Towards Fairer-ness in Machine Learning

**Thursday, August 8, 9:00 am - 9:50 am, JW Grand Ballroom 5/6**

In this talk, we will address several areas of recent work centered around the themes of transparency and fairness in machine learning as well as highlight the challenges in this area. We will discuss recent results involving linear algebraic tools for learning, such as methods in non-negative matrix factorization that include tailored approaches for fairness. We will showcase our derived theoretical guarantees as well as practical applications of those approaches. These methods allow for natural transparency and human interpretability while still offering strong performance. Then, we will discuss new challenges and directions in fairness including an example in large-scale optimization that allows for population subgroups to have better predictors than when treated within the population as a whole. Throughout the talk, we will include example applications from collaborations with community partners, using machine learning to help organizations with fairness and justice goals.

*The Association for Women in Mathematics and the Mathematical Association of America annually present the Etta Zuber Falconer Lecture to honor women who have made distinguished contributions to the mathematical sciences or mathematics education. While the lectures began with MathFest 1996, the title “Etta Zuber Falconer Lecture” was established in 2004 in memory of Falconer’s profound vision and accomplishments in enhancing the movement of minorities and women into scientific careers. Etta Zuber Falconer herself (featured) was the 1995 winner of the AWM Hay Award. Read Dr. Falconer’s citation for this award and learn how to nominate women for to be the next Etta Zuber Falconer Lecturer at the AWM website.*

Iterative and Sketching Approaches for Linear Systems and Beyond

**IPS Part A: Thursday, August 8, 3:30pm - 6:00pm, JW Grand Ballroom 8**

**IPS Part B: Friday, August 9, 8:00am - 10:00am, JW Grand Ballroom 8**

Iterative and sketching approaches play crucial roles in solving linear, convex, and even non-convex systems, offering different strategies for handling various types of problems. Iterative methods involve...
repeatedly refining an initial guess for the solution until it converges, and often act on small amounts of data at a time, making them amenable to large-scale and/or sparse problems. Sketching approaches, often inspired by techniques from signal processing, provide a more efficient way to approximate solutions in situations where the system is overdetermined or ill-conditioned. They reduce the computational burden by sampling or sketching the input data, thus making it feasible to solve systems that would be computationally infeasible using traditional methods. Both approaches offer valuable tools in the realm of linear system solvers and beyond, allowing for flexibility in choosing the most suitable method depending on the problem's characteristics and computational resources available. Work on these methods, their applications, their theoretical underpinnings, and their connections to machine learning are welcome.

**Organizer:** Deanna Needell, University of California, Los Angeles

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**How to Hire a Math Educator: Considerations for Mathematics Departments**

**Panel:** Friday, August 9, 2:00 pm - 3:20 pm, JW Grand Ballroom 2

The goal of the panel is to discuss the challenges that mathematics educators face when working in mathematics departments that do not have mathematics education research as part of their portfolio and to use examples of both supportive and less supportive situations to give attendees tools to build constructive spaces for all faculty to flourish. This session is sponsored by the Education Committee of the Association of Women in Mathematics.

**Panelists:**
- Yvonne Lai, University of Nebraska-Lincoln
- Jessica Ellis Hagman, Colorado State University
- Shari Stockero, Michigan Tech University
- Elsa Medina, Cal Poly, San Luis Obispo

**Moderator:**
- Danté Tawfeeq, John Jay College of Criminal Justice, CUNY

**AWM Education Committee Members:** Rachel Chaphalkar, University of Wisconsin-Whitewater; Mayra Ortiz Galarza, University of Texas Rio Grande Valley; Rachael Kenney, Purdue University; Elsa Medina, Cal Poly San Luis Obispo; Vilma Mesa, University of Michigan; Natalie Naehrig, University of Washington; Danté Tawfeeq, John Jay City University of New York

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**AWM Student Chapter Awards - with Sweet Treats!**

