

NANO NEWS - SOUTH AFRICA

Volume 5, June 2010

Edited by *Patience Iyuke*

Co-edited by *Neil Coville*

Introduction

The latest newsletter again indicates some of the activities taking place in the vibrant 'nano' community in South Africa (SA). As will be seen, the student chapter has been active and this will ensure the future of this activity in SA. The annual Nanoscience Young Researcher Symposium held in the Gauteng region continues to attract strong student support leading to a high quality of oral presentations by the speakers. The continued excellent support of 'nano' infrastructure in SA is reflected in the Grants that were awarded by the DST within the NNEP Programme recently. Congratulations to the successful recipients! It is this infrastructure that allows SA scientists and engineers and post-graduate students to compete with our world competitors.

Neil Coville

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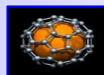
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The 2010/2011 SANi Student Chapter Executive Committee

The new South African Nanotechnology Initiative (SANi) student chapter executive committee elected on the 24th November 2009 held its first meeting on the 19th February 2010 at the University of the Witwatersrand, Johannesburg. In the first meeting, facilitated by Dr Sabelo Mhlanga (University of the Witwatersrand, School of Chemistry), the various portfolios of the committee were occupied. The 'Student Chapter' is a sub-division of the SANi that represents all students involved in nanotechnology based research in South Africa with the aim of establishing a network amongst the students, industries and professional societies involved in nanoscience and nanotechnology based activities.

The committee members were elected as follows:

Chairperson: Ms Nikiwe Kunjuzwa (University of the Witwatersrand)
Vice Chairperson: Ms Ntombi Mathe (University of Cape Town)
Secretary: Ms Rosy Ocwelwang (University of Limpopo)



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Treasurer: Mr James Ramontja (CSIR National Centre for Nano-structured Materials)
Member: Mr Nsikayezwe Dlamini (University of Johannesburg)
Member: Mr Olushola Adeniyi (University of the Western Cape)



SANi Student Chapter Committee 2010 posing with Dr Sabelo Mhlanga (far right). Left to right: Rosy, Nsika, James, Niki, Ntombi, and Olushola.

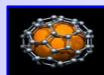
Report by Dr Sabelo Mhlanga, Wits University

Report on the Nanoscience Young Researcher Symposium

As a follow to the initiative by Dr. LM Sikhwivilu, Dr. Sabelo Mhlanga and Mrs. Nosipho Moloto, the Nanoscience Young Researcher Symposium (NYRS) was held on the 7th of May 2010 at the University of Johannesburg (UJ) under the leadership of Mr. Nsika Dlamini and Ms. Nikiwe Kunjuzwa with support from Sabelo Mhlanga and Lucky Sikhwivilu as well as staff from the Department of Chemical Technology, UJ – Dr. Justice Moloto and Prof. Rui Krause.

The programme included the Dean of Faculty of Science, Prof. K. Burger for welcome and Dr. Sibulelo Vilakazi (from Mintek NIC) as the guest speaker, who gave a talk highlighting aspect of nanotechnology applications pertaining to South Africa and the world. The talks were subdivided into three sessions – 1st and 3rd for MSc students and 2nd for PhD students and hosted talks ranging from pure synthesis of nanomaterials to the health related topics with representation from Wits, CSIR, University of Limpopo, North West University and the host UJ.

The quality of presentations was very high with both technical aspects and subject knowledge. The awards were given to the 1st and 2nd prize for both MSc and PhD categories with the 1st prize R1000 and 2nd prize R750 for both categories.



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The following students walked away with the prizes – for MSc, Gcina Vilakati and Phindile Khoza both from the University of Johannesburg, Chemical Technology Department and for PhD, Mahluli Moyo and Myriam Motchelaho both from Wits, School of Chemistry, respectively.

South African Agency for Science and Technology Advancement (SAASTA) was for the first time taking part alongside the presentation with the aim being to extend public awareness campaign on nanotechnology and nanosciences to larger university community including both students and staff from all faculties. This will be extended to the upcoming NYRS to be held in the Western Cape in the second semester. They also sponsored transportation and accommodation for those students from outside Gauteng province, i.e. North West and Limpopo. The person behind the awareness campaign at SAASTA is Mr. Mthuthuzeli Zamxaka. The symposium was such a success and we hope to see more successes in others to be hosted in other institutions for next year and continued support from SANi public awareness funding and SAASTA under the major support from Department of Science and Technology (DST).

