Mathematical Matters

The Newsletter of the Pacific Northwest Section of the MAA
Fall 2016

Tevian Dray awarded MAA's Haimo Teaching Award

The Pacific Northwest Section of the MAA is delighted to learn that Tevian Dray has been selected to receive the Deborah and Franklin Tepper Haimo Award at the JMM meeting in January 2017 in Atlanta, GA. This award is given in recognition of distinguished college or university teaching of mathematics. Tevian is an active memeber of the PNW MAA section. He won the section's Distinguished Teaching Award in 2014 and gave an invited address at the 2015 meeting in Tacoma. The following is an excerpt from the MAA prize book for 2017, highlighting some of Tevian's accomplishments. Congratulations, Tevian!

Tevian Dray is recognized for his record of exemplary mathematics teaching at Oregon State University and distinguished work in college mathematics curriculum development. Over the course of his career, Tevian has created a greater awareness of the need for mathematicians to look at how other fields see mathematics, and his curriculum development work has given the mathematics community a powerful tool to engage students by showing them how the mathematics they are learning will look in their major.

Math in the Inland Empire

PNW MAA and Project NExT at Gonzaga University
June 16 - 18, 2016

By Shannon Overbay, Gonzaga Universtiy, Local Organizer

Gonzaga University will host the summer meeting of the Pacific Northwest Section of the MAA and Project NExT from June 16-18, 2017 in Spokane, Washington. Friday, June 16th will include Section NExT activities, with MAA conference activities on Saturday and Sunday, June 17th and 18th. Proposals for special sessions and panel discussions should be sent to Bonni Dichone (dichone@gonzaga.edu) by February 1st. We hope to offer a wide variety of sessions for students, researchers, community college faculty, and those interested in pedagogy. So, please send your ideas. Once the call for special sessions is closed, registration for special sessions and general sessions will be available on our website by March 1st.

We have scheduled three invited speakers. The first is the new MAA President, Deanna Haunsperger, Ph.D., from Carleton College.

Tevian Dray, continued from pg. 1.

Tevian excels at teaching in the classroom. He loves to teach, and students love to participate and actively learn in his courses. Tevian creates a very interactive classroom and employs non-traditional and alternative teaching methods. In both large and small classroom settings, student questions and other feedback drive the coherent presentation of the subject matter, emphasizing conceptual understanding, and the relationships between different parts of the course.

Tevian has also made significant and original contributions to the teaching of mathematics, both at Oregon State and nationwide. He has played a key role in two successful long-term curriculum development projects. Tevian was the PI of the "Vector Calculus Bridge" project, that addressed the divide between how vector calculus is taught by mathematicians and how it is understood by physicists. He also coauthored an online multivariable calculus textbook based on this approach. Tevian is also the co-PI of the "Paradigms in Physics" project, a 19-year NSF-funded effort by the Oregon State physics department to redesign their upper-division physics courses with a strong emphasis on pedagogical reform.

Tevian designed a new course on Reference Frames and an accompanying textbook that presents a geometric approach to relativity.

Tevian has also participated extensively in teacher development for the state of Oregon. Through the Oregon Mathematics Leadership Institute (OMLI), he was part of the team that designed an OMLI course in non-Euclidean geometry that encouraged teachers to improve the quality of mathematical discourse in their own classrooms by modeling instruction on an unfamiliar but accessible mathematical topic. Tevian also served as a co-PI of the Central Oregon Consortium, a Mathematics and Science Partnership providing professional development to middle-school math teachers in rural Oregon.

Tevian is a professor of mathematics at Oregon State University. He is also a fellow of the American Physical Society and currently a member of CRAFTY, the MAA subcommittee on Curriculum Reform Across the First Two Years. He remains active in mathematical physics, with two recently published textbooks on relativity, and a third on his latest interest, the octonions and their applications to physics.

2017 Meeting, continued from pg. 1.

Second, is John Milton, M.D., Ph.D., computational neuroscientist from Claremont McKenna College. The third speaker is Stan Yoshinobu, Ph.D., from California State Polytechnic University. Additionally, Eric Schulz of Walla Walla Community College will be conducting a mini-course on teaching with Mathematica. Here is a link:
 http://www.gonzaga.edu/Academics/Colleges-and-Schools/College-of-Arts-and-Sciences/Majors-Programs/Mathematics/PNW-MAA-2017.asp

We hope you come enjoy our great city and warm summer weather. Spokane offers numerous outdoor activities, restaurants, and local breweries on our Ale Trail (http://inlandnwaletrail.com/). See http://www.visitspokane.com/ to learn more.

