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Science Matters

Science Faculty Newsletter

Message from the Dean

In this first edition of Science Matters 2019, I welcome the new team in the executive of the faculty: Professor Rebecca Ackermann (Deputy Dean Transformation), Associate Professors Adam West (Deputy Dean Undergraduate Matters) and Jeff Murugan (Deputy Dean Postgraduate Studies & Research). This new team builds on the solid foundation of the Faculty and we are keen to maintain the good reputation of the faculty and to place it firmly within the new vision of UCT.

The first half of 2019 has just passed but the stories and the news are still fresh in our mind. It was pleasing to attend Professor Shadreck Chirikure's inaugural lecture that was a celebration of his scholarship and of the Africa Month at UCT. In this edition you will read about our excellence in teaching and research by academic staff and postgraduate students. The Department of Mathematics & Applied Mathematics is home to some of the best teachers at UCT and this makes us proud. We congratulate our students who graduated in April and in the shorter ceremony in July, and thank our academic and pass staff for making these ceremonies memorable. We are pleased to see new innovation in the teaching space that will ensure that the faculty continues to excel in teaching.

It is exciting to see that research excellence in the faculty takes place across generations. Two of UCT's six leading scientists selected for the Future Leaders – African Independent Research programme are in the Science Faculty. The faculty also hosts the majority of young researchers selected for the UCT's 2030 Future Leaders Programme. This cohort of outstanding young scientists will ensure that the faculty maintains its excellent research record. At the top end of the research spectrum we are proud of the awards received by Profs George Ellis and Ed Rybicki. Research in the Science Faculty also contributes to cutting-edge policy as evident in the recognition given to Prof Mark New and Emeritus Prof Doug Butterworth.

As the new Dean of Science I would like to sincerely thank Prof Susan Bourne for a smooth handover and for her willingness to continue to serve on two important committees in the faculty. I appreciate the ways in which staff in the office made me feel at home and how they quickly adjusted to working with me! My interactions with the Faculty Board, HoDs, departments, units, colleagues, Student Councils, Pass Staff and other committees give me hope for an excellent, transformed and sustainable faculty.

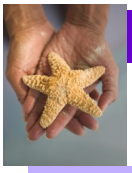
Maano Ramutsindela

UCT Distinguished Teacher Awards go to two Mathematicians

UCT's annual Distinguished Teacher Award recognizes outstanding teaching at UCT and acknowledges the recipient's contribution to the promotion of teaching and learning excellence at our university. The 2018 awardees were recently announced as Associate Professor Jeff Murugan and Dr Annelise Schauerte, both from the Department of Mathematics & Applied Mathematics:

Associate Professor Jeff Murugan has taught from first-year to master's level at UCT. His lectures are described as beautifully choreographed performances that generate awe and mutual respect between him and his students. In addition to his passion for his subject, easy-going rapport with students, humour, heartfelt encouragement and clear impact on student's lived experiences of applied mathematics, Associate Professor Murugan's students attest to him being able to draw in all of his students, changing the teaching environment to accommodate diverse groups of students.

Dr Anneliese Schauerte's methodology of teaching mathematics at UCT is attested to by her students, as being designed to develop a deep understanding of the content and ensure that the content is understood in a way that enables students to use it and move forward with it on their own. She shows strength in preparation, materials development, organisation and course administration. She stands out in a field dominated by males and is a role model to female students.



Our Science Stars:

Professor Susan Bourne wins International Distinguished Women in Chemistry Award

The International Union of Pure and Applied Chemistry (IUPAC) announced the awardees of the IUPAC 2019 Distinguished Women in Chemistry or Chemical Engineering. **Professor Susan Bourne**, from the Department of Chemistry at UCT was one of twelve women in the world awarded of this prestigious award.

The awards programme was created to acknowledge and promote the work of women chemists/ chemical engineers worldwide. The 12 awardees were selected based on excellence in basic or applied research, distinguished accomplishments in teaching or education, or demonstrated leadership or managerial excellence in the chemical sciences. The Awards Committee was particularly interested in nominees with a history of leadership and/ or community service during their careers.

UCT Leading Scientists selected to be part of £25M FLAIR scheme

Six UCT scientists have been selected as FLAIR research fellows. The FLAIR (Future Leaders—African Independent Research) is a programme of the African Academy of Science (AAS) and Royal Society, with support from the UK's Global Challenges Research Fund (GCRF), designed to help talented early-career researchers, whose science is focused on the needs of the continent, establish independent careers in African institutions and ultimately, their own research groups. Two of the six recipients are from the Faculty of Science:

Dr Sarah Fawcett, Department of Oceanography. For every benefit provided by urbanised, coastal regions—fishing, seafood harvesting, tourism—is a suite of damaging corollaries including sewage and pesticide run-off. Dr Fawcett will track the sources of pollution by using an immense model system: False Bay, South Africa's largest natural bay, with the aims of informing government on where to place Marine Protected areas.

Dr Wade Petersen, Department of Chemistry. A recurring and chemically useful structure 'spirocyclic oxindoles' can be used as the backbone for many, potentially disease-quashing drugs, however when it is produced, its mirrored, less functional form is often the result. Dr Petersen aims to use new chemistry, including the manipulation of light, to selectively produce the desirable version of the molecule. His research will be applied to drugs treating malaria, TB and HIV.

Emeritus Professor Jennifer Thomson wins international prize for protection of human rights

Emeritus Professor Jennifer Thomson, President of the Organization for Women in Science for the Developing World (www.owsd.net) received the 2019 International Tartufari Prize for the Protections of Human Rights presented by Accademia dei Lincei of Italy.

Jennifer Thomson receiving her award from from the President of the Accademie.

The award was made to her for her contribution to the development of human rights by promoting the contribution that women scientists give in the fields of health, education, agriculture and food, with the use of appropriate policies and techniques in the poorest and most vulnerable areas of the world. The citation notes how she herself has made important contributions to the production of genetically modified maize for use in Africa. This affirms how women are contributing to making human solidarity concrete and in line with the UN Agenda 2030.

George Ellis honoured with international award

Emeritus Professor George Ellis was recently awarded the Georges Lemaître International Prize in Louvain-la-Neuve, Belgium. Created in 1995 at the initiative of the alumni and friends of Université catholique de Louvain (UCLouvain), the prize is awarded every two years to a scientist who has made a major contribution to the development and dissemination of knowledge in the fields of astronomy, astrophysics, geophysics or space research.

Internationally recognised as a leader in cosmology and complex dynamic systems, Ellis is an outstanding scientist with interests in many fields: philosophy, the relationship between science and faith, and issues of social engagement. A collaborator with Stephen Hawking, he clarified the notion of singularity in space-time physics, in relation to the geometric properties of cosmological solutions in general relativity. He is a pioneer in the study of the Einstein-Boltzmann equations and contributed significantly to the development of Friedmann-Lemaître cosmology.

