

# NANO NEWS - SOUTH AFRICA

Volume 10, November 2010

Edited by *Patience Iyuke*

Co-edited by *Neil Coville*

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## Annual Meeting on Carbon Nanotubes and Composites

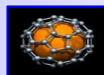
The annual meeting on carbon nanotubes and composites held at the University of the Witwatersrand took place on Wednesday, 20th of October this year. This event showcases the student studies that are being carried out in the focus area on 'nano' in the DST/NRF Centre of Excellence on Strong Materials. This year presentations from the Schools/Departments of Mechanical Engineering, Chemical Engineering, Chemistry (both UJ and Wits) and Physics were made. A total of 14 presentations were made. The topics varied from synthesis to electrical and magnetic properties of carbons to their use in Hg removal from water, in car rims, in solar cells and as catalyst supports. About 45 attended the event. As always, the afternoon event was followed by a mixer, where the students from the different groups could share experiences.

**Neil Coville**

## The Environment and Materials Congress

Recently a group of academics from UCT, Wits and UNISA visited Algeria to attend a conference on The First International Congress on the Environment and Materials. This was an interesting event as it focused on science/technology issues important to Algeria. The conference proved to be a formidable challenge for the SA delegates as most of the proceedings were in French. The main objective of the visit was however for the SA group to interact with researchers in Algeria with the aim of setting up joint projects in materials/energy and some of these projects will certainly have a nano component. The team, led by Dr Tuhami Mokrani (UNISA), had valuable discussions with many Algerian researchers while in Algeria

**Neil Coville**



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## Report on the Nanoscience Young Researches Symposium

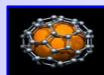
The first Western Cape Young Researchers Symposium (WC-NYRS) was held at the University of the Western Cape on the 17<sup>th</sup> of September, 2010. The symposium was organised by the SANi student chapter committee and provided a forum for postgraduate students to present their work to peers in a relaxed environment. The very successful event comprised 9 student talks and motivational talks. Students from the Universities of Stellenbosch, Cape Town and Western Cape participated and presented their work.



*Picture taken at the 1st WC NYRS*

Prof. Dirk Knoesen, a professor at UWC and a member of SANi committee gave us a warm welcome, and was such a delightful host too. Prof Malik Maaza, the founder of SANi also delivered a motivational speech. His passion and extensive knowledge were certainly present in his speech, and his dynamic presentation challenged students to take a larger view of their life-planning. In our midst, we were very honoured to have Ms Nontombi Marule, a delegate from the Department of Science and Technology (DST). She appreciated the growth in the student component of the nanotechnology field. She touched mostly on the plans DST has, highlighting that DST is considering to make available funding for young researchers not rated by NRF who wish to pursue their own research without being directed by a senior scientist. Ms Marule also stressed that DST welcomes the new ideas/suggestions students might have to make the program more efficient. Mr. Mthuthuzeli Zamxaka, a project coordinator for Public Engagement with Nanotechnology at SASTA was also present, to inform about the public awareness campaign on nanotechnology and nanosciences to the larger university community including both students and staff from all faculties. He played a very important role in making sure that his organization sponsored the event as they did this year at UJ.

The SANi student chapter is forever grateful to Prof. Lesley Petrik who chaired the morning session and also sat the whole day with her colleagues as judges of the event. Commenting about the presentations, Prof Petrik applauded the students for the high standard and the quality of their presentations. All the students that took part in the presentation were knowledgeable and enthusiastic about their work.



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Awards were given to the 1<sup>st</sup> and 2<sup>nd</sup> prize for both MSc and PhD categories with the 1<sup>st</sup> prize R1000 and 2<sup>nd</sup> prize R750 for both categories. The following students walked away with the prizes –

1 <sup>st</sup> Prize MSc:	Mr S. van den Heever (SUN)
2 <sup>nd</sup> Prize MSc:	Mr N.M. Musyoka (UWC)
1 <sup>st</sup> Prize PhD:	Mr. N. Fischer (UCT)
2 <sup>nd</sup> Prize PhD:	Mr E. Zengeni (SUN)

I would like to take this opportunity to thank all the students and their supervisors who participated in the event. My gratitude also goes to the SAASTA and SANi executive for their commitment in helping the Student Chapter to achieve their goals. Last but not least, I wish to also thank the Student Chapter committee for making it happen!!