Spokane photo credit: Matt Gollnick

Notes from the Chair

Ideas for Activities at our Meetings

By Nancy Ann Neudauer

The Pacific Northwest Section is sponsoring two meetings this year: the Northwest Undergraduate Mathematics Symposium (NUMS) at Linfield College in April and the Pacific Northwest MAA Section meeting at Gonzaga University in June. We hope to see you and your students at both of these events.

As I mentioned in this newsletter last year, as Chair I have learned so much not only about our Section but also other MAA Sections. I'll take this opportunity to report on the Section Officers Meeting at MathFest in Columbus.

There are fourteen Special Interest Groups of the MAA (SIGMAAs). Bonnie Gold and Tom Drucker, officers of POM (Philosophy of Mathematics) SIGMAA, led a discussion about how Sections and SIGMAAs can plan mutually beneficial programs at Section meetings. Some ideas were to host a discussion table at lunch, bring a SIGMAA speaker to a meeting, organize a panel on a topic related to a SIGMAA, or offer a minicourse, workshop, or paper session. The Northeastern Section supported a POM SIGMAA speaker at their meeting, and the SIGMAA provided refreshments. If you belong to a SIGMAA and would like the opportunity to spread the word at a Section Meeting, please contact the meeting hosts or propose a panel or session during the Call for Special Sessions.

There is an update on the Department Liaison Program, which we will discuss at the Business Meeting during our Section meeting. The main question is, do we want to continue a Liaison Program within our section? This is from the MAA:

The official Association-level Department Liaison Program has been discontinued. But many Sections have found the liaisons to be helpful in their work – in disseminating information from both the Section and the Association, in soliciting nominations for awards or elections, in collecting information for the Section newsletter. This program has been especially helpful in reaching non-members and encouraging them to join the MAA and participate in its activities. Sections are thus encouraged to develop their own Section-level liaison programs.

MAA's Committee on the Undergraduate Program in Mathematics (CUPM) recently published the 2015 CUPM Curriculum Guide to Majors in the Mathematical Sciences. The printed version, available (free) in paper from the MAA, covers the Introduction and the Overview and several essays on the common elements of the major in mathematical sciences. This includes the recommendations of the central cognitive and content goals of any mathematics major program. The second and third parts of the 2015 Guide, the Course Study Group reports and the Program Study Group reports, are online only.

The MAA has a new Departmental Membership structure. Full MAA membership benefits are available to the students you nominate for membership as well as to the faculty member who serves as your institutions MAA membership administrator. Some

Chair Notes, continued from pg. 3.

institutions have more than a hundred student members.

MAA FOCUS has a new column, Section Happenings, for highlighting interesting events happening in each of the twenty-nine Sections. They are soliciting articles that highlight something that makes our Section special.

I always enjoy learning about novel activities at other section meetings. This year, the Golden Section (Northern California, Northern Nevada, and Hawaii) held its first ever Mathematical Art Exhibit at the Section Meeting, with "19 artists exhibiting their work in a variety of media, including paintings, digital prints, and sculptures in wood, metal, and glass."

I look forward to seeing you in April at Linfield College for NUMS and in June at Gonzaga University for the PNW MAA Section Meeting. Beyond this year, we look forward to upcoming meetings at Seattle University, Lewis and Clark College, and the University of Alaska Anchorage, as we continue to explore diverse regions of our vast section.

Future Meetings

2017 NUMS Linfield College, **April 8**

2017 Gonzaga University, **June 16 - 18**

2018 Seattle University

2019 Lewis and Clark College

2020 University of Alaska Anchorage

2021 Western Washington University (tentative)

NUMS April 8, 2017

**By Xiaoyue Luo, Linfield College
and Christian Millichap, Lindfield College.**

We are excited to announce that the 2017 NUMS will be on held on Saturday, April 8, 2017 at Linfield College in McMinnville, Oregon. NUMS is a regional mathematics conference providing a venue for undergraduate students to present mathematical research. Students will have opportunities to present their research by giving short talks or presenting posters. In addition, this conference will feature a keynote talk from Professor John Caughman (Portland State University) and some fun mathematical competitions for students. Registration is free and lunch will be provide for all participants. We are looking forward to seeing you at Linfield!
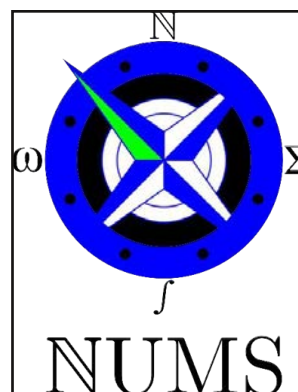
Project NExT: 2016 OSU meeting

Impressions from the Project NExT portion of the spring 2016 section meeting are provided this year by two of the newest Project NExT members.