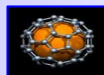
***Reported by Dr. Justice Moloto, University of Johannesburg
Chemical Technology Department***

SAASTA Nanotechnology Project

The Rationale

The Sci-Bono Discovery Centre has been awarded the Nanotechnology Project to manage on its behalf. The goal of the project is to introduce Teachers who teach Maths, Science and Life Sciences to research and determine career opportunities that exist for their learners in the fields of Nanosciences and Nanotechnology. Therefore, it is important to select teachers from schools that have a strong science and maths curriculum. The selection is weighted in favour of previously disadvantaged schools but includes a small percentage of advantaged schools to ensure their exposure to research in South Africa and to build the profile of Nanotechnology across the board.

- Educate the public on, and enhance their understanding of nanotechnology.
- Stimulate interest in nanotechnology and nanoscience as a career in order to ensure long term capacity building in the field.
- Introduce teachers to Nanoscience and Nanotechnology and the importance of multidisciplinary studies.
- Stimulate teachers' interest in Nanotechnology research in South Africa and to provide teachers with opportunity for professional development.



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Target

High School Teachers (Mathematics, Science & Life Sciences) will be selected from different schools to participate in a two day Teacher Symposium on Nanotechnology & Nanosciences. The symposium is planned for the 30 June and 1 July 2010. The schools will be selected by Sci-Bono (Teacher Development Unit), GDE and partnering organisations. The symposium aims to introduce teachers to the multi-disciplinary aspects of Nanoscience, to share knowledge of career opportunities within these fields and to expose teachers to current Nanotechnology research in South Africa.

Programme will include:

- Lectures
- Workshops
- Site Visits to Research Councils, Universities and Industries

The curriculum, developed in conjunction with identified partners will cover:

- Introduction to Nanotechnology.
- Understanding risks in emerging technologies through Life Cycle Assessment.
- Science principles and Nanotechnology: Understanding mathematics, science, biology and physics in Nanotechnology.
- Innovations in Nanotechnology Globally
- Research and applications in South Africa with particular reference to Water and Health.

For more information, please contact:

Hemant Waghmarae, Project Officer

Tel: 082 657 0550 or 011-639 8400.

E-mail: hemant@sci-bono.co.za



science
& technology

Department:
Science and Technology
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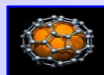


SAASTA

South African Agency for Science
and Technology Advancement

Submitted by Hemant Waghmarae

Project Officer, Sci-Bono Discovery Centre, Johannesburg



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Recipients of NNEP Grants

On the 22nd of April 2010, the following people received the National Nanotechnology Equipment grant:

1. Prof. Somnath Bhattacharya – Physic, Wits

Amount: **R152 782**

Equipment: Set up for a nano-magnetic characterization and spin transport measurements consisting of two pieces: 1) Vibrating Sample Magnetometer (VSM) Probe 2) AC Susceptibility Measurement Probe.

Use The complete nano-magnetic characterization and spin transport measurements system will be built up by adding a Vibrating Sample Magnetometer (VSM) Probe and an AC Susceptibility measurement Probe which will be used as attachments for the existing cryostat to perform magnetic susceptibility measurements of bulk as well as nano-structured samples at temperatures down to 1.6 Kelvin & magnetic fields up to 12 Tesla.

With this equipment, Somnath and his group can initiate magnetic property measurements of various materials for the first time at Wits University. This application was strongly supported by a group of researchers who are also members of the CoESM.

2. Prof Viness Pillay - Pharmacy and Pharmacology, Wits :

Amount: **R1 467 600**

Equipment: A MARAN-iP In Vitro Imager

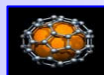
Use: Vitro Imager is able to provide superior imaging of solid polymeric nanostructures embedded within composite carrier scaffold devices or drug delivery systems such as nano-enabled tablet matrices, capsules or other polymeric scaffolds developed within the materials, biomaterials and pharmaceutical sciences.