**Report Submitted by: Nikiwe Kunjuzwa**  
**SANi Student Chapter Chairperson**

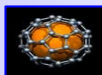
## Nanotechnology at the Reporting Science Conference

The Reporting Science Conference 2010 took place on the 21<sup>st</sup> -22<sup>nd</sup> September 2010 at Sturrock Park, Wits University, Johannesburg. The conference was organized by frayintermedia in partnership with the Advancement and Partnerships Division, Wits University, to bring together science reporters, journalism students, leading scientists and science communicators to explore science research into the past, present and future. The conference was sponsored by the South African Agency for Science and Technology Advancement (SAASTA) and the Ford Foundation. The objective of the conference was to bridge the gap between scientists and science reporters and communicators and to share ideas and views that would lead to a win-win situation for both science and the media.

According to the Deputy Vice Chancellor: Advancements and Partnerships, Professor Rob Moore, the conference was positively appraised by the majority of the delegates who attended the conference, who all emphasized the significant value in exposure and knowledge that they gained from the experts that presented at the conference.

I was invited to share my knowledge, research and expertise in my area with a range of science journalists, science communicators and science and journalism students. I participated in a panel discussion on “Future Science”, which ran from 14:00 – 15:30 on Wednesday, 22 September 2010. Besides showcasing scientific research relevant to us, my talk was aimed at providing an easy to comprehend overview of nanotechnology as a future science and to emphasize on the importance of public awareness in this area of science.

**Reported submitted by: Dr Sabelo Mhlanga**



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## CO<sub>2</sub> and CH<sub>4</sub> for the Production of Carbon Nanofibres and Carbon Nanotubes using Nickel Alloy

The research work of two MSc students from the School of Chemical & Metallurgical Engineering and the Centre of Excellence in Strong Materials, Wits featured in the September 2010 edition of the Chemical Technology magazine, a renowned magazine for Chemical Technology. The research entitled "CO<sub>2</sub> and CH<sub>4</sub> for the Production of Carbon Nanofibres and Carbon Nanotubes using Nickel Alloy" was done by S. Maphutha and K. Moothi under the supervision of Prof. Sunny Iyuke.

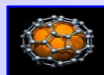
The production of carbon nanotubes and carbon nanofibres from greenhouse gases, namely, CO<sub>2</sub> and CH<sub>4</sub> was done using a vertical Chemical Vapour Deposition (CVD) apparatus. Experiments were conducted at temperatures ranging from 650-850°C for CO<sub>2</sub> and CH<sub>4</sub> utilizing LaNi<sub>5</sub> alloy catalyst. Transmission electron microscope (TEM), Raman spectrometer and gas chromatography (GC) were used for the analysis of the products and exhaust gases. TEM images showed the production of carbon nanofibres from CO<sub>2</sub> at the aforementioned temperatures. The CH<sub>4</sub> produced carbon nanotubes at all the temperatures.

**Source: *Chemical Technology*, (26-29), September 200. [www.crown.co.za](http://www.crown.co.za)**  
***Patience Iyuke***

## Presentation on the Nanotechnology Flagship Project.

On the 22<sup>nd</sup> of September, 2010, I made presentation to the DST/NRF on the Nanotechnology Flagship Project. Below are some of the pointers

- The good news is that the funding will still continue for projects they deem necessary so. Each project will be evaluated individually to assess its progress and need for funding-more information will be sent by NRF soon.
- The DST raised the concern about the need for the projects to be aligned to the National Nanotechnology strategy-perhaps we need to look at the document and ensure alignment is clearly highlighted when motivating for extension.
- There were questions about the toxicity of nanotubes in the beer. On the proposal work-plan one of the milestones was to taste the product, the concern was the developed biocatalyst (toxic nanotubes) can it be used for beer as per proposal?



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- The primary goal of this particular funding is not to fund any regular academic research, but to raise the flag in the nanotechnology field by coming up with innovative products that can put SA on the map. Innovative products should be the primary product whereas staff and students development should come as the by-product.
- As it is the nanotechnology flagship, most of the publications should be in the nanotechnology journals.
- The research should be focused and there should not be too much diversity in it.

NRF/DST will shortly send us forms to fill in so they can assess our possibilities for extended funding. Overall the workshop went well, it was very much eye opening opportunity in terms of learning avenues for funding and I made quiet important contacts as well.

**Report submitted by: Ezekiel Madigoe**  
**School of Chemical & Metallurgical Engineering, Wits.**

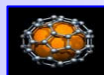
## Report on the IBMM conference - Montreal Canada

Ion beam technology has been widely used since its invention in the mid 20<sup>th</sup> century. It has successfully been used in the modification, synthesis, patterning and characterization of both macro and nanomaterials. The most commonly used ion beam technologies include; ion implantation and ion beam assisted deposition.

