

Isa Gbolahan BABALOLA

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Research Interests

Applied mathematics, fluid dynamics, mathematical modelling of physical systems using partial and ordinary differential equations, numerical analysis and computation.

Education

University of Ibadan, Ibadan, Nigeria

Jan. 2022 – Jan. 2026

BSc Mathematics, CGPA of 3.82/4.00 (First Class Honours, top 3 of 63 students)

Research Experience

Lunar Tides of a Basal Magma Ocean

Ongoing

Research Project, Mathematical Institute's Online Research Projects with Africa (MIORPA),

Supervisors: Prof. Richard Katz, Dr. David Rees Jones

- Developing mathematical and fluid dynamical models of the tidal response of a basal magma ocean, the molten silicate layer between Earth's solid mantle and liquid iron core.
- Modelling the sharp immiscible interface between the two liquid layers as susceptible to lunar tidal forcing, analogous to atmosphere-ocean boundaries.
- Applying shallow-water theory and solving fluid dynamical problems analytically in Cartesian, cylindrical, and spherical coordinates.

Mathematical Modelling of Boundary Layer Flows Over a Flat Plate

Jan. 2026

Undergraduate Thesis, Supervisor: Prof. S. S. Okoya

- Derived the Prandtl boundary layer equations from the Navier-Stokes equations through non-dimensionalisation and scaling analysis.
- Derived similarity transformations using Lie group scaling and dimensional analysis to reduce the system of non-linear partial differential equations to third-order ordinary differential equations.
- Obtained the numerical solution of the Blasius problem and an exact closed-form solution for the stretching sheet problem.
- Computed the velocity profiles and boundary layer parameters for both models.

Study of Unsteady Viscous Flow Between Oscillating Plates

July 2025

Group Project, Supervisor: Prof. S. S. Okoya

- Derived the governing equation of motion for viscous incompressible flow between oscillating plates.
- Solved for the velocity distribution, shear stress and corresponding frictional force on the plates using analytical methods.

Numerical Analysis with Python

Oct. 2024

Group Project, Supervisor: Dr. D. A. Dikko

- Used Python to explore and compute examples in numerical analysis methods.

Epsilon - Delta Approach to Proving Arithmetic Properties of Differentiable Functions

Mar. 2024

Personal Project

- Used the epsilon-delta definition to prove the arithmetic properties of differentiable functions through foundational concepts of limits and continuity.

Work Experience

International Centre for Applied Mathematical Modelling and Data Analytics,

Federal University Oye-Ekiti

Feb. 2026 – Present

Graduate Research Intern

- Using Mathematics to model the spread of infectious diseases.
- Building expertise in Statistics, R programming, and other essential tools for data analysis and modelling.

Department of Mathematics, University of Ibadan

May 2024 – July 2024

Undergraduate Intern

- Supported research activities as a research assistant.
- Performed computations using Python, SageMath, and Maple.
- Provided technical support for virtual learning platforms, troubleshooting issues for students and the department to enhance remote education experiences.

Teaching and Volunteer Experience

CHRISTAD Foundation, Nigeria

May 2025 – Present

Volunteer Tutor and MathClub Member

- Tutoring mathematics to students ranging from year 1 to A-level in US, UK and Canada.
- Facilitated MathClub activities by introducing engaging mathematics games to secondary school students across Oyo State, Nigeria, to promote interest and participation in mathematics among young learners.
- Participated in the annual summer camp, where I taught mathematics and its applications to junior secondary school students.

Community Development Service: Digital Literacy for All (DL4ALL)

March 2026

Volunteer

- Assisted in delivering a career development programme aimed at expanding access to digital skills and opportunities for young people in Oye-Ekiti, an underserved local government area.
- Contributed to the logistics and coordination of the Oye-Ekiti Digital Career Summit, supporting the digital empowerment of 150 students from the Oye-Ekiti community.

Academic Committee, Department of Mathematics, University of Ibadan

Oct. 2022 – Apr. 2025

Tutor and Mentor

- Provided tutoring support to 40+ students who had difficulties in mathematics and physics courses.
- Provided practice questions and answers to encourage problem solving in these courses.
- Mentored 10 students from first-year to penultimate level, with over 75% attaining top grades in their courses.

Faculty of Science Students' Association Academic Team, University of Ibadan

Aug. 2023 – Nov. 2024

Volunteer Tutor

- Tutored Geometry, Calculus, Electricity and Waves to 100+ faculty students.
- Provided practice questions and solutions for some mathematics courses to encourage academic growth and engagement.

