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Category 2 Centre
of Excellence

AIMS GHANA

# CONSOLIDATED REPORT

2018 - 2024

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# ABOUT AIMS

The African Institute for Mathematical Sciences (AIMS) is a pan-African network of centres of excellence enabling Africa's talented students to become innovators driving the continent's scientific, educational and economic self-sufficiency. Since its inception in South Africa in 2003, AIMS has trained over 3700 students from across six Centres suited in South Africa, Senegal, Ghana, Cameroon, Tanzania and Rwanda, a testament to its commitment to great opportunities to African youths. AIMS as a network has trained 513 Ghanaians.

At the heart of Africa's scientific transformation, is the African Institute for Mathematical Sciences (AIMS) Ghana; a Centre committed to empowering the continent's brightest minds through cutting-edge scientific training, technological advancement, and innovation for societal impact. With a bold vision to nurture independent thinkers, skilled problem solvers, and visionary innovators, AIMS Ghana continues to play a pivotal role in driving Africa's self-reliance across science, education, industry, and the economy.

Embedded in the core values of Excellence, Equity, Integrity, and Pan-Africanism, AIMS Ghana has spent the past 12 years charting a remarkable path to delivering world-class education, equipping students with practical skills, building strong industry partnerships, and engaging the public meaningfully in science and technology.

Since its designation as a UNESCO Category 2 Centre in 2018, AIMS Ghana's mandate has expanded significantly, leading to notable achievements in research, education, and policy engagement. This report captures the Centre's key milestones, initiatives, and contributions from 2018 to 2024 reflecting our alignment with UNESCO's objectives and AIMS' strategic goals; Scaling Up, Education, Employment and Discovery (SEED).

## SCALING UP

Increasing AIMS' capacity, operational excellence, and organizational sustainability is the core of the SEED goals: it is the foundation on which all other goals can be achieved. Establishing permanent AIMS centers and adding five satellite centers – coupled with strengthened administrative systems and expanded, diversified funding streams – will enable AIMS to scale up all other areas. The training offered at satellite centers will focus exclusively on STEM fields that are in high demand in industry, further diversifying AIMS' offerings and enhancing the employability of its graduates.

## EDUCATION

Education and training are, of course, the heart of AIMS. New satellite centers will allow AIMS to train significantly more master's students, who will go on to apply their skills in research, industry, government, and education across the continent. Training more teachers in gender-responsive teaching methods will allow AIMS to reach and inspire more high school students of all genders to pursue higher education and careers in science, and providing professionals with upskilling courses will increase the contributions of STEM to industry and government.

## EMPLOYMENT

The AIMS mission is to empower talented young Africans to be creative leaders in science and technology. AIMS' focus is therefore on the end goal: on giving its graduates the skills and support they need to become innovators, to seek solutions to real-world problems. Scaling up work integrated learning, internship opportunities, and partnerships with industry will support graduate transition to employment. Establishing incubator programs and investment funds to support graduate entrepreneurship will create more job opportunities for alumni, and boost women's participation in the economy.

## DISCOVERY

Giving brilliant young African women and men the opportunity and resources to pursue basic research will set the scene for dramatic discoveries. As history has shown time and again, one such discovery can have an exponential effect – exciting and invigorating scientists across a region to make further breakthroughs. Scaling up not only AIMS' capacity for research and innovation but its knowledge-sharing and technology transfer activities will ensure that its results have the greatest impact.

**Equipping Africans with the knowledge and skills required to solve key issues of development in Africa.**

*UNESCO Category 2 Objective*

# EDUCATION

## EDUCATION & TRAINING

**651** Young African scholars graduated from

**28** Unique African Countries

**33%** Female Graduates

**316** Other African Nationals trained at AIMS Ghana

**100** High School Teachers trained in masters program across Ghana

**56** Currently enrolled in MSc. Mathematical Sciences

**3** Masters Programs

**30** Visiting lecturers per year on an average

**40** Courses per year on an average

**16** Resident Tutors per year on an average

**24/7** Learning environment

**99** Currently enrolled in MSc. Mathematical Sciences for Teachers students

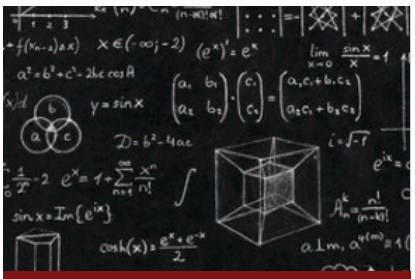
**513** Ghanaians Trained across the AIMS Network

AIMS Ghana in the last 12 years in line with its educational goals, has trained over 650 young and brilliant Africans from 28 countries, equipping them to tackle developmental challenges in their home countries. The Centre trains students in mathematical sciences and its applications to tackle the developmental challenges in Africa.

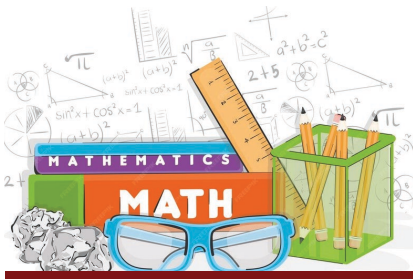
The AIMS model aims to enable Africa's brightest students to flourish as independent thinkers, problem solvers, and innovators capable of propelling Africa's future self-sufficiency.

The Centre focuses on three (3) major main streams which include:

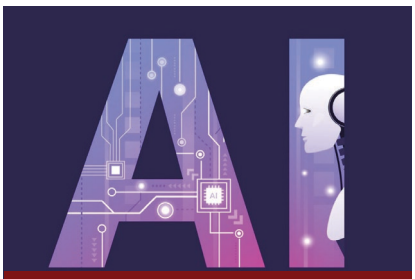
- MSc. Mathematical Sciences
- MSc. Mathematical Sciences - Machine Intelligence
- MSc. Mathematical Sciences for Teachers



**MSC. MATHEMATICAL SCIENCES**




**MSC. MATHEMATICAL SCIENCES FOR TEACHERS (MMST)**




**MSC. MATHEMATICAL SCIENCES -** MACHINE INTELLIGENCE

**The Master of Mathematical Sciences**

This program is the AIMS signature program and offers exposure to a range of topics, providing a broad overview of cutting-edge science and strong mathematical and computer research skills. The goal is to develop well-rounded scientists with excellent problem-solving skills, capable of creative thinking and genuine innovation.

AIMS tuition, study materials and housing are funded through full or partial scholarships, awarded to all accepted students. AIMS' residential nature allows more contact time between lecturers and students than is available in a typical university setting. Students study two subjects for three weeks each, with each day typically comprising morning lectures followed by problem-solving and computing sessions each afternoon. Additional tutorials and special lectures are held in the evenings when students also usually complete their assignments.

With outstanding visiting lecturers from renowned institutions and laboratories worldwide, the courses are broad in scope and employ the latest pedagogical methods to stimulate critical and creative thinking.

**The MSc Mathematical Sciences for Teachers (MMST)**

The MMST program equips teachers with 21st-century mathematical skills towards improved content and methodology and aims to expand knowledge and ensure in-depth understanding of mathematical foundations and modern applications. It challenges learners to be creative and innovative in teaching mathematics and to change the narration grades in High School mathematics.

The MMST modules adopt a learner-centred and gender-responsive approach to improve the quality of teaching at the secondary level and enable teachers to address the specific learning needs of both female and male students. Delivered through a hybrid model (30% residential and 70% online), the MMST programme allows teachers to immediately apply their learning in their classrooms and adapt to contemporary computer-based online teaching and learning environments. A key focus of the MMST is to inspire creativity and innovation in mathematics teaching, thereby increasing young learners' interest in mathematics and science and ultimately building human capital for Ghana and Africa's socio-economic development. The program has graduated over 100 from students Ghana, Kenya, Rwanda and Uganda since inception in 2020.

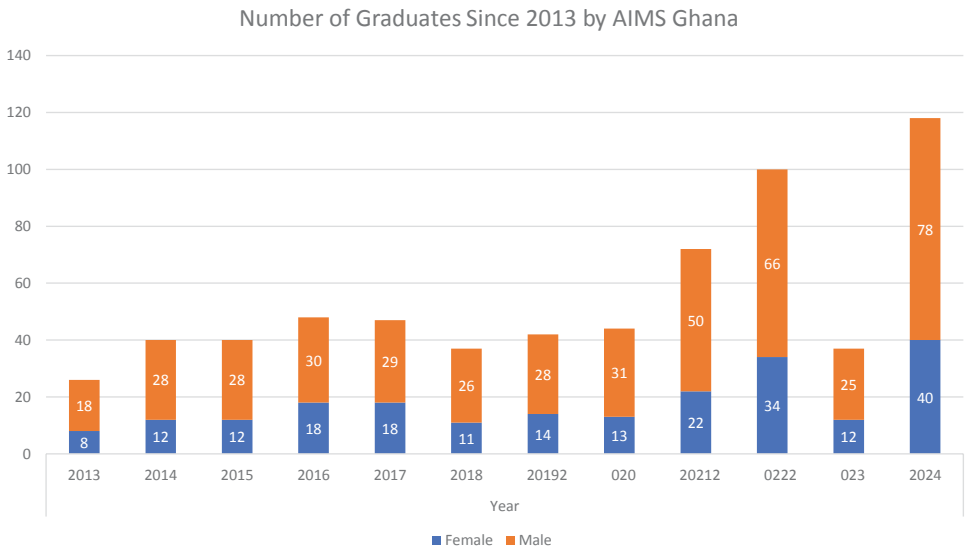
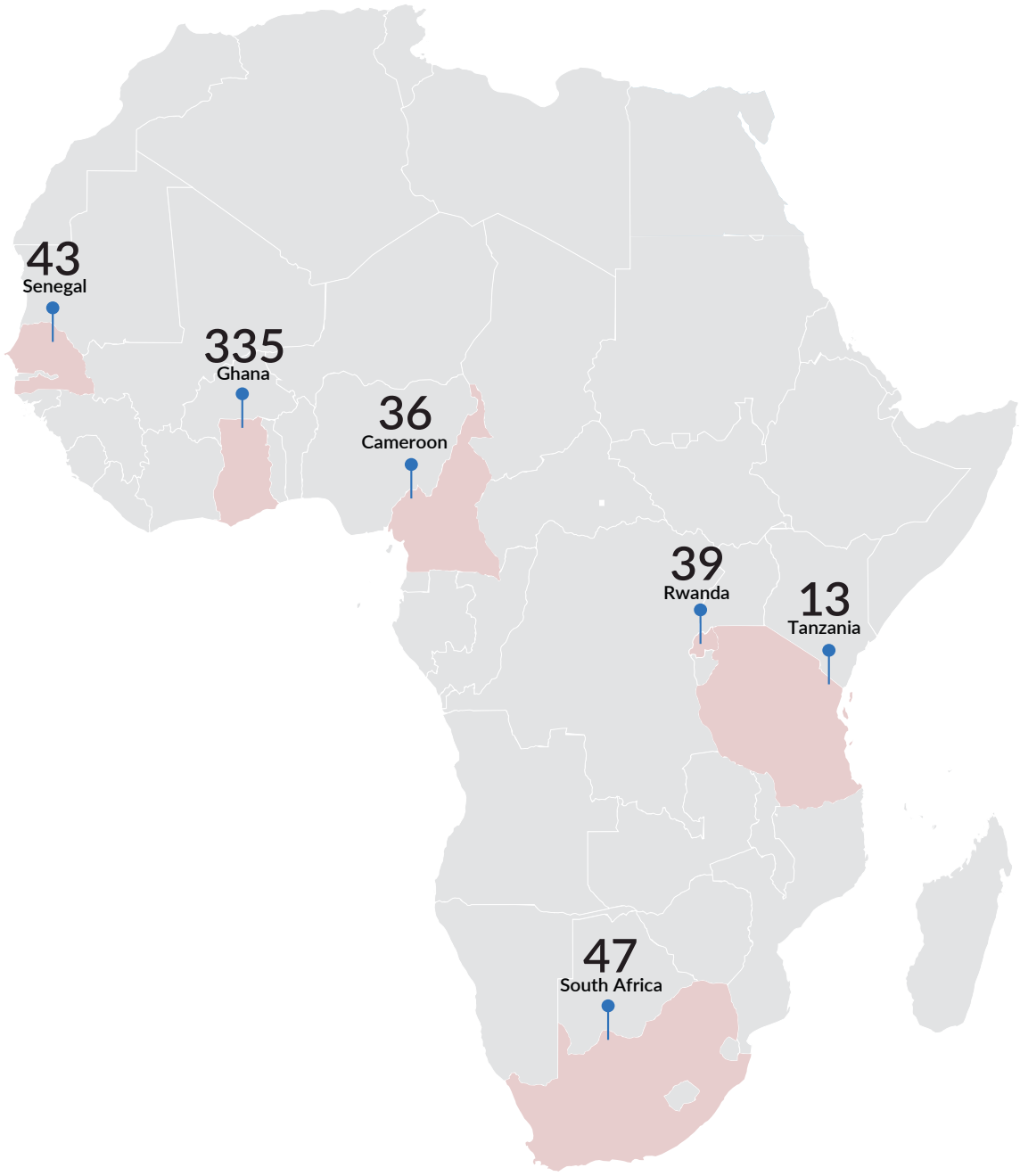