Prof Ed Rybicki, UCT's most prolific inventor wins Top Intellectual Property Creator Award

Professor Ed Rybicki, Department of Molecular & Cell Biology, was identified as the Top Intellectual Property Creator for UCT. He received the award from NIPMO/DST for disclosures /applications made between 2011 and 2018—which covers work on plant-made vaccines against human papillomaviruses, bluetongue and African horse sickness viruses, HIV Env protein as a vaccine, and horse radish peroxidase as a reagent. This award comes with a R605 000 grant to RC&I to assist in driving our IP towards products.

Dr Ann Meyers, Professor Edward Rybicki and Dr Inga Hitzeroth in the laboratory when so many of their inventions are born.

Prof Rybicki says, "I have to credit all my co-inventors and RC&I, and in particular Inga **Hitzeroth** and **Ann Meyers**, and Piet Barnard and Andrew Bailey, for aiding and abetting our efforts."

What does the recognition mean in the scheme of things?

According to Rybicki it is, "Acknowledgement of our long history in creating IP at UCT, and especially for plant-made recombinant proteins, and more visibility in the South African and wider biotech space."

How will the grant assist in the IP work they are doing?

The RC&I Office as UCT will administer the grant: it will make it possible to go and visit prospective industrial partners - in the US and Canada and elsewhere - as well as to maintain patents, and possibly even to add to work necessary to show the viability of certain patent applications.

Award for outstanding lifetime contributions to ornithology in southern Africa

Professor Claire Spottiswoode, FitzPatrick Institute of African Ornithology, was awarded the Gill Memorial Award for outstanding lifetime contributions to ornithology in southern Africa. The citation says that although she is still in her thirties, she has already contributed more to African ornithology than most ornithologists manage in a lifetime of research. She is the youngest person to receive this prestigious award to date.

Claire's fascination with birds was evident from an early age and she was active in the Cape birding scene as a teenager and together with Callan Cohen, she co-founded the eco-tourism company Birding Africa while still at school. Together with Callan, she produced the acclaimed guide to birding in western South Africa, *Essential Birding* while an undergraduate student. Her burgeoning research career has seen her raising substantial research funding and she is described as extremely generous in sharing her ideas and is popular with students and peers alike.

UCT professor honoured by Emperor of Japan

Applied mathematician and fisheries scientist **Professor Emeritus Doug Butterworth** has been awarded the Order of the Rising Sun, Gold Rays with Neck Ribbon by the Emperor of Japan for his contribution to the sustainable management of the country's fisheries.

The Order, established in 1875, is given for distinguished achievements in the advancement of one's field. Previous recipients include the American actor and film maker Clint Eastwood and French civil engineer Gustave Eiffel. Butterworth was awarded the Order for his contribution to ensuring sustainable use of marine living resources by Japan, in particular southern bluefin tuna, one of the world's most valuable fisheries.

Butterworth, who also previously received South Africa's highest National Order of Mapungubwe (Silver), has been responsible for developing the scientific methods underlying the management of nearly all South Africa's major fisheries. He has made major contributions internationally to the analysis and management of bluefin tuna and various whale populations, as well as Antarctic krill and fisheries in Canada and the USA.

In the two decades that Butterworth has served on Japan's delegation to the Scientific Committee of the Commission for the Conservation of Southern Bluefin Tuna, he played a leading role in developing a management approach that saw the highly threatened resource under international litigation move to a situation where it is well on the route to recovery.

Science Faculty researcher awarded Global Professorship

Professor Shadreck Chirikure, head of the UCT Archaeological Materials Laboratory, has won a Global Professorship from the British Academy for his work dating historical artefacts and the study of pre-colonial urban societies in Africa. The award provides the opportunity for internationally recognised scholars working in the social sciences and humanities to relocate to the United Kingdom (UK) for four years and continue their research at a British university. Chirikure will soon take up his place at the University of Oxford's School of Archaeology.

"When I heard the news I was ecstatic," says Chirikure. "It is wonderful recognition of my work. But beyond this, I believe it also comes with a great deal of responsibility. My hope is that this award will mean we can really focus on the development of students working in the field, especially in previously disadvantaged institutions such as the University of Venda, the University of Limpopo and institutions in Mozambique, for example."

The Global Professorships, which aim to demonstrate the UK's commitment to international research partnerships, have been awarded to scholars from seven countries: Australia, Chile, France, Ghana, South Africa, Spain and the United States.

Climate 100 honour for Mark New

Professor Mark New, director of the African Climate and Development Initiative (ACDI), has been listed among the world's 100 most influential people in climate policy for 2019.

The Climate 100 list of politicians, civil servants, academics and activists comes courtesy of global network Apolitical, and is drawn from hundreds of nominations from experts and leading organisations. The aim is to recognise high-profile advocates whose work is indispensable to raising awareness and demanding change in respect of climate policy. The citation credits his research career that spans over 20 years, with a focus on detecting climate trends, climate modelling and assessing the impact of failed climate mitigation policy.

Double publication prize for archaeologist Chirikure

Professor Shadreck Chirikure, HOD of Archaeology and director of the Archaeological Materials Laboratory, has won the *Antiquity* journal of archaeology's Antiquity Prize 2019, for best paper of 2018. This is the second time Chirikure has won this award.

He is the first African and perhaps the first archaeologist to have won the prize twice.

Antiquity is based in the Department of Archaeology at Durham University in the UK. Founded by OGS Crawford in 1927, it is a peer-reviewed journal owned by the Antiquity Trust. It awards two prizes annually for outstanding work in the field of archaeology: The Antiquity Prize and the Ben Cullen Antiquity Prize.

Chirikure's winning paper is titled "Elites and commoners at Great Zimbabwe: Archaeological and ethnographic insights on social power". It appeared in the August 2018 issue of *Antiquity*, a journal to which he has contributed since 2008 when his first submission won him his initial Antiquity Prize.

Young UCT scientist selected for international leadership initiative

After contracting malaria himself as a child, **Dickson Mambwe** is determined to make an impact in the fight against the disease.

"Who knew a boy from rural Mansa, Zambia could come this far, stand a chance and become successful at opportunities like this?" These are the words of Dickson Mambwe, a Science Faculty PhD student working in the field of drug discovery, after recently being selected for the 2019 CAS Future Leaders Program.

An initiative of the American Chemical Society (ACS), it's one of the most prestigious and fiercely contested leadership programmes in the world. Mambwe is one of only thirty early-career scientists selected from across the globe to participate this year. Since its inception 10 years ago, there have only been two other participants selected from the African continent (both also from UCT).

Each successful applicant receives a paid trip to the CAS (Chemical Abstract Services) headquarters in Columbus, Ohio as well as the ACS Fall National Meeting & Exposition in San Diego, California. These two events will be taking place over a period of two weeks in August this year. Participants are also awarded a three-year prepaid ACS membership, a certificate of distinction and USD$ 1 000.

Being selected for the CAS Leadership Program comes hot on the heels of his participation in the Next Generation Scientist Program by Novartis and University of Basel in Switzerland last year. With such a strong 'why' underpinning his research, however, it's hardly surprising that Mambwe has established himself as a promising leader among young scientists around the globe.