3. Prof C. Ngila – Chemistry, UKZN

Amount: **R7 000 000**

Equipment: Zeiss Ultra Plus

Use: The instrument will facilitate high resolution images of the surface of chemically-modified substrates with level of detail unattainable with conventional scanning electron microscopes, selective imaging of heavy metals present on the surface of nanofilters, catalysts or carbon nanotubes using the sophisticated array of signal detectors on the FEGSEM,



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Use contd. Analysis of the elemental composition (EDX) of samples that is highly localised due to the small interaction volume generated by the field emission beam, the ability to observe at low (cryo) temperatures beam-sensitive and/or partially hydrated samples that would otherwise deform during observation, thus giving rise to artefactual images and the ability to obtain corresponding surface and internal information from thin films using STEM detector technology.

4. **Prof T Nyokong – Chemistry, RU**

Amount: **R6 954 000**

Equipment : X-ray Photoelectron Spectrometer (XPS)/Electron Spectroscopy for Chemical Analysis (ESCA)

Use: XPS is a quantitative spectroscopic technique that measures the elemental composition, chemical state and electronic state of the elements that exist within a material. It gives information in the nanoscale (1 to 10nm), hence it is an essential nanotechnology tool.

5. **Dr Leslie Petrik – Chemistry, UWC**

Amount: **R732 000**

Equipment: (Quantachrome Instruments) Austosorb-1C

Use: Performs measurements of adsorption and desorption isotherms for characterisation of surface area, pore volume and pore size distribution of microporous and mesoporous solids. Includes automated gas switching, in-situ sample preparation, high temperature furnace and digital temperature controller for precise chemisorption measurements and characterisation of active surface area, heats of adsorption, degree of dispersion, average crystallite size.

6. **Prof JH Neethling -Physics , (Centre for HRTEM)NMMU**

Amount: **R1 441 000**

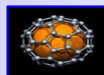
Equipment: Cross Section Polisher

Use: Uses an Argon Ion Beam to prepare cross sections of materials for characterization by Scanning Electron Microscopy. The method is useful for the observation of layered structures, interfaces and the microstructure of metals, ceramics semiconductor devices and composites.

7. **Prof CI Lang - Mechanical Engineering, UCT**

Amount: **R577 000**

Equipment: 1) Plasma cleaner for TEM specimens, 2) Heating specimen holder for TEM



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Use: Plasma cleaners eliminate contamination of specimens for resolution TEM. Heating specimen holders allow thermally-activated phase transformation and shape evolution to be observed in situ in the TEM. They also allow "baking" of TEM specimens to reduce contamination in specimens which are not suitable for plasma cleaning.

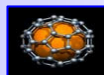
South African Chemical Institute Convention

On behalf of the conference organizing committee I would like to invite you to the 40th SACI convention and the 3rd FASC meeting to be held at the University of the Witwatersrand in Johannesburg, South Africa from January 16th to 21st, 2011. It is the first event of a series of events planned by IUPAC and UNESCO for the International Year of Chemistry (IYC). This event is a prelude to the official ceremony opening the International Year of Chemistry and is billed to bring chemists from the continent of Africa and the world-over to celebrate chemistry. The conference is being organized by the Gauteng Coordination Committee of SACI and the local organizing committee is putting together a full, multisession programme that will address the conference theme: Chemistry- the key to Africa's future.

The conference will cover the usual aspects of a SACI convention during the first four days of the conference. The FASC meeting will focus on green chemistry and will be held on the last day of the conference. This combined meeting offers chemists in South Africa and their colleagues on the African continent a unique opportunity to come together and represents only the second time SACI has held a joint conference with chemists on the continent. The first was the 34th SACI convention and the 7th International Chemistry Conference in Africa (ICCA) in Durban in 1998. This joint 40th SACI and 3rd FASC meeting is geared towards building collaboration between chemists on the African continent on sustainable chemistry and hence has the last day of the conference earmarked for green chemistry.

We are putting together a scientific programme that will showcase research activities in all traditional branches of chemistry (Organic, Inorganic, Physical and Analytical) as well as interdisciplinary areas (such as Materials, Nano-science, Bioinorganic, Green chemistry, Environmental chemistry etc.). The programme will provide a platform for presenting current research work going on in the African continent, as well as in the rest of the world. We see this as an opportunity for chemists on the continent to build links to strengthen the Pan African Chemistry Network (PACN) recently launched in Kenya.