University of Ibadan Research and Development Fair

Nov. 2024

Booth Attendant

- Showcased innovative mathematical research projects, various applications and solutions to real-world problems to academics, industry experts, and stakeholders.
- Contributed to interdisciplinary discussions to highlight the role of mathematical modelling in advancing research and community development initiatives.

University of Ibadan ODE-Integration Bee

2023, 2024

Co – Organiser

- Coordinated event logistics, registration, promotion as a member of the planning committee.
- Marked, recorded and presented participants' results.

Peer Assisted Study Session (PASS), University of Ibadan

Sept. 2023 – Dec. 2023

Mathematics Tutor

- Planned and facilitated study sessions for 25 students in MAT 121 (Calculus and Trigonometry), to improve academic success in the university community.

Leadership Experience

Department of Mathematics, University of Ibadan

Jan. 2022 – Jan. 2026

Class Representative, Class of 2025

- Ensured smooth running of the classroom while serving as a strong link between the lecturers and my colleagues.
- Organised virtual study groups and academic events.
- Represented over 80 students, ensured to represent my classmates in their best interest and kept them well informed.

University of Ibadan Students' Union Academic Help Desk Committee

May 2025 – Jan. 2026

Faculty Representative

- Offered tutoring support to fresh students who had difficulties in mathematics and physics courses.
- Led department academic coordinators to deliver quality tutorial and mentorship.
- Collaborated with other faculty representatives to provide practice questions and their solutions for all undergraduate courses in the university.

Workshops and Conferences Attended

International Conference on Advances in Industrial and Applied Mathematics

Feb. 2026

Theme: Mathematics for Technological Advancement and Sustainability in 21st Century

International Conference and Workshop on Applied Mathematical Modelling and Analytics

Feb. 2026

Theme: Mathematical and Theoretical Biology

46th Annual Quantum Probability School/Conference

Sept. 2025

Theme: Mathematics: Frontiers, Perspectives and Applications

Basel Convention Coordinating Centre for Africa (BCCCA)

Sept. 2025

Plastics Awareness Workshop

IBM Qiskit Fall Fest Event 2024

Oct. 2024

IBM-UI Collaboration Workshop on Quantum Computation for University Students

41st Annual Conference of the Nigerian Mathematical Society

May 2024

Theme: Mathematics, Artificial Intelligence and National Economy

Honours and Awards

- Award of Academic Excellence for Graduating with First Class Honours in the 2024/2025 academic session by the Muslim Students' Society of Nigeria, University of Ibadan Branch.
- Three-time recipient of the Faculty of Science Dean's Roll of Honour Awards for exemplary academic performance in the 2023/2024, 2022/2023 and 2021/2022 academic sessions.
- Three-time recipient of the Department of Mathematics Academic Award of Excellence for the 2023/2024, 2022/2023 and 2021/2022 academic sessions.
- Three-time recipient of the Academic Excellence Award for the 2023/2024, 2022/2023 and 2021/2022 academic sessions by the Muslim Students' Society of Nigeria, University of Ibadan Branch.
- Department of Mathematics, University of Ibadan Most Outstanding Student for the 2022/2023 academic session: awarded for having distinctions in all courses in the 2022/2023 academic session.

Presentations

2026: Undergraduate Thesis Presentation on Mathematical Modelling of Boundary Layer Flows Over a Flat Plate.

2025: Presentation on The 120-Cell at University of Ibadan Research and Development Fair (UIRESDEV), 2025.

2025: Presentation of the report on Study of Unsteady Viscous Flow Between Oscillating Plates, Department of Mathematics, University of Ibadan.

2024: Report presentation on Students Industrial Work Experience Scheme (SIWES), University of Ibadan.

2023: Presentation of the report on Numerical Analysis with SageMath, Department of Mathematics, University of Ibadan.

Technical Skills

Programming & Computation: Python, R, SageMath, Maple, MATLAB

Typesetting & Reporting: $\text{\LaTeX}$, technical report writing

Office Productivity: Microsoft Word, Excel, PowerPoint

Language Proficiency

Language	Listening	Reading	Spoken Production	Spoken Interaction	Writing
English	C2	C2	C2	C2	C1

Self-assessed according to the Common European Framework of Reference for Languages (CEFR).

Visit my portfolio at <https://igbabalola.vercel.app>