



Highlights

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Eight South African students graduate from AIMS South Africa

AIMS South Africa has acknowledged the success of its third group of South African students at a special Recognition of Achievement Ceremony which was held on 27 November 2014.

The guest speaker at the event was Professor Francis Benyah, from the Department of Mathematics and Applied Mathematics at UWC and member of the AIMS South Africa Executive Team who said, "AIMS is a unique environment, it has the ability to fill in the gaps and create a strong foundation for its students."



Front Row: Dr Ian Durbach, Prof. Jeff Sanders, Prof. Barry Green, Prof. Francis Benyah, Dr Dorothy Nyambi, Dr Hannes Kriel, Mr Jacob Mohau Mateyisi and Dr Gaston Mazandu Back Row: Ms Valentia Boledi Tlomatsana, Ms Xolisile Octavia Thusini, Mr Siyabonga Phiwanyinkosi Mthiyane, Mr Africa Mgudlwa, Mr William Malose Manamela, Mr Matjale Clement Mabula, Mr Tlou Lazarus Kubjana and Ms Linsay Blows.

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Imaginary Exhibition and Workshop



Excellent NRF Ratings for members of the AIMS South Africa Research Centre



Prof. Davé



Prof. Bassett

AIMS South Africa is proud to report that the National Research Foundation (NRF) has awarded Prof. Romeel Davé, the SARChI in Cosmology with Multi-wavelength Data jointly

held between AIMS South Africa, UCT and SAAO an A2 rating. Prof. Bruce Bassett head of the Cosmology Group was awarded a B1 rating.

NRF ratings are allocated based on a researcher's recent research outputs and impact as perceived by international peer reviewers.

An A rating is given to leading international researchers and a B rating is given to internationally acclaimed researchers.

The first ever IMAGINARY Exhibition-Workshop held in Africa from 5-7 November 2014, was hosted at AIMS South Africa in Muizenberg. The event was organized by the African Institute for Mathematical Sciences - Next Einstein Initiative (AIMS-NEI), IMAGINARY and the Mathematisches Forschungsinstitut Oberwolfach in Germany.

IMAGINARY is an interactive travelling exhibition curated by the Mathematisches Forschungsinstitut Oberwolfach.

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AIMS Research Centre updates

Explore the financial market with maths student workshop



Participants at the workshop

AIMS South Africa hosted this workshop from 24 to 28 November 2014. There were 20 participants which included senior undergraduates (3rd year) or honours students in financial mathematics, actuarial sciences or statistics, and two AIMS South Africa students.

Participants were introduced to essential concepts and the main instruments in finance. They were taught some computing skills and shown how to use them to analyse financial data, to design portfolios and to hedge against losses.

Theoretical sessions were followed by lab sessions.

Feedback received from students who attended the workshop:

"The lecturers were concerned about us understanding the topics and I have actually gained more than I expected. This workshop has been very helpful to me."

"This was a good introduction to Financial Mathematics as I now know what it is about and what it focuses on, it is an interesting area and I would enjoy studying it further."

Master's Defences



On Monday 10 November 2014 there were two Master's defences in the AIMS South Africa Research Centre:

-Mr Lesiba Charles Galane defended his Master's Thesis titled: "The Risk Parity Approach to Asset Allocation."

-Ms Phumza Thafeni defended her Master's Thesis titled "A No-Arbitrage Macro-Finance Approach to the Term Structure of Interest Rates."

They are pictured here with their supervisor Dr Raouf Ghomrasni.

ARÉTÉ Junior Chair news



Dr Antoine Tambue the ARETE Junior Chair based at AIMS South Africa gave a talk at CERECAM

(UCT) on 12 November titled: "Efficient Mathematical Methods for Subsurface Energy Recovery".

Cosmology Seminar



On Wednesday 26 November 2014, a seminar titled: "Analogue Models of Gravity: the Ubiquitous Space-time" by Prof. Stefano Liberati (SISSA, Trieste, Italy) was hosted by the Cosmology Group.

