



## Contents

From the Editor	2
Topology of Magnetic Helicity and Its Application to Fusion Energy	3
Age Perceptions, Knowledge, and Preventive Behaviors Regarding Cervical Cancer	4
Spotlight on a Mathematician: Art Fuller	5
My REU: A Topology on Certain Initial Algebras	6
Call for Papers: Mathematics and Motherhood	6
Blacks Earned 1.4% of All Mathematics Doctorates in 2015	7
Azarian Receives MAA-Indiana Award	7
Spelman Falconer Lecturer Monica Cox	8
NAM Calendar	8
MSRI Workshops Announced	9
Job Openings	9
NAM Golden Anniversary Campaign & Online Store	10
NAM Board of Directors	10
NAM Membership Form	11

## *Topology of Diversity*



NAM hosted the 2017 Regional Faculty Conference on Research and Teaching Excellence (FCRTE) at Morehouse College in Atlanta, Georgia from March 24-25. The Albert Turner Bharucha-Reid Lecture was given by Shelby Wilson (shown at upper left) of Morehouse College.

***Upcoming Elections!*** Interested in running for NAM President, Member Outside-Academia, or Region A Member? Email Robin Wilson by August 31 at [robinwilson@cpp.edu](mailto:robinwilson@cpp.edu). Candidates will be featured in the fall Newsletter.

# The National Association of Mathematicians (NAM)

publishes the NAM Newsletter four times per year.

## Editor

Dr. Talitha M. Washington  
Howard University  
nam\_newsletter@yahoo.com  
www.talithawashington.com

## Editorial Board

Dr. Mohammad K. Azarian  
University of Evansville  
azarian@evansville.edu  
<http://faculty.evansville.edu/ma3>

Check out the  
webpage!  
[nam-newsletter.org](http://nam-newsletter.org)

**NAM Newsletter Website:** <http://nam-newsletter.org>  
The website has a list of employment as well as summer opportunities on the *Advertisements* page. It also features past editions of the *Newsletter* on the *Archives* page.

**Upcoming Elections!** Interested in running for NAM President, Member Outside-Academia, or Member Region A? Email Robin Wilson by August 31 at [robinwilson@cpp.edu](mailto:robinwilson@cpp.edu). Candidates will be featured in the fall Newsletter.

**Letters to the editor and articles** should be sent to Dr. Talitha M. Washington via email to [nam\\_newsletter@yahoo.com](mailto:nam_newsletter@yahoo.com)

**Subscription and membership** questions should be directed to Dr. Roselyn E. Williams, Secretary-Treasurer, National Association of Mathematicians, P.O. Box 5766, Tallahassee, Florida 32314-5766; (850) 412-5236; email: [Roselyn.Williams@fam.edu](mailto:Roselyn.Williams@fam.edu)

**NAM Website:** [www.nam-math.org](http://www.nam-math.org)

**NAM's National Office:** Leon Woodson, Executive Secretary, Department of Mathematics, Morgan State University, 1700 E Cold Spring LN, Baltimore, MD 21251

**NAM's History and Goals:** The National Association of Mathematicians, Inc., known as NAM, was founded in 1969. NAM, a nonprofit professional organization, has always had as its main objectives, the promotion of excellence in the mathematical sciences and the promotion and mathematical development of under-represented minority mathematicians and mathematics students. It also aims to address the issue of the serious shortage of minorities in the workforce of mathematical scientists.

## From the Editor

As stated on Wolfram MathWorld, "Topology is the mathematical study of the properties that are preserved through deformations, twistings, and stretchings of objects. Tearing, however, is not allowed." We are deforming the mathematical community through the active infusion of equity and demographic diversity. At times we may feel twisted and stretched due to the political climate that often times is more suffocating than a scorching ozone alert day in mid-July. In the end, we are one community — not torn, not broken — just one who needs to understand each other from our unique positions.

The applications of topology to understand fusion energy create wonderful research experiences for faculty and students alike (page 3). Other applications of statistics help a student-faculty team explore the social characteristics of the cervical cancer epidemic (page 4). Coding helped Art Fuller develop programs to better understand the functionalities of submarines (page 5). We continued to be encouraged to incorporate students into researching topology as well as publishing their works (page 6). An editorial team from the Math Mamas Facebook group asks for articles in a special issue that will highlight the synergy between mathematics and motherhood (page 6). The Journal of Blacks in Higher Education reminds us that there is much work to be done since Blacks earned only 1.4% of doctorates in mathematics in 2015 (page 5). We celebrate the accomplishments of NAM Editorial Board member, Mohammad K. Azarian, who recently was awarded the Math-

ematical Association of America-Indiana section Distinguished Service Award (page 5). We also celebrate the trail being blazed by Monica Cox in the arena of engineering education through the Spelman College Falconer Lecture (page 6). We hope that you can join in on the refreshing upcoming mathematical activities in the NAM Calendar (page 8) and the MSRI workshops (page 9). We are thankful for job opportunities for all levels of the mathematical career (page 9). You, yes you, can support NAM both financially through the Golden Anniversary Campaign as well as by wearing fresh NAM attire in our online store (page 10).

Even though at times it may become emotionally tiring to convey inclusion of underrepresented groups and why efforts are still needed, it is through these interactions that we make progress. If we stand in isolation as one piece of string, we tear easily. However, if we come together and build a tapestry of mathematics as colorful as a field of flowers, we can preserve and build our topological properties that could invigorate our nation and beyond.

*Enjoy!*



Talitha Washington





# Topology of Magnetic Helicity and Its Application to Fusion Energy

Roselyn Williams

One of the global issues of the twenty first century is to efficiently provide economical and clean energy sources. Fusion energy is one of the many research areas designed to address this challenge. Fusion is a carbon-free source of energy based on the same principle that powers the suns and stars. Research mathematicians currently use homotopy theory of knots, braids, tangles and other areas to investigate issues in fusion research.