International Award for crystallography student

Alexios Vicatos was awarded the prestigious international Ludo Frevel Scholarship. He was one of 6 selected candidates world wide out of 90 applications (and the only recipient in Africa). This scholarship is given as an award to support the education and research program of promising graduate students in crystallography-related fields. Alexios is currently registered for my PhD in the field of X-ray crystallography under the supervision of Professor Mino Caira and he hopes to follow an academic career in this field in the future.

UCT students to meet Nobel laureates

Kimeel Sooknunan (UCT, Mathematics and Applied Mathematics), Jake Gordin (UCT, Mathematics and Applied Mathematics), Julia Healy (UCT, Astronomy) and Dr Itumeleng Monageng (SAAO)

UCT Astronomy PhD student **Julia Healy** was selected as one of 20 top young scientists selected for the prestigious 69th Lindau Nobel Laureate Meeting, which this year is dedicated to physics, and met in Germany in June. Julia's PhD is focused on the SKA science theme of galaxy evolution; this is a joint degree between UCT and the University of Groningen in the Netherlands.

The South African delegation includes 5 other UCT Astronomy alumni, namely **Dr Itumeleng Monageng** (who obtained his PhD from the Astronomy department in 2018), **Jake Gordin**, **Kimeel Sooknunan, Tariq Blecher and Nicole Thomas**. Four of the people selected are alumni of the National Astrophysics and Space Science Program (NASSP). Congratulations Julia, Itumeleng, Jake, Kimeel, Tariq and Nicole!

Award for novel approach to extracting DNA from eagle feathers

Post-doc **Dr Petra Sumasgutner** of the FitzPatrick Institute of African Ornithology, Department of Biological Sciences, received an award of the Theodor Körner Fund in the Hofburg, Vienna, Austria during May, in recognition of scientific advances in Austria, for her novel approach of extracting DNA from the feathers of falconry Golden Eagles .

Water polo stars have a ball in Perth

UCT'S water polo Springboks in Australia. L to R: Liam Neill, Nicola MacLeod and David Rom.

Three UCT water polo players took part in the International Swimming Federation (FINA) World League Intercontinental Cup competition in Australia, where they acquired some valuable new skills**.** The students, **Nicola MacLeod** (final-year BSc in anatomy and genetics), and Liam Neill and David Rom (both completing a BCom in finance and accounting) all did their best for South Africa, even though the teams turned in less than stellar performances.

The South African team have a lot to celebrate, however, according to MacLeod. "It's always tough coming from a South African standpoint. We are not professionals, we are students who take out of our own time, and we are not funded at all. All the other teams are professionals who are on a completely different level," she explained. One of the benefits of the Intercontinental Cup is the practice it afforded the South Africans. "This was also like a warm-up for the World Championships which we don't usually have," said MacLeod, adding that they gained valuable experience and skills to bring back home.

Graduation: Astronomy PhD's reach for the stars

From L to R: Dr's Sam Legodi, Marie Korsaga, Brenda Numumba and Elizabeth Naluminsa

The Department of Astronomy at UCT had a record five PhD students graduating in April this year. Among the group were the first female PhD Astrophysicist from Burkina Faso and the first female PhD in any area of Physics from Zambia.

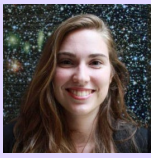
Read their stories on the next page to discovery more about the new Astronomy PhD students and click on the link to read further about their motivation for studying in this field and their journey to gaining their PhD.

Dr Brenda Namumba is the first female Physicist from Zambia to attain a PhD in the entire field of physics and the first Zambian to hold a PhD in Astrophysics. Brenda did well in science subjects at school but wasn't initially clear on what she wanted to study and it was only in her final undergraduate year, when she attended an academic conference, where she met astronomers and space scientists from around the world, that she became fascinated by how much we can actually know about our universe. She looked through a telescope for the first time, seeing planets and the moon, which made her curious to know more. It was a big step to leave her family and country behind to come to Cape Town to pursue her dreams. Brenda is now a postdoctoral fellow at the SA Radio Astronomy Observatory where she will dedicate her three years to understanding star formation in dwarf galaxies. Her future aspirations are to be part of a team that will see Zambia participating in cutting edge astronomy and to help motivate and encourage young girls in science and help them see their worth and value.

Dr Marie Korsaga is the first female PhD Astrophysicist from Burkina Faso, is officially a doctor of astrophysics in two different universities: at UCT and aix-Marseille University in France. From a young age Marie was fascinated by the phenomena of the universe, such as eclipses, shooting stars and the existence of other planets. This led her to study Astronomy during her undergraduate degree in Burkina Faso, but this was not without challenges as she describes, "in developing countries such as Burkina Faso, the majority of society thinks that scientific fields are dedicated to men and not to women, so this shook my motivation to pursue studies in scientific fields, but I stuck to my decisions". Marie would like to pursue a research career in astrophysics and have the opportunity to train young astronomers at her home university, working towards more equal gender representation in Science—showing the public that like men, women can do science and achieve great things.

Dr. Elizabeth Naluminsa from Uganda, whose dissertation topic was "Star Formation and Disk Stability in Nearby Galaxies", which puts her at the forefront of galaxy evolution studies. Elizabeth had a deep-seated desire to pursue Astronomy from a young age —sparked by the Apollo II moon-landing which she read about in Grade 5. Undeterred by the fact that there were no dedicated Astronomy courses in Uganda, she initially pursued a BSc degree in Physics and Mathematics and her lecturers encouraged her to apply to UCT for the NASSP programme. Her studies were not without challenges—she lost her mother, who was her confidant and strength, midway through her PhD, but she credits her friends for carrying her through the touch times. Elizabeth is currently writing a paper with her supervisors and aspires to be a leading voice in Astronomy research on the continent—contributing to research, training and inspiring young scientists and lecturing at university.

Dr Samuel Legodi whose PhD thesis focused on 'Wideband Spectropolarimetry of Extragalactic Radio Sources with KAT-7 and Commission Phase of MeerKAT' now has a position as junior commissioning scientist at the South African Radio Astronomy in Observatory. Sam has always enjoyed science and nature and is a huge sci-fi fan, especially when it comes to space/ astronomy/ future related media. When he was in grade 6 he had to write an essay about a career and one of them on the list was astronomer—which he knew nothing about. After researching what an astronomer was, he found other books in the library about solar systems, aliens and the vastness of the cosmos and he was hooked. The shift from a small rural school to UCT was challenging for Sam and he spent many late nights in the library where he met like-minded students and got involved in SHAWCO. Sam is now a commissioning scientist at the SA Radio Astronomy Observatory and is part of a team getting the new MeerKAT telescopes ready for use by the astronomy community. He aspires to remain in astrophysics, doing research and mentoring young researchers . He is eager to do outreach about astronomy and physics and comments that "the universe is too big us (astronomers) to keep it to ourselves"!



Dr Kerry Paterson now a postdoc at Northwestern University, Chicago, USA. Kerry explained that living on the edge of a small town, she always had a dark view of the night sky and the beauty and wonder of space always fascinated her. When she discovered that it was possible to study astronomy at university, she knew with certainty that that would be her career. In her postdoc studies in the USA Kerry is continuing her work on astrophysical transients, focusing on short Gamma-ray Bursts and the electromagnetic follow up of gravitational waves. She is enjoying using large telescope facilities and collaborating with people across the world.