AIMS Journal Club

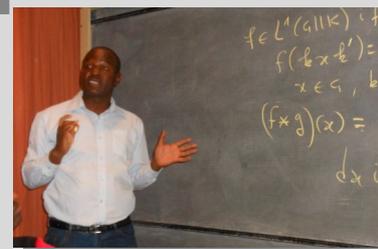
On Tuesday 4 November, Dr Alain Mvogo (Laboratory of Biophysics, Department of Physics, Faculty of Science, University of Yaoundé I) gave a talk in the Journal Club titled: "Dissipative fractional solitons in diffuse neural networks with global couplings."



On Tuesday 11 November, Prof. Diane Wilcox (School of Computational & Applied Mathematics, WITS University) gave a talk in the Journal Club titled: "Risk monitoring in high frequency trading."



On Tuesday 18 November, Dr Ibrahima Touré (UFR de Mathématiques et Informatique, Université de Cocody-Abidjan, Côte d'Ivoire) gave a talk in the Journal Club titled: "Spherical functions on transitive groupoids."



On Tuesday 25 November, Dr Alain Mvogo (Laboratory of Biophysics, Department of Physics, Faculty of Science, University of Yaoundé I) gave a talk in the Journal Club titled: "Inhomogeneity effects on energy transport in alpha-helical of protein molecules."



Workshop attendance

Prof. Barry Green attended the Oberwolfach Forschungsinstitut workshop on Valuation Theory and its Applications from 26 October to 1 November 2014

Prof. Jeff Sanders, Academic Director attended the Computational Topology and Data Analysis Workshop hosted by the Centre for Mathematical and Computational Sciences,

WITS university from 17 to 21 November 2014.

At the same time Research Master's student Evans Ochiaga attended the Sub-Saharan Conference on Spatial Statistics hosted by the School of Public Health at WITS University. His attendance was sponsored by the WITS Division of Epidemiology and Biostatistics.

Staff news



MacDonald Chapwanya joined AIMSSEC as part-time IT Coordinator on 4 November



On 13 November AIMS South Africa said farewell to finance administrator, Jo-Anne Louw, who is expecting a baby early in 2015.



On 5 November Jonathan Carter joined AIMS South Africa as a part-time Systems Architect.



On 17 November Noluvuyo Hobana joined AIMS South Africa as a part-time Language and Communication Teacher.

Recognition of Achievement Ceremony continued



The Hout Bay Music Project

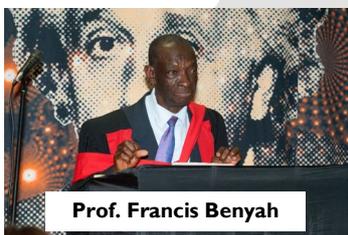
He encouraged the students to have a dream, "Initially it need not be very big, AIMS started as one centre and now it has grown. Your dream can brighten a small corner somewhere, look around you, there is always a chance for us to make something better. If you can follow up on your dream you could well be on your way to becoming the next Einstein."

The student address was given by Ms Valentia Boledi Tlomatsana, from Ekangala, Gauteng Province. "This year has been a tough but enjoyable journey for us all. AIMS has taught me to be patient with myself and what it means to be African. AIMS enables young Africans to advance maths and science in Africa for a brighter future."

Guests were entertained by



Ms Valentia Boledi Tlomatsana



Prof. Francis Benyah

the Hout Bay Music Project, a project which began in the same year as AIMS, when one motivated individual, Ms Leanne Dollman, responded to the absence of music development opportunities for disadvantaged children and started the project. The children are invited to entertain and showcase their musical achievements at various functions and the funds raised are used to help pay for scholarships.

The eight South African graduates now join the AIMS South Africa alumni group bringing the total number of graduates to 536 (30% women) from 36 different African countries. The number of South Africans who have graduated from AIMS South Africa is 36. The students will officially graduate from the universities where they are registered.

Neil Turok visits AIMS South Africa



Prof. Neil Turok, the founder of AIMS and Chair of the Council and Board of Trustees visited the centre from 14 to 17 November 2014. "It is a pleasure and honor to welcome him back to AIMS South Africa and to interact with him during his visit," said Prof.