In a fusion reactor, a mixture of deuterium and tritium is ionized and the resulting plasma, which is confined by a magnetic field, is heated to temperatures of the order of a few hundred million degrees centigrade. The deuterium and tritium nuclei would fuse upon colliding, thereby forming plasma of helium nuclei and very energetic neutrons. These neutrons would be captured in a thermalizing blanket and the heat energy would be used for electric power generation. At such temperatures the only way to confine the plasma while the reactions take place is to use electric or magnetic fields.

A spheromak is an arrangement of plasma formed into a toroidal shape. The spheromak contains large internal electric currents and their associated magnetic fields arranged so that the forces within the spheromak are nearly balanced, resulting in long-lived confinement times without external fields. There are several designs for fusion reactors. One class of reactors that confines the plasma into the shape of a torus includes the tokamak and the spheromak reactor.

Currently under construction, the International Thermonuclear Experimental Reactor "ITER" (Latin meaning the way), will be the largest and most powerful fusion device in the world. ITER is a tokamak designed to produce 500 MW of fusion power for 50 MW of input power. The ITER will be the first fusion device to test the technologies necessary for the commercial production of fusion-based electricity. In southern France, 35 nations are collaborating to build the ITER. The ITER Members include China, the European Union, India, Japan, Korea, Russia and the United States. Construction of the ITER Tokamak complex started in 2010 and the building costs are now over US \$14 billion as of June 2015.

Tokamaks were invented in the 1950s by Soviet physicists Igor Tamm and Andrei Sakharov. A tokamak uses a powerful magnetic field to confine plasma in the shape of a torus by adding a toroidal field (traveling around the torus in circles) and a poloidal field (traveling in circles orthogonal to the toroidal field). In a tokamak,

the toroidal field is produced by magnetic field coils that surround the torus, and the poloidal field is the result of a toroidal electric current that flows inside the plasma. The current is induced inside the plasma with a second set of poloidal magnetic field coils.

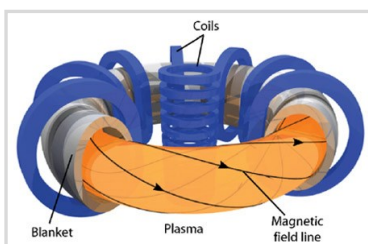
In 2010, the Florida A&M University's Center for Plasma Science and Technology (FAMU CePaST) began building a spheromak fusion laboratory. "The Spheromak Turbulent Physics Experiment (STPX)" is in a class of experiments used to investigate the physics principles of self-organized plasmas.

The spheromak reactor uses a "gun" that ejects toroidal plasma off the end of cylindrical electrodes into a spherical chamber. It confines hot plasma in a compact magnetic field system that uses the strong electric and magnetic fields generated inside the plasma. The plasma ions and electrons produce its own confining magnetic fields. The magnetic fields pass through the flowing plasma and generate more plasma current, which in turn reinforces the magnetic field.

Research into fusion reactors began in the 1940s, but as of 2017 no design has produced positive net energy (more energy output than input). Fusion reactions have been unable to produce self-sustaining, controlled fusion. One of the challenges is that in order to achieve conditions with high enough temperatures and densities for fusion, the plasma needs to be confined. This occurs when the magnetic fields surrounding the plasma reaches a relaxed state with minimum energy. Magnetic confinement keeps plasmas away from chamber walls because charged electrons and ions tend to follow magnetic field lines. As the particles within the gas are charged, this allows them to be manipulated by electric or magnetic fields. Even if this temperature is reached, the gas will be constantly losing energy and cooling down. The major challenge in the development of fusion power is that of designing a system that can confine the plasma long enough at high enough temperature and density. The confinement time corresponds to the time in which the magnetic field reaches its relaxed state. Computer simulations have demonstrated that magnetic helicity is the constant in which the confinement time depends. The relaxed state with minimum energy is consistent with the initial total helicity of the magnetic field. Magnetic helicity measures the extent to which a magnetic field "wraps, knots, twist, and coils around itself". Knotted and linked fluid structures deform continuously to a state that is energetically favorable. During this relaxation process the knot topology remains conserved, so that the physical knots, twists, and links can relax to some minimum energy configuration, while remaining in the same class of topological equivalence.



Roselyn Williams



In a tokamak the plasma is held in a doughnut-shaped vessel. Using special coils, a magnetic field is generated, which causes the plasma particles to run around in spirals, without touching the wall of the chamber. (Image courtesy of EFDA).



Opportunities to investigate issues in fusion energy range from research by top mathematicians to projects for undergraduate students. Projects for students could apply number theory, differential geometry, group theory, computer simulations, and other areas to model fusion reactions. For example one could create a “helicity group” consisting of knots, braids and tangles in order to develop models of dynamic stochastic magnetic field lines that evolve around and converge onto a torus. Helicity, writhe and linking parameters could be used to investigate the time for magnetic field relaxation and plasma confine-

ment. The homotopy group of knots, braids, and tangle which are interesting from a purely mathematical point of view also are applicable to other areas of study such as DNA research. Such undergraduate projects could inspire new ideas that could, in particular, contribute to fusion research.

