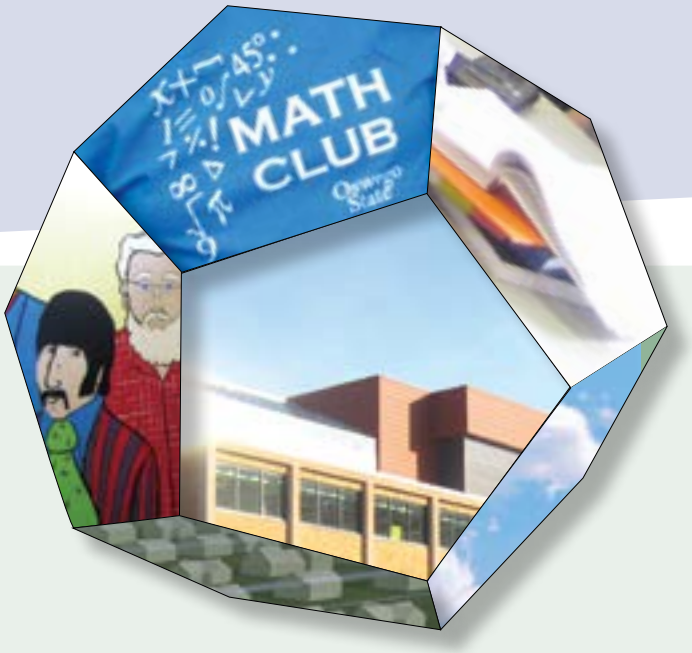
SUNY Oswego Mathematics Department

Snygglet

Volume 2 Issue 1
Spring 2013



Letter from Math Department Chair

Greetings from Snygg Hall!

Some years ago, in the age of mimeograph, we put out an occasional newsletter, under the editorship of James Burling. It was called *The Snygglet*. The main audience was our alumni. This is the first issue of a revived *Snygglet*. Again, our main audience is to be our alumni. We hope it will help keep the close ties of our graduates to each other and to the department members. We form a community that should not be shedding members as they graduate. We will post issues on our department website, available to prospective students or anyone else who would like a view of the Department of Mathematics. We plan, after this initial issue, to send out the newsletter early each February and each June.

My thanks to Prof. Zohra Manseur, who took the photos, and to student Paul Comfort, whose abbreviated piece on the Common Core Standards appears in the newsletter.

When you receive this, we would appreciate a note to let us know you received it. If you can, please send an email to me at christopher.baltus@oswego.edu, or our part-time secretary, Terri Pettie, at theresa.pettie@oswego.edu. Please send us any news about yourself, such as where you are living, or your work, or your family. And let us know if you would like the information shared in the next *Snygglet*. We also appreciate reflections on your years at Oswego and how we can make things better for students to come.

Christopher Baltus

December 2012 Graduates

Sara Bauer
Childhood Ed (Math Concentrate),
Lee Center, NY

Sean Bereza
Adolescence Ed (Mathematics),
Rome, NY

Lydia Bury
Adolescence Ed (Mathematics),
Liverpool, NY

Brendan Carter
Mathematics BA, Oswego, NY

Paul Comfort
Mathematics BA & Adolescence Ed (Mathematics),
Fort Edward, NY

Erin Cummings
Adolescence Ed (Mathematics),
Valley Cottage, NY

Mary Hesler
Mathematics BA & Adolescence Ed (Mathematics), Oswego, NY

Kerry Jones
Mathematics BA & Adolescence Ed (Mathematics),
Bay Shore, NY

Jessica Krebs
Applied Mathematical Economics, Vernon, NY

Kaitlyn Smegelsky
Applied Mathematical Economics, Oswego, NY

Janet Stryker
Applied Mathematical Economics, Cato, NY

Joseph Tricarico
Mathematics BA & Adolescence Ed (Mathematics),
Wading River, NY

Rodney Warren
Mathematics BA & Adolescence Ed (Mathematics), Altmar, NY

Robert Wimler
Applied Mathematics BS & Applied Statistics minor,
Hannibal, NY

Ryan Wood
Mathematics BA & Adolescence Ed (Mathematics), Phoenix, NY

Mathematics/Applied Statistics Cooperative

When the provost's office announced the development of co-ops in 2011, we felt a program centered around a co-op experience would be just the thing for a number of our majors who choose to specialize in statistics. As our department was among the first to create a co-op program, we had a lot of leeway and rather little guidance in our work. Professors Fettes and Nanthakumar worked with the chair and the provost's office in designing a program which finally won approval from the college's faculty assembly this February. We have the possibility of students going out for co-op as early as next January.