Green. Prof Turok had a meeting with AIMS South Africa staff on Friday and gave a special talk to the students and other interested parties on Sunday evening. Prof. Turok also visited the AIMS-NEI secretariat office.

AIMS South Africa visitors



Prof. Green, Prof. Carton and Dr Nyambi

On Tuesday 25 November, following on from a meeting at the AIMS-NEI Secretariat, Prof. Michel Carton, Executive Director of NORRAG visited AIMS South Africa to meet with Prof. Green.

On Friday 28 November, Naser Faruqui: Director at IRDC who is responsible for the AIMS portfolio, visited the Secretariat where he met staff and had a round

table discussion with the some of the Research Chairs, AIMS alumni and staff. He then took the opportunity to visit AIMS South Africa where he met staff, took a tour of the research centre and watched a student presentation. In his address to the students he told them, "People all around the world, including Canada, are all inspired by what you do."

Student updates

The August intake completed the following courses: Introduction to Quantum Physics (Babette Doebrich, DESY); Differential Calculus (Pierre Schapira, Paris Sud XI) and Finite-dimensional Quantum Mechanics and Quantum computing (Bernd Schroers, Heriot -Watt).

Prof. Schroers also arranged three hikes for the students on 15, 22 and 29 November.

The first was a hike up to Muizenberg Cave, then on to the Amphitheatre and to St James via Bona Spes Forest. The second was a hike up Table Mountain from Camps Bay and down Skeleton Gorge into the Botanical Garden at Kirstenbosch. The third was a hike from Lion's Head in Cape Town and descending into the centre of Cape Town from there.



Student hikes with Prof. Schroers

Imaginary workshop continued



Dr Andreas Matt

It presents visualisations, interactive installations, virtual realities, 3D objects and their theoretical background in algebraic geometry and singularity theory, in an attractive and understandable manner. Demonstrations for all audiences provide insights into the theoretical background.

At the opening of the event, Dr Andreas Matt, a representative from IMAGINARY said, "We are very excited to be hosting this exhibition in Africa for the first time. It is also the first time that the exhibition is being combined with a workshop to share ideas and plan future scientific and educational public engagement/outreach activities with peers in Africa on maths communication."

Prof Barry Green, AIMS South Africa Director welcomed everyone to the opening and said, "We are very proud to be hosting this exhibition in our centre. Our students, local school children, students from local universities and the public are able to experience the uniqueness of this exhibition."

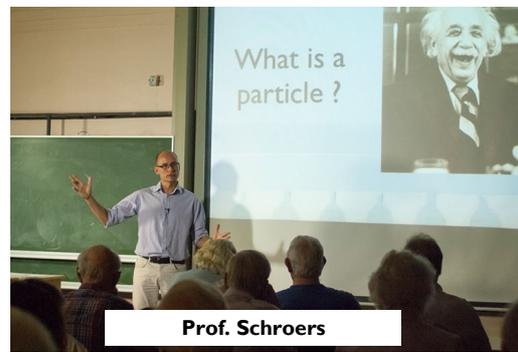
The exhibition featured extraordinary images and 3D prints, and visitors had the opportunity to talk to mathematicians, watch fascinating movies, be creative at interactive computer stations and create their own mathematical artwork! The exhibition also included a series of hands-on exhibits from the UNESCO mathematics exhibition "Experiencing Mathematics".

A Science Slam event titled "From the Big Bang to the Brain" took place on Friday 7 November. The participants were Savannah Nuwagaba (SU), Justine Nasejje (UKZN) and Philip Southey (UCT). All three talks were very interesting and Philip was announced as the winner.