*Roselyn Williams is an Associate Professor of Mathematics at Florida A&M University and is the NAM Secretary/Treasurer. She can be reached at: [roselyn.williams@famu.edu](mailto:roselyn.williams@famu.edu).*

## Age Perceptions, Knowledge, and Preventive Behaviors Regarding Cervical Cancer

*Julian Rayford and Samuel Dolo*

Cervical cancer is considered to be the third most common type of cancer in women, and the second largest cause of deaths in women. The Gale Encyclopedia of Cancer defines cervical cancer as a disease in which the cells of the cervix become abnormal and start to grow uncontrollably (hence forming tumors). Almost all cervical cancer is caused by Human Papillomavirus (HPV), a common virus that is spread through sexual intercourse. Its toll is greatest in population that lack screening programs to detect precursor lesions (Roden 2006). Research studies show that older women are at the highest risk for cervical cancer, while girls under the age of 15 rarely develop this cancer. In the United States the death rates from cervical cancer are higher among Hispanic American, Native American, and African American women than among Caucasian women (Gale 2011). It is widely believed among experts that most women who are diagnosed with cervical cancer today have not had regular pap smears or followed up on abnormal pap smear results. But the question is how knowledgeable are women regarding this deadly disease which is curable when detected early.

**Method:**

To investigate the state of cervical cancer perceptions and prevention knowledge among U.S. adults, we analyzed data, with 4468 respondents, from the 2005 Health Information National Trends Survey (HINTS) for the purpose of determining any potential relationship of positive associations between people’s awareness of cancer prevention recommendations and adherence to such recommendations. We restricted the analysis to women over the age of 18. We considered socioeconomic and demographic variables linked to health disparities in cervical cancer and media use, including education, annual household income, race/ethnicity, age, and insurance status. We categorized education (as less than high school graduate, high school graduate, some college, or college graduate), annual household income (as less than \$25,000, \$25,000 to \$34,000, \$35,000 to \$49,000, \$50,000 to \$74,000, or \$75,000 and above), race/ethnicity (as Hispanic, white, black, native American, Asian, Hawaiian, or multiple races), insurance status (as yes, or no), and age (as 18-34, 35-49, 50-64, 64-74, or 75+).

The data showed that 57.1% of respondents have never smoked while 26.2%, and 16.7% of respondents were

former and current smokers respectively. The data also showed that 30.5% of respondents have some form of college education, while 11.6%, 22.9%, 25.7%, and 9.3% had post bachelor’s degree, bachelor’s degree, high school diploma, and less than high school diploma respectively. With regards to household income, 31.6% revealed they had a combined household income of \$75,000 or more while 19.7%, 14.9%, 19.9%, and 22.7% said their combined income was \$50,000-\$75,000, \$35,000-\$50,000, \$20,000-\$35,000, and less than \$20,000 respectively. In terms of insurance status, a vast majority of respondents, 89.1% do have health insurance while 10.8% said they do not have any form of health insurance coverage.

For specific cervical cancer questions, we obtained and analyzed the answers to the following questions: Do you agree that cancer is an illness that when detected early can typically be cured? Have you ever been tested for cervical cancer? Have you ever been treated for genital warts? Have you heard anything about a vaccine or shot to prevent cervical cancer? Do you agree that getting checked regularly for cancer helps find cancer when it is easy to treat? How many people who develop cancer do you think survive at least 5 years? Each of the questions was analyzed in terms of race (or ethnicity) and age group. The questions assessed respondents’ awareness of cervical cancer prevention strategies were developed specifically for HINTS and were based on the HINTS conceptual framework, which describes consumer-oriented health communication.

One preventive measure to ensure no signs of cancer exist is by routinely being checked during a pelvic exam. Nearly all women who responded (96.8%) to the survey agreed that they have been checked for cervical cancer. The younger age group (18-34) accounted for the most amounts of women who have not been tested. The data show that majority (3507 out of 4468) of the respondents (across all age groups) are aware of the vaccines or shots to prevent cervical cancer: 18-34 (586 of 4468), 35-49 (904 of 4468), 50-64 (1149 of 4468) 65-74 (512 of 4468), 75+ (356 of 4468).

In accordance with the education levels in the research, it is noted that 50-64 year olds are the most opinionated



Samuel Dolo



when it comes to the prevention of cancer related questions. They strongly and overwhelmingly believe that cancer can be cured if detected early enough. Overall, the general consensus amongst the age ranges is that cancer can be cured with 85.6% in optimism and 14.4% disagreeing.

In terms of survival rates after being diagnosed with cancer after five years, the data show that the younger group (18-34) and older groups (75+) share similar beliefs. They both believe that there is likely a 50% chance of survival after five years. The other age groups share similar sentiments on the survival amongst cancer patients.

In this study, 50-64 year old women were found to be the most knowledgeable individuals who took the best preventive measures to ensure their health. They held the strongest belief that cancer can be typically cured if it is detected early. Their high optimism of cancer detection is unified with their strong survival beliefs of individuals who have been diagnosed after five years. These strong

sentiments and feelings towards cancer prevention and treatment make 50-64 year old women the most knowledgeable.

Despite increasing emphasis on the deadly nature of the cervical cancer epidemic, much work remains to be done in mapping the pathways between social characteristics and health outcomes via media communications.

References

Gale Encyclopedia of Cancer, (2011). Retrieved from [www.answers.com/topic/cervical-cancer](http://www.answers.com/topic/cervical-cancer).  
 Roden, Richard, (2006). How will HPV vaccines affect cervical cancer? *Nature Reviews Cancer*. 6, pp. 753-763.

\*\*\*\*\*  
*Julian Rayford is an undergraduate mathematics student at Savannah State University. Samuel Dolo is Associate Professor of Mathematics at Savannah State University and can be reached at [dolos@savannahstate.edu](mailto:dolos@savannahstate.edu).*

## Spotlight on a Mathematician: Art Fuller

*Jacqueline Brannon Giles*

Art Fuller is a pioneer who started with computers at their beginning, before software and systems. As a graduate of Miles College in Birmingham, Alabama, he wrote some applications in binary code during the early years when UNIVAC computers took up the basement and 2 ½ floors of a building at Courant Institute of Mathematical Studies at New York University in New York City.