Jaime Shinn
Gonzaga University

Throughout the day of the section Project NExT meeting, I noticed a theme of active learning in the classroom. In discussing alternative methods of assessment, one alternative method required students to create a poster in class to answer the question "What is a derivative?" Clearly, this is a method of assessment that encourages active learning in the classroom. In another session, titled 'Teaching an Active Curriculum: Helping Students Constructively Persevere Through the Problem Solving Process', we were given examples of worksheets that encourage active student participation in class. Similarly, in the session on POGIL (Process Oriented Guided Inquiry Learning), we got to see examples of POGIL worksheets where students work on these worksheets in groups in class. It was during this session that the question came up in our small group about how to measure the amount of active learning occurring in a given classroom. We all seemed to agree that this is a very difficult task.

To be sure, I was both intrigued and inspired by the many ideas and conversations that were had about active learning in the classroom. I am very much looking forward to implementing many of these ideas into my own classrooms.

Carolyn James
Portland State University

During the Project NExT meeting there was a session on "Alternative Assessment". Three panelists spoke during the session. A.J. Stewart talked about his experience implementing oral exams. Although it was a big drain on his time, it allowed students the opportunity to demonstrate a deeper understanding of conceptual ideas beyond what he could do on a written test. He had a positive experience, although it is something he would not recommend for larger classes.

I talked about formative assessment in groupwork. A common problem in groupwork is that students don't engage to the level that you hope, and assigning mathematical roles is one way to get students to focus on particular components of the mathematics. Also, using a self-score of "completeness" and "correctness" helps students feel more comfortable sharing their ideas, and it offers a starting place for group discussions.

John Foster talked about his experience with mastery-based grading. Each week there was an exam in which students had the option to select the problem of a given difficulty (apprentice, journeyman or mastery) and of a particular content area. If a student completed a fully correct problem, they were given credit for that content area. It was a student's responsibility to master a certain number of topics to fulfill a given grade. John had a positive experience with the model: students seemed to enjoy it and had comparable scores when compared to the traditional model. Also, failing students seemed to have a more positive experience than is typical. I really liked the idea of mastery grading, and I think it could be done at a smaller scale in any class.

Other sessions included "Preparing your file for tenure or promotion", "The Bridge between two year and four year", "Teaching an Active Curriculum" and "Experiences in POGIL-ish Calculus" (where I learned you should never have a group of 5 in groupwork because they will be disruptive and contradictory. Particularly a group of 5 professional mathematicians!)

PNW MAA Student Happenings

Calling all PNW students!
Summer meetings are a great way for PNW graduate students in mathematics to show their stuff! David Hartenstine (WWU) and Kelly McKinnie (U. Montana) will be organizing graduate student activities at the 2017 meeting at Gonzaga. Tell your grad students and let us know if you have any questions.

At the April 2016 section meeting in Corvallis, OR, students from Western Washington University's math club shared their experience in an open group discussion "Leading a Successful Math Club". About 40 students and maybe a dozen faculty from more than 15 colleges and universities attended. Discussion was lively and lasted far past the scheduled time and well into the social hour, with club leaders from many schools sharing ideas about planning interesting activities, fundraising, publicity and outreach among other topics of interest.To continue this dialog, a Facebook page for Pacific Northwest math clubs was set up. Here is the link to that page: https://www.facebook.com/PNWmathclub/ This page is also linked to the section homepage. Look for similar events for math clubs at upcoming section meetings and NUMS.

News and Notes from the PNW MAA section

Montana

The University of Montana is please to welcome Dr. Ekaterina Smirnova as a new Assistant Professor of Statistics in the Department of Mathematical Sciences. Ekaterina received her doctorate in statistics in August 2014 at the University of Texas Dallas where she worked signal processing methods with applications to functional magnetic resonance imaging (MRI). Prior to the appointment at the University of Montana, Dr. Smirnova held a position as a post-doctoral

Ekaterina Smirnova

research associate in the Department of Statistics at the University of Wyoming, where she developed an extensive research agenda, working on overcoming statistical challenges with data analysis in preterm birth studies in affiliation with the Vaginal Microbiome Project with VCU. Her research is focused on the areas of signal analysis, dimension reduction problems, and analysis of longitudinal data as with microbiome data.