In talking to Novelis (aluminum processing) of Oswego and Welch Allyn (medical diagnostic devices) of Skaneateles, we find that employers are eager to have good students working for them in internships and co-ops. Besides a community service, it is way for companies to find good employees. Nevertheless, we hope to develop a wide range of employer contacts and alumni are asked to help locate prospective employers.

Brief Description. The program integrates a six-month work experience into the college program of students in mathematics and statistics. Students will complete the major in Mathematics and the minor in Applied Statistics, with most coursework in those fields finished before the co-op. The six-month co-op will be planned with an employer to provide full-time, paid work, in which students apply their skills in statistics. No tuition is paid during the co-op semester. Students should apply after at least one semester at SUNY Oswego and at least a year before the co-op. At least one semester is to be at Oswego after the co-op. The course requirements are those for a mathematics major and the Applied Statistics minor, plus 1-credit courses before and after the co-op experience. The student's transcript will record the co-op.

Admission (simplified) requires 15 hours completed at Oswego, with a 3.0 gpa, and grades of B- or higher in a statistics course and a calculus course.

Before the co-op, students need to complete all the 200-level courses for the major (Calculus 1–3, Matrix Algebra, Discrete Math), Mathematical Statistics A, CSC 212 Principles of Programming, and three other statistics courses, with a GPA in those courses of 2.8.

As students will not earn course credit during the co-op, any participant who is to graduate in four years will need about 12 credits by such means as AP courses, summer classes or semester overloads.

Some members of SUNY Oswego's math faculty.
From the left: Preety Tripathi, Pat Halpin, Magdalena Mosbo, and Jack Narayan.

The Common Core State Standards

Much is happening in and about our schools these days. The constellation of changes include greater involvement of the state and federal government, more elaborate evaluation of teachers, and the Common Core State Standards (CCSS). Unlike earlier "reform" movements, back as far as the New Math, this new one is driven by state governors and state departments of education. Will that make for a more enduring impact?

It is hard to read anything on school mathematics which does not include some mention of the CCSS. The transition is already under way in New York State schools, with little tolerance for delay. Richard Iannuzzi, president of New York State United Teacher's, complained [Dec 19, 2012] that teachers will be assessed in spring 2013 based on the CCSS: "We assess before we teach the curriculum. And that is just backwards."

So what are the CCSS? The CCSS document lists in detail the Content Standards: what is to be covered each year from Kindergarten through Grade 8, and then by mathematics topic in the secondary years. There are also eight standards for Mathematical Practice, emphasizing the underlying curriculum of developing mathematical thinking. These are things that warm the heart of mathematicians, starting with:

MP 1. Make sense of problems and persevere in solving them.
MP 2. Reason abstractly and quantitatively.
MP 3. Construct viable arguments and critique the reasoning of others.

To get a sense of the standards, we present an abridgment of a report by Paul Comfort, a December 2012 graduate with both the Mathematics BA and the Adolescence Education BS. It looks in detail at one area, fractions in the upper elementary grades, comparing the CCSS with the NY State curriculum which they replace. Following that is a recommendation for Stephen Brill's Class Warfare, 2011, to get you up to date on the politics and practice of the movement for charter schools along with "No Child Left Behind" and "Race to the Top."

Math students in the Commons Room.
From the left: Michelle Mariano, Caitlin Dabkowski, Justin Ford, and Rebecca Tango.

Changes to Expect with the Common Core State Standards

see www.corestandards.org

by Paul Comfort

On June 2, 2010, a new set of learning standards, Common Core State Standard (CCSS), were released. For the first time, a set of American standards goes beyond the mile-wide, inch-deep approach to really focus on what the world has found as the most important topics that will deliver a level of math performance that is higher than in the past.

The Board of Regents in New York State adopted the Common Core State Standards for English Language Arts, History, Science, and Mathematics—and, in January 2011, the board approved the necessary changes to the English and Mathematics curriculum.