Art Fuller

His career positioned him near professionals at the caliber of Bill Gates, Admiral Grace Hopper who was the first female admiral in the US Navy, and the graduate architect who designed the Vietnam War Memorial.

He was hired as a mathematician to develop mathematical equations, computer programs, and hardware for the conversion of ship design and

construction to computers. The project was called Computer Aided Ship Design and Construction (CASDAC).

Fuller visited S.H.A.P.E. Community Center, at 3815 Live Oak Street in Houston, Texas. He made two presentations to the Elders Institute of Wisdom. On the day of his presentation there was an intergenerational audience who was fascinated with the report of the historical projects Fuller was involved in as a young mathematician and computer science expert.

Fuller is an avid reader. His motto is: Read, Read, Read, Read and READ!!! He stated that he developed computer applications, hardware and software over the years since 1958. He also shared that he reads 1 to 3 books per month and he has done this for more than 35 years.

As Fuller described in one of his projects he stated: “...when the USS Thresher Nuclear Submarine sank in 8400 feet of water in April of 1963, it became my assignment and responsibility to develop the mathematics and write a FORTRAN computer program that was called ‘Submarine Input Control’ which would simulate the motion of submarines in six degrees of freedom in order to

study and control the direction, motion, and speed of the submarine in order to redesign and control the emergency Ballast Tanks of Nuclear Submarines.”

He continued, “This was because it was determined that the Emergency Ballast Tanks on the submarine were not strong enough to cause it to recover from the increasing pressure of the sea water after it sank below its design depth.”

Fuller indicated that the project took place during the punch card era of computers and resulted in a 3500 to 4000 card FORTRAN program. He also had the responsibility of correcting any coding errors resulting from keypunch errors and other errors. Since the project was a Top Secret Project, he added, “In fact, I was the only person allowed to keep and carry the entire program card deck and printout to any place at any time.” He was also the Department of the Navy’s Representative on the Department of Defense Committee that managed the development of ARPANET (Army Research Project Agency Network) which when declassified from Top Secret about 19 later became the Internet. The beginning of computer to computer communication.

Fuller had the pleasure of meeting several retired mathematicians who support and participate at the community center. His presentation was hailed as an outstanding contribution to the elders, youth, and parents who anticipate his future presentations.

Art Fuller is now an executive with ArtFul Enterprises International, [www.artfulenterprisesintl.com](http://www.artfulenterprisesintl.com).



Jaqueline Brannon Giles

\*\*\*\*\*  
*Jaqueline Brannon Giles is a Professor of Mathematics at Houston Community College and is the NAM Board of Directors Region C Representatives. She can be reached at [jbgiles@yahoo.com](mailto:jbgiles@yahoo.com).*





## My REU: A Topology on Certain Initial Algebras

Mohammed Tesemma

On March 25, 2017, I gave a talk at the NAM Regional Faculty Conference on Research and Teaching Excellence held at Morehouse College. My talk was focused on a project done by REU (research experience for undergraduates) participants at Clemson University. In 2011 the Clemson REU advisors invited me to join them while they applied for a renewal of a National Science Foundation (NSF) grant to continue their long standing REU program. We succeeded in getting the NSF support for the summers of 2012 and 2013 under grant number DMS-1156734. In summer of 2013, we admitted 14 participants, of which 2 were African Americans: Danielle Middlebrooks (Spelman College) and Ashley Morris (Savannah State University).

After each advisor introduced the research projects, the students made a team of three students under each project. Ashley and Danielle, along with Jennifer Loe of Oklahoma Christian University were on one team working on a graph theory project entitled “2-tone colorings in graph products.” They have done original work in their research and their result is published by the journal *Discussiones Mathematicae Graph Theory* (2015). Currently Danielle is a PhD student in the Department of Mathematics at the University of Maryland, College Park and Ashley teaches at George Washington Carver High School.

I also supervised another team of three students: Andrew Smith (Carnegie Mellon University), Peter Stewart (Clemson University), and Jeremy Usatine (Harvey Mudd College). They worked on a project entitled “A topological structure on certain initial algebras”. The topological

space under study in this project comes from ring theory, more specifically a certain infinite family of monomial subalgebras of a Laurant polynomial ring in  $n$ -variables. This “special family” of subalgebras form a vector space,  $V$ , over a base field. We endow  $V$  with a metric topology generalizing the topology defined by Shigeru Kuroda in his paper “The infiniteness of the SAGBI basis for certain invariant rings”, in the *Osaka Journal of Mathematics* (2002). The students investigated further topological properties of this space and they showed that  $V$  is compact, totally disconnected (which means that the only connected components are the single points), and also perfect space (which means that there are no isolated point in the space). It is known that a metric space satisfying all above conditions is homeomorphic to the Cantor set. The Cantor set is the one well known in Real analysis. The result of their findings is published by the journal *Topology and its Applications* (2015).

I would like to take this opportunity to thank Professor Edray Herber Goins, NAM President and the organizer of the March 2017 regional conference held at Morehouse College for inviting me to give a talk and write a contribution for the NAM Newsletter.

Mohammed Tesemma is an Associate Professor of Mathematics at Spelman College and can be reached at [mtesemma@spelman.edu](mailto:mtesemma@spelman.edu).



Mohammed Tesemma

## Call for Papers: Mathematics and Motherhood

Pamela E. Harris, Becky Hall, Carrie Diaz Eaton, and Emille Lawrence

The Math Mama’s Facebook group began in January 2016 and is now a ~500 member support group for mathematician mothers who are balancing career and family. It is a self-organized attempt at creating a community of support for mothers in the professional mathematics community. One of the members of the group, Dr. Becky Hall, was invited to review a book called “Mom, the Chemistry Professor” and her review spurred an excellent discussion about the dearth of these positive stories and storylines in the mathematics community, particularly around the ability to have work-life balance with a family, while being a woman in academia. Immediately, many of the group members stepped up to write contributions, with an amazing and open willingness to share extremely personal stories of culture, institution, pregnancy, fertility, and motherhood.

