Training Africa’s Top Mathematical Scientists
About AIMS

The African Institute for Mathematical Sciences (AIMS) is a pan-African network of Centres of Excellence for post-graduate training, research and public engagement in mathematics with a mission to lead the transformation of Africa through innovative scientific training, technological advances, breakthrough discoveries, strategic foresight and innovative policy design.

Founded in 2003 in South Africa and later replicated in Senegal, Ghana, Cameroon, Tanzania and Rwanda under the framework of the Next Einstein Initiative, AIMS is feeding the STEM pipeline by training African students for a Master’s in Mathematical Sciences, including a co-operative option with a direct link to industry. The network also offers research programs, with 90 researchers currently conducting studies under the tutelage of prestigious Research Chairs across the network. In addition to a gender-responsive Teacher Training Program currently implemented in Cameroon and Rwanda, AIMS equally created two critical initiatives: Quantum Leap Africa to prepare the continent for the coming quantum revolution and the Next Einstein Forum to propel Africa on to the global scientific stage.
We’re enabling Africa’s youth to shape Africa’s future

We are leading Africa’s socio-economic transformation through

Innovative scientific training / Technical advances & discoveries / Strategic foresight & policy design

How are we doing this?

AIMS Centres of Excellence
Research Centres / Chairs
Quantum Leap Africa
AIMS Industry Initiative
Gender Responsive Teacher Training
Next Einstein Forum

AIMS Ecosystem of Transformation

AIMS Centres of Excellence

Our students come from 43 countries

2018 centres of excellence

6

1,692 Alumni as of July 2018
(32% are women)
Five Facts about AIMS Senegal

• AIMS Senegal was the second centre of excellence (out of 6 centres) of the AIMS network to be created under the framework of the Next Einstein Initiative in 2011.

• AIMS Senegal has trained 272 students, with 68 of them being women—240 in the Taught Master’s and 32 in the Co-operative Master’s.

• The first edition of the Next Einstein Forum took place in Senegal in March 2016, under the patronage of President Macky Sall.

• All our students dedicate 20 hours to mandatory community service activities each year.

• We have a gender equality and inclusion framework targeting at least 30% females within the student body each year.
Our Programs

AIMS Senegal offers the following programs:

**CO-OPERATIVE MASTER’S:** A work-integrated learning program spanning through 18 months – 10 months of course work and 6 to 8 months of internship with appropriate industry, followed by the defence of their findings. This program targets students with a background in mathematics or relevant sciences, strong leadership skills, with an engagement to invest in their communities. The Co-op Master’s offers specializations in Big Data, Computer Security and Financial Mathematics.

**TAUGHT MASTER’S:** 10 months of course work and research, culminating in the defence of their dissertations. All our students are selected through a rigorous application process and must have studied mathematics or related sciences for 4 Years (B.Sc. (4 years) or Master’s). All AIMS students benefit from full scholarships.

**SKILLS FOR EMPLOYABILITY:** Designed to find solutions to development challenges in Francophonie Africa by facilitating school-to-work transition for students in STEM, this program targets the following beneficiaries, 30% of whom must be women: 200 Co-op Master’s students, 360 Post AIMS Business Certificate (PAB) students (160 online and only women and 160 face to face), as well as 2 250 Massive Open Online Courses (MOOC) beneficiaries – we are targeting students from 13 partner institutions within the Francophonie region.

**RESEARCH CENTRE:** The Chair of Research in Mathematics and its Applications (with the support of DAAD and the Alexander von Humboldt Foundation) is conducting research with doctorate and post-doctorate researchers, in collaboration with universities in Senegal and abroad. Our Chair, Professor Mouhamed Moustapha Fall is currently supervising 8 doctorate researchers, with a record of 2 recent PhDs and 8 Master’s degrees defended under his tutelage.
Our Students

We are currently training two cohorts of 76 students comprising:

- **34** Co-op students of the 2017/2018 cohort (**7** Female and **27** Male) and **42** students of the 2018/2019 cohort (**14** Female and **28** Male), pursuing the Taught (**17**) and Co-op Master’s (**25**) in mathematics.

- The students benefit from the experience of world-renowned visiting Professors who give lectures for a period of 3 weeks on a rotational basis.

- Permanent follow-up and capacity building is provided by the Tutors who are always available on campus, to provide a 24-hour learning environment.

