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Deep Learning INDABA

South Africa’s first Deep Learning Indaba was held at the University of the Witwatersrand between 10 and 15 September. The event hosted approximately 300 students and practitioners from 22 African countries, the UK and the USA. The aim of the conference was to establish an understanding of the principles of machine learning and deep learning as well as foster new continental collaborations.

Dr Bubacarr Bah, the German Research Chair based at AIMS South Africa was part of the Advisory Board and one of the speakers at the event. The workshop was also attended by Dr Pierre-Yves Lablance and Dr Etienne De Vos, postdoctoral fellows, Mr Emmanuel Dufourq, a PhD student and Research Master’s students: Mr Mhlasakululeka Mvubu; Mr Felician Jordan Masakuna, Ms Alice Nanyazi; Ms Innocenter Amina; Ms Zaifirah Banon Hosonie and Mr Thabang Doreen Lebese, a Structured Master’s student.

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Student News

All students for the August intake have now arrived, 41 students (including 16 women) from 17 African countries, are currently busy with the following courses: Experimental Mathematics with Sage (Evans Ocansey, Research Institute for Symbolic Computation, Johannes Kepler University) and the Numerical Solution of Differential Equations (Gabriel Lord, Heriot-Watt University).

Click here to listen to interviews with two new August intake students.

The January 2016 intake are busy working on their research projects.

Announcing 2017-2019 Next Einstein Forum Fellows, Africa’s top scientists solving global challenges

On 12 September the Next Einstein Forum (NEF) announced its second Fellows Class 16 scientists, all under 42 years of age, who are solving Africa’s and the world’s challenges. An initiative of the African Institute for Mathematical Sciences (AIMS) in partnership with the Robert Bosch Stiftung, the NEF will hold its second global forum for science in Kigali, Rwanda, under the patronage of H.E. President Paul Kagame.

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Research Centre updates

SMART 2017 Conference

Dr Rejoyce Gavhi-Molefe, an AIMS South Africa resident researcher and Ms Dinna Ranirina, a PhD student, attended the Second Conference on Subdivision, Geometric and Algebraic Methods, Isogeometric Analysis and Refinability in Italy (SMART 2017) conference held in Gaeta, Italy from 17 to 21 September. The conference included 83 delegates (59% female) from 21 countries from all the continents, 8 invited talks, 46 contributed talks and 13 posters.

The conference presented useful topics such as Algebraic and Differential Geometry, Computer Aided Design, Curve and Surface Design, Finite Elements, Non-uniform rational basis spline (NURBS) and Isogeometric Analysis, Refinability, Approximation Theory, Subdivision, Wavelets and Multi-Resolution Methods. Dr Gavhi-Molefe and Ms Ranirina presented posters titled ‘One-parameter Interpolatory Subdivision Convergence’ and ‘The Refinable Hermite Vector Splines’ respectively which were received successfully by academic researchers and experts.

“This conference was an ideal platform for us because it presented old problems in subdivision that are still waiting to be solved, such as the construction of high-quality surface schemes and new challenges arising as subdivision is attracting new interest in engineering applications, such as isogeometric analysis and additive manufacturing. Many thanks to AIMS for giving us the opportunity to attend the conference and our supervisor Prof. Johan de Villiers for his generous support and guidance.”

Deep Learning INDABA continued...

The days were packed with multiple lectures and practical sessions which enabled the attendees to implement various deep learning techniques such as convolutional neural networks, recurrent neural networks and reinforcement learning. In the poster sessions Ms Hosenie, Dr Vos and Mr Dufourq from the Cosmology Group won best poster awards. The presence of several industrial sponsors on-site also offered the opportunity to discover further machine learning industrial applications and career opportunities outside academia.

All resources from the conference can be found here: http://www.deeplearningindaba.com

Journal Club

On 12 September, Prof. Jeff Sanders, AIMS South Africa Academic Director gave a talk titled: ‘Journal Club and Cryptocurrency.’ He followed this up with another talk on “Cryptocurrency” on 26 September.

Journal Club

Cosmology Group updates

Three Grade 11 learners from the Waldorf School, Ciara Rattue, Joshua Sello and Saskia van der Want, volunteered in the Cosmology Group from 11-22 September.

The students had a keen interest in mathematics and this visit formed part of their required job shadowing experience.

Visiting researcher

Dr Eddy Kimba Phongi is visiting the Research Centre from 1 September to 30 October 2017. He graduated from AIMS South Africa in 2007 and returned as a tutor in 2015. He completed his PhD in Applied Mathematics at UCT in 2015. His area of research is the ordinary differential equations and dynamical systems.

Probalistic and Statistical Methods for Networks Summer School

Ms Alice Nanyanzi, a Research Master’s student attended this summer school which was held from 21 August to 1 September at the Berlin Mathematical School, TU Berlin. The central theme was the randomness that may arise in various forms: it can be used to construct models for networks, to analyse networks using statistical methods, or as part of stochastic processes on networks.

She was selected as one of the participants to give a talk titled: ‘The Laplacian matrix of a network and its applications,’ about her current research. She notes, “I received constructive feedback from the other participants and I believe this will be very helpful in my ongoing research.”