Oregon

Pacific Univesity

Nancy Ann Neudauer was awarded a Simons Foundation Collaboration Grant for Mathematicians. She was also awarded a Fulbright Specialist Grant to teach a class at the African Institute for Mathematical Sciences in Cameroon. Michael Boardman was appointed Chair of the MAA's Committee on the Undergraduate Program in Mathematics. The department recently sponsored two public lectures and a workshop on symmetry and art by Frank Farris of Santa Clara University. Some of Farris's work currently is on display at the university gallery and is now part of the university's permanent collection.

Washington

Central Washington University

The math department at Central Washington University welcomes its newest faculty member, Sooie-Hoe Loke. Sooie-Hoe earned his Ph.D. in Mathematics at Oregon State University in 2015. His research interests

include actuarial science in general and ruin theory in particular. After his doctorate Sooie-Hoe worked on his research as a post-doc at the University of Waterloo for eight months. Outside of teaching and doing research Dr. Loke enjoys playing table tennis.

Sooie-Hoe Loke

Stuart Boersma, professor and chair, was awarded the 2016 Meritorious Service Award for our section of the MAA. Stuart formally received this award at Mathfest in Columbus, Ohio this August.

Brandy Wiegers (aka "Dr. Brandy") had the "awesome opportunity" to travel to Hamburg, Germany, in July to present her poster "United States of America Math Circles, vertically integrated informal mathematical communities" to the 13th International Congress of Mathematical Education. She also had the privilege to participate in early career researcher training.

Gonzaga

Gonzaga welcome four new faculty members to its department. Dr. Melody Alsaker is an Assistant Professor of Mathematics. Melody received her Ph.D. in Mathematics from Colorado State University. Her interests are in applied and computational mathematics. In particular, her research involves computational problems in medical imaging and digital image processing. She enjoys writing, artsy movies, and music.

Melody Alsaker

Dr. Tomás Guardia is a Mathematics Lecturer. Tomás joins Gonzaga from the Central University of Venezuela in Caracas. His areas of interest are differential geometry and topology, but have recently shifted to number

theory, combinatorics, discrete mathematics, mathematical learning, the medieval game of Rithmomachia, and the history of mathematics.

Tomás Guardia

Dr. Jason Lutz is an Assistant Professor of Mathematics. Jason completed his Ph.D. in Mathematics at the University of Nebraska, Lincoln. His areas of interest are commutative and homological algebra. Jason enjoys hiking, disc golf, and ultimate Frisbee. He is committed to actively engaging students and incorporating evidence-based teaching methods in the classroom.

Jason Lutz

Dr. Justin Marks is an Assistant Professor of Mathematics. Justin completed his Ph.D. in Mathematics at Colorado State University. His research interests lie within the intersection of pure and applied mathematics and combine the areas of geometric data analysis, matrix manifolds, and linear algebra. He enjoys outdoor activities and is hoping to catch his fair share of Zag basketball games this year.

Justin Marks

Pacific Luthern University

Tom Edgar and Jessica Sklar published "A Confused Electrician Uses Smith Normal Form" in the Mathematics Magazine. Two faculty members: Bryan Dorner and Jessica Sklar, are on full-year sabbaticals, and visiting faculty members Yajun An and Jeremiah Jones are teaching in the mathematics department this year.The department holds seminars on select Wednesday afternoons, and

encourages those living in or visiting the area, and who are interested in speaking, to contact Yajun An.

University of Washington Tacoma

UW-Tacoma welcomes three faculty members this year. Lecturer Alan Bartlett received his Ph.D. from the University of Washington. Alan's research focuses on aperiodic order, or mathematical structures which are in between deterministic and chaotic in nature, and is concerned

Alan Bartlett

with how local properties give rise to global order. Specifically, he classifies spectral properties of substitution dynamical systems which relate to (X-ray) diffraction spectra of mathematical (and actual) quasicrystals. His thesis developed a unified method for classification of such structures. Alan has been teaching part-time at UW Tacoma and is very excited to join full-time. Since everyone engages mathematics differently, Alan tries his best to encourage and accommodate different learning styles and comfort levels in his teaching. Alan enjoys games, supporting friends, walking, and spending time with his wife, Yajun An, who teaches Mathematics at Pacific Lutheran University.

