study rated "mathematician," "actuary," and "statistician" as the three "best" jobs one can have. The second study found that the 15 highest-earning college degrees all require significant coursework in math.

The MAA is a wonderful source of information for math majors who would like to understand

some of their career options. At a subpage of its website (www.maa.org/careers), the MAA has compiled information and links to webpages containing career information, resources, and advice for undergraduate math majors. Additionally, the MAA Math Classifieds website allows students to "create a career profile, upload or create a resume (with guidance and even critique), free career coaching, career tests, and job alerts... The MAA has also produce a variety of career-related publications, including the books *She Does Math* and *101 Careers in Mathematics* [a copy is in the Math Common Room, Bailey 204], the *We Do Math!* Brochure, and the *MAA Online Career Profiles* webpage."

The Brigham Young University (BYU) Math Department's website www.math.byu.edu also has some nice resources, including a link to a

PowerPoint presentation on Career options for math majors, and a new website created by BYU students called *When Will I Use Math?* One interesting quote from a 2004 BYU math alum who then attended Columbia Law School: "Being a math major in law school sets you apart from the majority of law students who are humanities majors, a distinction that proves advantageous upon applying for jobs."

So, take a look at some of these sources of information. You will (hopefully) discover that by taking more math courses, or minoring or majoring in math, you will be providing yourself with a background that will open many opportunities to you.

The following websites contain information about careers options for math majors and uses of mathematics.

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| • MAA Careers site | www.maa.org/careers |
| • MAA Online Career Profiles | www.maa.org/careers/profiles.html |
| • MAA Math Classifieds | www.mathclassifieds.org |
| • JobsRated.com "Best Jobs" | www.careercast.com/jobs/content/JobsRated_10BestJobs |
| • Careers and Colleges | www.careersandcolleges.com |
| • When Will I Use Math? | www.whenwilliusemath.com |
| • AMS Careers Site | www.ams.org/employment |
| • SIAM Careers Site | www.siam.org/careers |

Resources for Students

- **Math for America.** Math for America (MfA) seeks to improve math education in the nation's public schools by recruiting, training and retaining outstanding secondary school mathematics teachers. MfA offers mathematically talented college graduates a five year MfA Fellowship that includes a full tuition scholarship for a master's degree program and four years of teaching in a New York City public secondary school. Today, there are over 200 MfA Fellows in the New York City program, with 60 new Fellows entering the classroom next fall.

MfA Fellows receive:

- A full tuition scholarship for a master's degree in mathematics education from MfA NY partner universities Bard College, New York University or Teachers College, Columbia University
- A stipend of \$100,000 over five years, in addition to a full time teacher's salary
- Extensive professional development support and mentoring
- Guidance from a community of highly qualified math teachers

The website to visit is www.mathforamerica.org. This position is listed in eRecruiting and students can contact **Lyndsay Ferguson** at the **Becker Career Center** directly with any questions.

- **Free Calculus Tutoring.** The Calculus Help Center, which operates in Sorum House on Sunday-Thursday nights from 7:30-10:00, offers free tutoring in calculus classes numbered 115 or lower.

Problem of the Newsletter: January 22, 2010

This week's problem. AVERAGING DIGITS

1. How many *four-digit* numbers are composed of three distinct digits (with no leading 0s) such that **one digit is the average of the other three**?
2. How many such four digit numbers with repeating digits are possible?

Professor Friedman will accept solutions to this problem until 12:00 noon Thursday, January 28th. Email your solution to him (friedmap@union.edu) or put it in his mailbox in the Math office in Bailey Hall.