Read more about these stellar achievers here.

STAFF NEWS

WELCOME TO NEW STAFF

African Climate & Development Initiative:
- **Dr Jiska De Groot**—Senior Research Officer
-

Department of Archaeology
- **Dr Vincent Hare**—Lecturer

Department of Chemistry
- **Dr Ncamiso Khanyile**—Lecturer
- **Dr Mashikoane Mogodi**—Lecturer
- **Mr Molefi Makuebu**—Chief Scientific Officer

Drug Discovery & Development (H3-D)
- **Dr Lauren Arendse**—Research Officer

Department of Geological Sciences
- **Dr Rosalie Tostevin**—Lecturer
- **Ms Miengah Abrahams**—Lecturer
- **Dr Geoffrey Howarth**—Lecturer

Institute for Data Intensive Astronomy
- **Dr Jordan Collier**—Research Officer

Department of Molecular & Cell Biology
- **Dr Monique Williams**—Lecturer
- Ms Ingrid Jacobs—Scientific Officer

Percy Fitzpatrick Institute
- **Janine Dunlop**—Librarian

Department of Physics
- **Dr James Keaveney**—Lecturer
- Mrs Bongeka Matubatuba—Admin Assistant

Department of Statistical Sciences
- **Dr Rosephine Rakotonirainy**—Lecturer
- **Ms Deslynne Davids**—Finance Officer

New Niven Librarian

The FitzPatrick Institute of African Ornithology is delighted to welcome **Janine Dunlop** as the new Niven Librarian.

Janine spent almost 10 years in UCT Libraries' Manuscripts & Archives department. She has experience in curating library collections and has specific skills in taking a library system into the digital era.

FAREWELL TO STAFF

African Climate & Development Initiative
- **Dr Dian Spear**
- **Dr Tali Hoffman**
- **Ms Lucia Scondanibbio**
- **Ms Zoe Boshoff**
- **Mr Ryan Fortune**

Department of Archaeology
- **Dr Jayne Wilkins**

Department of Astronomy
- **Dr Margaretha Pretorius**

Department of Biological Sciences
- **Mrs Samantha Venter**

Drug Discovery & Development
- **Professor Leslie Street**
- **Dr Charles Eyermann**

Marine Research Institute
- **Mr Sven Ragaller**

Department of Mathematics & Applied Mathematics
- **Dr Robert Martin**

Department of Molecular & Cell Biology
- **Associate Professor Laura Roden**

Adam West Lab Gets Moving

Professor Adam West challenged his lab to participate in the annual UCT Merrilyn Smith Memorial 10km race and they took up the challenge with great spirit and results. Congratulations! Maybe next year we should have an inter-departmental challenge?

L to R: Prof Adam West, Simcelile Chenge, Tshepiso Mafole, Ruan de Wet, Michelle Louw.

NEW IN THE FACULTY

UCT hosts Falling Walls Lab

In May, UCT hosted the Falling Walls Lab innovation competition, jointly organised by two previous winners from UCT, Dr Dyllon Randall (senior lecturer, Department of Civil Engineering) and **Dr John Woodland** (postdoctoral fellow, H3D Drug Discovery and Development Centre). Almost a dozen students, representing nearly every faculty, pitched their breakthrough ideas in just three minutes. The winner was engineering postgraduate Hlumelo Marepula who will present her work on synthetic urea production at the international finals in Berlin in November this year.

This was the first time UCT had hosted the competition and the judging panel comprised a broad selection of leaders from science and society, including **Dr Chris Barnett** (lecturer, Department of Chemistry).

New initiatives in Chemistry: Ingxoxo

Ingxoxo (isiXhosa for conversation, discussion) is a first year physical chemistry discussion platform and textbook. It is a web-based forum, powered by Discourse which provides a platform for student discussions around first year physical chemistry in any South African language. Here they can share their ideas, understandings and opinions of physical chemical concepts. Video and audio explanations of some of the more difficult concepts encountered in first year chemistry will be available. The content creation will be primarily driven by discussions with first year chemistry students and the Ingxoxo community. An emphasis will be on understanding how students are explaining concepts to their peers. These new ideas and explanations of chemical concepts that are relevant to the South African student will be compiled into an openly licensed, online, mixed-media e-book, co-authored by the students themselves to allow for a fully inclusive look into first year physical chemistry.

This new initiative is led by **Cesarina Edmonds-Smith** and **Chris Barnett** who are early career academics interested in improving first year physical chemistry education.

L to R: Chris Barnett; Sidney Tiravavi (ITMasters student) Simone Renga (Chemistry Masters student); Cesarina Edmonds-Smith

Galaxy Computational Chemistry South Africa on ilifu

Galaxy Computational Chemistry South Africa will provide a collaborative computational modelling platform for computational chemistry and glycobiology with robust tools and repeatable workflows. The platform will be available from August 2019 on ilifu, a South African shared data-intensive cloud infrastructure. Academic users interested in cheminformatics and computational modelling are welcome and encouraged to complete a show of interest survey (http://bit.ly/gcc-za). At present, these tools are available at https://cheminformatics.usegalaxy.eu/ and further information is available at https://galaxycomputationalchemistry.github.io/usegalaxy-za/.

Global networking: Empowering Women in Chemistry

About forty women and one man gathered at the Stellenbosch Botanical Gardens on 12 February for an informal breakfast which is part of a global initiative for empowering women in Chemistry. Participants were from UCT, University of Stellenbosch and Cape Peninsula University of Technology.

The Global Women's Breakfast was designed to assist women chemists to expand their network of contacts, both locally and internationally. Women at different stages of their individual careers were encouraged to inform each other about their career progress, and together explore opportunities, in professional development and in research or teaching horizons. Organisations of all types, e.g., universities, companies, national chemistry societies, government laboratories, and other scientific organisations, as well as individual groups of chemists, were invited to participate. The world map highlights locations that participated in this event. The first breakfasts began in New Zealand at approximately 07:00 local time, initiating a global hand wave around the world ending in Hawaii.

Professor Susan Bourne, **Dr Cesarina Edmonds-Smith** (both University of Cape Town) and Seanette Wilson (Biovac Institute) had been invited to form a panel for discussion, selected because each is at a different career stage and each had followed different career paths. PhD students Bella Claassens (Stellenbosch) and Junia Malapile (CPUT) led the way in posing questions to members of the panel, and facilitated discussion with the audience. Topics covered included leadership, managing work/life balance, raising children while building a career, finding your strengths and a number of others.

Strengthening capacity for drug discovery research in Africa

During April Advanced Courses and Scientific Conferences (ACSC) held a one-week course in South Africa entitled 'Practical Aspects of Drug Discovery: At the Interface of Biology, Chemistry and Pharmacology'. Having taken place several times at the Wellcome Genome Campus in UK, the course was incorporated into the ACSC Overseas Courses programme for the first time, in collaboration with the Wellcome Centre for Anti-infectives Research (WCAIR), University of Dundee, and UCT's Drug Discovery and Development Unit (H3D). Both WCAIR (led by Professor Paul Wyatt) and H3D (led by **Professor Kelly Chibale),** focus in developing treatments for communicable Neglected Tropical Diseases, TB, Malaria and HIV.

