Black Heroes of Mathematics 2024 – 2/3 October 2024
Agenda, speakers, titles and abstracts

Wednesday 2 October

12:00 **Registration**

13:00 **Welcome from the organisers**

13:10 **Kim Sellers (online)**

Dispersed Regression Models for Dispersed Count Data

From a mathematical point of view, this leads to the study of interacting particle systems where particle identity plays a crucial role. One way to conceptualize these is to see them as particle systems on weighted graphs. Recent developments in graph theory have raised renewed interest in understanding large population limits in these systems. Two main approaches have emerged: graph limits and mean-field limits. In this presentation, I will discuss several models, mainly from the field of opinion dynamics, for which rigorous convergence results have been obtained.

13:50 **Justice Aheto (online)**

Spatiotemporal modelling and interactive web-based spatial mapping of malaria risk under Integrated Nested Laplace Approximation to support preventive and control efforts in Ghana

Ghana is among the top 10 highest malaria burden countries, with about 20,000 children dying annually, 25% of which were under five years. This study aimed to produce interactive web-based disease spatial maps and identify the high-burden malaria districts in Ghana.

14:40 **BREAK**

14:50 **Nathalie Ayi (online)**

Shaping Collective Opinions: Mathematical Insights into Social Dynamics in Large Population

Social interactions have the power to influence individuals' opinions on a wide range of subjects, from public figures and societal issues to political ideologies. Scientifically, these considerations form the basics of a domain called opinion dynamics. This very active field explores how opinions evolve and spread within social networks, and clarifies how the complex interplay between individuals can shape collective perspectives.

15:30 **Flavia Santos (in person)**

Scoping Maths Anxiety in Our Community

Maths anxiety (MA) is a feeling of nervousness related to numbers, mathematics homework, or classroom activities (Santos, 2022). Feeling anxious during maths exercises or exams can hinder cognitive processes and cause avoidance behaviours. Then, the less students practice maths content, the lower their maths competence. In turn, maths grades of anxious students may not reflect their potential and leverage a cycle of defeat that can escalate. MA is persistent over time and observed among undergraduates.

While extensive MA studies have been conducted in WEIRD samples, research in distinct communities is emerging, accounting for variation across human populations. I will examine the MA research focusing mainly on Black students and the impact of MA on their academic performance. A study highlights causes of MA among Black pupils, such as misconceptions (viewing mathematical ability as innate rather than malleable), Invisibility (experiencing low expectations and dismissive attitudes from teachers), and Intergenerational influences (parental struggles with maths). Furthermore, it has been noted that Black schoolchildren and Hispanic or Black undergraduates are often underrepresented in psychometric studies of tools to measure MA. Classroom climate studies theorise that having a higher percentage of same-ethnic peers in maths classes could offer protective benefits.

However, many factors intervene in the association between ethnic representation and classroom performance, such as intersectionality. Longitudinal research indicates that early MA in Black and Latinx girls predicts low achievement in maths three years later. Upcoming studies should address early MA through interventions tailored for these groups as a vital mechanism to increase their interest in STEM areas.

16:20 **BREAK**

17:00 **Panel event (in person)**

18:30 **RECEPTION**

Thursday 3 October

09:30 **Registration open**

10:00 **Welcome from organisers**

10:10 ***Teresa Senyah*** **(in person)**

Representation in Mathematics Education

This session delves into the importance of representation in mathematics education and a personal perspective on the impact it can have

10:50 **Imoleayomide Ajayi (online)**

Modelling Low Energy Electron Emission with Truncated Normal-Generalized Linear Model (TN-GLM)

A common method to measure the size of nanoscopic objects is to use a beam of electrons that interact with the particle. Their scattering carries information about the nanoparticle under investigation. However, it is often very complex to reconstruct information about the size of particles with irregular shapes and a priori unknown size. We propose a statistical spatial model of low-energy electrons (LEEs) generation within a sample during imaging with a scanning electron microscope (SEM) as a function of incident electron energy, sample shape, and tilt. This work aims to improve the resolution of images obtained from SEM to extract more precise size estimates from SEM-captured data. Current standard SEM sizing methods exhibit the counter-intuitive characteristic of dependence of footprint measures on sample topography above the sample footprint. This is due to neglecting the effect of sample shape on low-energy electron generation and emission.

11:30 **Angela Tabiri (online)**

Becoming the World's Most Interesting Mathematician

In my talk I will share how I became World's Most Interesting Mathematician 2024. What did I talk about. What were my challenges. What did I learn from this experience. Finally, what happened afterwards.

12:10 **LUNCH**

13:00 **Robin T Wilson (online)**
Bob Moses and the movement for math literacy as a civil right

In this talk we'll share the story of mathematics teacher and civil rights organizer Bob Moses who helped lead a voting rights movement in the US in the 1960's and then went on to build a movement around math literacy by drawing from the lessons of the civil rights movement. We will also discuss Moses's vision for math literacy as a civil right, as well as his vision for the role that mathematicians will have to play to create the systematic change needed to ensure a quality education for all, especially black children.

14:00 **Panel (in person)**

15:30 **END**