One of the biggest changes is that in third through sixth grades great attention is given to assure that students will fully understand every aspect of fractions. Starting in third grade, we can see that the old and the new standards have the same number of learning goals, six. However, the CCSS goes more deeply into the reasoning behind each goal. For example, the first learning goal about fractions in the old Math Core standards for New York State is (3.N.10): "Develop an understanding of fractions as part of a whole unit and as parts of a collection." Some teachers may have some difficulty understanding what is meant by "parts of a collection." But if we look at the CCSS, the first standard for fractions states (3.NF): "Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b." The standard from the CCSS goes into detail on what a fraction really is.

The next critical standard(s) regarding fractions in the CCSS involves representing fractions, 1/b and a/b, on a number line. The standard (3.NF.2) states: "Understand a fraction as a number on a number line; represent fractions on a number line diagram." There are then sub-standards, for 1/b and for a/b. The first reads:

a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.

The old New York State standard simply states: Compare and order unit fractions (1/2, 1/3, 1/4) and find their approximate locations on a number line (3.N.15). Thus the CCSS goes into more detail of what the students should actually be doing. Again, third grade will be the first time students will be seeing anything with fractions, so creating a firm foundation for future learning is very important.

In fourth grade, using the Common Core Standards, students will be learning about multiplying fractions for the first time, as well as adding and subtracting fractions. However, with the old standards, students would not see multiplying or dividing of fractions until sixth grade with the standard: multiply and divide fractions with unlike denominators. This is probably one of the biggest leaps made with the common core, a two year difference between the two standards. Granted, with CCSS, the students only have to multiply a fraction by a whole number, but it has to start somewhere. By having the students start their fraction skills earlier in their school career, the more confident they will feel once they become involved in more complicated computations involving fractions. **That is the benefit of the common core; more practice earlier will help students down the road.**

In fifth grade, using the CCSS, those students will "apply and extend previous understanding of multiplication and division to multiply and divide fractions" (5.NF). While with the old standards, fifth grade students are merely comparing fractions. It is important to learn, but students start learning how to do that in third grade while using the number line. Students then move on to dividing fractions by fractions in sixth grade with the Common Core rather than jumping head first into multiplying and dividing fractions with the old standards.

Overall, because the new standards implement the essential basics that every student needs in earlier grades, the Common Core State Standards should bring up the United States' math and ELA testing scores.

Faculty members:
Kubrom Teka and Terry Tiballi. Terry's musical inspiration was painted on his office wall by Maggie Tiballi.

Class Warfare: Inside the fight to fix America's schools

by Christopher Baltus

I recommend Stephen Brill's Class Warfare, 2011. It reports on charter schools, Teach for America, teachers' unions, President George W. Bush's "No Child Left Behind" and President Obama's "Race to the Top," and the politics of schools in New York City. Behind it is one solid conclusion from analysis of several decades of test scores: the classroom teacher makes a very big difference, far bigger than other features such as class size or funding per student. The best teachers, year after year, advance their students by a couple grade levels while the poorest teachers, year after year, advance their students little or not at all. [It is unfortunate that the data do not give any clear picture of what in their background or training make for the best teachers.] Charter schools have served as a laboratory experiment: although on average they work no better than the public schools, the best ones show that children from poor districts can be educated as well as those from the best public schools anywhere. Thus the fight to have more of the best teachers in classrooms, under supportive conditions, and fewer of the poorest teachers.

Stephen Brill is a journalist who has worked for years on education issues. He wrote the notable article in *The New Yorker* about the "Rubber Rooms," where hundreds of New York City teachers, removed from teaching, came daily, with full pay, to play cards and read the newspaper while their legal cases dragged along. In Class Warfare, which covers news up to May 2011, Brill reports on the main characters in the fight, much based on interviews. His conclusions are optimistic, but sobering. Those best teachers and administrators were only able to do their work at high cost to themselves and their families. We know what can work, but as things now stand, it is far from clear how we will find the people, the resources, and the political support needed to implement those best practices everywhere.

Spring 2013 Prize Winners

Dean's Writing Award
Jessica Krebs

The Louis R. DeRitter (Senior) Award
Rebecca Tango, Ben Valentino

The Louis R. DeRitter (Junior) Award
Laura Murtha

The John Walcott (Adolescent Education) Award
Jackie Maguire

The John Walcott (Childhood Education) Award
Kailea Nelson

The Emmet C. Stopher Calculus Award
Erika Wilson

Snygglet Problems

1. My son's Masterlock combination (three distinct integers from 0 through 39) is an arithmetic sequence of 2-digit primes: a, a+ d, a + 2d.

How many such combinations are possible?