The aim of the course was to work collaboratively to build capacity in drug discovery expertise in Africa, which is emerging strongly across the continent. Although other training courses are available in Africa, the focus of those is on individual components of the drug discovery process such as chemistry or clinical development. Drug discovery researchers in academia also often work in relative isolation within their areas of interest, thereby limiting their scope and potential for developing collaborative research networks, a key component in drug discovery. The course aimed to address this by providing a comprehensive overview of the drug discovery process and focusing on international and inter-disciplinary collaboration, targeting researchers with a limited understanding of the field and those aiming to expand from traditional disease biology to early stage drug discovery. H3D is a well-established drug discovery centre embedded within an academic institution, the first and only one of its kind on the African continent, making this an appropriate collaborator for such a course.

AFIRM: ACM SIGIR/SIGKDD Africa Summer School on Machine Learning for Data Mining and Search

Earlier this year the first ACM SIGIR/SIGKDD Africa School on Machine Learning for Data Mining and Search took place at UCT. The event was run by **Professor Hussein Suleman** and was conceived with the aims of increasing opportunities in research from traditionally underserved communities, growing the IR and data mining communities in sub-Saharan Africa and expanding the horizons of IR and data mining research.

The workshop offered a week of lectures and labs for the participants. Each day centred around a broad theme in information retrieval and data mining and consisted of lectures on aspects of that theme and hands-on lab time. The program will also include keynote addresses, panels, poster sessions and social events.

The mission of the school was to enable students to learn about modern research challenges and methods in information retrieval and data mining; to stimulate scientific research and collaboration in these fields; and to grow a community of researchers, students, and industry professionals working on information retrieval and data mining across Africa with collaborations all around the world.

Day one kicked off with a keynote about safety and explicability in the development of online search and recommendation systems and another talk on information retrieval and research in the field. There was also a talk on mutilingual information retrieval. Day two began with a lecture by Professor Hussein Suleman on the topic of Information Retrieval for Development (IRAD). The rest of the day centred on evaluation. Day three was mainly about classification; day four centred around deep learning, led by a team from Microsoft and the day concluded with a dinner at Gold Restaurant, which features foods from a variety of African cuisines. Day five featured lectures on health search and music recommendations. The school concluded with a discussion panel, followed by a "graduation" ceremony. It will be held again in 2020 in Cape Town. For more details contact Prof Hussein Suleman.

Student's 3D-printer plan to change education

Experts have spoken of the need for a new kind of learning, of future-proofing children and of the benefits of design thinking. You've probably heard about 3D printing, blockchain technology, artificial intelligence, augmented and virtual reality. Student **Denislav Marinov,** a third-year BSc physics and chemistry student is combining these conversations, ideas and technologies to try to build a better education system.

Marinov (21), plans on using 3D printers in South Africa's schools to level the education playing fields. His plan is to put one 3D educational printer into every school in South Africa, which he believes will drive solution-based, collaborative and cross-disciplinary thinking among learners. The goal is to democratise quality education while also demystifying the technology.

He designed a large-scale industrial 3D printer and began crowdfunding. A major vote of confidence came from the KJB Leadership Programme which helped him raise nearly R70 000 in the first round of fundraising. This funding will allow Marinov to build a larger 3D printer, which will eventually produce the smaller, entry-level printers destined for schools.

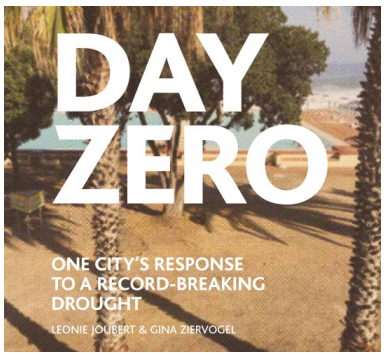
Shuttleworth Postgraduate Scholarship Programme

Yanga Bavuma and Simon Chili

The Department of Mathematics & Applied Mathematics has set up a programme on offer to highly motivated black South African students, who aspire to become academics. The Shuttleworth Postgraduate Scholarship aims to train the next generation of black South African pure and applied mathematicians by providing a unique learning programme at one of the leading Centres of Mathematics in Africa. Mark Shuttleworth graciously donated R6 million and if the scholarship programme goes well, potentially another R6 million will be donated later—this is the largest donation Mark has made to the university and is a significant step. The current students on the programme are **Yanga Bavuma** and **Simon Chili.** Read their reflections below.

Simon says: " I always had an interest in Mathematics and this has provided me with a solid support to pursue my interests and continue to deepen my understanding of the subject. It is a privilege to have the best teachers and mentors in the department who continuously inspire and contribute to our understanding. The scholarship also provides opportunities to travel and meet other Mathematicians, which is not only good for my growth but also to inspire other younger students. I hope to see a strong developing South African Mathematical culture in the future - a culture in which Mathematics is not merely seen as a subject to be studied for an exam but for its beauty and elegance - this is amongst the reasons I love sharing the little I know with younger students.

Yanga: The Scholarship support means that I can live somewhat comfortably and am even able to help out at home, which is the sort of thing you worry about when you're studying and black. Being part of the programme has also given me a chance to form a relationship with my fellow scholarship programme student, the very talented Mr Simon Chilli. I'm sure his influence alone will help greatly with my development. Also on this scholarship I have been given opportunities for international exposure in the form of a conference I'm going to attend and present at in Johannesburg as well as going to Italy for a couple of weeks in September.



New Book: Day Zero: One city's response to a record-breaking drought

Associate Professor Gina Ziervogel, a geographer and climate change adaptation expert in the Department of Environmental & Geographical Science, has spent the past 18 months examining what cities around the world can learn from Cape Town's response to a once-in-a-century drought. What she uncovered is the subject of her new book, *Day Zero*.

In 2017, after three years of drought, Cape Town – the oldest city in South Africa – faced the possibility that it might run out of water. The following year, Day Zero – the day the city's taps were predicted to run dry – was narrowly averted and the drought ended. During this time, Ziervogel began researching how the city's government had responded to the crisis. "I felt that the citizens of Cape Town deserved to have more insight into what happened behind the scenes and that it was essential to examine how Cape Town's municipal government responded to the crisis so as to share the lessons we have learned with other cities."

Day Zero: One city's response to a record-breaking drought, written with environmental journalist Leonie Joubert, is the result. The book examines the water crisis from five key perspectives – those of the water manager, politician, researcher, spokesperson and knowledge broker – to answer the question: what can we learn from the way Cape Town responded to the water crisis?