Figure 2:
Total Number of Graduates Trained by AIMS Ghana since 2012 across all three programs

## GHANAIANS TRAINED ACROSS THE AIMS NETWORK



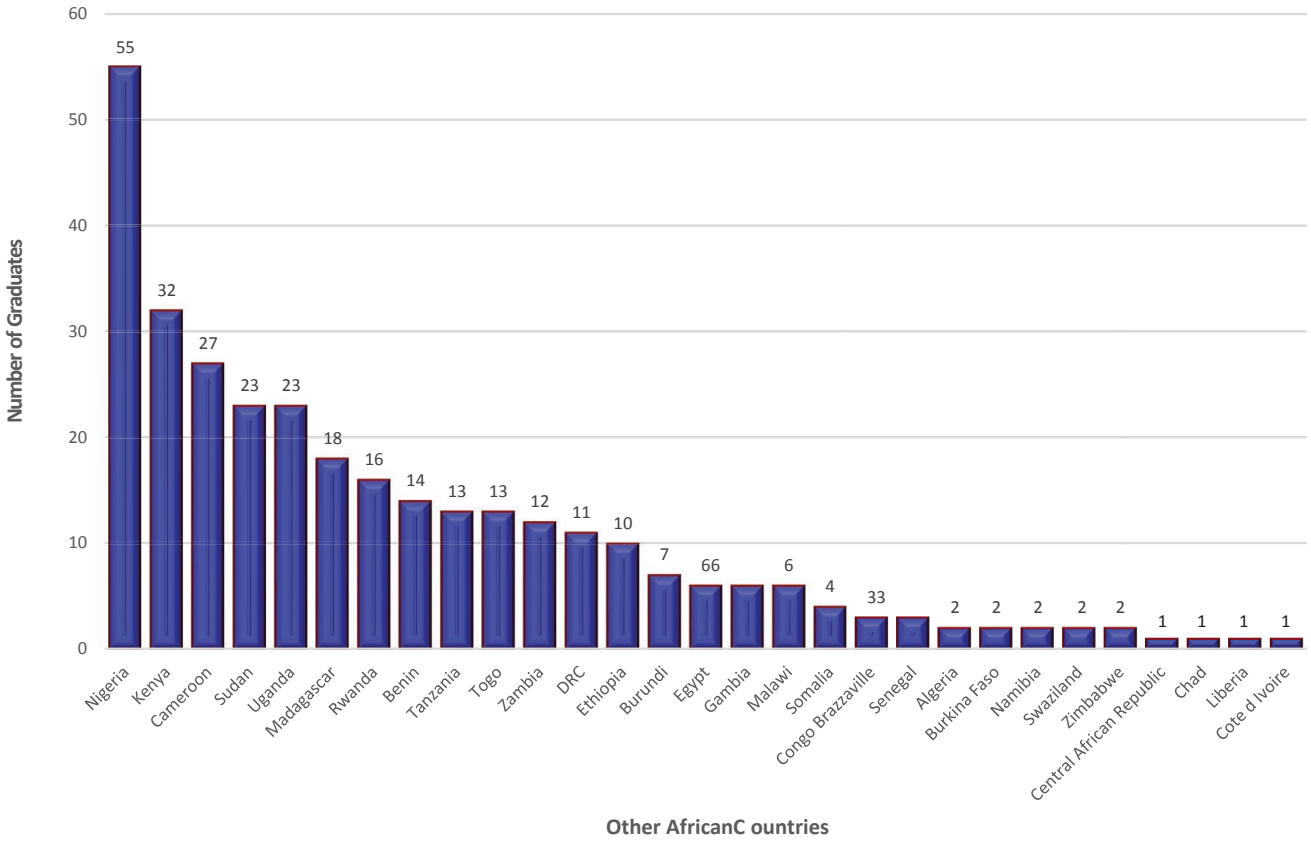

**The MSc. Mathematical Sciences -Machine Intelligence,**

Also known as the African Masters in Machine Intellience (AMMI) provided state-of-the-art training in machine learning and its applications, preparing well-rounded machine intelligence researchers to respond to the present and future needs of Africa and the world.

The AMMI program is run at AIMS in partnership with Facebook and Google and has the exceptional support of the global AI community. The goal of AMMI is to bring the best of AI education in Africa and contribute to building a healthy ecosystem of AI practitioners committed to making a positive impact on our societies.

As a pan-African university, AIMS Ghana has trained 316 other African nationals, equipping them to tackle developmental challenges in their home countries. Some of these graduates have subsequently headed mathematics departments in major universities in their home countries and are contributing to knowledge globally.

## NUMBER OF GRADUATES TRAINED AT AIMS GHANA FROM OTHER AFRICAN COUNTRIES




## OUR PRIDE - GRADUATES MAKING IMPACT ACROSS THE WORLD

**Khadija Iddrisu**
PhD student at the Research Ireland Centre for Data Analytics

My time at the African Institute for Mathematical Sciences (AIMS) was transformative. The fully funded MSc in Mathematical Sciences allowed me to pursue advanced studies in a collaborative, multicultural environment, enhancing my technical and problem-solving skills. Learning from global experts and working with diverse peers prepared me for my career, making me adept at teamwork, analytical thinking, and performing under pressure.

AIMS also fostered key mentorships and professional networks. I was guided by alumna Hanifatu Mumuni and co-founded the Women in Machine Learning & Data Science Accra Chapter to promote women in STEM. My achievements since Leaving AIMS include Best Female Data Analyst/Engineer (Ghana Ladies in Tech Awards 2022) and Business Post's 30 Under 30 (Ireland, 2023). AIMS played a pivotal role in my growth, underscoring the importance of inclusive education and mentorship in STEM.

**Dr. Angela Tabiri**
Research Associate and Academic Manager, AIMS Ghana

At AIMS, I had access to world class lecturers who facilitated learning among motivated students from diverse backgrounds in Africa. My masters dissertation supervisor became my PhD supervisor.

Through mentoring and the excellent opportunities offered at AIMS Ghana, I successfully completed a PhD in Mathematics degree in the UK. I returned to Ghana to support in teaching, research in mathematics and mentoring high school girls through our Girls in Mathematical Sciences Program.

**Elkanah Nyabuto**
PhD Student, University of Glasgow

Growing up, I always had a strong interest in mathematics, but it was challenging to find the right environment and resources to fully explore my potential. Despite the difficulties, I remained focused on my studies, hoping to one day use my skills to make a positive difference.

Joining the African Institute for Mathematical Sciences (AIMS) was a life-changing opportunity. At AIMS, I received high-quality training in data science, applied mathematics, and research. I learned from leading scientists and worked with students from across Africa. The support I received made me feel empowered to dream bigger and achieve more.

Since graduating from AIMS, I have moved on to Phd-level research in areas like air quality and spatial modelling. This journey has opened doors for me and also brought hope to my family, who are proud to see me grow and succeed. It has also inspired others in my community. AIMS didn't just change my future, but it also gave me the tools to uplift others, too.

## Building capacity for African initiative in Science Education, Research and Technology.

UNESCO Category 2 Objective

## THE UNSEEN HEROES - SACRIFICING TO TRAIN FUTURE AFRICAN SCIENTISTS

To ensure a global standard of education and training, our visiting lecturers are assembled from universities across the world with an average of 40 lecturers per academic year. These lecturers are selected by the Academic Council which is made up of professors from our partner universities.

Our quest to search for AIMS students to join the Perimeter Scholars International (PSI) master's program at the Perimeter Institute (PI) motivated us to teach at AIMS. AIMS Ghana turned out to be the best centre for our teaching schedule at Perimeter Institute. We had a great experience teaching the 2019/20 cohort, and that deepened the desire to come back to teach. We are pleased it worked out. The institute is very welcoming, and we had a great time. The classroom experience was superb: the students asked lots of questions and discussed vividly with each other and us during tutorials. The remote situation in this academic year however was not ideal. The students asked lots of questions during the lecture, but I received fewer questions during tutorials."