- With backgrounds in Mathematics, Engineering, Physics, Computer Science, as well as Actuarial Science, combined, our current students are nationals of 19 African countries, namely Benin, Burundi, Burkina-Faso, Cameroon, Chad, Congo Brazzaville, Côte d’Ivoire, Democratic Republic of Congo, Ghana, Kenya, Madagascar, Mauritania, Niger, Nigeria, Rwanda, Senegal, Sudan, Tanzania and Uganda.
Alumni Spotlight

NDEYE MBEUGUET NIANG (2015/2016 Cohort)
Senegal

Prior to joining AIMS Senegal, Mbeuguet studied Mathematics and Computer Science at Université Gaston Berger. She carried out her Co-op internship at the Centre of Networks and Information of the Ministry of Higher Education, where using Java and Hadoop, she prepared a sharing framework to accommodate the data, converting and modelling it to facilitate its accessibility to users. Her work was so compelling that during her defence in February 2017, ATOS offered her a position as Data Scientist. Now working for Sonatel-Orange as Data Scientist Manager for Orange Sierra Leone, she nurses the dream of creating a software system more performant than Google.

HUBERT KANYAMAHANGA (2015/2016 Cohort)
Rwanda

After studying Applied Mathematics at the University of Rwanda, Hubert joined our first cohort of Co-op Master’s students. He interned for 8 months at Wutiko, a social networking company where he learned, as a Data Scientist, how to apply theoretical knowledge of Big Data to solve real life problems. He currently works as Senior Software Developer at Wutiko.

NDEYE SIGA BEYE (2016/2017 Cohort)
Senegal

Siga came to us from Université Gaston Berger with a passion for networking. She quickly distinguished herself in the Co-op program, gleaning an internship at Neurotech where she deepened her knowledge in Pascal, C, Java, Python, R, Html, PHP, Android, Latex, Scala (Spark), etc. After graduation, she was hired at Neurotech as a Data Analyst.
Community Service

Every year, our students are expected to volunteer at least 20 hours, with the goal of strengthening their leadership skills as well as their commitment to invest in Africa. Designed to foster transformative leadership, community service aims to hone the personal development and leadership qualities of our students, equipping them with the tools necessary to lead the transformation of continent.
Our Industry Partners

The AIMS Industry Initiative was designed to expand and diversify the organisation's partner base to propel greater direct industry involvement in our training model. An essential part of our co-operative education program, this initiative has facilitated the transition to employment of our students through professional training within partner companies. The surge in the number of industry partners across the network (from 33 industry partners last year to around 50 this year) is a clear indication of the increase in the demand for skills offered by our programs. Our industry partners have realized that AIMS is a pool of human resources where they can go to tap from skills in mathematical science, which are relevant to their business sectors. AIMS Senegal is constantly seeking new avenues to create and formalize partnerships in a bid to fully integrate the Senegal ecosystem of technology and innovation, towards the development of the continent. 83% of our Co-operative Master's graduates have found employment 6 months after graduation.
Testimonials

“Canada is committed to investing in young people, especially women in the domain of science, which can play a huge role in the African continent. We have complex challenges to address and it’s important to equip the youths with entrepreneurial skills, so they will in turn invest in their communities.”

LISE FILIATRAULT
Canadian Ambassador to Senegal
*The Skills for Employability program is funded by Global Affairs Canada.*

“We found that they had a very solid scientific program – on the other hand, we felt the training was a little theoretical. A year later, they came back to us saying, we made some changes...we want to co-develop a Master’s in Big Data and Computer Security. That’s the flexibility of AIMS.”

MOMADOU NDOYE
Director of Operations, Atos
*Atos has hired 6 AIMS Senegal alumni post-internship, since the inception of the Co-op Program.*

“AIMS is a reference institution where students benefit from quality training in the mathematical sciences, a field which a technological start-up like Wutiko finds indispensable for its international influence.”

KÉMO TOURÉ JR.
CEO, Wutiko
*Wutiko has hired 3 AIMS Senegal alumni post-internship, since the inception of the Co-op Program.*

“Ever since the AIMS Coop students became available on the market, I have seen concrete changes in the start-up ecosystem. These talents are an unexpected resource allowing our local start-ups and businesses to be more ambitious and develop better products. My wish is for this program to be consolidated, specifically helping students transition from the academic to the professional world.”

CAMILLE KRAMER
Designer, Co-Founder, YUX
*Camille has been working with AIMS Senegal as a consultant in entrepreneurship and co-creation.*
Institutional Partners

AIMS-NEI has been able to thrive thanks to the commitment of our partners in advancing science and technology in Africa. Here are some of our key partners:

**THE GOVERNMENT OF SENEGAL** has been a long-standing partner of AIMS Senegal from its inception, in terms of accreditation (on-going), funding and public engagement.

**MASTERCARD FOUNDATION**, in November 2014, partnered with AIMS to support 30% of all admitted students from 2015/2016 to 2018/2019, targeting 503 scholarships including the Co-op Masters in Mathematical Sciences and the Teacher Training Program in Cameroon. Launched in March 2018, the Leaders in Teaching Initiative is supporting the Teacher Training Program in Rwanda.

**GLOBAL AFFAIRS CANADA** is currently funding the Skills for Employability Program, which is built upon the Co-op Master’s, targeting 200 AIMS Co-op students, 320 Post-AIMS Business Certificates and 2250 beneficiaries of Massive Open Online Courses across Francophonie Africa.