Cape Town residents queueing for water at Newlads

Research Bytes

Snobbish birds prefer to live in luxury

A unique study of birdlife in South African cities has found that birds prefer wealthy areas to poorer ones but will move out if things get too cramped. The study was conducted by a team of scientists from the University of Turin, Italy and UCT and WITS. Their findings were published earlier this year in the international journal of *Global Change Biology.* Co-author on the study, **Associate Professor Arjun Amar** from the Department of Biological Sciences at UCT, said: "This work is of particular importance because it is one of the few studies conducted in a developing country, and the only study of its kind in Africa, where urbanisation is predicted to occur at a faster rate than any other region on the planet." City soundscapes may not be famous for their birdsong, but the new study has revealed that the richer the neighbourhood, the more bird species are found there – as long as there is still enough good habitat for them to spread their wings. The researchers studied birdlife in 22 urban areas across South Africa and found that species richness increased according to the income level of the neighbourhood, but not in highly urbanised areas where vegetation has all but disappeared.

The so-called 'luxury effect' – well-documented in the developed world – also applies to relatively low-density urban areas in South Africa, where rich areas have a greater diversity of bird species than poor areas. This is probably because in wealthier neighbourhoods there is more investment in gardens, parks and other green spaces – hotspots of urban biodiversity. However, birds have no appetite for heavily built-up areas, even when they have wealthy inhabitants. This is the first time the 'luxury effect' in birds has been documented in Africa. In wealthier neighbourhoods there is more investment in gardens, parks and other green spaces – hotspots of urban biodiversity. The researchers believe such findings could help shape future urban planning in the interests of both biodiversity and environmental justice, particularly in the rapidly urbanising developing world. "This work is of particular importance because it is one of the few studies conducted in a developing country," said co-author UCT Associate Professor Arjun Amar. "Also it's the only study of its kind in Africa, which is predicted to urbanise in the future at a faster rate than any other region on the planet."

UCT's drug discovery centre receives R18m donation from former Coca-Cola chairman to drive crucial research

UCT alumnus and former chairman and CEO of Coca-Cola, Neville Isdell, has donated about R18 million towards research into the discovery of new medicines for infectious diseases at the UCT Drug Discovery and Development Centre, H3D. The generous donation will be used to establish an initial five-year Neville Isdell Chair in African-centric Drug Discovery and Development at H3D. H3D's director and founder, **Professor Kelly Chibale,** will hold the Chair, which includes the directorship of H3D. Through the donation, Isdell will support solution-orientated research to create life-saving health innovations.

"I am excited about playing a part in helping to achieve African solutions to public health challenges on the continent and across the world. I hope this support will help Professor Chibale to drive and lead innovative research and development (R&D) of new malaria medicines, as well as new tuberculosis and antimicrobial resistance treatments, and train a new generation of African scientists with key modern pharmaceutical skills required to discover modern medicines," said Isdell.

The donation will be used partly to lead efforts in establishing the H3D African Drug Metabolism and Disposition Project, also known as the H3D 'African Liver Project'. This project will focus on addressing the issue of variability in drug response across African populations, mostly driven by genetic differences in the expression and activity of drug metabolizing enzymes. Chibale said the aim was to develop and validate a preclinical discovery tool that can be used to prioritise drug candidates during their chemical lead optimisation phase based on the predicted pharmacological profile in African patients.

New dinosaur discovered in Mongolia

An artist's reconstruction of the new dinosaur, Gobiraptor minutus.

A new species of dinosaur – a type of oviraptorosaur – has been discovered in Mongolia by a team of researchers from South Korea and their colleagues, including UCT's **Professor Anusuya Chinsamy-Turan.**

Oviraptorosaurs were a diverse group of bird-like dinosaurs from the Cretaceous of Asia and North America. They are characterised by their short snouts that feature parrot-like beaks, and their commonly feathered hides. The diet and feeding strategies of these toothless dinosaurs are unclear despite the abundance of nearly complete oviraptorosaur skeletons that have been found in southern China and Mongolia. In this study, the team describes an incomplete skeleton of an oviraptorosaur from the Late Cretaceous – around 100.5 to 66 million years ago – found in the Nemegt Formation of the Gobi Desert of Mongolia in 2008 during the Korea–Mongolia International Dinosaur Expedition.

The unusual, thickened jaws of the new species (*Gobiraptor minutus*) distinguish it from other oviraptorosaurs and indicate that it may have used a crushing feeding strategy. This supports previous suggestions that oviraptorosaurs fed on hard foods, such as eggs, seeds or hard-shelled molluscs. Chinsamy-Turan contributed histological analyses of the skeleton's femur, which revealed that the specimen was likely from a very young individual. "The microscopic structure of the thigh bone of this Cretaceous-aged, baby dinosaur showed that it was richly inundated with blood vessels and that it was rapidly growing at the time of its death," says Chinsamy-Turan.

The location of the *G. minutus* skeleton in the Nemegt Formation – which consists mostly of river and lake deposits – confirms that oviraptorosaurs were well adapted to wet environments. The research team proposes that different dietary strategies may explain the wide diversity and evolutionary success of this group in the region.

Eliminating malaria in the Asia-Pacific could save 400 000 lives

Increased funding is needed to eliminate malaria across 22 Asia-Pacific countries and save an estimated 400,000 lives, according to research published in a new collection of studies on Wellcome Open Research.

Dr Sheetal Silal, from the Department of Statistical Sciences at UCT, a lead author on a recently published paper says that, "While the Asia-Pacific region has made significant progress in combatting malaria, external malaria financing has recently plateaued. With competing health risks, countries near elimination face the risk of withdrawal of funding as malaria is perceived as less of a threat. Mathematical modelling was used to compute the economic benefits and costs of elimination, and the resultant investment case can be used to advocate for sustained financing to realise the goal of malaria elimination in Asia-Pacific by 2030."

Although Asia-Pacific countries have made significant progress towards their goal of eliminating malaria by 2030, collection researchers warn that stagnating donor funding puts at risk national malaria control efforts and access to lifesaving drugs and other tools, and could, under one potential scenario, result in as many as 845 million more malaria cases and 3.5 million deaths. "In the current climate of decreasing global malaria funding, countries with a lower malaria burden are becoming a lesser priority for donors, but sustained financing needs to be secured to realise this goal of *P. falciparum* and *P. vivax* elimination in the Asia-Pacific by 2030," said study author Dr Sheetal Silal.

No touching please! Non-invasive physiological measurements in wild animals

by Amanda Bourne and Susan Cunningham

Just like us, when animals experience stress, they show a physiological response in the body. This response can take many forms - an elevated heart rate, higher metabolic rate, an increase in circulating stress hormones (called cortisol in most mammals, including humans, and corticosterone in reptiles and birds), or, when heat stressed, a heightened risk of dehydration. Studying these responses in animals can tell us a lot about how much environmental stress animals can tolerate, helping to improve our understanding of animal biology and inform conservation management actions.