2. [From Jeremy Berquist, who posts the Problem of the Week. This is the first problem of the Spring semester.]

If three distinct integers are selected at random from {0, 1, 2, . . . , N}, what is the probability the three numbers, in some order, form an arithmetic sequence: { a, a+ d, a + 2d}?

[You may first want a rule for odd N and a rule for even N. But Jeremy would like just one rule, involving the greatest integer function.]

3. [An oldie-but-goody.]

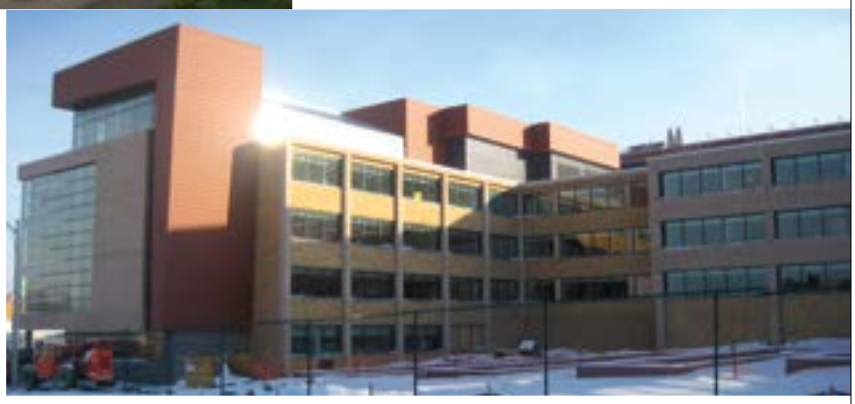
A worm crawls at a steady speed of 1 inch per hour, starting from one end, along a 50 inch rubber band. To frustrate the poor worm, at each hour the band is suddenly lengthened by 1 inch.

Does the worm ever reach the other end?

ANSWERS in next issue

Top:
Artist's view of the Richard S. Shineman Center for Science, Engineering and Innovation, looking east.

Bottom:
The new Shineman Center, in February 2013. The building is built around a renovated Piez Hall.



Chair's Report

After many years where it seemed little has changed, and what change we saw came slowly, we are undergoing major transitions. We are to move out of Snygg, and take all belongings, this June. We will go into the new sciences building, called the Richard S. Shineman Center for Science, Engineering and Innovation. It will house all the science departments, mathematics, computer science, and electrical engineering. (Yes, Oswego is beginning majors in Computer Engineering and in Electrical Engineering, to be administered through a new department.) In place of classrooms across the hall from professors' offices, in the Shineman Center all classrooms will be on the first floor while professor's offices will be on the second, third, and fourth floors. (That arrangement was not our choice.) As there will be fewer classrooms, a lot of teaching will be in Wilber and Park Halls, connected by enclosed walkways. On the classroom walls there will be a mix of whiteboards and chalkboards—we had to fight to get any blackboards—and of course there will be a console with a computer and projector and a document camera. So modern!

The mix in our majors and minors is changing. The number of majors in secondary mathematics—Adolescence Education, as it is called—is dropping. Numbers will probably increase again when we see more job openings, but we may never return to the enrollments of thirty students in College Geometry and History of Mathematics. However, the number of graduates in mathematics is holding near constant, with a small increase in recent years. Graduates last December, and students expecting to graduate in the coming May and August, number some eighteen mathematics majors, of whom nine are double majors with Adolescence Education. We had three graduates in Applied Mathematical Economics in December, with one more expected in May. That is an increase.

Our students are taking more statistics. About four students a year graduate with a minor in Applied Statistics. Although the number is small, this program draws students planning on graduate work. In the last two years, four mathematics majors with the minor in Applied Statistics have gone, fully funded, to graduate programs in applied statistics. There is a new Mathematics/Applied Statistics Co-op, designed last year and just given final approval. (It is outlined on page 2.) And we are discussing a Statistics Major.

Personnel are changing. From 1967 through 1970, the department hired eleven tenure-track PhD mathematicians. That group chaired department committees and did most of the teaching for the next three decades. Their replacements have included statisticians and math educators, along with mathematics PhDs. Jack Narayan has announced his retirement for December 2013; he will be the last to retire out of those teaching in 1970. We will miss his wisdom and energy. We were fortunate to hire, in 2012, Kubrom Teka, who works in differential equations and statistics, and, for this coming fall, Elizabeth Wilcox, in algebra.

Christopher Baltus