So, come celebrate chemistry with us in the vibrant city of Johannesburg and enjoy the rich culture and interesting sites of the city and surrounding areas, even if it six



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months after the Soccer World Cup. We assure you that all the facilities used for the World Cup will still be there for soccer and non-soccer fans to enjoy in January 2011. For more information on the convention, please visit <http://www.saci2011.org.za/>

**Posted by Laila Hughes,
South African Chemical Institute.**

ICPC Nanonet News and Events Highlights

Second ICPC Annual Region Reports published

The second set of annual reports from the eight ICPC regions will be published on the ICPC Nanonet website and available to registered users from May 28th 2010. Each report profiles the latest N&N developments in all countries active within each region, and each region as a whole. As well as providing an update on the of N&N activities during the past year, the reports provide an in-depth focus on technical themes and topics of interest. Also included is a comprehensive "Who's who" of scientists and researchers, information about relevant organisations, national, regional and inter-regional initiatives, funding bodies, and lists of events. Comments and suggestions are particularly welcome. Contact the relevant project partner to submit these. If you are based in sub-Saharan Africa and would like details of your organisation or current research interests and foci to be included in the report, you are can submit to Lesley Tobin

ICPC NanoNet Workshop 2010 Beijing – Register for the live webcast!

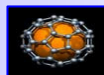
The Second ICPC Nanonet Annual Workshop takes place on 14th and 15th June in Beijing, China, prior to the famous Dragon Boat Festival. The workshop will showcase regional initiatives and developments, with a special focus on East Asian N&N from the perspective of building mutually beneficial collaborations with the EU. Speakers from other ICPC regions will also present news of novel developments and address current themes. The full programme can be accessed at: <http://www.icpc-nanonet.org/content/view/121/123/>.

Are you unable to travel to the event? Follow the proceedings online and be part of discussions in real-time through a free live webcast. In addition, this year the second day of the workshop will be webcasting one of three discussion groups, giving you the opportunity to engage in a question and answer session with an expert panel on the EC Code of Conduct for Responsible Nanotechnology, scheduled to take place at 13.55pm local time (6.55am GMT).

Pre-registration is required to participate in the free webcast of the workshop and discussion group and/or to receive the free DVD after the event:

http://www.icpc-nanonet.org/2ndWorkshopWebcast/indexWebCast_reg.html

For information contact the project coordinator: Lesley Tobin or the local organizer, Dr Chi Zhang (icpcworkshop2010@gmail.com).



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Call for Papers: The Nano Archive approaches 7,000 items - Deposit your papers and add to the growing body of open-access Nano research

As the population of items in the Nano Archive approaches 7,000, this online open-access repository for nanoscience and nanotechnology research invites you to submit papers to be published free online for users world-wide. Submitted papers can include peer-reviewed articles, journal articles, review articles, conference and workshop papers, theses and dissertations, book chapters and sections, as well as multimedia and audio-visual materials. The Nano Archive also welcomes new, unpublished research results to be shared with the wider community.

This electronic archive of nanoscience publications has a simple interface for the deposit of full-text papers and incorporates facilities for retrieval by browsing or searching. It is freely accessible to researchers everywhere, making research papers and other scholarly publications widely available. For more information on the benefits to you as a researcher, see:

<http://www.icpc-nanonet.org/content/view/123/92/>

If you would like an editor's account and instructions for depositing papers, contact the Project Coordinator, Lesley Tobin.

News and Events highlights

- 1) 14-15th June 2010: Second annual workshop, Beijing
- 2) 8th May 2010: ICPCNanoNet organizes online workshop on "Nanotechnology for Biomedical Applications"
- 3) 28th May 2010: Publication of Second Regional Reports
- 4) 16th April 2010: ICPCNanoNet organizes online workshop on "Nanotechnology and Photovoltaics"

Add your event to the ICPC Nanonet Calendar on the website forum

Project contacts

For further information:

Project website: <http://www.icpc-nanonet.org>

Nano Archive: <http://www.nanoarchive.org>

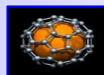
Regional project partners:

<http://www.icpc-nanonet.org/images/stories/Regions/ListofICPCs.pdf>

Beijing Workshop Coordinator,
Dr Chi Zhang. Email: icpcworkshop2010@gmail.com

Project Coordinator,
Ms. Lesley Tobin, Institute of Nanotechnology (UK)
Email: lesley.tobin@nano.org.uk or Tel: +44 (0)1786 458088.