Traditional methods for measuring physiological responses to environmental stress can cause considerable disturbance, particularly when they involve repeated capture of individuals along with taking samples of blood or tissue. For example, a common way to estimate energy expenditure and water use is by measuring the turnover of hydrogen and oxygen atoms in an animal's body as they are used during respiration and evaporative cooling. Typically, this involves capturing the animal, injecting it with heavy isotopes of hydrogen and oxygen (non-toxic 'doubly labelled water'), keeping it captive for a brief period, then releasing and, later, recapturing it. During this time, three blood samples are taken, and levels of heavy isotopes in the blood are measured over time. Likewise, estimates of stress, measured as concentrations of stress hormones (glucocorticoids) circulating in the body, are often measured using blood plasma. Again, this involves capturing and handling study animals. It is possible that handling stress may obscure signatures of environmental stress, and finding less invasive ways to measure physiology in wild animals is therefore an important research priority.

Recently, the Hot Birds Research Project team, led by **Dr Susan Cunningham** (UCT) and Prof. Andrew McKechnie (University of Pretoria) from the FitzPatrick Institute of African Ornithology, took up this challenge. PhD student, **Amanda Bourne** (UCT), and Honours student, Emma Jepsen (UP), have been developing and testing non-invasive methods for measuring physiological responses in wild birds. Amanda's research focuses on measuring metabolic rates and water use, and Emma's focuses on measuring stress. The research takes advantage of a habituated population of Southern Pied Babblers *Turdoides bicolor* at Kuruman River Reserve in the Northern Cape, in collaboration with Associate Prof. Amanda Ridley, also affiliated with the Fitz. The babblers are trained to weigh themselves on a portable scale in return for a small food reward, and they can be approached and observed by people consistently within 2 – 5 m without disturbance. Instead of injecting the birds with doubly labelled water, Amanda dosed her study birds by feeding them beetle larvae injected with the isotope solution. Instead of capturing the birds and taking blood samples, both Amanda and Emma collected faeces from the ground after the birds had excreted them naturally. These methods remove the need to touch the birds entirely.

In both studies, faeces provided an adequate substitute for blood as a source of body water (for the labelled water study) and stress hormone concentrations (faecal glucocorticoid metabolites used in the stress study). Derived measurements were sufficiently sensitive to detect meaningful biological patterns. And both non-invasive dosing and non-invasive sampling proved feasible in practice. The two methods were recently published, in *Functional Ecology* (Bourne et al. 2019, 33: 162-174) and *General and Comparative Endocrinology* (Jepsen et al. 2019, 276: 60-68). Together, these studies demonstrate that valuable information on the physiology of wild birds can be collected without imposing capture or handling stress – a step in the right direction for both improving animal welfare in science and maximising the validity of measurements of responses to environmental stress under natural conditions.

Images by Nicholas B. Pattinson

Travels across the Globe

SEAmester give students hands-on tools to study our oceans

"Science should be cool, it needs to be engaging and interactive. This is how we enthuse the next generation of scientists", says **Professor Isabelle Ansorge**, from the Department of Oceanography. Professor Ansorge's annual SEAmester programme which she founded in 2016, assists a wide range of students to gain access to South Africa's world-class research vessel the SA Agulhas II. SEAmester, now in its fourth year, with funding from the Department of Science and Technology and supported by the Department of Environmental Affairs, has allowed many students to deepen their involvement with marine research at sea. This year 41 students from universities and other tertiary institutions across South Africa were selected for the voyage through a competitive application process. For many of these students, SEAmester will be their first experience at sea.

During the immersive 11-day programme at sea, students engage in a busy schedule of lectures and work on deck and in laboratories. The ship is travelling from Cape Town to the heart of the Agulhas Current. While on board the voyage, the students participate in ongoing oceanographic research on the Agulhas System Climate Array (ASCA). Two areas of focus are on offer for this year's students: 'Tools of the Trade' includes many of the technical aspects of measuring the oceans, predicting weather, mapping and remote sensing. And 'Oceans in a Changing Climate' focuses on the biology of the oceans, from the smallest microbes to the largest marine mammals, and how humans influence marine life.

Submitting Master's thesis while 'all at sea'

The inhospitable Southern Ocean, an engine room of massive storms and waves, is not a place from which any master's candidate – not even an oceanographer – would choose to relay final changes to their thesis but for **Jessica Burger**, that was the reality!

"While my M.Sc. thesis work focused mainly on the southern Benguela upwelling system, I plan to conduct my Ph.D. research in the Southern Ocean. To that end, I was lucky enough to spend three months on a research cruise to the Antarctic aboard the R/V *SA Agulhas II*. The cruise left Cape Town at the beginning of December, just after I had handed in my M.Sc. thesis. I received examiner comments in late January, such that I had to address them, make corrections, and resubmit my thesis from the ship in the middle of the very remote Weddell Sea. The most difficult thing about doing the corrections at sea was the poor internet connection, which made it very time consuming to download the resources that I needed – and tricky to communicate via email with the people that I needed to on land".

This meant asking her fellow scientists and crew members to stop using the internet connection while her word- and data-heavy thesis travelled across the seas. Getting permission from the captain to isolate the ship's Wi-Fi for her final submission was actually not difficult and she said he was very understanding and helpful. The other passengers were only left without Wi-Fi for about an hour.

UCT hosts IdeasLab at World Economic Forum meeting in China

Three researchers from the UCT led this year's discussions on innovative research into infectious diseases at the World Economic Forum's (WEF) IdeasLab in China. The IdeasLab is on the programme of the WEF 13th Annual Meeting of the New Champions (AMNC) 2019. And because the three presenters are from UCT, the university is regarded as "hosting" this year's talk. **Dr Sheetal Silal,** from the Department of Statistical Science presented mathematical modelling of infectious diseases research at the meeting, with a focus on her App development for Policy in Africa. The research was presented to industry leaders, chief executives of top-ranked multinational corporations, heads of government and ministers and leaders from media, academia and civil society.

Dr Silal commented "The AMNC is a high profile exhibition of scientific and political thinking in the world where one gets a glimpse of the future, in terms of technological and scientific advancement in the context of global political strategy, and it also serves as benchmark to judge one's own progress. Our IdeasLab session was well received, and special recognition was given to the all-female panel. The IdeasLab format lends itself particularly well to teams from academic institutions, allowing stimulating discussion around the innovations presented. My personal experience at the meeting was uplifting - engaging with high profile individuals. While we were the only African university at the meeting, there was a significant South African presence from industry. I spent some time engaging with Patrice Motsepe and members of his delegation discussing the key ideas of the meeting in the South African developmental context. The South African banking industry were also part of crucial discussions on China's continued investment in Africa. Personally, there was considerable interest in my disease modelling research, with follow-up discussions with the World Health Organisation and the Ministry of Botswana. The AMNC is an incredible opportunity for networking globally, reinforcing the university's standing in Africa and the world and provides a conducive environment for procuring funding for the university. My attendance at the meeting has helped me to expand my vision for my newly formed research unit. I am honoured to have been selected to represent the university at this event."

Documenting nature's 'dangerous decline'

Dr Lynne Shannon , a senior researcher at UCT's Marine Research Institute (MARE), is part of a team of expert authors who collaborated to compile an exhaustive report on a global study which warns that humans' devastating impact on nature leaves one million species at risk of extinction. Dr Shannon is one of 145 expert authors from 50 countries who joined forces with 310 contributing authors to compile the report. "Over the past three years, I have had the pleasure and privilege of working with an incredible, hand-picked team of 13 leading scientists," said Shannon. These scientists, she said, have expertise in natural, social, economic and indigenous local knowledge fields, spanning the terrestrial, freshwater and the marine environments.