**Gang Xu**
Perimeter Institute, Lecturer for Quantum Field Theory

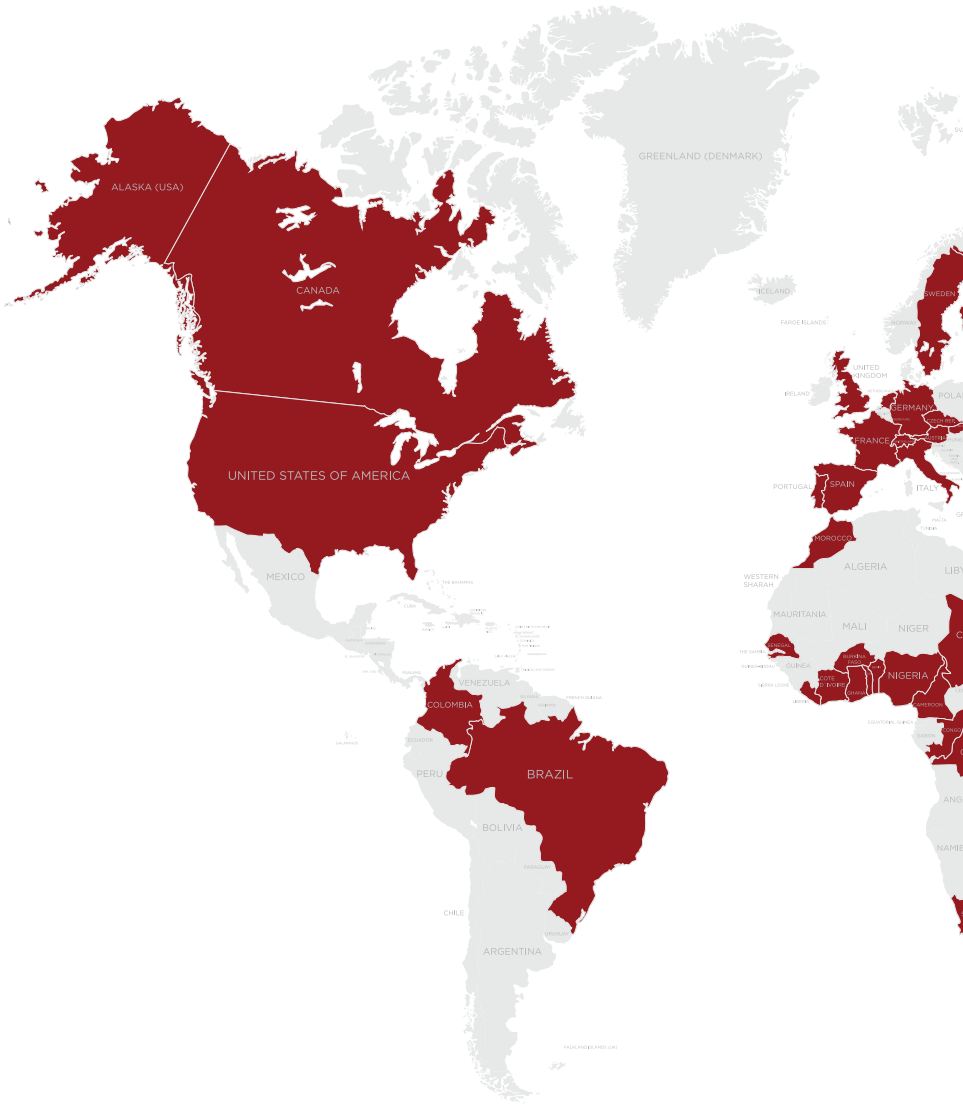
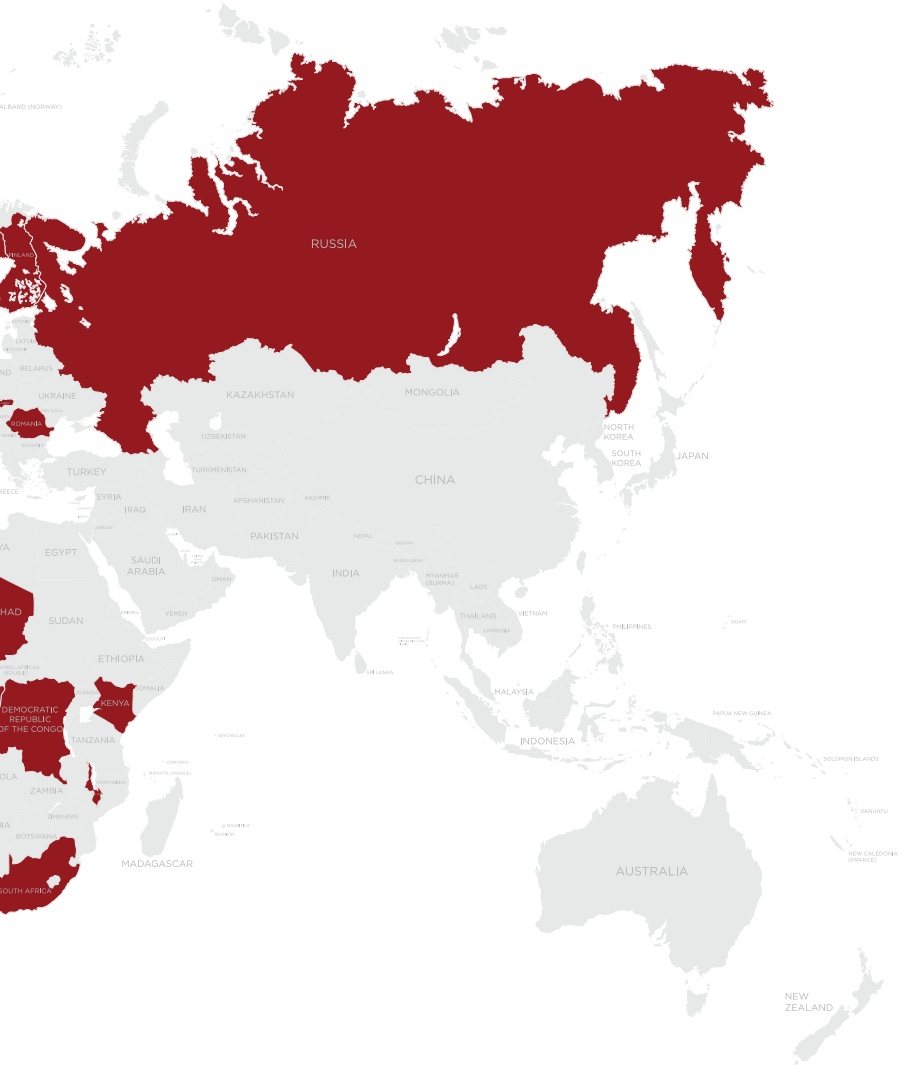



Figure 3: A map showing where our lecturers come from.

## THE RELIABLE AID - OUR TUTORS SUPPORTING STUDENTS TO SUCCESS

The Centre continuously maintains a 24-hour learning environment. To facilitate student participation and follow-up, the Centre offers a Tutoring Fellowship, which permits Postdoc and doctorate researchers to work as dedicated teaching assistants, providing capacity building for the students. Tutors provide after class tutorials to help students get a better understanding of concepts taught during lectures. Tutors also contribute to the assessment of student performance on an ongoing basis, preparing instructional materials and additional exercises as needed.




As a tutor at AIMS Ghana, I feel excited knowing that I am contributing to improving students' academic performance and helping them achieve full potential for their future endeavors. I also enjoy the diversity of the students and lecturers we work with. It allows me to build on my human-relation abilities. Given my experience with research, I have come to learn how to grasp concepts relatively quickly. This skill allows me to do extensive reading beyond the class material. By doing so, I am able to adequately help students when having discussions. Otherwise, I contact lecturers for more information about the course to fully support the students under my care. I hope to see the students from all the cohorts I have tutored, both on the Taught Masters and Teachers Program make good use of the knowledge, skillset and networks they have acquired through AIMS to achieve their goals, irrespective of whether that is further studies or working in the industry."

Jennifer Ahiable is a Researcher at Universitat Autònoma de Barcelona. Her specialization is in Quantum Information and Computing, specifically the theory of Quantum Entanglement.

**Jennifer Ahiable**
Tutor 2020-2023

# Providing the region with a propitious environment for capacity development in the basic sciences

**UNESCO Category 2 Objective**

# DISCOVERY

## RESEARCH

**651** Masters student Thesis

**51** Papers published by our Researchers

**334** Citations

**13** PhD Students so far

**3** Doctoral Degrees conferred

**8** Postdoctoral Fellows so far

**8** Research Faculty

**3** Research Chairs hosted

**15** MPhil / Research Masters

**10** Conferences/ Workshops

**360** Seminars and Talks

## PUBLIC ENGAGEMENT

**120K+** Junior and Senior High School students reached over the past decade

**5** Community outreaches per year by our scholars

**20** Hours dedicated to community impact givebacks per student per year

**120** Girls graduated from Girls in Mathematical Sciences Program (GMSP)

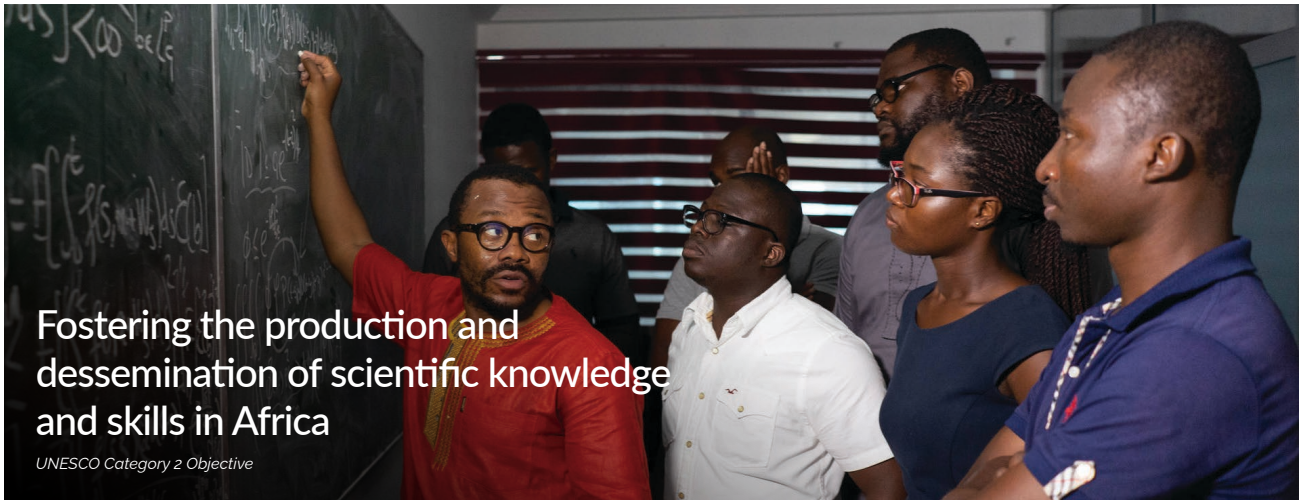
**520+** Teachers benefiting from our Helping Teachers Teach Mathematics Conference (HTTMC)

**200K+** Youth impacted through International Day Celebrations both in-person and online

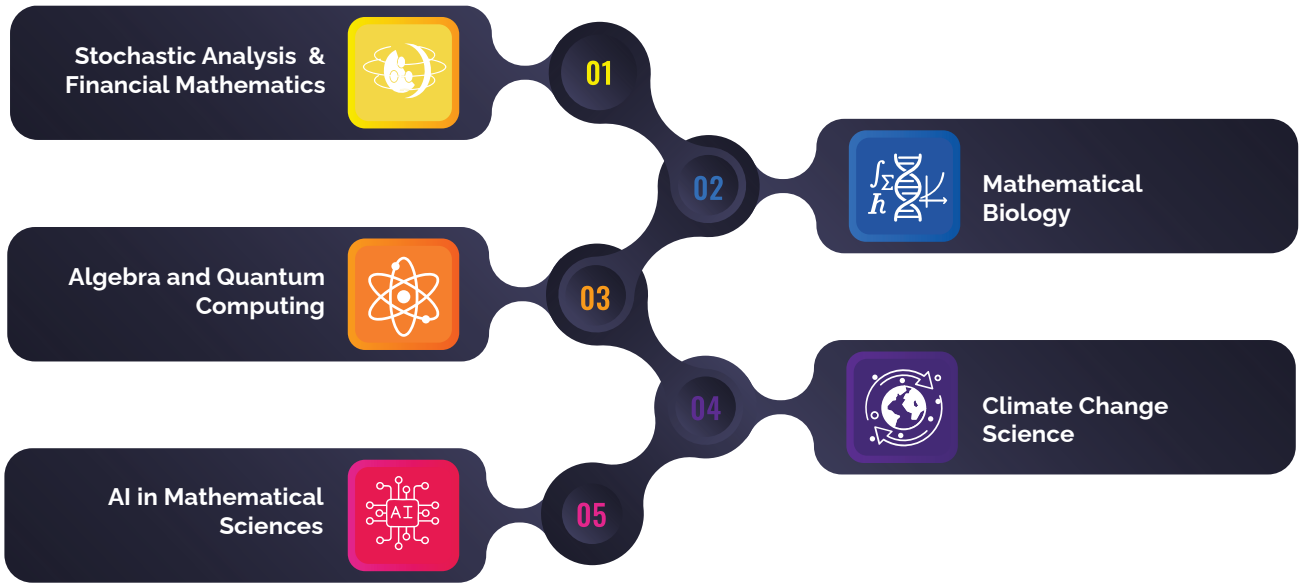
**80%** GMSP alumni enrolled in STEM programs in the University

## EXPLORING FRONTIERS THROUGH GROUNDBREAKING RESEARCH

The research department at AIMS Ghana also known as the 'Research Centre', established in 2014, is a vital component of the Centre, driving research and innovation that contributes to knowledge and development in Africa and beyond. Headed by dedicated Research Chairs, the department fosters partnerships with local universities and research institutions, broadening the available expertise and initiating long-term research programmes within the local academic community. It also actively collaborates with institutions across Africa to ensure strong Pan-African participation in all research programmes, stimulating the growth of pan-African research networks and partnerships. Furthermore, the department connects leading international researchers with African academics and students to develop cutting-edge projects.




