

**Black Heroes of Maths: To celebrate the inspirational contributions of black role models to the field of mathematics**

**Titles and Abstracts**

**26th October 2020 (Day 1, Session 1 – 10:10 (GMT))**

**Dr Angela Tabiri (Aims Ghana)**

Title: *The Journey of Female African Mathematicians*

Abstract: When we mention female mathematicians with African descent, Katherine Johnson is a name that stands out. The Hidden Figures book and movie brought her outstanding achievements into the spotlight. Katherine calculated the trajectory which put the first American in space. Young girls are inspired by her work and aspire to pursue careers in mathematics irrespective of the challenges anticipated.

In recent years, the journeys of female African mathematicians (Femafricmaths) and their achievements are not easily accessible both in print and online. Chelsea Walton and Eunice Mureithi are Femafricmaths making excellent contributions in mathematics which need to be highlighted. This talk will put the spotlight on successful journeys of early, mid and established Femafricmaths across Africa and those of African descent.

**26th October 2020 (Day 1, Session 1 – 10:50 (GMT))**

**Dr Howard Haughton (King's College London)**

Title: *On the use of Probability and Moment generating functions for quantifying loan portfolio credit losses*

Abstract: The quantification of portfolio credit loss has and remains an important topic in the field of quantitative finance. Over the years, a number of methods have been developed for the derivation of credit loss distributions including Monte-Carlo simulation and actuarial-based models. In this presentation, we discuss an approach to quantifying portfolio credit loss based on use of Moment and Probability generating functions. The approach makes use of relatively simple concepts of probability theory and calculus to derive the portfolio expected and variance of loss as well as the notion of the risk-contribution to the Value-At-Risk. The results can be seen to be a contribution to the area of credit risk concerning infectious defaults.

**26th October 2020 (Day 1, Session 1 – 11:30 (GMT))**

**Professor Tannie Liverpool (Bristol)**

Title: *From Boltzmann to bird flocks: journeys in non-equilibrium statistical mechanics*

Abstract: I give an overview of the type of research done in my area of non-equilibrium statistical mechanics. At the end I briefly outline the trajectory of my career

**26th October 2020 (Day 1, Session 2 – 13:00 (GMT))**

**Dr Nira Chamberlain (President IMA)**

Title: *Black Heroes of Mathematics*

Abstract: Dr. Nira Chamberlain looks at the Black Heroes of Mathematics. The 2017 film, Hidden Figures, is based on the true story of a group of black female mathematicians that served as the brains behind calculating the momentous launch of the NASA astronaut John Glenn into orbit. However, these mathematicians of colour are not the only 'Hidden Figures'. Nira will discuss other inspirational men and women who overcame obstacles to prove that 'mathematics is truly for everybody!'

Dr Nira Chamberlain PhD HonDSc is the President of the Institute of Mathematics and its Application (IMA) and in 2019 the Inclusive Tech Alliance named Nira as one of the Top 100 Most Influential Black, Asian and Minority Ethnic leaders in the UK's Tech.

**End of Day 1 TALKS**

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**27th October 2020 (Day 2, Session 1 - 13:10 (GMT))**

**Natalya Silcott (FIMA Harrow School & Caribbean Diaspora for Science, Technology and Innovation, UK)**

Title: *Leaving a Legacy.*

Abstract: This talk will firstly be about the lack of acknowledgement of Mathematics that was founded in Africa in the Western Curriculum and what can be done to redress the balance. Finally, I will be sharing my research findings in the field of Graph Theory.

**27th October 2020 (Day 2, Session 1 - 13:50 (GMT))**

**Dr Spencer Becker-Kahn (Cambridge)**

Title: *Soap Bubbles and Minimal Surfaces*

Abstract: Minimal surfaces, studied since the middle of the 18th century and often popularised as soap bubbles, are prototypical and ubiquitous in geometric analysis. A single bubble is perfectly round and smooth, but - in general - a minimal surface can have non-smooth bits: self-intersections, sharp angles or places where it is somehow badly contorted. These bits are called 'singularities'. What exactly are minimal surfaces and what do the singularities of minimal surfaces look like? Aided by mediocre pictures and apocryphal anecdotes, I will introduce this venerable subject and hint at the depth of the mathematics which it offers.

**27th October 2020 (Day 2, Session 1 - 14:50 (GMT))**

**Professor Nkechi Agwu (BMCC) (CUNY)**

Title: *Mathematical Storytelling: Fostering Creativity, Innovation, Cultural Awareness and Entrepreneurship*

Abstract: This presentation provides a summary of the genesis of Rev. Nkechi Madonna Agwu, Ph.D., aka Nma (Beautiful) Jacob, as a mathematical storyteller. It provides a summary of the Federal University of Technology, Akure, National Mathematical Centre and Carnegie African Diaspora Fellowship Program ethnomathematics teaching-research project, Culture, History and Women's Stories: A Framework for Capacity Building in Science, Technology, Engineering and Mathematics (STEM) Related Fields and for Fostering Entrepreneurship Education (2014 – present). Dr. Agwu is the Carnegie Fellow and the Founder of CHI STEM TOYS Foundation, an NGO geared towards facilitating STEM and entrepreneurship education among under-represented groups of people in STEM and in rural and vulnerable communities in Africa. In addition to the afore-mentioned partnering institutions, this project is conducted with support and collaboration from many other organizations and institutions, particularly, CHI STEM TOYS Foundation, Jacob Agwu Memorial Vocational Education and Entrepreneurship Center, World-wide Association of Small Churches, the Drammeh Institute and the Nigerian Women in Agricultural Research for Development (NiWARD). The focus of this presentation is on the mathematical story-telling of a subset of NiWARD and the mathematical story-telling workshop for high school girls of CHI STEM TOYS Foundation and the Drammeh Institute in facilitating creativity, cultural awareness and gender equity, mainstreaming and empowerment. The purpose of this project is to engage in ethnomathematics research and teaching-research that will lead to the development of gender sensitive and African culturally based curricular activities for the teaching and learning of mathematics, that fosters creativity, innovation, leadership development and entrepreneurship education, while simultaneously nurturing, grooming and mentoring girls to consider STEM related careers by making visible the stories of successful African women in STEM and the work of rural women in STEM related areas.

**27th October 2020 (Day 2, Session 1 - 15:30 (GMT))**

**Professor Edray Goins (Pomona College) –**

Title: *The Black Mathematician Chronicles: Our Quest to Update the MAD Pages*

Abstract: In 1997, Scott Williams (SUNY Buffalo) founded the website "Mathematicians of the African Diaspora," which has since become widely known as the MAD Pages. Williams built the site over the course of 11 years, creating over 1,000 pages by himself as a personal labor of love. The site features more than 700 African Americans in mathematics, computer science, and physics as a way to showcase the intellectual prowess of those from the Diaspora.

Soon after Williams retired in 2008, Edray Goins (Pomona College), Donald King (Northeastern University), Asamoah Nkwanta (Morgan State University), and Weaver (Varsity Software) have been working since 2015 to update the Pages. Edray Goins led an REU of eight undergraduates during the summer of 2020 to write more biographies for the new MAD Pages.

In this talk, we discuss the results from Pomona Research in Mathematics Experience (PRiME), recalling some stories of the various biographies of previously unknown African American

mathematical scientists, and reflecting on some of the challenges of running a math history REU. This project is funded by the National Science Foundation (DMS-1560394).

**End of Titles and Abstracts**

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