The school was also a very good opportunity for networking and Ms Nanyanzi took the opportunity to tell the other participants about AIMS.
Students visit AIMS South Africa

On 21 September, 72 students from the University of Limpopo, visited AIMS South Africa. They were welcomed by Prof. Barry Green, given an overview of the academic programmes at AIMS by Prof. Jeff Sanders and Ms Sihle Ncube, a January 2017 intake, gave a talk on being a student at AIMS. The visitors were also given tea and a tour of the facilities.

AMMSI-Phillip Griffiths Prize

AIMS South Africa would like to take the opportunity to congratulate Prof. Philibert Nang who was awarded the AMMSI-Phillip Griffiths Prize. The prize is awarded annually to an African mathematician, living in Africa, who has made outstanding contribution to mathematics, application of mathematics or promotion of mathematics, as evidenced by research and impact of the work.

He has also made notable contributions to mathematical development in his home country of Gabon. He is full professor and Head of the Research Laboratory of Mathematics, Ecole Normale Supérieure of Libreville, as well as serving as President of the Mathematical Society of Gabon.

Prof. Nang is a regular visitor to the AIMS Research Centre with his last visit being in March this year.

AMISWIS Mentoring Programme

The AIMS South Africa Women in STEM (AIMSWIS) mentoring programme for the academic year 2017-2018 will kick off in October with a “meet and greet” event which aims to introduce students (both male and female) to this initiative.

The objectives this programme are to:

- provide a platform for AIMS South Africa (both male and female) students to actively engage in the community by mentoring at local schools,
- regularly provide information to students outlining career and funding opportunities, and
- create a safe space where female students can obtain support from caring senior students who listen to them, serve as good role models and help them develop their life skills and build self-confidence and self-esteem.

IEEE AFRICON 2017

The 13th edition of the Institute of Electrical and Electronic Engineers (IEEE) AFRICON conference was held in Cape Town from 18 to 20 September. Prof. Barry Green gave a talk titled: ‘The AIMS Educational Ecosystem’ on the first day.

Visit to ICTP

Prof. Barry Green, CIMPA President and Director of AIMS South Africa visited the International Centre for Theoretical Physics (ICTP) in Italy on 8 September to discuss possible projects between the two institutes.

Alumni News

Listen to a fantastic interview of AIMS alumnus and aspiring nuclear physicist Dr. Thifhelimbilu Daphney Bucher who was interviewed on Cape Talk radio station on 27 September. She reveals how she had to endure a six-kilometer walk come rain or sunshine to graduate in Grade 12 at her secondary school and how the AIMS scholarship helped her to achieve her career goals.


She is one of the 25 South African Emerging Women Scientists profiled in a book titled ‘Because Science is Fun – Stories of Emerging Female Scientists in South Africa.’
Dr Yabebal Fantaye, who is an AIMS ARETÉ Junior Research Chair based at AIMS South Africa, was selected as a NEF Fellow. His research investigates the statistical properties of the Universe using the Cosmic Microwave Background (CMB) data from the Planck satellite. More practically, his research focuses on developing machine learning and other advanced statistical methods for harnessing the African GIS and social Big Data for extracting actionable insights to help Africa meet the UN Sustainable Development Goals. He is also working on the establishment of the NEF Scientific Community.

For more information please visit [http://nef.org/announcing-new-nef-fellows/](http://nef.org/announcing-new-nef-fellows/)

Be the solution!

Provide a gift in support of empowering Africa’s youth to lead a new revolution in STEM. Harness the potential of young scientists impassioned about discovery and inspired by the promise of a new future for Africa.

Your donation will assist AIMS South Africa with funding for student bursaries which cover travel, accommodation, meals, medical insurance and a monthly stipend.

For more information and to donate please visit [https://www.givengain.com/cause/2319/campaigns/8281/](https://www.givengain.com/cause/2319/campaigns/8281/)

**Announcements**

**Applications for the January 2018 intake for the AIMS Master’s in Mathematical Sciences**

Applications are now OPEN for the AIMS structured Master’s degree in Mathematical Sciences which is awarded by the Universities of Stellenbosch, Cape Town and the Western Cape. The January intake is for students who follow the South African academic calendar and preference will be given to South African nationals.


**AIMS NEI Fellowship Program for Women in Climate Change Science: Call for applications**

Climate change represents one of humanity’s greatest challenges of the 21st century. The continued ascent of our species depends to a significant extent on our ability to limit further catastrophic changes to the climate and to adapt to both past and future changes. In many parts of the world, changes in climatic variables – including incessant increases in temperature and declines in precipitation – are already having detrimental impacts on food security, human health, energy, biodiversity, etc. Some of these impacts further alter the climate – e.g. plant biodiversity loss reduces CO₂ sequestration, contributing to temperature rises – creating positive feedback loops with increasingly perilous consequences for humanity.

[Click here](https://www.aims.ac.za/en/programmes/aims-structured-masters-in-mathematical-sciences/applications-january-intake) to read more and to apply