In light of this overwhelming response, we began pur-



Some Members of the Math Mamas Facebook group at the 2017 Joint Mathematics Meetings

suing options for a variety of diverse projects with the goal of empowering women in mathematics to pursue careers in the professoriate. After much work, we are excited to announce a “Special Issue Call for Papers: Mathematics and Motherhood” in the *Journal of Humanistic Mathematics* (<http://scholarship.claremont.edu/jhm/>). This Journal describes humanistic mathematics as the “human face of mathematics.” Behind the mathematics, there are the humans involved in knowledge creation who identify as mathematicians. The perception of “who is a mathematician” is changing. In its wake, we are rewriting the storyline of what it means to be a mathematician. This special issue will explore the intersectionality of mathematics and



motherhood with the aim of empowering more women in mathematics to pursue careers in the mathematical sciences and the professoriate. To this end, this issue will feature articles, autobiographical stories, poetry, and essays from a diverse set of women who have found success and balance in their mathematics career and motherhood.

The contributions will include raw, witty, and relatable stories that address the true challenges of being an academic mother, while providing concrete tips to overcome these challenges and thrive as a mathematician. Articles, including ethnographies and historical pieces, expand on the common experiences and challenges faced by math mamas, along with ways to support the community. Poetry and other communication forms round out this issue by giving a voice to math mamas' experiences in the intersectionality of mathematics and motherhood.

Mathematics and Motherhood will serve as a doorway to a community of support for women who want both a career and a family, as well as a guide offering insight to administrators about the challenges faced by mother mathematicians and some possible solutions. The contributors of this special issue come from diverse backgrounds in terms of ethnicity, religious affiliations, academic rank, and represent the changing face of mathematics. This special issue is part of a broader collaboration between indi-

viduals, the Journal of Humanistic Mathematics, the Association for Women in Mathematics, and the American Mathematical Society to encourage dialogue and create community space to support motherhood in the mathematical sciences.

Interested contributing authors should submit proposals, with title and abstract, to Pamela Harris at [peh2williams.edu](mailto:peh2williams.edu) by October 1, 2017. On November 1, 2017, accepted proposals will be invited to submit manuscripts for consideration to appear in the issue scheduled to appear in July 2018.

We welcome email inquiries from all those considering contributing to this issue.

*Pamela E. Harris is an Assistant Professor of Mathematics at Williams College and can be reached at [peh2@williams.edu](mailto:peh2@williams.edu). Becky Hall is an Associate Professor of Mathematics at Western Connecticut State University and can be reached at [hallb@wcsu.edu](mailto:hallb@wcsu.edu). Carrie Diaz Eaton is an Associate Professor of Mathematics at Unity College and can be reached at [ceaton@unity.edu](mailto:ceaton@unity.edu). Emille Davie Lawrence is an Assistant Professor of Mathematics at the University of San Francisco and can be reached at [edlawrence@usfca.edu](mailto:edlawrence@usfca.edu).*

## Blacks Earned 1.4% of All Mathematics Doctorates in 2015



The National Science Foundation (NSF) recently released its annual data on doctoral degree recipients in the United States. Data for the annual Survey of Earned Doctorates shows that universities in the United States conferred 55,006 doctorates in 2015.

As reported recently in a Journal of Blacks in Higher Education (JBHE) post, African Americans earned 2,281 doctoral degrees in 2015. They made up 6.5 percent of all doctoral degrees awarded to students who are U.S. citizens or permanent residents of this country.

But Blacks are vastly underrepresented among doctoral degree recipients in some disciplines. For example, African Americans earned only 1.7 percent of all doctorates awarded in the physical sciences. Blacks earned 1.4 percent of all mathematics doctorates and only 1.7 percent of all doctorates awarded in engineering disciplines.

In 2015, according to NSF, 2,330 doctorates were awarded in the fields of animal nutrition, fisheries science, botany, computational biology, wildlife biology, zoology,

geomorphology, paleontology, oceanography, biophysics, elementary particle physics, nuclear physics, plasma physics, algebra, logic, environmental economics, robotics, Asian history, history of science and technology, classics, art history, music, and music theory.

Not one was earned by an African American.

JBHE has published a similar list of fields where no African Americans have earned doctorates for many years. The good news is that, unlike many prior years, there are some African Americans who have earned doctorates in astronomy, most physics disciplines, most chemistry disciplines, most mathematics fields, and many areas of engineering. The racial gap in doctoral awards in STEM fields remains large, but progress is being made, albeit at a very slow rate.

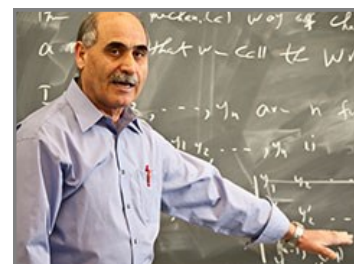
*This was first published on [www.JBHE.com](http://www.JBHE.com) on February 20, 2017 and reprinted with permission. Subscription to their weekly bulletin is free.*



## Azarian Receives MAA-Indiana Award

Mohammad K. Azarian, Professor of Mathematics at the University of Evansville, is the recipient of the 2017 Mathematical Association of America-Indiana section Distinguished Service Award. Azarian served on the Executive Board of the Indiana Section of the MAA (2001-2007), where he was responsible for the Indiana College Mathematics Competition each of those years, and coordinated all other student activities. He also serves as a

referee for the Problems Section of The College Mathematics Journal, published by the journal of the MAA and has presented 33 papers at MAA meetings. Azarian also as an Editor of the NAM Newsletter.