Lecturer Olga Shatunova received her MA from Moscow State University. Olga has specialization in teaching mathematics and focused her studies on Discrete Mathematics with emphasis on Diagram Completeness of Deterministic Finite Automata. In her teaching, she incorporates her own diverse cultural background and life experience. She was born and educated in Russia. She has taught mathematics in Moscow at the University for Engineers of Metallurgy and Aviation Institute

Olga Shatunova

and in Washington at several community colleges. She worked, taught and developed curriculum in Russia, France, Germany and US. In her curriculum and pedagogy, she utilizes this work experience. She points out to students the origins of mathematical ideas from western civilization and from other cultures and other parts of the world. She is excited to work with other talented math faculty at UWT to develop curriculum and studies for the new mathematics major. She enjoys hiking with two dogs in beautiful Northwest, skiing, running, yoga and painting. Her husband is also a mathematician and they collaborate on making presentations at math conferences and writing.

Assistant Professor Erik R. Tou received his Ph.D. in Mathematics from Dartmouth College. Before joining the UW-Tacoma faculty in 2014 as a lecturer, Erik taught for Pacific Lutheran University in Tacoma and Carthage College in Kenosha, Wisconsin. Erik's research interests are in two areas—number theory and the history of mathematics. As a number theorist, his research covers a wide range of topics, including the

Erik Tou

mathematics of juggling, zeta functions, and the Gaussian integers. As a historian, Erik serves as Chief Historian of the Euler Archive, a scholarly organization devoted to the collection, digitization, and translation of the works of 18th century Swiss mathematician Leonhard Euler. His current research interest is Euler's role in the origins of fluid mechanics. Erik is excited to help build the new math major into a successful program. He lives in Tacoma with his wife, Lizz, and son, Asher.

Washington State University

The Department of Mathematics and Statistics at Washington State University will be hosting the Spring Western Sectional Meeting of the American Mathematical Society on April 22 and 23, 2017, on the campus at Pullman, WA.

The meeting will include three invited addresses and 18 special sessions.

WSU has just developed a Bachelor of Science degree in Data Analytics. Offered jointly by the Department of Mathematics and Statistics and the School of Electrical Engineering and Computer Science, the curriculum requires substantial training in computer science, mathematics, and statistics, with an emphasis on experiential learning.

The 35th T. G. Ostrom Lecture was given in March by Dr. Kathleen Heid, Distinguished Professor of Education and Professor of Mathematics Education, Penn State University, who spoke on "What does it really mean to understand (or not understand) mathematics". The lecture honors the late professor emeritus Theodore G. Ostrom who retired from WSU in 1981 after serving 21 years as a WSU Mathematics Department faculty member.

Washington State University Vancouver

The B.S. in Mathematics is now offered at Washington State University Vancouver. Students can choose between an emphasis in Applied Mathematics or Secondary Mathematics, Teaching without Certification. More information can be found at the following link:
https://cas.vancouver.wsu.edu/mathematics

Whitman College

Whitman College is very excited to welcome three new assistant professors to the Department of Mathematics and Computer Science. Andy Exley earned his B.A. in Computer Science at Carleton College, and his Ph.D. at the University of Minnesota Twin Cities. His research is in the field of Natural Language Processing, specifically focusing on a system that can automatically detect errors in conversational

Andy Exley

speech. As part of this research, he has worked with parsing, speech recognition and semantic analysis. Dr. Exley has spent two years teaching at St. Catherine University and three years teaching at Carleton College, his alma mater, where he taught a range of courses including Artificial Intelligence, Natural Language Processing, Computer Organization and Architecture, and Digital Electronics. He also has had the opportunity to help students build large projects such as a phase vocoder and developing an autonomous navigation system for drones.

Marina Ptukhina is a native of Ukraine, and joined the department after completing her M.S. in mathematics at Texas Tech University and her PhD in statistics at University of Nebraska-Lincoln. She is interested in applications to biostatistics, particularly developing methodology for shelf life determination. In her spare time Marina enjoys traveling, salsa dancing and cooking.

Marina Ptukhina

John Stratton received his bachelor's, master's, and doctoral degrees in computer engineering from the University of Illinois at Urbana-Champaign. His research focuses on the intersection of software performance and programmer productivity. He works on making easy-to-use languages efficient, and efficient programs easy to write, through computer architecture, compilers, and programming language design. He will be working with Andy Exley and Janet Davis to develop a new computer science program and major.

John Stratton