The goal of the IMAGINARY workshop was to showcase interactive mathematics learning tools, to work on dedicated activities for Africa, and to jointly plan future activities. Participants in the IMAGINARY workshop shared experiences and challenges in presenting and applying mathematics internationally with a focus on the African continent; networked with AIMS, IMAGINARY/MFO representatives, and other partners in the field of mathematics and sciences; and planned

Public Lecture

On Tuesday 25 November, Prof. Bernd Schroers (Heriot-Watt University) gave a talk in the AIMS South Africa Public Lecture Series titled: "What is a particle?" The talk was about the smallest units of matter and the Standard Model of particle physics. This model is one of the triumphs of modern science, crowned last year with the discovery of the Higgs particle. At the same time, it is a bafflingly complicated description



Prof. Schroers

of what is supposed to be the simplest form of matter. It also leaves open important questions, including the one in the title of this talk.

The talk looked at the different ways of modelling particles that are currently being explored.

NEPAD flagship programme meeting

Prof. Barry Green and Lynne Teixeira attended the 2nd NEPAD STI Flagship Coordinators Workshop hosted by the

Department of Science and Technology in Pretoria on 20 November 2014.

Network News

The Next Einstein Forum launches search for 15 of Africa's top young scientists

The Next Einstein Forum (NEF), an AIMS initiative in partnership with the [Robert Bosch Stiftung](#), announced the opening of the NEF Fellows Programme which will identify 15 of Africa's top young scientists, honoring their achievement and contributions to Africa and the world's development at the premier NEF Global Gathering. For more information please [click here](#)

Falling Walls Conference

Thierry Zomahoun, President and CEO of AIMS-NEI gave a presentation at the Falling Walls Conference in Berlin on Monday 10 November. To view this talk please [click here](#).

Mr Zomahoun also recently visited Washington DC to attend several meetings and he had an interview with Jacques Aristide, the host of the Washington Forum at *La Voix de l'Amerique*. To view the video of his interview about AIMS-NEI please [click here](#).

Alumni News



AIMS graduates presently in graduate programmes at the University of British Columbia

(UBC). Right to left: Felix Oghenekohwo, PhD student in Geophysics, Mekdes Tessame, PhD student in Glaciology, Jummy Funke David, MSc student in mathematics (Epidemiology) and Sarafa Iyaniwura, MSc student in mathematics (Epidemiology) with Douw Steyn, Professor in the Department of Earth, Ocean and Atmospheric Sciences at UBC.



Workshop attendees



The Science Slam participants, Savannah and Justine, with tutor Sam Meehan, who was the MC, and Philip on the right.

Africa Calling series

Africa Calling is a five part feature documentary series exploring the work of South African Scientists, Institutions and Innovators discovering scientific and technological solutions pertinent to the

social and economic advancement of South Africa. The series will feature Prof Neil Turok in an episode titled: "Space Pioneers" that will be aired on SABC 3 television on 7 December 2014.

AIMSSEC Newsletters

To view the latest AIMSSEC newsletter please [click here](#).

If you have not seen the first issue please [click here](#) to view.

Announcements

Call for research project topic proposals

The AIMS Structured Masters in Mathematical Sciences includes a research project, which makes up one third of the course. Academics and industry researchers are invited to propose topics to be taken under their supervision. Proposal submissions using the form below close on 5 February 2015, but are reviewed by AIMS staff as they are submitted. Students begin their research project on 16 February and submit their dissertations on 21 May 2015. In previous years we have had many excellent proposals, some of which were not selected by students because of the wide choice. We encourage resubmission of previously unselected proposals, as well as new proposals.

To propose a topic, visit the webpage below:

<http://www.aims.ac.za/en/opportunities/research-project-supervisors>

Call for course proposals

The AIMS structured Master's in Mathematical Sciences programme commences in August each year at all centres. AIMS South Africa has a second intake for South African students commencing in January. August 2015 at all centres and January 2016 at AIMS South Africa. For more information and to apply:

<http://www.aims.ac.za/en/apply/structured-masters-course-proposals>

January 2015 intake for the AIMS Master's in Mathematical Sciences:

AIMS is still accepting applications 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.