AIMS Ghana's Research Centre is a noted hub for hosting visiting researchers from around the globe, fostering a unique environment of interaction and collaboration between resident and visiting scholars. With a focus on explorative research for scientific advancement, the Centre accommodates a diverse group of scholars, including doctoral and postdoctoral researchers. This collaborative atmosphere has contributed to the production of cutting-edge innovations and solutions relevant to the African continent and beyond.



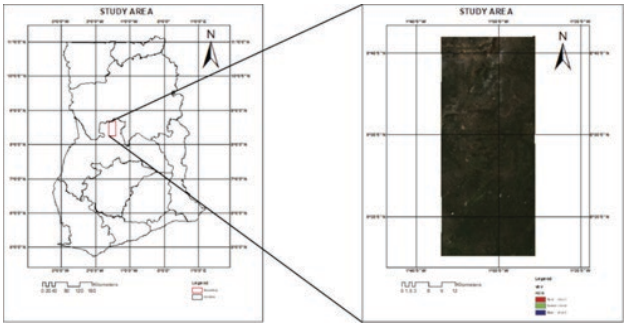
# THE CLIMATIC ANALYSIS OF SUMMER MONSOON EXTREME PRECIPITATION EVENTS OVER WEST AFRICA IN CMIP6 SIMULATIONS

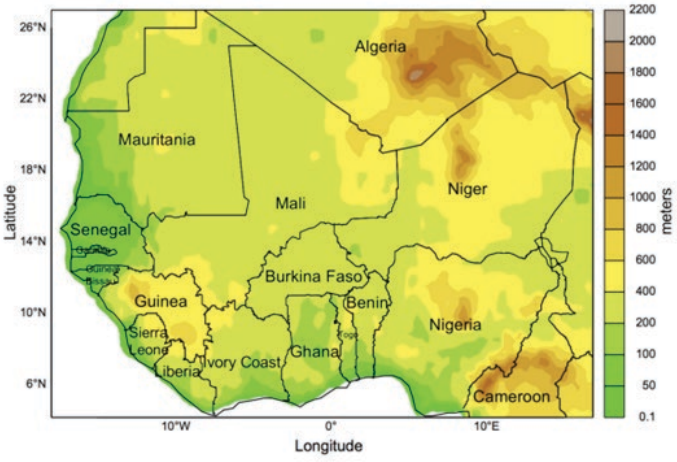
**Prof. Nana Ama Browne-Klutse**
AIMS Canada Research Chair

Climate change is having an adverse effect on the environment, especially in sub-Saharan Africa, where capacity for natural resource management such as water is very low. To inform effective solutions, the scope of this effect on land use types has to be estimated. This study employs the high resolution and internalized calibration (METRIC) method to create evapotranspiration maps for land use, using remotely sensed data from a satellite that is processed and analyzed in ArcGIS. Evapotranspiration (ET) is a major component in the world hydrological cycle, and understanding its spatial dimensions is critical in evaluating the effects it has on regional land use.

Remote sensing-based ET is produced to extract ET in respective land use in the study area (see Figure 1). It is the first of its kind to provide ET data for land use in the location with such spatiotemporal resolution. Therefore, the estimated ET is expected to contribute to understanding of crop water requirement in respective farming communities for sustainable water management.

Precipitation is one of the most complex climatic variables with extensive impacts on agricultural production, water resource, hydroelectric power generation, and the environment at the local and global scale. The focus of this study is to understand this variable by analyzing the daily rainfall characteristics, such as mean rainfall climatology, extreme indices, such as the intensity of rainy days, frequency of heavy rainfall, and extreme events, as well as mean maximum length of dry and wet spells within the monsoon season JJAS over West Africa from 1997 through 2014 (see Figure 2 for a map of the West African region and topography). It is important to assess the performance of the new state-of-the-art CMIP6 models in representing daily precipitation characteristics over West Africa, and the results from this study offer useful information about the precipitation in CMIP6 over West Africa. This can be used to serve as a reference for the new generation of climate models over the continent




Klutse, N. A. B., Quagraine, K. A., Nkrumah, F., Quagraine, K. T., Berkoh-Oforiwaa, R., Dzrobi, J. F., & Sylla, M. B. (2021). The climatic analysis of summer monsoon extremve precipitation events over West Africa in CMIP6 simulations. Earth Systems and Environment, 5, 25-41.

## ON THE VALUATION OF LIFE INSURANCE POLICIES FOR DEPENDENT COUPLED LIVES

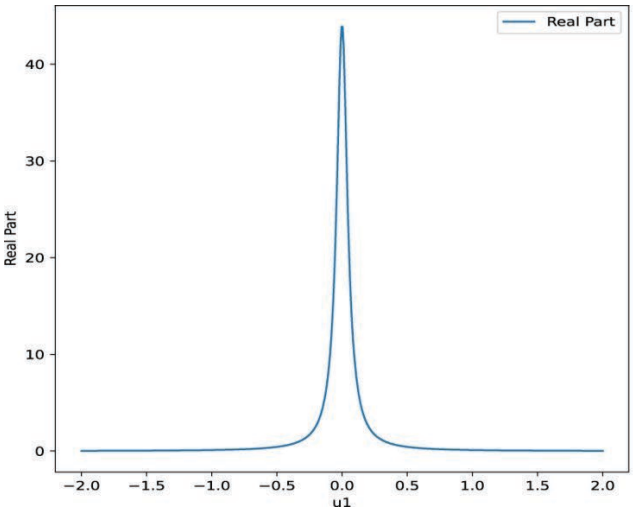
**Prof. Olivier Menoukeu Pamen**
German Research Chair

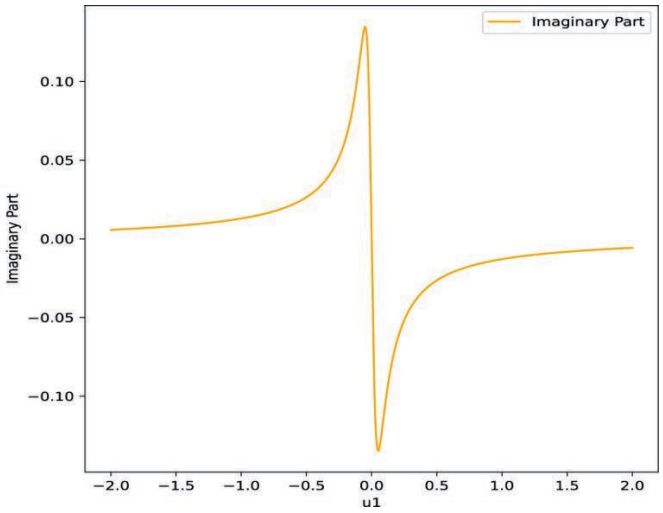
This research paper explores a new type of life insurance policy designed for couples, which offers benefits to surviving partners or their beneficiaries if both pass away. The policy includes three main benefits: a guaranteed payout at maturity (GMAB), a surrender benefit (SB) if the policy is canceled early, and a death benefit (DB) paid upon the death of one or both partners. The goal is to accurately price this policy by considering the financial market risks and the dependency between the couple's lifespans, such as the "broken-heart syndrome," where one partner's death increases the mortality risk for the surviving partner.

The study uses a hybrid model combining real-world mortality risk (under probability measure P) and financial market risk (under risk-neutral measure Q), employing the QP-rule to merge these evaluations. The mortality model accounts for both short-term effects (like the emotional impact of losing a spouse) and long-term adjustments in the surviving partner's health. The financial model uses advanced mathematical techniques, including Lévy processes, to simulate market behaviors like stock prices and interest rates.

Numerical simulations show how factors like surrender rates, guaranteed returns, and mortality dependencies affect the policy's price. For example, higher surrender rates reduce the policy's value, while stronger "broken-heart" effects increase it due to higher risk. The results provide insights for insurers to design competitive products and for couples to understand the pricing of such policies. The paper also suggests future extensions, such as ensuring positive mortality rates or adding periodic benefits, to further refine the model.

Henshaw, K., Koffi, C. H., Menoukeu Pamen, O., & Zeineddine, R. (2025). On the valuation of life insurance policies for dependent coupled lives. Scandinavian Actuarial Journal, 1-36.



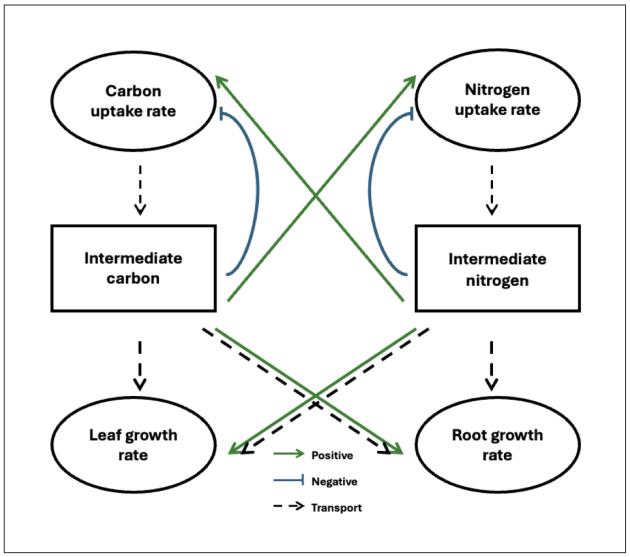
## UNDERSTANDING PLANT GROWTH THROUGH MATHEMATICAL MODELLING OF RESOURCE ALLOCATION

**Prof. Nick Monk**
German Research Chair

Safeguarding and enhancing crop yields and plant biomass in the face of changing climate and soil conditions is a critical global challenge. Addressing this challenge requires a detailed understanding of how plant growth is regulated by environmental conditions. A recently published study by Professor Nick Monk (Humboldt Foundation German Research Chair, AIMS Ghana) in collaboration with Dr Bethany Holland at Michigan State University and Professors Colin Osborne and Richard Clayton at the University of Sheffield, uses mathematical modelling to explore the ways in which plant growth depends on the availability of key nutrients: atmospheric carbon dioxide and soil nitrogen.

Plants harness the Sun's energy through the process of photosynthesis, which requires atmospheric carbon dioxide and occurs predominantly in leaves. However, plant growth also depends on nutrients that are obtained from the soil through plant roots.

Nutrient uptake in the roots and photosynthesis in the leaves are coupled by multiple regulatory and transport feedback loops, and the new study explores mathematical models of these feedbacks and their impact on overall plant growth. The model captures well the principal experimental findings on the response of plants to changes in the availability of carbon dioxide and nitrogen, thus providing a valuable framework for exploring how these can be regulated to optimise yield in specific crop species. It also highlights key areas of uncertainty, helping to focus future experimental studies and plant breeding programmes.