The 17<sup>th</sup> International Conference on Ion Beam Modification of Materials (IBMM) was held in Vieux Montréal (Canada) from the 22<sup>nd</sup> to 27<sup>th</sup> August, 2010. It was a major event that brought together 285 participants from 34 countries. South Africa had two participants; Prof. K. Bharuth- Ram and Emily Aradi. A great number of participants were from Japan and Germany.

Most of the papers presented were on nanostructure synthesis and nanopatterning. Some of the most interesting topics were:

- Biomaterials and soft materials- Nanofibres for tissue generation.
- Self-organization nanopatterning- Ion beam assisted assembly of metal bilayer nanostructures, Surface nanopatterning via ion bombardment.



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- Nanostructures- Ion bombardment of gold nanoparticles, experimental evidence for size dependent sputtering, Mechanism of Fe impurity motivated by ion nanopatterning of Si (100) surface, swift heavy ion tracks and implications for nanoparticles shaping.
- Magnetic and semiconducting materials- A single ion track etched nanochannel as a nanosensor device.
- Fundamentals of ion solid interactions- Nanoscale phase transition in A<sub>2</sub>B<sub>2</sub>O<sub>7</sub> pyrochlore (complex oxides) under the extreme condition of pressure and ion irradiation.

Other focus areas presented included; Defect induced modification of materials, Irradiation induced effects in insulators and nuclear materials among others.

Respective papers will be published in the Nuclear Instrumentation and Methods B (NIMB) journal starting October 2010.

For more information on the IBMM conference visit <http://ibmm.lps.umontreal.ca/ocs/index.php/IBMM/IBMM2010>

**Report submitted by: Emily Aradi,  
School of Physics, Wits.**

## Webster Memorial Seminar on Nanotechnology

**Date:** 10 November 2010

**Venue:** Tony Davies Lecture Theatre, National Institute for Occupational Health (NIOH), 25 Hospital Street, Constitution Hill, Johannesburg.

### Programme

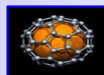
08h30 - 09h00 REGISTRATION & TEA

**Chair: Barry Kistnasamy**

09h00-09h20 Opening and Welcome Sagie Pillay (NHLS, SA)

09h20-09h40 DST and Nanotechnology in South Africa Daniel Adams (DST, SA)

09h40h-10h00 Nanotechnology internationally Mar Gonzalez (OECD, France)



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10h00-10h40	Nanotoxicology and the NIOH: A tribute to Ian Webster	Mary Gulumian (NIOH, SA)
10h40-11h10	-	-
<b>Chair: Jim Phillips</b>		
11h10-11h40	Applications of Nanotechnology	Robert Tshikhudo (Mintek, SA)
11h40-12h10	Risk assessment and Nanotechnology	Rita Schoeny (EPA, USA)
12h10-12h40	Assessing occupational health risk of nanofibres – lessons learned from asbestos	Eileen Kuempel (NIOSH, USA)
12h40-13h10	Occupational Risk Management Applied to engineered nanomaterials	Henri Heussen (Arbo Unie, The Netherlands)
13h10-13h30	Interpreting signatures of common response: What is needed for interpretation for nanoparticle risk assessment?	Elaine Faustman (University of Washington, USA)
13h30-13h40	Closing	Barry Kistnasamy (NIOH, SA)

**For registration Details & Form, please contact:**

**Shanaz Shapurjee**

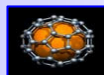
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## Forthcoming Nanoscience and Nanotechnology Events