For more information and to apply please visit

<http://aims.ac.za/en/programmes/aims-structured-masters-in-mathematical-sciences/applications-january-intake>

AIMS Small Research Grant Program for Alumni

The continuous professional growth of AIMS students and alumni remains a top priority for the AIMS network. With generous support from the government of Canada's International Development Research Centre (IDRC), and within the framework of the AIMS Research for Africa Project, Please [click here](#) for more information.

Postdoctoral Fellowships

IMS South Africa is seeking applicants for Postdoctoral Fellowships in the area of mathematical finance and computational algebra. Fellowships are tenable for two years, contingent on satisfactory progress, and could be extended for a third year. Fellowships are immediately available and the value of the award ranges between R200 – R240k per annum, taxfree, subject to qualification and experience. Preference will be given to African applicants and those from SADC member states are particularly encouraged. Please click on the links below for project descriptions for the two positions: [Financial Mathematics](#); [Computational Algebra](#);

[Mathematical Biology](#)

For more information please visit <http://www.aims.ac.za/en/opportunities/vacancies/postdoctoral-fellowships>

Send completed applications to rene@aims.ac.za

Send subject related questions to jeff@aims.ac.za

DAAD PhD scholarships - Applications for 2015 are now open

[DAAD](#), the German Academic Exchange Service, in association with AIMS, provides five in-region scholarships for a PhD programme in Mathematical Sciences. These scholarships are available to students wishing to commence a PhD programme at a South African University. Funds awarded by the scholarship must be used towards covering the costs of tuition fees, living expenses, medical insurance, books, stationery, research literature expenses, study permit and research.

Eligibility: African nationals from Sub Saharan countries (excluding South African nationals), and not older than 36 years of age on the date of nomination may apply. Women are particularly encouraged to submit an application.

For more information and to apply please visit the [website](#).

Workshops

Mathematics in Industry Study Group (MISGSA) 2015

The Mathematics in Industry Study Group in South Africa will take at AIMS South Africa from 12 to 16 January 2015. This will be preceded by a Graduate Workshop from 6 -10 January 2015.

A Mathematics in Industry Study Group is a five-day workshop at which academic researchers and graduate students work collaboratively with representatives from industry on research problems submitted by local industry. Study Groups have been organised for over forty years in many countries around the world. The MISG in South Africa was held in 2004. For more information and to apply please [click here](#).

AIMS-Stellenbosch University Number Theory Conference 19 to 23 January 2015

This conference will be hosted at AIMS South Africa and the goal of this conference is to give a broad perspective of areas of modern number theory and to highlight some recent advances. This conference is one of the biennial Number Theory meetings which has been held at Stellenbosch University since 1997. ([Recent conferences](#)). It is planned that leading international specialists, local academics and graduate students will attend. For more information and to register please [click here](#).

The **8th Summer School in Mathematical Finance** is being held at AIMS from 19 to 21 February 2015. This workshop presents a unique opportunity for local practitioners, academics and students to interact with international leaders in research on topics and modelling techniques current in the South African and international financial markets.

Intended audience: Practitioners, academics, PhD (and advanced MSc) students in mathematical finance.

For more information and to apply please [click here](#).

Public Lecture

The AIMS Public Lecture series presents a talk titled:

"Gaining insight into brain matters with magnetic resonance imaging" by **Dr Paul Taylor, Postdoctoral Research Fellow, Division of Biomedical Engineering, UCT**

Abstract: Magnetic resonance imaging (MRI) provides a non-invasive means for studying the brain, one which is important for both researchers and clinicians. Here, we will briefly present the principals of two approaches for assessing complementary information about the brain: functional MRI (fMRI), for studying how and which gray matter regions work together to process data; and diffusion tensor imaging (DTI), for estimating the integrity and location of white matter tracts that connect functional regions. We will discuss applications of these methods to research in brain development under various circumstances, such as healthy aging or after prenatal alcohol exposure, and to neurosurgical planning.

Date: Tuesday 9 December 2014

Time: 18:45 for 19:00

Venue: African Institute for Mathematical Sciences 6 Melrose Road, Muizenberg

Cost: Free

[Tuesday 9 December 2014](#) [Dr Paul Taylor](#)