Holland, B.L., Monk, N.A.M., Clayton, R.H. & Osborne, C.P. (2025). Implementing a framework of carbon and nitrogen feedback responses into a plant resource allocation model. in silico Plants, diaf004, https://doi.org/10.1093/insilicoplants/diaf004.

## HIGHLIGHTING THE FIRST PHD. GRADUATES FROM OUR RESEARCH CENTRE

**Dr. Edward Korveh**

Lecturer, Department of Mathematics, University of Ghana

**Dr. Rhoss Beauneur Likibi Pellat**

Postdoctoral Fellow, Dieudonné Mathematics Laboratory, University Côte d'Azur, Nice, France

## PUBLIC ENGAGEMENT FOR INCLUSIVE STEM-DRIVEN IMPACT

AIMS Ghana is deeply committed to public engagement, aiming to nurture STEM talents and foster community involvement as a cornerstone of its educational philosophy. Through a dynamic approach to STEM education, the Centre aims to cultivate a new generation of innovators and problem solvers.

Under the Public engagment strategy, AIMS Ghana focuses on 5 areas:

- The Girls in Mathematical Sciences Program (GMSP)
- The Mastercard Foundation Scholars (Outreach) Program
- The Allotey Maths Camp
- Africa Science Week
- Climate Science Speaker Series
- Green Ghana Day Celebration
- Gender Summit Africa
- Celebration of Scientific International Days

**The Girls in Mathematical Sciences Program (GMSP)** was launched in partnership with UNESCO and the Government of Ghana in 2020. The GMSP is a mentoring program for talented high school girls to nurture their talents in the mathematical sciences with the goal of the girls leading breakthrough advances in STEM and winning international laurels in the next 10 years.This programme mentors and empowers young female high school students to pursue STEM careers through online masterclasses, onsite minicourses, mentorship, and industrial visits. About 1,000 applications from all 16 regions of Ghana were submitted in the last call for the GMSP. The GMSP has successfully graduated over 120 girls, with about 80% of GMSP alumni who are enrolled in universities pursuing STEM courses who are now pursuing STEM programmes in universities across the country and abroad, showcasing its profound impact on promoting gender equality in science. Include the number of secondary schools who have been on the GMSP all three cohorts.

## IMPACT STORIES FROM THE AIMS GHANA GMSP

**Maxima Pegyen Danzi**
Final Year Student of KNUST

Personally, the GMSP was a timely initiative. Through the mentorship, intentional guidance and exposure to the world and endless possibilities of STEM, I got a clear vision of who I wanted to be. The STEM field wasn't an area I was so enthused about, especially because I knew it was male dominated. But I got so much enlightenment and exposure to the many women who have thrived and excelled in various STEM fields, and it inspired me to also challenge myself, knowing that there were others rooting out for me.

I'm currently in my final year in the College of Engineering of the Kwame Nkrumah University of Science and Technology (KNUST) studying Electrical and Electronic engineering, and it has been less burdensome with the GETFund scholarship I received from the GMSP. I'm glad I was guided on this path, and I have other people I'm walking with who have the same motivation I got from GMSP. I'm excited to be called a professional Electrical Engineer in a few years to come.

**Dorcas Afi Mawutor Seshie**
Final Year Student of University of Ghana

The Girls in Mathematical Sciences Program (GMSP) at AIMS-Ghana completely transformed my worldview. Like most science students in my community, I had blindly pursued the default dream of becoming a medical doctor - until GMSP revealed the breathtaking possibilities of mathematical sciences to me. Through its inspiring curriculum and supportive community, I discovered my true passion, which led me to pursue a fully-funded Physics degree with a Computer Science minor at the University of Ghana through GETFUND.

But GMSP's impact reached far beyond academics. The program cultivated in me an unwavering commitment to excellence, leadership, and service. Surrounded by brilliant mentors and peers, I grew into someone who could envision herself making meaningful contributions to STEM. This transformation manifests in my current roles as Vice President of the Physics Students Association, a WAAW Foundation Fellow advocating for girls in STEM education, and an ambassador for the Huawei UG ICT Academy.

**Christabel Akpene Dafeamekpor**
Third Year Student of University of Mines and Technology

Participating in the AIMS Girls in Mathematical Sciences Programme (GMSP) was a transformative experience that reshaped my understanding of mathematics and its application in the real world. Through the program, I got to see that maths is applied in every aspect of my life and it's a powerful tool for problem solving and analytical thinking. The various teaching sessions, though challenging, encouraged me to think outside the box. The coding sessions motivated me to pursue a degree in Computer Science and Engineering at the University of Mines and Technology, Tarkwa.

I also met amazing people from various schools. They created a motivating and supportive environment. AIMS Ghana has a beautiful family. Through the program, I got a supportive and encouraging mentor. The fireside chats from women doing amazing things in their field of work taught me to push beyond my limits in everything I do in spite of challenges that may come. GMPS was more than an academic journey but one of growth, self discovery and empowerment and I would like to thank AIMS Ghana for making me part of this transformative experience.

**Ayi Abigail Welanna**
Third Year Student of University of Mines and Technology

My journey with mathematics transformed dramatically when I was fortunate enough to be selected for the inaugural cohort of the Girls in Mathematical Science Programme (GMSP). This pioneering initiative aimed to bridge the gender gap in STEM fields by nurturing mathematical talent among girls from diverse backgrounds. The AIMS GMS Program ignited a passion for problem-solving within me, and paved the way for my current pursuit – medicine – at the University for Development Studies.The program's emphasis on critical thinking, analytical skills, and creativity profoundly influenced my approach to learning and ultimately guided my career choice.

Personally, I think the AIMS GMSP is more than just a program- it is a community, a catalyst for change and a celebration of girl power in STEM.

**The Mastercard Foundation Scholars Program** at AIMS focuses on developing transformative leadership among scholars, encouraging their active involvement in community and continental development to drive socio-economic change. These scholars, often facing socio-economic challenges, actively engage in give-back initiatives within the local community, such as visiting basic schools to inspire students in mathematics and science and organising annual days of service. Initiatives like the "Bridging Maths Gap Initiative" where scholars dedicate three hours of their time every weekend to teach in community high schools demonstrate the scholars' commitment to outreach and impacting younger generations. Students at AIMS also engage in cleaning exercises in communities they find themselves. They do this by collaborating with Assemblymen and women in the Electoral Areas AIMS operates and speak to the relevance of AIMS in those communities.

**The Allotey Maths Camp**, named in honour of the late Professor Francis K.A. Allotey, aims to instill a passion for mathematics among young people through engaging activities like games, puzzles, programming, and simulations. This annual camp brings together students and volunteers from various regions of Ghana to learn and explore mathematics in a fun and interactive way.

The Centre together with the bi-annually selected Next Einstein Forum (NEF) Ambassador led national activities for the **Africa Science Week**. During these weeks, the Ambassadors organise broad-based events across multiple regions to engage students, educators, policymakers, and the public in science and technology.

## Encouraging learners, particularly girls and boys, to take STEM education and research

*UNESCO Category 2 Objective*


The Centre also spearheads research and public awareness on critical issues such as climate change, participating in national initiatives like the "**Green Ghana**" project. The Climate Science Speaker Series further enhances public understanding of climate change and provides research opportunities for students.


In 2023, AIMS Ghana co-hosted the '**Gender Summit Africa**'. The three day event brought together over 150 participants 50% of which are foreign nations from Africa and the rest of the world to address gender equality in STEM, focusing on research's role in informing policy and practice.


AIMS Ghana actively celebrates international days of observance related to science and mathematics, including the **International Day of Mathematics (IDM)**, the **International Day of Women and Girls in Science** and the **International Day of the Girl Child**. These celebrations involve a wide range of activities, bringing together students, faculty, and the public to highlight the importance of these fields and promote


In the 2022/23 academic year, the Centre led advocacy and communication efforts for the UNESCO Recommendation on Science and Scientific Researchers (RSSR), raising awareness about the importance of ethical conduct, academic freedom, and the role of science in sustainable development. The advocacy exposed many researchers across Ghana to the privileges and rights they have as researchers and how they can capitalise on such privileges to enhance their research findings and reach.

# EMPLOYMENT

The Centre focuses on three pathways after training: further studies, employment, and entrepreneurial ventures. Further studies is currently the dominant pathway, supplying lecturers across Africa and globally. Until the establishment of AIMS, most of the Ghanaian universities lacked competent faculty to handle courses in the Mathematical Sciences. This has changed as AIMS alumni are found in almost all the mathematics departments across the major universities in Ghana. The table below highlights a few of them.

The Centre also introduced courses in Climate Science to introduce students to the challenging influences of the phenomenal and how to mitigate it. Since its introduction, over 30% of AIMS Ghana alumni have gained research positions across the globe to work on Climate Related topics.

AIMS alumni are also valuable employees in fields such as finance, engineering, IT, data science, and healthcare. AIMS Ghana is on track to launch an incubation hub to support alumni and students to nurture their business ideas and train coders who will take up the development of breakthrough technologies to solve African challenges.

## ALUMNI WORKING IN THE VARIOUS UNIVERSITIESIN GHANA

| | Name of Alumni | Title and University of Affiliation | Department |
|---|---|---|---|
| 1 | Dr. Perpetual Saah Andam | Senior Lecturer, University of Ghana | Statistics and Actuarial Science |
| 2 | Dr. Eugene Adjei | Lecturer, University of Ghana | Mathematics |
| 3 | Dr. Edward Korveh | Lecturer, University of Ghana | Mathematics |
| 4 | Dr. Kenneth Dadedzi | Lecturer, University of Ghana | Mathematics |
| 5 | Dr. Ishmael Takyi | Senior Lecturer, Kwame Nkrumah University of Science and Technology | Mathematics |
| 6 | Dr. Bernard Bainson | Lecturer, Kwame Nkrumah University of Science and Technology | Mathematics |
| 7 | Dr. Joshua Kiddy Kwesi Asamoah | Lecturer, Kwame Nkrumah University of Science and Technology | Mathematics |
| 8 | Dr. George Awiakye-Marfo | Lecturer, Kwame Nkrumah University of Science and Technology | Statistics and Actuarial Science |
| 9 | Ms. Philomina Marfo | Ass. Lecturer, Kwame Nkrumah University of Science and Technology | Statistics and Actuarial Science |
| 10 | Dr. Winifried Ayinpogbilla Atiah | Lecturer, Kwame Nkrumah University of Science and Technology | Meteorology and Climate Science |
| 11 | Dr. Angela Tabiri | Academic Manager and Research Associate, AIMS Ghana | Mathematical Sciences |
| 12 | Dr. Abdulzeid Yen Anafo | Lecturer, University of Mines and Technology | Mathematical Sciences |
| 13 | Dr. Hanifatu Napari Mumuni | Lecturer and Head of Department, Tamale Technical University | Statistics |
| 14 | Dr. Emily Asaa Addison | Lecturer, Presbyterian University, Ghana | Mathematics |
| 15 | Dr. Christine Dagbovie | Lecturer, Ashesi University | Mathematics |
| 16 | Dr. Abdul Ghaniyyu Abubakari | Senior Lecturer, Simon Diedong Dombo University of Business and Integrated Development Studies | Statistics and Actuarial Science |
| 17 | Dr Kwabena Owusu Afriyie | Lecturer, University of Energy and Natural Resources | Mathematics |
| 18 | Ms. Wilhelmina Adoma Pels | Lecturer, University of Energy and Natural Resources | Mathematics |
| 19 | Ms. Rhoda Afutu | Ass. Lecturer Sunyani Technical University | Computer Science |
| 20 | Ms. Dorcas Attubea Addo | Ass. Lecturer, University of Education, Winneba | Mathematics |

In 2020, the AIMS-ESMT Industry Immersion Program (IIP), funded by the German Federal Ministry for Economic Cooperation (BMZ) through DAAD, was launched at the Centre with the aim of grooming young scientists graduating from AIMS for industry positions. The 20-week IIP included intensive business and soft skills training and a minimum of 3 months internship with an industry partner.