Mohammad K. Azarian



## Spelman Falconer Lecturer Monica Cox

*Yewande Olubummo*

Dr. Monica Cox, Professor and Chair of the Department of Engineering Education at The Ohio State University, inspired students, faculty, members of the Falconer family and guests during the 13th annual Etta Z. Falconer Mathematics Lecture at Spelman College on April 20, 2017. In her lecture entitled “Mathematics: A Foundation for Advancing Engineering Education”, Cox shared findings from her research projects on persistence of women of color engineering faculty in academia, and on assessment and evaluation in STEM environments. Cox also spoke about Falconer’s influence on her as an undergraduate student, and described how Falconer’s support, encouragement and belief in her were instrumental in her decision to attend graduate school in engineering.

Cox shared her pioneering educational and professional paths along with her own personal challenges which resonated with the students. After graduating from Spelman College with a BS in mathematics, she received an MS degree in industrial engineering from the University of Alabama and then a PhD in leadership and policy studies from Vanderbilt University. In 2010, she received a Presidential Early Career Award for Scientists and Engineers from former President Barack Obama for her

research in engineering education. In 2011, Cox became the first African American female to be tenured in the entire College of Engineering at Purdue University. She again made history in 2016, by her appointment at The Ohio State University as the inaugural Department Chair of the College of Engineering’s newly established Department of Engineering Education. Over the years, Cox has graduated 10 PhD students, received more than \$13 million in research funding, and has over 100 research publications.

The Etta Z. Falconer Mathematics Lecture Series, held each spring at Spelman College, honors and celebrates the memory and ongoing legacy of Etta Z. Falconer, PhD, Fuller E. Callaway Professor of Mathematics, who began teaching at Spelman College in 1965 and served the college with distinction for 37 years.

*Yewande Olubummo is an Associate Professor of Mathematics at Spelman College and can be reached at [yolubumm@spelman.edu](mailto:yolubumm@spelman.edu).*



Spelman College President Mary Campbell and Monica Cox

## NAM Calendar

The **2017 SIAM Annual Meeting** will be held July 10-14 in Pittsburgh, Pennsylvania. The SIAM Workshop Celebrating Diversity will have a panel entitled **Contributions of Black Mathematicians to Current Research Problems** featuring Raymond Perkins (Princeton University), Karen Hicklin (North Carolina State University) and Taleo Mayo (University of Central Florida). There will also be a panel on **Hidden Figures** featuring Christin Darden (NASA), Erica Graham (Bryn Mawr College), Talitha Washington (Howard University), Shelby Wilson (Morehouse College) and moderator Carla Cotwright-Williams (Social Security Administration). See: <http://www.siam.org/meetings/an17>

**MAA MathFest 2017**, will be held **July 26-29** in Chicago,



Taraji Henson and Rudy Horne

Illinois. The **NAM David Blackwell Lecture** will be given by Rudy Horne (Morehouse College) and is entitled “Hidden Figures: My Role as a Math Consultant for this Film”.

The **MAA Invited Address** will be given by Ronald Mickens (Clark Atlanta University), the **AWM-MAA Etta Z. Falconer Lecture** will be



J Ernest Wilkins

given by Talitha Williams (Harvey Mudd College). There will be a special session entitled “The Life and Legacy of **J Ernest Wilkins** (1923-2011)” organized by Ronald Mickens (Clark Atlanta University) and Talitha Washington (Howard University). See: [www.maa.org/mathfest](http://www.maa.org/mathfest)

## Conferences & Workshops

The **2017 Joint Statistical Meetings** will be held **July 29-August 3** in Baltimore, Maryland. The IMS Medallion Lecture II will be given by **Emery Brown** (MIT). See: [www.amstat.org/meetings/jsm/2017](http://www.amstat.org/meetings/jsm/2017),

**Women in Numbers (WIN)** will be held **August 14-18, 2017** at Banff International Research Station. See: <http://www.math.washington.edu/~bviray/WIN4.html>

The **Richard Tapia Celebration of Diversity in Computing** conference will be held **September 20-23, 2017** in Atlanta, Georgia. See: <http://tapiaconference.org>

**StatFest** will be held on **September 23, 2017** at Emory University in Atlanta, Georgia. See:

<http://community.amstat.org/cmis/events/statfest>

The **NAM Undergraduate MathFest** will take place from September 29-October 1, 2017 at Medgar Evers College. See: <http://nam-math.org/mathfest.html>

The **SACNAS National Conference** on **October 19-21, 2017** in Salt Lake City, Utah. See: [www.sacnas.org/events/national-conf](http://www.sacnas.org/events/national-conf)

The **Black Doctoral Network Conference** will be held on **October 26-28, 2017** in Atlanta, Georgia. See: [www.blackphdnetwork.com](http://www.blackphdnetwork.com)

The **2017 Field of Dreams Conference** will be held **November 3-5** in St. Louis, Missouri. See: <http://www.mathalliance.org>

The **Joint Mathematics Meetings** will be held **January 10-13, 2018** in San Diego California. See: <http://jointmathematicsmeetings.org>





## MSRI Workshops Announced

The Mathematical Sciences Research Institute (MSRI) in Berkeley, California will hold the following workshops during the Fall of 2017.

Connections for Women: geometry and probability in high dimensions, August 17-18

Introductory Workshop: phenomena in high dimensions, August 21-25

Connections for Women Workshop: Geometric and Topological Combinatorics, August 31-September 01

Introductory Workshop: Geometric and Topological Combinatorics, September 5-8

Geometric and Topological Combinatorics: Modern techniques and methods, October 9-13

Modern Math Workshop, SACNAS Pre-conference event (see NAM Calendar, page 8), October 18-19

Geometric functional analysis and applications, November 13-17

Women in Topology, November 29-December 1  
On February 21-23, 2018, they will host the much anticipated workshop entitled “Critical Issues in Mathematics Education 2018: Access to mathematics by opening doors for students currently excluded from mathematics”.