**Submitted by Lesley Tobin
Institute of Nanotechnology, UK.**



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Nano-Land Global

NanoLandGlobal Ltd has been established as THE global on-line hub for all things related to nanotechnology.

The web site is now live and the NanoLandGlobal community will consist of product manufacturers, government ministries, sales distribution channels, end users, the media and academic partners - right around the world.

We will be writing to you in due course with more details of your opportunity to be part of this global network, but in the meantime I am writing to invite you to submit a 1,000 word article for publishing on the web site. It would be helpful if you were able to send us the article by 30th June 2010.

The University of Manchester (UK) are already submitting an article for inclusion and others are already preparing their response.

Please include with your article, permission for us to publish the article on the web site, but we will mark it as copyright your source.

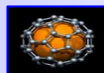
Your article maybe about some area of scientific or academic study you have completed in nanotechnology and nanoscience, or your perspectives on the future of nanotechnology and nanoscience in your country.

I look forward to hearing from you in this connection.

David Jensen FIOD FInstSMM ACIM
Co-Founder & Director
NanoLandGlobal

T +44 (0) 20 3287 9234
M +44 (0) 7776 186 981
www.nanolandglobal.com





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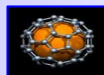
Forthcoming Nanoscience and Nanotechnology Events

Local Events:

- i) The 40th SACI Convention Incorporating the 3rd FASC Congress, University of Witwatersrand, Johannesburg, South Africa <http://www.saci2011.org.za/>

International Events

- i) Bridging the Gaps: 2010 SME Annual Conference, Sheraton Music City Nashville TN USA, 6th-8th June 2010
<http://www.goingtomeet.com/conventions/details/55058> or
<http://www.sme.org/cgi-bin/get-event.pl?--001889-000007-home--SME->
- ii) Intensive Course on Nanomaterials, Bad Gastein, Austria, 8th-10th June 2010:
<http://www.nanoconsulting.de/englisch/annoucement-2010.pdf>
- iii) The 2nd Annual ICPC NanoNet Workshop, Beijing, China, 14th-15th June 2010: <http://www.icpc-nanonet.org/>
- iv) 5th Annual Greener Nanoscience Conference & Program Review, Portland, Oregon, 16th-18th June 2010:
<http://oregonstate.edu/conferences/greenernano/> or
<http://www.nanopaprika.eu/profiles/blogs/greener-nano-2010-reducing>
- v) Nanotech Conference & Expo 2010, Anaheim Convention Centre, Anaheim, California, USA, 21st-25th June, 2010
<http://www.techconnectworld.com/Nanotech2010/>
- v) 2010 Villa Conference on Interaction Among Nanostructures (VCIAN-2010), Santorini, Greece, 21st-25th June 2010:
<http://www.oanano.org/vcian> or http://www.nanopaprika.eu/events/events/show?id=161234%3AEvents%3A56407&xg_source=msg_invite_event
- vi) Nanomedicine Conference: "Business Development & Successful Nanotechnology Practice", Berlin, Germany, 1st-2nd July 2010
<http://www.nanopaprika.eu/profiles/blogs/-2>
- vii) Nanotechnology for Sustainable Energy, ESF Research Conference, Austria, 4th-9th July 2010.
<http://www.esf.org/activities/esf-conferences/details/2010/confdetail315.html>



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- viii) 18th International Conference on Composites/Nano Engineering (ICCE-18), Anchorage, AK (USA), 4th-10th July 2010
http://myweb.polyu.edu.hk/~mmkklau/ICCE/ICCE_Main.htm
- ix) Challenges in Physical Chemistry and Nanoscience (ISACS2), Budapest, Hungary, 13th-16th July 2010 : <http://www.rsc.org/ConferencesandEvents/ISACS/PhysicalChemistryandNanoscience/index.asp>
- x) Taiwan Nano Exhibition, Taipei World Trade Centre, Hall 1, Taipei, Taiwan, 7th- 9th October 2010 <http://nano.tca.org.tw/index.php?lang=e>
- xi) Nanosafe 2010, Minatec, Grenoble (France) 15th-19th November 2010. More information: <http://www.nanosafe.org/>
- xii) The 2010 International Chemical Congress of Pacific Basin Societies (Pacifichem), Honolulu, Hawaii, USA, 15th-20th December 2010:
<http://www.pacifichem.org/>