**Courses taken under the AIMS-ESMT IIP**

Introduction to General Management

- Data and Decisions
- Data Analytics in Business for Mathematicians
- People, Teams and Organisations
- Marketing and Sales
- Finance and Accounting
- Agile Leadership
- Entrepreneurial Strategy
- Soft skills and communication

**Summary Beneficiary Report on the AIMS-ESMT IIP**

The AIMS-ESMT IIP Summary Beneficiary Report from 2020 to 2022 shows a steady increase in the number and diversity of beneficiaries across several African countries. In 2020, a total of 15 participants benefited from the program, with Ghana leading at 8 beneficiaries, followed by Kenya (4), and one each from Nigeria, Cameroon, and Rwanda. The following year, 2021, saw a slight increase to 15 participants again, with Ghana's contribution rising to 11. Nigeria, Kenya, and Sudan each had one or two beneficiaries, reflecting consistent engagement from a few key countries.

By 2022, the program experienced a notable expansion, reaching 22 beneficiaries from seven countries. Ghana continued to dominate with 12 participants, while Kenya and Uganda followed with 3 each. Additionally, Gambia, Tanzania, Zambia, and Cameroon each had one beneficiary, indicating broader outreach and inclusion of new countries in the program. This growth over the three years reflects AIMS-ESMT's sustained efforts to enhance regional representation and impact across the continent.

To strengthen entrepreneurial capabilities of African youth, AIMS in partnership with Science Po undertook the 'Bettering Entrepreneurial Training in Africa (BETAF)' project to understand what African universities can do to enhance the support they render to students and alumni, the output of the project has been a great contributor to AIMS Ghana's Innovation Hub.

The StArfrica Project, a collaboration with the University of Koblenz and Startup Germany Africa, also aims to foster collaboration between German and African start-ups, further boosting entrepreneurial opportunities for Ghanaian youth.

## TURNING IDEAS INTO REAL-WORLD SOLUTIONS - INNOVAMIS

Despite AIMS's success in producing top-tier scientific talent, there remains a critical gap between academic excellence and real-world impact. Many students and researchers generate innovative ideas, yet only a few are transformed into tangible solutions that address Africa's most pressing challenges. Innovate AIMS is the answer to this gap—a bold initiative designed to unlock the full potential of Africa's brightest minds by bridging the divide between research, innovation, and entrepreneurship.

Innovate AIMS is more than just an innovation hub; it is a movement. It provides a structured and collaborative environment, both physically and virtually, where students, researchers, startups, and entrepreneurs can take their ideas from concept to impact. Whether it's pioneering breakthroughs in agriculture, climate resilience, health tech, clean energy, or artificial intelligence, Innovate AIMS will equip innovators with the tools, mentorship, and networks needed to bring their ideas to life.

## TOP FIVE INDUSTRIES THAT EMPLOYS AIMS ALUMNI

At its core, Innovate AIMS is built on three pillars:

**CREATIVITY & EXPERIMENTATION:**
A dedicated space to ideate, prototype, and test groundbreaking innovations.

**MENTORSHIP & LEARNING:**
Access to expert guidance, structured programs, and industry partnerships.

**COLLABORATION & IMPACT:**
A vibrant community where like-minded problem-solvers work together to create scalable and sustainable solutions.

Through structured programs such as hackathons, accelerators, reverse innovation boot camps, and international exchange programs, AIMS Ghana will evolve into a premier innovation powerhouse, connecting talent across the Pan-African network and beyond.

# SCALING UP

## ORGANIZATIONAL EXCELLENCE AND INSTITUTIONAL STRENGTHENING

In our continuous pursuit of academic distinction and impactful societal contribution, AIMS has prioritized organizational excellence and institutional strengthening as key pillars of sustainable growth and scaling up. In this period under review, AIMS made significant strides to enhance governance structures, streamline operational processes, invest in capacity development, and reinforce accountability mechanisms. These efforts are not only aimed at improving internal efficiency but also at positioning AIMS through strategic partnerships as a resilient, future-ready institution capable of responding to evolving educational and research demands.

### HIGH PROFILE VISITS

**President of Imperial College London visits AIMS Ghana**

The President of Imperial College London, Professor Hugh Brady paid a working visit to the African Institute for Mathematical Sciences (AIMS) Ghana on Wednesday, 13th November 2024, to engage with the leadership of the Centre on ways of strengthening collaboration and partnership between the two institutions, building on shared commitment to advancing scientific education and research in Africa.

Professor Brady in his remarks indicated that AIMS remains one of Imperial's key educational partners in Africa, creating a brighter and more sustainable future for global society through nurturing the next generation of leaders, researchers, and entrepreneurs. He assured AIMS of the commitment of Imperial to grow the partnership and collaboration even further to ensure that Africa's brightest youth receive world class training and education that prepares them to be part of contributing to matters of development across the globe.

**President & Vice Chancellor of University of Waterloo Visits AIMS Ghana**

AIMS Ghana had the privilege of hosting a distinguished delegation from the University of Waterloo (UWaterloo), on December 8, 2023, led by Dr. Vivek Goel, the esteemed President and Vice-Chancellor (UWaterloo). The purpose of their visit to Accra was to explore collaborative opportunities with prominent educational institutions in Ghana, fostering stronger ties between the two countries, specifically with institutions like Ashesi University and AIMS Ghana. The delegation from Waterloo had an exciting session with AIMS Ghana Master's students at the Centre to better understand how their academics were structured and give them insight into some higher education opportunities that they consider at the University of Waterloo.

**Visit by a Team from Saviynt**

A team of Cybersecurity experts from Saviynt visited AIMS Ghana on 30th May 2022, under the auspices of Choice Secure, a company the team hope to establish in Ghana to specialize in providing cybersecurity services. Discussions focused on establishing collaborations between the two institutions to train people in cybersecurity.

## PARTNERSHIP AGREEMENTS

**AIMS signs MoU with German Government; to build capacities of Maths, Science students**

The Africa Institute for Mathematical Sciences (AMIS) and the German Government have signed a partnership with the aim of building the capacities of mathematics and science students in Africa. The partnership will help train the students to acquire knowledge to enable them to conduct high level research that would solve some of the numerous challenges in the fields of public health, finance, social and economic issues, as well as problems with education and technology, among others.

At a brief signing ceremony in Accra in 2019, the President of AIMS, Mr Thierry Zomahoun, signed on behalf of AIMS while the German Federal Minister of Education and Research, Ms Anja Karliczek, signed on behalf of the German Government.

**AIMS partners with Google to pursue joint research interests while strengthening research collaborations in Africa**


In advancing the frontiers of scientific research in areas of specialization like artificial intelligence, the African Institute of Mathematical Sciences – Ghana (AIMS Ghana) signed a Masters Sponsored Research Agreement (MSRA) with Google Research in May 2022. The agreement seeks to further strengthen the partnership between both institutions as part of efforts to enforce their ongoing commitment to collaborate and advance computing and technology in Africa. AIMS Ghana welcomed a delegation from Google's Research Centre on a mission to re-establish and build on its partnership with AIMS. The visit was led by Google's Prof Yossi Matias, who was received at the AIMS Ghana Centre by the AIMS Global CEO, Ms. Lydie Hakizimana, as well as Management, students and staff of the Centre.

## INSTITUTIONAL ADVANCEMENT

**Construction of AIMS Ghana Permanent Campus at Katamanso**

Following the allocation of a five Acre land at Katamanso by the Ministry of Education, The Center has initiated discussions with LifeForms (which is a Ghanaian registered company that specializes in infrastructure project development and financing for mainly public sector organizations) to explore the possibility of providing an Engineering, Procurement and Construction (EPC) services to AIMS Ghana through the Ministry of Education. Subsequently, on 27th October 2022, a meeting was held with the Minister of Education to present the preliminary architectural designs and proposals for the construction of the AIMS Ghana Campus. During the meeting, the Minister directed that designs and proposals be submitted to the Ministry for further discussions with the Ministry of Finance.

Subsequently, the Ministry of Finance has listed the construction of the AIMS Ghana campus project as part of the approved list of public investment projects in the medium term in the 2022 budget statement submitted to parliament in November 2021.

**Re-Accreditation**

AIMS Ghana submitted the necessary documentation to the Ghana Tertiary Education Commission (GTEC) for the Regular Master Programme re-accreditation. The GTEC is the institution that ensures all tertiary education institutions in Ghana apply the highest quality standards and relevance of teaching, learning, and research programmes.

As part of the process, the GTEC visited the centre for the initial programme assessment exercise on 28th June 2022 and have continually engaged with the Centre to get it re-accredited.

## AIMS GHANA DIGITAL COMMUNICATION REPORT SUMMARY (2021–2024)

**Social media & Website Growth**

Over the past three years, AIMS Ghana has seen consistent growth across its digital communication platforms:

### X (FORMERLY TWITTER)

**Organic Follower count:**

- 1,573 - 2020/2021
- 2,451 - 2021/22
- 3,281 - 2023/24
- 4005 – Present

**Cumulative Posts (2021-2025):**

985 X posts and 820 Facebook posts including daily academic and research updates, outreach activities, engagement on international day celebrations and coverage of institutional events.
https://twitter.com/AIMSGhana

### FACEBOOK:

5,854 in 2021 to 8,818 followers presently
https://www.facebook.com/AIMSGH

Reach increase from 45,528 in 2021 to 128,300 Facebook users currently.

### WEBSITE:

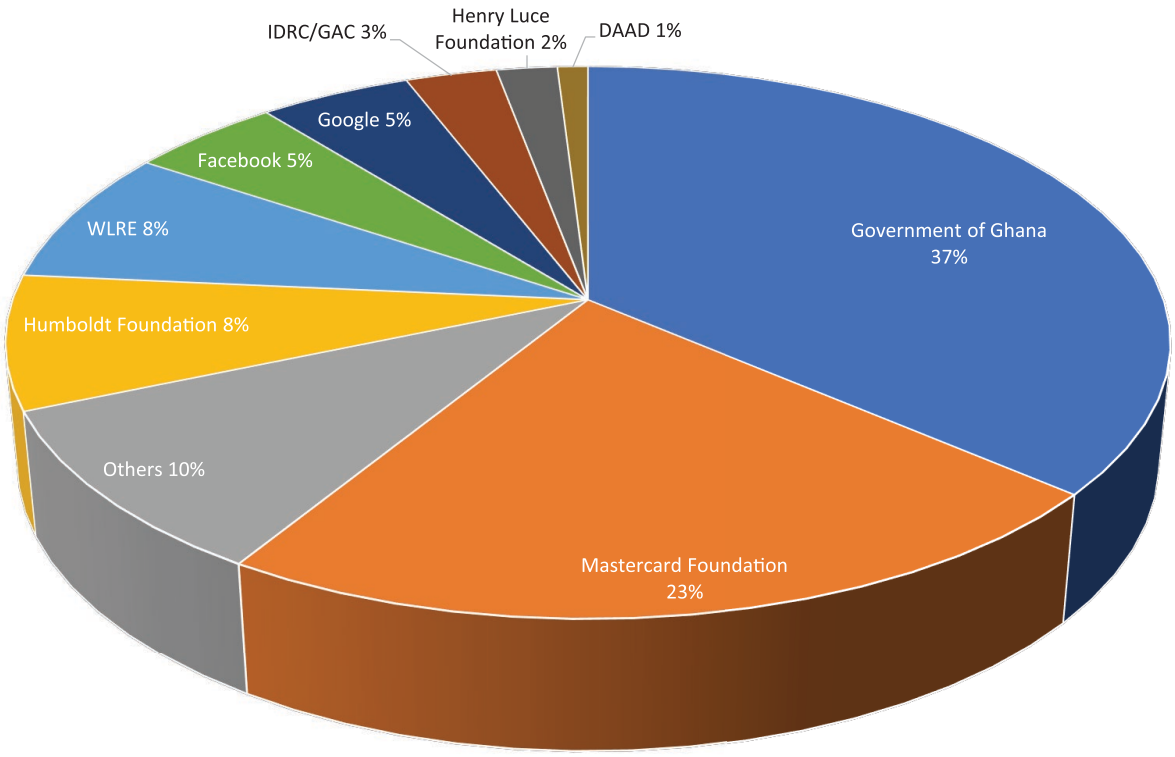
87 news stories and blog posts published between 2021 and 2025.