**Friday, August 9, 8:00 pm - 10:00 pm, White River Ballroom E**

Each year the AWM recognizes outstanding achievements in chapter activities among the AWM Student Chapters. Awards will be given in four categories: (1) community outreach; (2) funding and sustainability, (3) professional development, and (4) scientific excellence. These awards will be given out at the MAA Student Dessert Reception on Friday night. Come celebrate with us!
Mathematical Games and Puzzles: Fun for All!
*Saturday, August 10, 10:30 am - 11:50 am, JW Grand Ballroom 2*

Join us for some fun with mathematical games and puzzles! For many in the mathematics community, games or puzzles sparked our initial interest in mathematics. Such activities continue to serve as a source of enjoyment and entertainment. This highly-interactive workshop aims to bring faculty, students, and other members of the mathematics community of all ages together to experience new mathematical games and puzzles and to share their own favorites. Some will involve physical components, while others may be played with pencil and paper alone. (Feel free to bring one in any form!) After learning of new mathematical games and puzzles, participants can return home to share them with others. Perhaps you will incorporate a game or puzzle into a course or research experience, develop an associated activity for a science festival, share the fun with math club members, or simply play with friends and family. This session is sponsored by the Association for Women in Mathematics.

**AWM MathFest Committee Members:** Janet Fierson, La Salle University; Sarah Kerrigan, George Fox University; Julia Plavnik, Indiana University; Buna Sambandham, Utah Tech University; Jeanette Shakalli, Panamanian Foundation for the Promotion of Mathematics (FUNDAPROMAT); Mariana Smit Vega Garcia, Western Washington University

Mental Health in the Mathematics Community
*Panel: Saturday, August 10, 3:00 pm - 4:20 pm, JW Grand Ballroom 2*

Mental health remains a topic of widespread concern in the mathematics community. This panel continues the conversation on the subject that was initiated through a panel at last year’s MAA MathFest. This year, the session will include strategies for improving the mental health of individuals and groups. It will also allow for the sharing of progress that has been made locally and more globally in addressing some of the common issues that negatively impact the mental health of faculty, students, and others in the mathematics community. Attendees will benefit from the professional and personal experiences of the panelists, who collectively contribute diverse perspectives as faculty members, researchers in the emotional aspects of learning mathematics, and mental health professionals. We once again hope to encourage an open and empathetic dialogue to raise awareness, inspire positive change, and improve the well-being of our unique and vibrant community.

**Panelists:**
- Geillan Ally, Compassionate Math
- Taina Amaro, Harmony Health Therapy
- Allison Henrich, Seattle University
- Matthew Pons, North Central College

**Moderator:**
- Jeanette Shakalli, FUNDAPROMAT
**AWM MathFest Committee Members:** Janet Fierson, La Salle University; Sarah Kerrigan, George Fox University; Julia Plavnik, Indiana University; Buna Sambandham, Utah Tech University; Jeanette Shakalli, Panamanian Foundation for the Promotion of Mathematics (FUNDAPROMAT); Mariana Smit Vega Garcia, Western Washington University

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**Visit the AWM Booth in the Exhibit Hall**

Swing by the AWM booth, buy a t-shirt, learn about the many programs AWM has to offer and meet other AWM’ers! Are you interested in volunteering your time at the booth? Email ed.admin@awm-math.org to help out.

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**The AWM 2024 MAA MathFest Organizing Committee**

*A special thanks to the AWM committee members who have helped organize this year’s program!*

Janet Fierson, LaSalle University  
Sarah Kerrigan, George Fox University  
Lakeshia Legette Jones (AWM Meetings Coordinator), Clark Atlanta University  
Julia Plavnik, Indiana University  
Bhuvaneswari (Buna) Sambandham, Utah Tech University  
Jeanette Shakalli (Chair), Government  
Mariana Smit Vega Garcia, George Fox University  
Jeanette Shakalli (Chair), Government