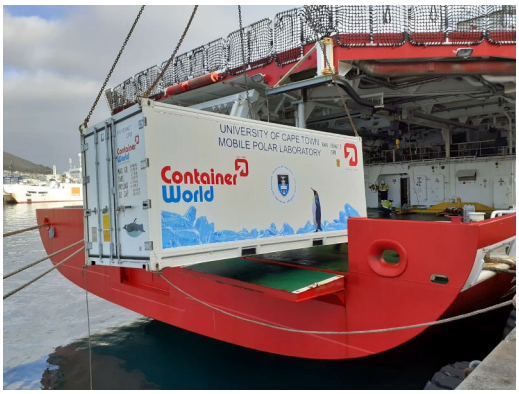
Recently, the United Nations Environment Programme's Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) released the findings of the study, the *IPBES Global Assessment Report on Biodiversity and Ecosystem Services*. It issues a critical and urgent warning: Nature is declining globally at rates unprecedented in human history. The rate of species extinction is accelerating, with grave impacts on people around the world now likely. Among its many shocking findings, the report warns that around one million animal and plant species are threatened with extinction – many within decades, and more than ever before in human history.

On the importance of the report, Shannon said it includes "novel and insightful approaches and ways of summarising the current and likely future status and trends of biodiversity and ecosystem services that can be of practical use in taking action to curb the alarming degradation of our natural world".

Polar cyclones, Antarctic sea ice and a cruise to understand it all

On 15 July, the South African research vessel *SA Agulhas II* departed from Cape Town bound for the Southern Ocean and Antarctica's winter sea ice. Onboard will be 25 researchers from the University of Cape Town (UCT), joining 70 participants from South Africa and the rest of the world.

The expedition – which is part of a large collaborative project sponsored by the South African National Antarctic Project (Southern oCean seAsonaL Experiment, SCALE) – plans to study winter conditions in the Southern Ocean and Antarctica's sea ice. Something scientists realised we knew very little about after they unexpectedly saw extreme changes to Antarctic sea ice during 2016. In addition to **Associate Professor Marcello Vichi** from the Department of Oceanography, the cruise's chief scientist, there will be two principal investigators from oceanography – **Dr Katye Altieri** and **Dr Sarah Fawcett** – and three from the Faculty of Engineering & the Built Environment.

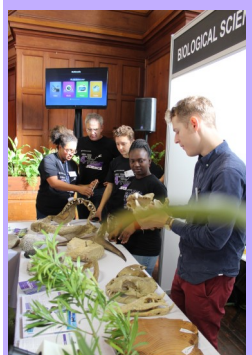


The team will also be the first to use a new mobile polar laboratory (pictured left) they've installed on the *SA Agulhas II* – a joint effort between UCT engineering and oceanography.

During 2016, the natural, seasonal melting of sea ice in Antarctica happened in less than a month between October and November – something that had never happened before. It usually takes three to four months to melt. During 2016, the extent of the ice also reached a record low. As Vichi describes it, the 2016 melt "had an interesting statistical consequence: it wiped out the apparent increasing trend that has been reported for Southern Hemisphere sea ice previously." A trend that had, up to then, been in stark contrast to the dramatically declining sea ice in the Arctic. Vichi says that there are a few hypotheses on how or why this happened, but without better understanding, they won't be able to predict how the Southern Ocean and its ice will respond to climate change.

"Winter cruises to the Antarctic are essential to bridge this gap in our knowledge." "South Africa – and UCT – have contributed considerably to collecting more winter data over the past few years." says Vichi. Antarctic sea ice is usually measured throughout the year using satellites. However, the reliability of remote sensing relies on direct measurements taken by scientists on the ice – and only very few of those measurements have been taken during winter.

UCT Open Day: May the 4th be With You



The Faculty of Science ensured that the Sarah Baartman Memorial Hall was abuzz with activity once again on UCT Open Day - thanks to all the volunteers who gave up their Saturday to inspire learners and their parents about the exciting world of Science at UCT. The Departments put on impressive displays and the talks were all jam-packed with people spilling out onto the floor and in the aisles.

A huge thanks to all involved in making this day a success!

OUTREACH IN THE FACULTY

Computer Science grooms young tech innovators

Learner Yusri Nelson (17) was fascinated by the possibilities of 3D printing

It's no secret that Generation Z are already attuned to the demands of a modern, tech-savvy world. But possibilities became reality when a group of high school learners from Ocean View Secondary School were introduced to developments such as 3D printing, antenna Wifi networks and cantennas during a computer science information day at the UCT. The Department of Computer Science organised a jam-packed one-day programme of demonstrations, discussions on computer hardware and a campus tour which enthralled the learners.

Dr Melissa Densmore, senior lecturer in the department, said the event aimed to introduce the grade 8 to 12 learners to the numerous possibilities offered by a career in computer science. "We really wanted them to learn what is required to be admitted to the science faculty, and to be motivated to get the marks to pursue a career in computer science. I especially want to ensure that girls in Ocean View are part of this opportunity," she said.

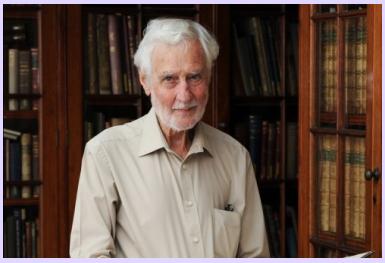
How did this initiative come into being? Dr Densmore explained that they have been partnering with people in Ocean View for the past two years to develop skills to support a community-based wireless network and to develop the iNethi platform, which facilitates local content creation and sharing with an objective of strengthening the community. A key partner in Ocean View is Cloud Classroom, which operates out of Ocean View Secondary School, where learners can go after school to use tablets to access educational content and games in addition to homework assistance.

Celebrating Nelson Mandela Day: Statisticians create sandwiches from loaves of bread

The Department of Statistical Sciences, spent 67 minutes (and a bit more) making sandwiches for the UCT Food Security Programme. In total 43 loaves –created 475 sandwiches! Thanks to all staff and postgraduate students who contributed ingredients and time.

How long does it take how many statisticians to make how many sandwiches??

In Memoriam:



Emeritus Professor Michael William Feast died peacefully early on the morning of 1 April 2019, aged 92. He is survived by his wife Connie, three children and eight grand-children.

Michael was an honorary professor in the Department of Astronomy at the University of Cape Town from 1992, and he was awarded a DSc (honoris causa) by UCT in 1993. He was a former director of the South African Astronomical Observatory (SAAO), a founding member of the Academy of Science of South Africa, a member of the International Astronomical Union, an honorary fellow of the Royal Astronomical Society and a fellow of the Royal Society of South Africa and the South African Institute of Physics (SAIP).

Physics Celebration on the beach

Several members of the Physics Dept (plus partners and some family members) recently attended a private function/celebration on Llandudno beach with one of their colleagues.

photo: Gregor Leigh

LAST LAUGH....