Key content included program reports, outreach activities, alumni features and special events coverage. Website updates also incorporated student and tutor profiles, redesigned content for internal newsletters, and fact sheet statistics.
https://aims.edu.gh/newsroom/

# FINANCIAL REPORT

This section presents an overview of the organization's financial performance and position over the period from 2019 to 2024. It highlights key trends in revenue, expenses, and the overall financial health of AIMS Ghana. These highlights provide insights into the effectiveness of strategic decisions during this period.

## SUMMARY OF FUNDING TO AIMS GHANA (2019-2024) - USD 12.5M




*WLRE- Waivers of liability by related entities

## AIMS GHANA FUNDING DETAILS - USD 12.5M (2019-2024)

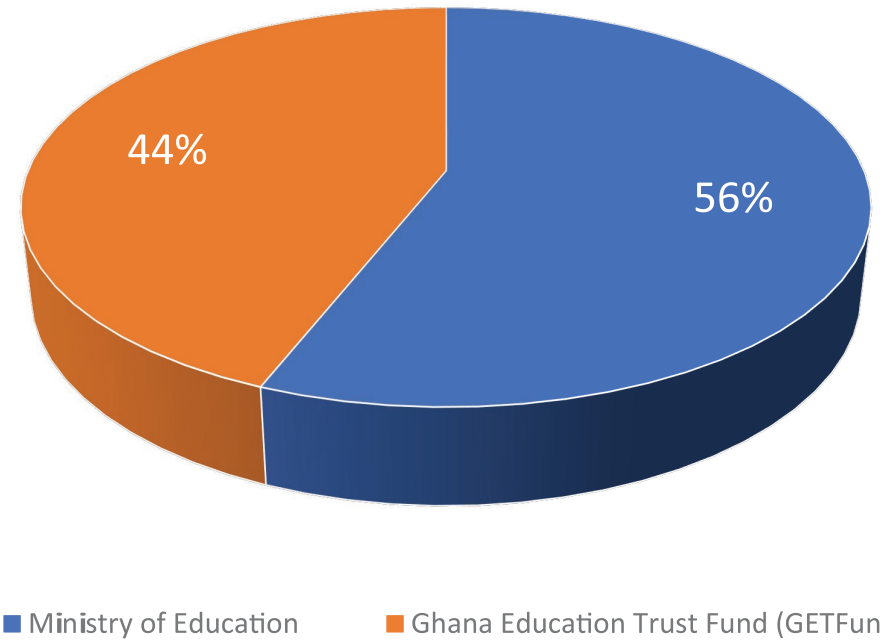
| Donor/Partner | 2024 | 2023 | 2022 | 2021 | 2020 |
|---|---|---|---|---|---|
| Government of Ghana | 642,726 | 516,609 | 528,720 | 1,256,723 | 911,459 |
| IDRC/GAC | - | 72,000 | 172,694 | 63,479 | 21,000 |
| Mastercard Foundation | 697,252 | 514,588 | 451,027 | 397,148 | 477,744 |
| Henry Luce Foundation | 55,000 | 134,000 | - | - | - |
| Canergie Corporation Funds | - | 2,013 | - | - | - |
| University of Koblenz | 28,819 | 10,334 | - | - | - |
| Google | 20,000 | - | - | - | 300,000 |
| University of Ottawa | - | - | - | - | 29,080 |
| University of Waterloo | 10,000 | - | - | - | 18,420 |
| Interest on fixed deposits | - | - | - | - | - |
| Facebook | - | - | - | - | 600,000 |
| Mastercard Unrestricted | - | - | - | 250,000 | - |
| Humboldt Foundation | 288,484 | 203,951 | 166,004 | 83,914 | 181,515 |
| Waiver of liabilities by related entities* | 63,118 | 85,104 | 65,182 | 88,357 | 418,602 |
| Germany Academic Exchange Services (DAAD) | - | - | 8,792 | 21,825 | 55,346 |
| Deep Learning Indaba | 16,817 | - | - | - | - |
| Imperial College of Sci, Tech and Med | 6,480 | - | - | - | - |
| Carnegie Corporation RCP in Data Science | 9,900 | - | - | - | - |
| Bill & Melinda Gates Foundation Grant | 1,620 | - | - | - | - |
| Individual donation | 0 | - | - | - | 67,645 |
| Income from disposal of assets | 0 | - | - | - | 3,080 |
| Other Income (Exchange Gains) | 275,434 | 157,920 | 243,041 | - | - |
| Miscellaneous income | 0 | 25,738 | 14,828 | 2,399 | 12,722 |

## SUMMARY OF EXPENSES BY PROJECT – USD 12M (2019-2024)

## STATEMENT OF FINANCIAL POSITION (2019-2024)

| | 2024 | 2023 | 2022 | 2021 | 2020 | 2019 |
|---|---|---|---|---|---|---|
| | US$ | US$ | US$ | US$ | US$ | US$ |
| ASSETS EMPLOYED: | | | | | | |
| Non-current assets | - | - | - | - | - | - |
| Property and equipment | 25,000 | 5,919 | 25,051 | 211,801 | 426,664 | 14172 |
| Right-of-use Assets | 872,913 | 46,834 | 330,312 | 635215 | 0 | 0 |
| Total Non-current assets | 897,913 | 52,753 | 355,363 | 847,016 | 426,664 | 14172 |
| Current assets | | | | | | |
| Accounts receivable and prepayments | 6,260 | 10,657 | 5,121 | 13,338 | 18,182 | 143537 |
| Cash and bank balances | 509,918 | 16,476 | 46,984 | 284,586 | 68,174 | 84033 |
| Total current assets | 516,178 | 27,133 | 52,105 | 297,924 | 86,356 | 227570 |
| Total assets | 1,414,091 | 79,886 | 407,468 | 1,144,940 | 513,020 | 241742 |
| | | | | | | |
| EQUITY AND LIABILITIES: | | | | | | |
| Equity | | | | | | |
| Reserves | -122,014 | -267,815 | -361,614 | 221,071 | 396,497 | 12041 |
| Non-current liabilities | | | | | | |
| Lease Liabilities | 559359 | 0 | 17,469 | 293509 | 0 | 0 |
| Current liabilities | | | | | | |
| Accounts payable and accrued expenses | 820,254 | 309,308 | 475,574 | 225,379 | 116,523 | 229701 |
| Lease Liabilities | 156,492 | 38,395 | 276,039 | 404981 | 0 | 0 |
| Total current liabilities | 976,746 | 347,703 | 751,613 | 630,360 | 116,523 | 229701 |
| Total liabilities and reserves | 1,414,091 | 79,888 | 407,468 | 1,144,940 | 513,020 | 241742 |

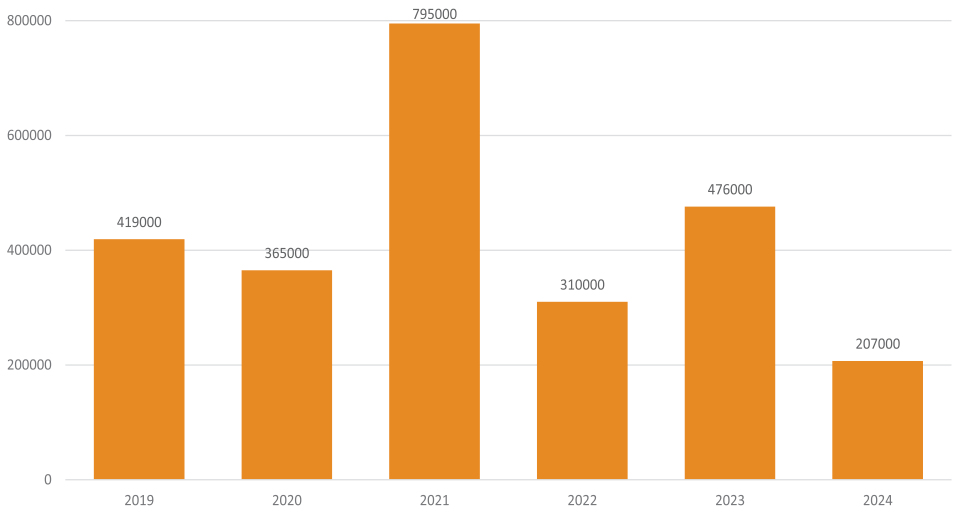
## DISTRIBUTION OF GOVERNMENT FUNDING TO AIMS GHANA (2019-2024) - USD 4.6M



## GHANA EDUCATION TRUST FUND (GETFUND)

Total Contribution - (2018-2024)

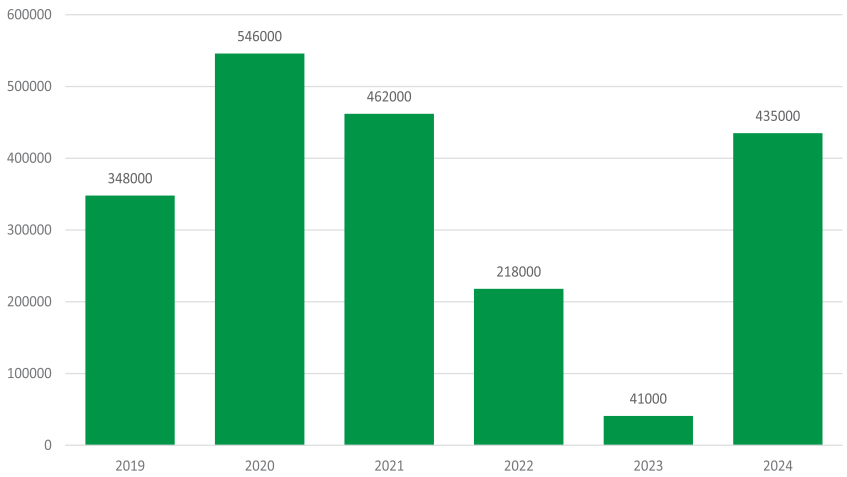
**USD 2.5M**




## MINISTRY OF EDUCATION

Average Annual Contribution - (2018-2024)