Established researchers, postdoctoral fellows and graduate students are invited to apply for funding to attend. MSRI actively seeks to achieve diversity in its workshops. Thus, a strong effort is made to remove barriers that hinder equal opportunity, particularly for those groups that have been historically underrepresented in the mathematical sciences. To register for a workshop, go to:  
[www.msri.org/web/msri/scientific/workshops](http://www.msri.org/web/msri/scientific/workshops)

For more information on participating at or organizing a workshop, contact Chris Marshall at [chris@msri.org](mailto:chris@msri.org).



## Job Openings



Additional job openings may be found on the *NAM Newsletter* webpage at:

<http://nam-newsletter.org>

Advertisements should be submitted electronically to the editor at [nam\\_newsletter@yahoo.com](mailto:nam_newsletter@yahoo.com). Any format is accepted. Details on deadlines and the cost to advertise may be found on the website.

## Mathematical Sciences Research Institute

*Multiple Positions*

MSRI invites applications for Research Professors, Research Members and Postdoctoral Fellows in the following programs: **Hamiltonian systems, from topology to applications through analysis** (August 13 - December 14, 2018), **Derived Algebraic Geometry** (January 22 - May 24, 2019) and **Birational Geometry and Moduli Spaces** (January 22 - May 24, 2019). Research Professorships are intended for senior researchers who will be making key contributions to a program, including the mentoring of postdoctoral fellows, and who will be in residence for three or more months. Research Memberships are intended for researchers who will be making contributions to a program and who will be in residence for one or more months. Postdoctoral Fellowships are intended for recent PhDs.

MSRI uses MathJobs to process applications. Interested candidates must apply online beginning August 1, 2017. To receive full consideration, applications must be complete, including all letters of support, by the following **deadlines**: Research Professorships, October 1, 2017; Research Memberships, December 1, 2017; Postdoctoral Fellowships, December 1, 2017. Application information can be found at [www.msri.org/application](http://www.msri.org/application).

It is the policy of MSRI actively to seek to achieve diversity in its programs and workshops. Thus, a strong effort is made to remove barriers that hinder equal opportunity, particularly for those groups that have been historically underrepresented in the mathematical sciences.

Programs funded by the National Science Foundation.

## University of Nebraska—Lincoln

*Milton Mohr Professor*

The Department of Mathematics at the University of Nebraska-Lincoln invites applications for the **Milton Mohr Professor of Mathematics**, at the **Associate Professor or Full Professor** level, to begin in August 2018. The ideal candidate will have a strong, internationally recognized research program in mathematics, a demonstrated ability to attract external funding, and a strong record of mentoring Ph.D. students and postdocs. To be considered for the position, applicants must complete the Faculty/Administrative application at <http://employment.unl.edu>, requisition #F\_160191. In addition, applicants must also submit a cov-

er letter, a curriculum vitae, and the names and contact information of three references. Materials may be submitted through [mathjobs.org](http://mathjobs.org) or via email to [hiring@math.unl.edu](mailto: hiring@math.unl.edu). Review of applications will begin **October 1, 2017** and continue until the position is filled. For more information about this position, please go to:

<http://www.math.unl.edu/departments/jobs>. The University of Nebraska-Lincoln is committed to a pluralistic campus community through affirmative action, equal opportunity, work-life balance, and dual careers. See <http://www.unl.edu/equity/notice-nondiscrimination>.



## University of Pennsylvania

*Calabi-Simons Chair*

The Departments of Mathematics and Biology invite applications at the level of Associate or Full Professor for the **Calabi-Simons Chair in Mathematics and Biology**. This is a permanent endowed chair for which we are seeking an exceptionally accomplished mathematical biologist, particularly in the fields of Probability Theory and Evolution. Responsibilities include teaching undergraduate and graduate courses in Mathematics and Biology and conducting research in the field. The chair-holder will help build excellence in this field at Penn and strengthen links between the Mathematics and Biology departments. The Simons Foundation provides generous programmatic funds, which could support graduate students and postdoctoral fellows as well as seminars and conferences.

Applications should be submitted online through

mathjobs.org (Position ID #10278) and include the following items: a cover letter, curriculum vitae, research statement, and a publication list.

Review of applications will begin **July 1, 2017** and will continue until the position is filled. It is anticipated that the position will **start July 1, 2018**.

The Departments of Mathematics and Biology are strongly committed to Penn's Action Plan for Faculty Diversity and Excellence and to creating a more diverse faculty (for more information see: <http://www.upenn.edu/almanac/volumes/v58/n02/diversityplan.html>). The University of Pennsylvania is an EOE. Minorities/Women/Individuals with disabilities/Protected Veterans are encouraged to apply.

## NAM Golden Anniversary Campaign & Online Store

The NAM Golden Anniversary Campaign is from January 1, 2017 until September 30, 2019, with the goal of establishing an endowment fund of at least \$2 million to serve as the base support, ensuring vibrant annual programs and activities. You can make a contribution via the form on

page 11 or online at [www.nam-math.org](http://www.nam-math.org).

