MAA MATHEMATICAL ASSOCIATION OF AMERICA

Mathematical Matters

Newsletter of the Pacific Northwest Section of the MAA

FEBRUARY 2024

PNW MAA Spring Meeting: University of Alaska Anchorage

2024 PNW Sectional MAA Meeting
University of Alaska Anchorage
June 20-22, 2024

Abstract submissions will be accepted until March 15, 2024. Registration will open soon. More information is available at the conference webpage:
`https://www.uaa.alaska.edu/academics/college-of-arts-and-sciences/programs/pnwmaa/index.cshtml`

This meeting's plenary speakers are:

Ximena Catepillán

Michael Pearson

Emilie Purvine

Ximena Catepillán
Dr. Ximena Catepillán is Professor Emerita at Millersville University of Pennsylvania. Dr. Catepillán taught mathematics at Universidad de Magallanes in the Chilean Patagonia prior to coming to USA to study her PhD in mathematics. She is the Chair for the History of Mathematics Interest Group of the MAA, HOM-SIGMAA, an associate editor of the Convergence Journal of the MAA, a member of the editorial board of the Journal of Mathematics and Culture, and Revista Morfismo at Universidad de Santiago de Chile.

Dr. Catepillán will give two talks: *Ethnomathematics: the connection between culture, history, and mathematics*. For over 16 years, I have traveled to remote places with Dr. Edwin Barnhart, founder and Director of the Maya Exploration Center and Ancient Explorations, and his team to do archaeological studies associated with ethnomathematics, the connection between culture, history, and mathematics. In this presentation, I will provide examples of ethnomathematics that I have taught in an undergraduate course, a graduate course, and a first-year seminar at Millersville University of Pennsylvania and at Universidad de Santiago de Chile USACH.

Ethnomathematics and Kinship Systems. In this talk, various examples will illustrate how kin relationships and mathematics can be connected. The first two originate in the Warlpiri and the Aranda tribes. These tribes are the most traditional aboriginal groups in Northern Australia. The last example is from the tribes in the Malekula and Ambrym Islands of the republic of Vanuatu located in the southwestern Pacific Ocean.

Michael Pearson
Michael Pearson received a bachelor's degree from the University of Mississippi in 1980, a master's degree from Mississippi State University in 1982 and a Ph.D. (Harmonic Analysis) from The University of Texas at Austin in 1989. Prior to joining the MAA (in 2002), he served on the faculty at Florida International University (1989-1992) and Mississippi State University (1992-2002).

Dr. Pearson will speak on:
500 Years of Data Science. The current high interest in exploiting the power of data to inform decisions has led to new formal areas of study in data science and analytics, but the underlying ideas are part and parcel of modern science. I'm going to share some vignettes to highlight this history, as well as some current MAA efforts to build capacity in this interdisciplinary and expanding field.

Emilie Purvine
Dr. Emilie Purvine is a mathematician and data scientist at Pacific Northwest National Laboratory. She joined PNNL in 2011 after receiving her PhD in mathematics from Rutgers University with a focus on enumerative combinatorics and nonlinear recurrence relations. While at PNNL Emilie has had the opportunity to contribute to a variety of projects tackling hard problems in applications including computational biology and chemistry, power grid modeling, cyber network analysis, and knowledge models. Her current mathematical research focus is on topological data analysis applied to discrete structures like graphs and hypergraphs. Much of her work involves finding mathematical nuggets in applied domains and working on theoretical advances to enable operational progress.

Dr. Purvine's talk will be:
Graphs and Hypergraphs and Topology, Oh My! Mathematical structures and concepts can be great models of real-world data. For example, differential equations have a long history of success in applied mathematics to model dynamics found in rivers and oceans, the atmosphere, and molecular systems (just to name a few!). Network science is an area of applied math that uses graph structures to model relational systems like social, collaboration, and transportation networks. Graphs, however, are limited to modeling pairwise relationships among entities. Hypergraphs and topological spaces provide alternate models of relational systems that allow for arbitrary sized and structured relationships. In this talk I will introduce the mathematical concepts of graphs, hypergraphs, and topology and show how they are used to model real-world data from a variety of applications including biological systems, chemistry measurements, and cyber networks. We'll also talk about what measurements and properties of these structures can tell us about the systems they model.

In This Issue...

NExT News: Spring Meeting

by Megan Buzby

The Section NExT portion of our section meeting is Thursday, June 20, 2024. The deadline for submission of abstracts for presentations, panels, or discussions is Friday, March 22. Please send submissions to Megan Buzby (mbuzby1@alaska.edu). Details about the program will be forthcoming on the Section NExT listserv. Looking forward to seeing you in Anchorage!

A note from the editor

by Kate Kearney

If you have any major changes in your department or University, I'd love to highlight them in an upcoming "University Spotlight" column. Anyone from your department achieve a major accomplishment recently? Let's celebrate them! Please email me (kearney@gonzaga.edu)with any contributions or other section news.

