

A WORD FROM...

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Photo courtesy of Charly Woodruff-White

Since 2018, the editorial board of the *Notices* has dedicated the February issue to highlighting contributions and accomplishments of African American and Black mathematicians. The issue coincides with Black History Month (BHM). Initially, BHM was a celebration of only a week. It was launched in 1926 by the African American scholar and historian Carter G. Woodson and others. The week was originally celebrated the second week of February to commemorate Abraham Lincoln, the 16th President of the United States, and Frederick Douglass, the 19th century African American leader from Maryland. Douglass was an abolitionist, statesman, and writer. His writings and speeches can be seen today as essential lessons in American history. Douglass' work and Woodson's are about equity and inclusiveness and their words continue to resonate. In the late 1960s during the civil rights movement, the week evolved into what is now called Black History Month. This special issue of the *Notices* presents articles that touch on the struggles and triumphs of Black mathematicians, from their undergraduate days to graduate school to becoming professional working mathematicians, researchers, and educators.

What types of research are Black mathematicians doing? And, how can one inspire and bring up more Black mathematicians? The three feature articles in this issue present research topics by Black mathematicians and their coauthors concerning discrete fractional calculus, lattice theory, and ergodic theory. The first one, "The \mathbb{N}_0 Story: Discrete Fractional Calculus," written by Raegan Higgins and Heidi Berger gives an overview of discrete fractional calculus followed by a discussion of how a discrete fractional equation has been used to model tumor growth in mice. Open problems are presented such as: "How can we extend fractional calculus beyond the real numbers and integers, over a certain time scale?" Jonathan D. Farley's article, "Was Gelfand Right? The Many Loves of Lattice Theory," presents narratives around a smorgasbord of open problems in lattice theory, the theory of ordered sets, and combinatorics. Combinatorial connections to McMahon's formula for counting plane partitions and the Narayana numbers that arise when calculating h-vectors of certain posets are mentioned. He concludes his article by listing 12 open problems in pure mathematics, such as: "Is the fixed-point property for posets preserved under products?" Idris Assani's article, "Wiener-Wintner Ergodic Theorem, in Brief," introduces the Birkhoff-Khinchin Ergodic Theorem and discusses the key role it played in the study of Furstenberg averages, averages along the cubes, and the Return Times Theorem. Open problems are given in his article such as: "Does a polynomial extension of the Wiener-Wintner Theorem hold?" This article gives readers an understanding of some mathematical advances on ergodic averages and the study of ergodic theory, a branch of mathematics with origins in statistical mechanics.

In the Early Career section, the article "The David Harold Blackwell Summer Institute: Goals, Experiences, and Future Plans," by Wilfrid Gangbo, Jelani Nelson, and Todd Coleman introduces *Notices* readers to a new six-week undergraduate summer program whose long-term goal is to increase the number of researchers in the mathematical and computational sciences who come from underrepresented groups. During their inaugural program in 2021, interdisciplinary research topics and projects involving bioengineering, machine learning, theoretical computer science, and optimal transportation theory were assigned to students. The coauthors Kagba Suaray, Robin Wilson,

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and Rob Rubalcaba in their article, "The Hesabu Circle," describe a community-based program started in southern California. This program, for children of all ages up through college students, builds support that encourages and empowers individuals of African descent to envision and achieve excellence in mathematics. The authors assert that "the Hesabu Circle is a tangible effort to rebuild the identity of members of the Black community as doers of mathematics." The article, "Reflections on Running an REU (With an Eye towards Equity)," written by Siddhi Krishna and Marissa Loving presents an REU program where marginalized students are made to feel welcome and comfortable. The authors conclude their article with the following questions: "Are you excluding the students who could use REUs the most? Are you using your power to create a space where any student can feel uplifted and affirmed?" The article, "The Road Less Traveled?," by Lloyd Douglas tells the story of the author's journey from a high school in Brooklyn, NY, to college and then to becoming a program officer in the Division of Mathematical Sciences at the National Science Foundation. The author describes some challenges, successes, the encouragement he received along the way, and how he is giving back after retirement.

This issue also includes "Solving for Equity in Practice: New Insights on Advancing College Opportunity and Success," by Rog air D. Purnell and Pamela Burdman which examines new math policies in California colleges and universities. Content delves into how higher educational professionals think about and address the equity implications of redesigned math pathways in statistics, data science, and quantitative reasoning. The article explains that teaching during the COVID-19 pandemic brought more awareness of student needs and reshaped professors' thinking about equity. They suggest that counselors and advisors should work closely with math departments to follow institutional policies and practices on how best to support student needs. The report concludes with some recommendations including: adopt a clear equity vision, foster a culture of inquiry, promote inclusive learning environments, and provide effective guidance for students.