NAM's Online Store features a variety of trendy polos, pullovers, bags as well as Dr. Johnny Houston's book on NAM's history. Proceeds support NAM activities. See: <https://squareup.com/store/natl-assoc-of-mathematicians>

## NAM Board of Directors

**President**, Dr. Edray Goins  
Purdue University  
[egoins@math.purdue.edu](mailto:egoins@math.purdue.edu)  
[www.math.purdue.edu/~egoins](http://www.math.purdue.edu/~egoins)



**Vice President**, Dr. Talitha Washington  
Howard University  
[talitha.washington@howard.edu](mailto:talitha.washington@howard.edu)  
[www.talithawashington.com](http://www.talithawashington.com)

**Secretary/Treasurer**, Dr. Roselyn Williams  
Florida A&M University  
[Roselyn.Williams@mail.famu.edu](mailto:Roselyn.Williams@mail.famu.edu)

**Executive Director**, Dr. Leon Woodson  
Morgan State University  
[leon.woodson@morgan.edu](mailto:leon.woodson@morgan.edu)

**Region A Member**, Dr. Tuwaner Hudson Lamar  
Morehouse College  
[tlamar@morehouse.edu](mailto:tlamar@morehouse.edu)

**Region B Member**, Dr. Shea Burns  
North Carolina A&T State University  
[sburns@ncat.edu](mailto:sburns@ncat.edu)

**Region C Member**, Dr. Jacqueline Brannon Giles  
Houston Community College System-Central College  
[jbgiles@yahoo.com](mailto:jbgiles@yahoo.com)  
<http://learning.hccs.edu/faculty/jacqueline.giles>

**Majority Institution Member**, Dr. Robin Wilson  
California State University at Pomona  
[robinwilson@cpp.edu](mailto:robinwilson@cpp.edu)  
<http://www.cpp.edu/~robinwilson>

**Member Outside-Academia**, Dr. Ron Buckmire  
National Science Foundation  
[rbuckmir@nsf.gov](mailto:rbuckmir@nsf.gov)

**Community College Member**, Dr. Janylle Carter  
Diablo Valley College  
[JCarter@dvc.edu](mailto:JCarter@dvc.edu)

**Editor**, Dr. Talitha M. Washington  
Howard University  
[nam\\_newsletter@yahoo.com](mailto:nam_newsletter@yahoo.com)

**Ex-Officio President Emeritus**, Dr. Nathaniel Dean  
Texas State University  
[nd17@txstate.edu](mailto:nd17@txstate.edu)

**Ex-Officio President Emeritus**, Dr. John W. Alexander  
Miami Dade College  
[jalexan2@mdc.edu](mailto:jalexan2@mdc.edu)

**Executive Secretary Emeritus**, Dr. Johnny Houston  
Elizabeth City State University  
[jlhouston602@gmail.com](mailto:jlhouston602@gmail.com)

### Region A: Southwest/West

Alabama Montana  
California Puerto Rico  
Florida South Carolina  
Georgia Virgin Islands  
Any State not in B or C

### Region B: Mid-Atlantic

Delaware New York  
District of Columbia North Carolina  
Kentucky Pennsylvania  
Maryland Virginia  
New Jersey West Virginia

### Region C: Midwest/Southwest

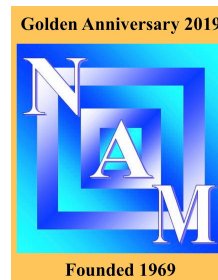
Arkansas Ohio  
Illinois Oklahoma  
Louisiana Tennessee  
Mississippi Texas  
Missouri



# NATIONAL ASSOCIATION OF MATHEMATICIANS MEMBERSHIP AND DONATION FORM

MEMBERSHIP IS FOR CALENDAR YEAR: JANUARY 1 to DECEMBER 31 of \_\_\_\_\_

TITLE \_\_\_\_\_ NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
INSTITUTION/EMPLOYER \_\_\_\_\_  
TELEPHONE: HOME (\_\_\_\_\_) \_\_\_\_\_ OFFICE (\_\_\_\_\_) \_\_\_\_\_  
FAX: (\_\_\_\_\_) \_\_\_\_\_ E-MAIL ADDRESS \_\_\_\_\_



### SELECT APPROPRIATE MEMBERSHIP TYPE

STUDENT: \$30  INDIVIDUAL: \$50  LIFE: \$500  GOLDEN LIFE: \$1000  INSTITUTIONAL: \$150  
GENERAL DONATION \$ \_\_\_\_\_  
GOLDEN ANNIVERSARY CAMPAIGN DONATION \$ \_\_\_\_\_

### PLEASE RETURN COMPLETED FORM AND MEMBERSHIP DUES TO:

Dr. Roselyn E. Williams, Secretary-Treasurer

National Association of Mathematicians  
P.O. Box 5766  
Tallahassee, Florida 32314-5766

Office Phone: (850) 412-5236  
Email: Roselyn.Williams@fam.u.edu  
Web page: <http://www.nam-math.org>

### INDIVIDUALS AND STUDENTS

Please complete below if you did not send NAM this information within the past three years. List all degrees you currently hold. Circle the correct degree.

B.S. or B.A.: Area \_\_\_\_\_ Institution \_\_\_\_\_  
M.S. or M.A.: Area \_\_\_\_\_ Institution \_\_\_\_\_  
Ph.D. or Ed.D.: Area \_\_\_\_\_ Institution \_\_\_\_\_  
Other: Area \_\_\_\_\_

Institutional Representative (for NAM)  
 Area or State Representative \_\_\_\_\_  
 Committee Member (specify interest): Interest \_\_\_\_\_  
 Need additional information about the organizational structure of NAM



### RACE/ETHNICITY (optional)

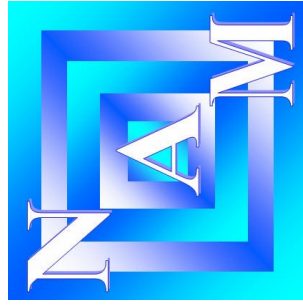
Asian  Black  Hispanic  Native American/Alaska Native  Pacific Islander  White  Other





Dr. Talitha M. Washington  
**NAM Newsletter**  
Howard University  
College of Arts and Sciences  
Department of Mathematics  
2441 6th Street, NW  
Washington, DC 20059

ADDRESS SERVICE REQUESTED



Summer 2017