**THE ALEXANDER VON HUMBOLDT FOUNDATION**, together with **DAAD**, is supporting the Endowed Chair of Research in Mathematics & its Applications. This program is beneficial to doctorate and post-doctorate researchers across Africa.

**THE UNIVERSITY OF OTTAWA**, in 2010, partnered with AIMS with the goal of growing strong links between AIMS Senegal, the AIMS Global Network and the University of Ottawa. The partnership comprises the One for Many Scholarship Program, collaborative research, faculty and student exchanges, the Canadian Queen Elizabeth II Diamond Jubilee Scholarships (QEIIIDJ), the Head start initiative, as well as the recruitment of up to 4 AIMS students into the University’s PhD program annually.
Success Stories

RESEARCH

Led by the Endowed Chair of Research in Mathematics and its Applications, the AIMS Senegal Research Centre is one out of the six Research Centres across the AIMS global network. Our current Chair, Professor Mouhamed Moustapha Fall is mandated to lead innovative research and scientific breakthroughs via supervision of doctorate and post-doc researchers, as well as collaborations with local and foreign universities through faculty exchange visits, hosting annual research schools, etc.

Last May 4th, AIMS Senegal witnessed its first ever PhD defence, featuring two researchers: Ignace Aristide Minlend from Cameroon defended a PhD in Differential Geometry and Applications with a thesis titled: “Solutions aux problèmes surdéterminés sur les variétés” while El Hadji Abdoulaye Thiam from Senegal presented a thesis titled “L’Influence de la courbure sur certaines inégalités fonctionnelles.” Conferred by the Université Cheikh Anta Diop (UCAD) Dakar, the research for both theses was conducted under the tutelage of AIMS Senegal’s Endowed Chair of Research in Mathematics and its Applications, funded by the Alexander von Humboldt Foundation, and DAAD.
UNIVERSITY OF OTTAWA PARTNERSHIP

The University of Ottawa has been one of the most significant international academic partners of AIMS-NEI over the past several years. Initiated in 2010, this partnership, in addition to funding, has provided a framework for the conception and implementation of programs, in line with the agendas of AIMS and uOttawa. Here are some of the main programs.

The AIMS HeadStart Initiative received a grant to allow five AIMS graduates to do a 6 month research internship at uOttawa during the 2013-2014 academic year, three of whom continued their studies at uOttawa. This was followed by a second grant which permitted three other AIMS graduates to conduct a 6 month research internship in 2015-2016, one of whom continued their studies at uOttawa.

The QEIIDJ Scholarship, through the uOttawa international bureau has provided an exchange forum for up to twenty-seven uOttawa Co-op students (by December 2019) through the AIMS-NEI Secretariat, the Next Einstein Forum and the AIMS Industry Initiative.

Book donation – AIMS-NEI acknowledges the generous donation of over 2,000 used math books to AIMS Senegal from the uOttawa Department of Mathematics.

Capacity Building – Gaby St Pierre and Anne Fannon, Directors of the uOttawa and uWaterloo Co-op Offices respectively led a two day capacity building workshop at AIMS Senegal in May 2018. The workshop identified a series of capacity and systems building areas in the AIMS Co-op program. As a result, AIMS Canada and the AIMS Industry Initiative are developing a comprehensive plan to leverage international partnerships and mobilize knowledge in order to advance AIMS’ mission of becoming a reference point for work integrated learning (WIL) across Africa.

The University of Ottawa has so far admitted eleven AIMS Senegal alumni, with ten currently pursuing doctorate research at the university, with at least twenty-four AIMS Senegal students working with uOttawa thesis supervisors.
Tutors

Dr. Cheikh B. Ndao  
Physics (Condensed Matter)

Dr. Oumy Niass  
Applied Statistics

Dr. Mouhamad Ayalla  
Financial Mathematics

Dr. Ignace A. Minlend  
Geometry Analysis

Zoe Hamel  
Graphs Theorem

Dr. Saliou Diouf  
Geometry Analysis (Material Sciences)

Kwabena Owusu  
Statistics, Expended Ds

Jean Claude Utazirubanda  
Statistics-Probability

Michel Seck  
Mathematics – Cryptography

Mbaye Faye  
Statistics-Probability
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Logistics & Facilities Manager

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Bilingual Program Officer, SFE

Oumalkhaire Oubed  
Administrative & Finance Officer

Sylla Diagne  
Driver

Amadou Cisse  
Director SFE & Programs

Professor Moustapha Fall  
Research Chair

Mohamed Lamine Diallo  
IT Manager

Souleymane Konte  
IT Database Specialist, SFE

Marieme Sarr  
HR Officer

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AIMS Senegal, Training Africa’s Top Mathematical Scientists
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