**USD 0.4M**



**GETFund Expenditure by Projects**

All figures in GHS

| Project Description | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| Taught Masters Project | 1,336,763 | 1,161,938 | 3,663,841 | 3,415,062 | 7,634,101 | 3,754,617 |
| Program Management | 986,328 | 544,043 | 676,813 | 620,059 | 736,497 | 342,565 |
| Research Chairs | 175,451 | 71,820 | 433,510 | 1,113,579 | 439,182 | 375,249 |
| Teachers Training Project | 802 | - | 426,078 | 313,911 | 751,112 | 198,373 |
| Honours Project | - | - | 627,937 | 684,724 | 458,689 | 377,543 |
| Quantum Leap Africa | - | 83,311 | 39,012 | 44,190 | 14,364 | 16,768 |
| Alumni | - | - | 12,713 | 25,695 | - | - |
| **Total** | **2,499,344** | **1,861,112** | **5,879,904** | **6,217,221** | **10,033,945** | **5,065,116** |

**Ministry of Education Expenditure by Projects**

All figures in GHS

| Project Description | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| Taught Masters Project | 1,142,932 | 1,688,979 | 2,140,532 | 2,276,708 | 615,916 | 7,675,304 |
| Program Management | 843,311 | 790,813 | 395,416 | 413,373 | 59,420 | 700,283 |
| Research Chairs | 150,011 | 104,396 | 253,270 | 742,386 | 35,433 | 767,097 |
| Teachers Training Project | 686 | - | 248,928 | 209,274 | 60,599 | 405,521 |
| Honours Project | - | - | - | - | - | - |
| Quantum Leap Africa | - | 121,100 | 22,792 | 29,460 | 1,159 | 34,277 |
| Alumni | - | - | 7,427 | 17,130 | - | - |
| **Total** | **2,136,939** | **2,705,289** | **3,068,365** | **3,688,331** | **772,528** | **9,582,481** |

# APPENDIX 1

## LIST OF PUBLICATIONS

**The following are some list of publication by the research team within the period under review:**


1. A.-M. Bogso and O. Menoukeu Pamen: Malliavin differentiability of solutions of hyperbolic stochastic partial differential equations with irregular drifts. ALEA: Latin American Journal of Probability and Mathematical Statistics (accepted), (2023)
2. P. H. Takam, R. Wunderlich and O. Menoukeu Pamen: "Modeling and Simulation of the Input-Output Behavior of a Geothermal Energy Storage." Mathematical Methods in the Applied Sciences. (accepted), (2023)
3. H. L. Nyandjo-Bamen, J.-M Ntaganda , A. Tellier and O. Menoukeu Pamen: Impact of imperfect vaccine, vaccine trade-off and population turnover on infectious disease dynamics. Mathematics. (2023)
4. O. Menoukeu Pamen and L. Tangpi: "Maximum principle for stochastic control of SDEs with measurable drifts." Journal of Optimization Theory and Applications. 197: 1195-1228, (2023). (24p).
5. O. Menoukeu Pamen, G. Xu and X. Zhuo: "Finite Difference Scheme versus Piecewise Binomial Lattice for Interest Rates under the Skew CEV Model." Quantitative Finance. 23 (5), 843-862 (2023). (20p)
6. A.-M. Bogso, M. Dieye and O. Menoukeu Pamen: "Stochastic integration with respect to the local time of the Brownian sheet and regularisation properties of Brownian sheet curves." Bernoulli, 29: (4) 2627-2651, (2023). (25p)
7. S. Dai and O. Menoukeu Pamen: "An algorithm based on an iterative optimal stopping method for Feller processes with applications to impulse control, perturbation, and possibly zero random discount problems". J. Comput. Appl. Math. 421, 114864 (2023). (24p) https:// doi.org/10.1016/j.cam.2022.11486
8. A. Babi Babi, M.Dieye and O. MenoukeuPamen: "Strong convergence of the EulerMaruyama approximation for SDEs with unbounded drift". Stochastic Analysis and Application. 41 (3), 545-563 (2023). (19p)
9. A.-M. Bogso, M. Dieye, and O. Menoukeu Pamen: "Path-by-path uniqueness of multidimensional SDE's on the plane with nondecreasing coefficients". Elect. J. Probab. , 27: 1–26, (2022). (26p)
10. R. M. Mbala, D. J. Fotsa-Mbogne, J. M. Nlong, O. Menoukeu-Pamen, J.-R. Kala-Kamdjoug: "Optimization of Wi-Fi direct average time to discovery: a global channel randomization approach". Optim Eng (2022). https://doi.org/10.1007/s11081-022-09749-w
11. R. L. Pellat, O. Menoukeu Pamen and Y. Ouknine:" A class of quadratic forwardbackward stochastic differential equations". J. Math. Anal. Appl., 514 (2) 126100, (2022). (39p)
12. P. Imkeller, O. Menoukeu Pamen, G. dos Reis and A. R´eveillac:"Rough Weierstrass functions and dynamical systems: the smoothness of the SBR measure". Pure and Applied functional Analysis. Special issue on Differential Equations and Dynamical Systems dedicated to Professor Peter Kloeden on the occasion of his 70th birthday. Accepted (2022). (29 p)
13. P. Liu, O. Menoukeu Pamen and L. Tangpi: "Strong solutions of forward-backward stochastic differential equations with measurable coefficients". Stochastic Processes and their Applications. 144, 1–22, (2022). (22 p)
14. O. Menoukeu Pamen, G. Xu and X. Zhuo: Finite Difference Scheme versus Piecewise Binomial Lattice for Interest Rates under the Skew CEV Model. Quantitative Finance, accepted (2022)
15. K. Henshaw, C. Constantinescu and O. Menoukeu Pamen: "Stochastic Mortality Modelling for Dependent Coupled Lives". Risks. 2020, 8, 17; doi:10.3390/risks8010017. (28 p)
16. Aidoo, K., Browne Klutse, N. A., Asare, K., Botchway, C. G., & Fosuhene, S. (2021). Mapping Evapotranspiration of Agricultural Areas in Ghana. Hindawi: The Scientific World Journal, 7.
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# APPENDIX 2

## LIST OF DONORS AND AMOUNT CONTRIBUTED

| Donor/Partner | Amount in USD |
|---|---|
| Government of Ghana | 4,622,678 |
| Mastercard Foundation | 3,087,438 |
| Alexander Von Humboldt | 1,050,526 |
| Waiver of Liabilities by Related Entities | 932,600 |
| Other Income (Exchange Gains | 676,395 |
| Facebook | 600,000 |
| Google | 420,000 |
| IDRC / GAC | 379,172 |
| Henry Luce Foundation | 189,000 |
| DAAD - Deutscher Akademischer Austauschdienst | 120,825 |
| Carnegie Corporation | 112,232 |
| Miscellaneous Income | 90,172 |
| University of Koblenz | 39,153 |
| University of Ottawa | 29,080 |
| University of Waterloo | 28,420 |
| UNESCO | 21,749 |
| Deep Learning Indaba | 16,817 |
| Investment Income | 9,583 |
| Imperial College | 6,480 |
| Youth Challenge International | 3,632 |
| European School of Management and Technology | 3,582 |
| Bill & Melinda Gates Foundation Grant | 1,620 |
| STEMBEES | 1,521 |
| ZINDI Award | 1,260 |
| Pensions Alliance Trust Fund | 1,243 |
| Ministry of Energy | 520 |
| Individual Donations | |
| Lucy Quist | 62,295 |
| Laura Clark | 2,326 |
| Lya Fichmann | 2,272 |
| Georg Bader | 1,389 |
| Ulrich Kreahmer | 1,300 |
| Anthony Lawrence | 1,200 |
| Prof Wolfgang Konig | 1,184 |
| Michael Ruzhansky | 810 |
| Federico Andrei | 600 |
| Marta Waclawczy | 600 |
| Alessandro Crim | 450 |
| Mr Dirk Gilbson | 448 |
| Prof Alexander Drewitz | 367 |
| Dr Michael Scherer | 300 |
| Clement Ampadu | 300 |
| Deepak Kar | 300 |
| Nick Monk | 300 |
| Johannes Muller | 300 |
| Prof Dirk Becherer | 251 |
| **Grand Total** | **12,522,691** |

# APPENDIX 3

## MAJOR PUBLIC OUTREACHES AND LINKS TO MEDIA PUBLICATIONS

| Event | Link to Publication |
|---|---|
| Francis Allotey Public Lecture | https://www.graphic.com.gh/news/general-news/african-youth-future-in-science-bright-professor-neil-turok.html<br>https://thebftonline.com/2022/08/16/global-scientists-eulogise-late-prof-allotey-on-his-90th-birthday/<br>http://www.businessghana.com/site/news/general/268401/African-youth-future-in-science-bright-Professor-Neil-Turok<br>https://gna.org.gh/2022/08/lets-increase-investments-in-science-to-prevent-more-pandemics-prof-turok-to-africa/ |
| UNESCO Recommendation on Science and Scientific Research (RSSR) Advocacy | https://gs.uds.edu.gh/news/aims-collaborates-with-ktcsr-uds-to-organize-training-on-the-unesco-recommendation-on-science-and-scientific-researchers-rssr<br>https://citinewsroom.com/2023/03/aims-ghana-uds-celebrate-the-international-day-of-mathematics-in-tamale/<br>https://gs.uds.edu.gh/news/aims-collaborates-with-ktcsr-uds-to-organize-training-on-the-unesco-recommendation-on-science-and-scientific-researchers-rssr |
| Conference in Mathematics and its Applications | https://newsghana.com.gh/conference-on-mathematics-applications-held-in-accra/ |
| Signing of MoU with CENDLOS | https://www.myjoyonline.com/aims-ghana-partners-cendlos-to-implement-online-mathematics-and-computing-courseware-for-jhs-and-shs-students/ |
| International Day of Women and Girls in Science Celebration | https://www.myjoyonline.com/aims-ghana-holds-historic-8th-international-day-of-women-and-girls-in-science-in-ghana/<br>https://www.ghanaiantimes.com.gh/aims-ghana-marks-8th-un-day-for-women-girls-in-science/ |
| International Day of Mathematics Celebration | https://www.myjoyonline.com/aims-ghana-uds-celebrate-international-day-of-mathematics-in-tamale/<br>https://citinewsroom.com/2023/03/aims-ghana-uds-celebrate-the-international-day-of-mathematics-in-tamale/ |
| Gender Summit | https://citinewsroom.com/2023/06/aims-ghana-portia-limited-host-gender-summit-africa-2023/<br>https://www.myjoyonline.com/gender-summit-africa-2023-open |
| The StArfrica Project | https://www.myjoyonline.com/germany-government-launches-initiative-to-support-innovative-start-ups-in-ghana/#:~:text=22%20May%202023%205%3A20pm%20The%20German%20government%20has,entrepreneurs%20in%20the%20area%20for%20the%20German%20market |
| Graduation Ceremonies | https://citinewsroom.com/2022/06/aims-ghana-graduates-100-msc-in-mathematical-science-students/<br>https://citinewsroom.com/2023/08/aims-ghana-holds-11th-graduation-ceremony/<br>https://3news.com/news/education/fifty-eight-aims-graduates-obtain-msc-in-mathematical-sciences-degree/<br>https://www.modernghana.com/news/1147931/stem-agenda-will-increase-science-to-humanity-rati.html<br>https://ghanaiantimes.com.gh/ministry-of-education-to-transform-teaching-of-mathematics-dr-adutwum/<br>https://citinewsroom.com/2021/07/government-to-establish-girls-stem-shs-in-accra-adutwum/ |
| Helping Teachers Teach Mathematics Conference (HTTMC) | https://3news.com/news/aims-ghana-in-collaboration-with-cemc-waterloo-train-mathematics-teachers-across-africa/ |

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