2024 Pacific Inland Mathematics Undergraduate Conference

Saturday April 13, 2024
University of Idaho, Moscow, ID

Undergraduates throughout the Pacific Inland Region and beyond are invited to participate in the seventh annual Pacific Inland Mathematics Undergraduate Conference. PiMUC provides an annual undergraduate only opportunity to present research in mathematics, statistics, or math education. The University of Idaho is hosting PiMUC 2024 on Saturday April 13, 2024. Talks and posters accepted. Registration opens in January.
`https://sites.google.com/view/pimuc/home`

MAA MATHEMATICAL ASSOCIATION OF AMERICA
Mathematical Matters
Newsletter of the Pacific Northwest Section of the MAA

University Spotlight: University of Alaska Anchorage

by Debbie Narang and Mark Fitch

UAA is an atypical, diverse institution located in Anchorage, Alaska. UAA incorporates the missions of a typical community college, and four year master's degree granting institution, along with a couple doctoral degrees. This work is spread across south central Alaska with campuses in Anchorage, MatSu valley, Kenai peninsula (Soldotna and Homer), Prince William Sound (Valdez), and Kodiak Island.

The Anchorage campus is located along Chanstnu (Chester) Creek. Campus stretches about a mile from end to end with views of the Chugach Mountains and on a good day the Alaska range including Denali. Moose are frequently found on campus and bear wander through.

Mathematics and statistics education is provided by two departments at UAA: the departments of Mathematics and Statistics and Quantitative Studies. General education and service courses are taught by both departments, Quantitative Studies offers pre-college level courses and developmental education approaches, and the mathematics major and minor are offered by the department of Mathematics and Statistics.

The Bachelor of Arts emphasizes strong communication skills. The Bachelor of Science offers complementary concentrations in statistics, computer science, finance, physics, and other disciplines, allowing students to customize their educational journey according to their unique interests. To support majors, we offer an introductory course that includes valuable insights from peers and alumni, tutorials on mathematical typesetting and software, and opportunities to connect with all of the faculty members in our department.

We prioritize fostering a sense of belonging through initiatives such as our peer mentoring program, ensuring students feel supported and empowered throughout their academic journey. A capstone requirement further enhances student learning through activities such as undergraduate research, tutoring, seminar leadership, or serving as a learning assistant.

At UAA, we emphasize the importance of showcasing students' mathematical knowledge and growth. To this end, students demonstrate their achievements through the creation and presentation of electronic portfolios, highlighting their academic accomplishments and future goals.

In addition to their roles in teaching and research, our faculty members actively participate in shared governance and contribute to national initiatives, such as the HHMI grant. Through their dedication and expertise, they enrich the academic experience and empower students to excel in their chosen fields. Someone is always trying something new, sometimes ideas picked up at the MAA PNW Section meeting.

KRYPTOS: A Series of Cryptanalysis Challenges, April 11-15, 2024

KRYPTOS is a contest open to undergraduate and high school students. The theme of the contest is centered around the breaking, or cryptanalysis, of ciphers (secret writing). Each challenge presents contestants with a brief scenario together with some ciphertext (encoded message). The goal is to discover the original plaintext message!

While it is not the intent of this contest to test overly technical aspects of cryptanalysis or advanced mathematical algorithms, some familiarity with basic codemaking and codebreaking is certainly helpful. See the KRYPTOS web page for some helpful resources.

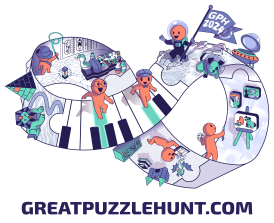
We had nearly 150 students participate last year and many have been clamoring for more! Please announce this contest to your students! Cool prizes are sent out to first and second place winners!

Visit the competition site for more information – including instructions on registering students for the contest.

Registration will begin in early March. KRYPTOS is sponsored by the MAA Pacific Northwest Section with Central Washington University and Western Oregon University.

Great Puzzle Hunt

The 8th Annual WWU Great Puzzle Hunt: Saturday, April 20, 2024, 9:30 AM – 5:00 PM (PT)



The WWU Great Puzzle Hunt is a fun, full-day, team puzzle-solving event that is OPEN TO ALL, anywhere in the world! The event is hybrid with options to play in-person or virtually. Teams of up to 6 work virtually or travel on foot to various locations on WWU campus solving a total of four hour-long puzzles, gathering clues along the way to solve one final meta puzzle. The event is FREE, but donations are gratefully accepted, and registration is required. Registration ends 11:59 pm April 18, 2024 or earlier if capacity is reached. Be a part of the fun!
You can also visit our website: `https://www.greatpuzzlehunt.com/`

PACIFIC INLAND MATHEMATICS UNDERGRADUATE *Conference*

LOOKING FOR A SPRING TERM OPPORTUNITY TO PRESENT YOUR RESEARCH?

Undergraduates at Universities and Colleges throughout the Pacific Inland Region are invited to participate in the Seventh Annual Pacific Inland Mathematics Undergraduate Conference

POSTERS AND TALKS ACCEPTED
REGISTER TODAY!

Moscow, Idaho

APRIL | 13TH | 2024

https://sites.google.com/view/pimuc

University of Idaho