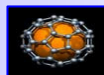
### Local Events

- i) Webster Memorial Seminar on Nanotechnology, Nanoparticles & Nanotoxicology, Tony David Lecture Theatre, National Institute for Occupational Health (NIOH), 25 Hospital Street, Constitution Hill, Johannesburg, South Africa, 10<sup>th</sup> November 2010: Contact Shanaz Shapurjee: at [shanaz.shapurjee@nioh.nhls.ac.za](mailto:shanaz.shapurjee@nioh.nhls.ac.za).
- ii) CATSA 2010, the annual Conference of the Catalysis Society of South Africa, Bloemfontein, Free State, 7<sup>th</sup>-10<sup>th</sup> November 2010: <http://www.catsa.org.za/> or <http://www.ufs.ac.za/apps/congress/index.php?FCODE=10>
- iii) An International Workshop on Advance Materials and Technologies for Global Energy and Environmental Challenges, CSIR, Pretoria, South Africa, 6<sup>th</sup>-9<sup>th</sup> December 2010. For more information, please contact Prof. Suprakas Sinha Ray, CSIR. E-mail: [rsuprakas@csir.co.za](mailto:rsuprakas@csir.co.za): Website: <http://www.csir.co.za>
- iv) The 4<sup>th</sup> NanoAfrica Conference, CSIR International Convention Centre, Pretoria, South Africa, 3<sup>rd</sup> -6<sup>th</sup> July 2011: <http://www.nanoafrica.co.za> or [www.csiricca.co.za](http://www.csiricca.co.za)
- v) The 40<sup>th</sup> SACI Convention Incorporating the 3<sup>rd</sup> FASC Congress, University of Witwatersrand, Johannesburg, South Africa, 16<sup>th</sup>-21<sup>st</sup> January 2011 <http://www.saci2011.org.za/>
- vi) The Eleventh International Conference on Frontiers of Polymers and Advanced Materials, University of Pretoria Conference Centre, Hatfield Campus, Pretoria, South Africa, 22<sup>nd</sup> -27<sup>th</sup> May 2011: [www.icfpam.co.za](http://www.icfpam.co.za)

### International Events

- i) International Workshop on Ultra Precision System and Processes, Cranfield University, Cranfield, United Kingdom, 11<sup>th</sup> -12<sup>th</sup> November, 2010: <http://www.goingtomeet.com/95494> or <http://www.cranfield.ac.uk/sas/aboutus/events/page48677.html>
- ii) LOC Nigerian Materials Congress 2010, Halls of Universal Hotel, Aguleri Street, Independence Layout, Enugu, 23<sup>rd</sup>-26<sup>th</sup> November, 2010. Tel: 08030736494/08034782762/08038820080 E-Mail: [nimacon@ymail.com](mailto:nimacon@ymail.com) or [nimacon@msn.org.ng](mailto:nimacon@msn.org.ng)





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- iii) 3rd Bangalore Nano, The Lalit Ashok, Bangalore, India, 8<sup>th</sup>-9<sup>th</sup> December 2010  
<http://www.nanopaprika.eu/profiles/blogs/3rd-bangalore-nano>
- iv) 2010 International Conference on Nanotechnology and Biosensors (ICBN 2010), Hong Kong, 28<sup>th</sup>-30<sup>th</sup> December 2010  
<http://www.goingtomeet.com/97228> or <http://www.icnb.org/>
- v) The International Conference on Nanoscience and Nanotechnology, School of Physical Sciences, Swami Ramanand Teerth Marathwada University, Nanded-431606, India [http://www.nanopaprika.eu/events/event/show?id=1612324%3AEvent%3A79983&xg\\_source=msg\\_invite\\_event](http://www.nanopaprika.eu/events/event/show?id=1612324%3AEvent%3A79983&xg_source=msg_invite_event)
- vi) LNLS Advance School on structural biology, 3D imaging, magnetism, nanosciences, catalysis, etc. Brazilian Synchrotron Light Laboratory (LNLS – CAMPINAS, SP – BRAZIL) Rua Giuseppe Máximo Scolfaro, 10.000 – Pólo II de Alta Tecnologia – Campinas – SP, 17<sup>th</sup>-25<sup>th</sup> January 2011:  
[http:// espca.lnls.br/](http://espca.lnls.br/) or Contact: Roberta Santarosa Colleto ([roberta.colleto@lnls.br](mailto:roberta.colleto@lnls.br))
- vii) Nanoscience Earlybird Conference, Sharm el Sheikh, Egypt, 19<sup>th</sup>-22<sup>nd</sup> February 2011: <http://www.zingconferences.com/z.cfm?c=63>
- viii) 4<sup>th</sup> NanoTech Insights Conference, Cairo, Egypt, 27<sup>th</sup> February-2<sup>nd</sup> March 2011: <http://www.nanopaprika.eu/profiles/blogs/nanotech-insights-conference>
- ix) World Congress on Sustainable Technologies (WCST-2011), London, England, United Kingdom, 21<sup>st</sup> -23<sup>rd</sup> March 2011: <http://www.goingtomeet.com/60073> or <http://www.wcst.org/>
- x) Nano and Water 2010: Nanotechnology for the water Sector, Centro Stefano Franscini, Monte Verità, Ascona, Switzerland, 15<sup>th</sup>-18<sup>th</sup> May, 2011  
<http://www.iwanano2011.org/> or  
[http://www.iwanano2011.org/IWA%20Nano\\_FirstCircular.pdf](http://www.iwanano2011.org/IWA%20Nano_FirstCircular.pdf)