The article, "Dr. Raymond L. Johnson: A Mathematical Journey and Some Reflections on African Americans in Graduate Mathematical Sciences Programs in the US," by Tasha Inniss, Raymond Johnson, and Sherry Scott offers a glimpse into the academic journey of Dr. Johnson while at the University of Maryland at College Park. Dr. Johnson is interviewed by his coauthors about his career as a research mathematician and mentor and his views and experiences on how to increase the number of African American mathematicians. His interview is summed up as follows: "Increasing and graduating African Americans in graduate mathematical sciences programs can be done! The recurring theme is that it requires a genuine and concentrated departmental and institutional commitment and effort in a positive supportive environment."

The article, "The National Research Rating System in South Africa: The Past Impacts the Future," by Eder Kikianty and Loyiso Nongxa discusses a rating system that evaluates the research of South African scientists and mathematicians. The system recognizes excellence in research. However, because of the legacy of apartheid, science and math faculty at ethnic universities haven't had the same research training, mentoring, and opportunities as the faculty at other South African institutions. Thus, it is harder for them to achieve a high rating. Race and gender inequities are also highlighted in the article.

The article, "From CAARMS25 to CAARMS 2021 and Beyond: Conferences for African-American Researchers in the Mathematical Sciences," by William Massey gives a two-year snapshot of the Conference for African American Researchers in the Mathematical Sciences (CAARMS). After 25 years, 120 graduate student poster presenters at CAARMS have completed their PhDs in the mathematical sciences, and over 50 CAARMS speakers or poster presenters have become tenured faculty members. The author closes his article with the following: "... increasing the number of African-American academic researchers adds a strong multiplier effect to increasing the number of African-American PhDs." On the cover of this issue is the CAARMS logo, which serves as a metaphor, depicting a supernova unleashing untapped energies of talented Black mathematicians. Finally, the Keystones article, "Uniting Mathematics, Statistics, and Engineering to Help Mitigate Sports Injuries," by Kristin D. Morgan presents an interdisciplinary effort at integrating mathematics, statistics, and engineering tools to advance research on challenges in the field of sports biomechanics.

In closing, I am honored to serve as an associate editor for the *Notices* in order to be able to share with the *Notices* readers these fantastic articles. It is important to mention, over the last year, the passing of seven leading African American mathematicians and educators: Gloria Ford Gilmer, Della Bell, Genevieve M. Knight, Janis Oldham, Nathaniel (Nate) Dean, Shirley McBay, and Robert P. (Bob) Moses. Future *Notices* articles are projected to be written about Moses, Gilmer, and McBay. Dr. Gilmer was a leader in the field of Ethnomathematics and the first Black female on the board of governors of the Mathematical Association of America (MAA). Dr. Bell was a longtime member of the National Association of Mathematicians (NAM), National Council of Teachers of Mathematics (NCTM), and MAA. She encouraged many women and minorities in STEM, especially in mathematics. Dr. Knight was a distinguished mathematics educator, teacher, mentor,

and lifetime NAM member. She received numerous teaching awards, including the NCTM's 1999 Lifetime Achievement Award. Dr. Oldham was a passionate math mentor and professor, and a dedicated NAM member and supporter of the Enhancing Diversity in Graduate Education (EDGE) program. EDGE is a national program that focuses on increasing the number of women who enter and successfully complete graduate programs in the mathematical sciences. Dr. Dean was a former President of NAM, an early CAARMS organizer, and a Bell Laboratories employee. He published numerous papers in graph theory, combinatorics, and discrete mathematics. Dr. McBay was an outstanding mathematics educator, leader, and advocate for improving STEM education for minority students. She is the founder and a former president of Quality Education for Minorities (QEM) Network. QEM is a nonprofit organization based in Washington, DC. Dr. Moses, civil rights leader and educator, directed the Student Non-Violent Coordinating Committee's (SNCCs) Mississippi Voter Registration project, and later became president and founder of the Algebra Project. The Algebra Project uses mathematics literacy as a tool to guarantee a quality education for all children in America. A fundamental goal of the project is enshrined in the project phrase, "*Math literacy is the key to 21st century citizenship.*"