



SA se top vroue- navorsers

Haar navorsing oor fungi het aan mikroloog dr Karin Jacobs van die Departement Mikrobiologie die toekening as Ontluikende Jong Vroue Wetenskaplike in die Departement van Wetenskap en Kuns en L'Oreal se Women in Science-kompetisie besorg.

Dit erken die uitstaande bydrae van 'n vroulike wetenskaplike onder 35 jaar oud tot die bevordering van natuurwetenskappe of ingenieurswese.

Dié ma van 'n agtjarige tweeling fokus op die taksonomie van verskeie fungi-genera wat moontlike ekonomiese toepassing vir die landboubedryf en ander industrieë het.

Dr Jacobs, wat vanaf die begin van die jaar as lektor verbonde is aan die Departement Mikrobiologie, het onlangs begin met 'n navorsingsprojek oor die fungus ekologie in fynbos grond. Sy was voorheen verbonde aan die Bosbou en Landbou Biotegnologie Instituut (FABI) aan die Universiteit van Pretoria.

Sy word erken as 'n wêreldkenner van die genus *Leptographium*, 'n belangrike patogeen van bome, waaroor sy ook haar PhD gedoen het. Sy het reeds 29 artikels in eweknie geëvalueerde vaktidskrifte gepubliseer, insluitend 'n boek en 'n hoofstuk in 'n ensiklopedie van bosbou patologie.



Chown sit vele stoele vol

Prof Steven Chown het onlangs die eerste Suid-Afrikaner geword wat as Hoofbeampte van die internasionale Wetenskaplike Komitee oor Antarktiese Navorsing (SCAR) se Staande Komitee vir die Antarktiese Verdragsisteem (SC-ATS) gekies is.

Dié liggaam is 'n belangrike skakel tussen Antarktiese Verdrag-lidlande en wetenskaplikes wat op die yskontinent werk.

Dié professor in plant- en dierkunde is direkteur van die DWT-NNS Sentrum van Uitnemendheid vir Indringerbiologie. Prof Chown is ook 'n raadslid van die Suid-Afrikaanse Nasionale Biodiversiteitsinstituut (SANBI) en sekondus in die plek van prof Brian Huntley, hoofdirekteur van SANBI, op die raad van die Global Invasive Species Programme.

Vir meer inligting besoek:

http://academic@sun.ac.za/cib/team_research.htm

Maties help with new names on Marion Island map

Names suggested by zoology honours student Natasha Mothapo and lecturer Dr Nomsa Satyo of the Department of African Languages are now part of a new map of Marion Island.

The map for this sub-Antarctic island, produced by the Chief Directorate: Surveys and Mapping, includes names for geographic features that are more representative of South Africa's eleven official languages.

Many of the names are the result of a competition initiated by the Capacity Building Programme for Climate Change Research (CBP-CCR) in the Department of Botany and Zoology, which invited South Africans to name previously unnamed features on Marion.

Natasha, an honours student with the DST Centre of Excellence for Invasion Biology (CIB) at Stellenbosch University, suggested Kopanong ("place of meeting" in sePedi) for a lake near the research station.

Dr Satyo's suggestion of Umkhombe ("rhino horn" in isiZulu) was chosen for a prominent point on the north-eastern side of the island.



Director of Antarctica "and" Island, Henry Valentine presented Matie honours student Natasha Mothapo (left) with a framed picture of the small body of water on the north-eastern side of Marion Island. Photo: SSFD

Goud vir Dekaan

Die vernuwende bydrae van prof Albert van Jaarsveld, dekaan van die Fakulteit Natuurwetenskappe, tot navorsing en opleiding oor die subkontinent se biodiversiteit en die bewaring daarvan, is met die Dierkundige Vereniging van Suider-Afrika (DVSA) se Goue Medalje vereer.

Sy navorsing fokus veral op bewaringsbeplanning en -bestuur, en die invloed van mense op die natuurlike omgewing.

Die DVSA het hom geloof vir sy mentorskap van nagraadse studente, asook sy natuurlike en innoverende leierskapstyl. Hy is 'n dryfkrag agter die daarstelling van die Suid-Afrikaanse Netwerk vir Omgewingswaarneming wat langtermyn biodiversiteitsmonitering en -navorsing ondersteun, asook die Suider-Afrikaanse Millenium Ekosistempromjek. Nasionale en internasionale belangstelling in hierdie inisiatiewe het reeds gelei tot verdere soortgelyke streeksprogramme.



Matie scientist scoops writing award

With her essay on how magnetic drug delivery can help to cure cancer, Chemistry PhD student Laura Vatta scooped first prize in the inaugural Young Science Writers' Competition (YSW), held by the South African Agency for Science and Technology Advancement (SAASTA) in association with the newspaper *Saturday Star*. The YSW competition gave scientists aged between 20 and 35 years old at South African higher education institutions and Science Councils the opportunity to write a 700-word article on any scientific or science-related subject. Laura won R10 000 and a week-long trip to attend the American Association for the Advancement of Science meeting in St Louis, Missouri in February 2006.

Dr Anthony Mills, a post-doctoral fellow in the Department of Soil Sciences at Stellenbosch University, was one of the runners-up with his article on the distribution of animals across the planet, while Olivia Engelbrecht, a junior lecturer in the Department of Economics, and Debra Joubert, an MSc student in the Institute for Plant Biotechnology, were amongst the twelve finalists commended by the judges.



Miniature in new workers



The Harbour Lights plant in Australia was built to treat gold-bearing arsenopyrite minerals using technology and specifications developed in South Africa - as most such plants around the world have been.

The world's most effective mineworkers do not wear hard hats or stand the risk of being injured in mining accidents. They're simply too small for that!

One-celled rock-eating bacteria called chemolithotrophs – miniature miners if you wish – that occur naturally in ore have been employed in huge commercial plants as biomining agents to extract gold, cobalt, copper and zinc. The added bonus is that they are more environment-tally friendly and cost-effective than other chemical extraction methods and they can even extract low-grade minerals efficiently.

Modern plants for copper extraction were developed in the 1960s, while those for gold and cobalt followed in the late 1980s and 1990s respectively.

"Biomining can only be used for metals with a iron or reduced sulphur contents, as the bacteria needs sulphur condensed in rock as their chemical energy source," says Prof Doug Rawlings from the Microbiology Department at SU.

During this energising process, with the bacteria eating away at the ore in search of sulphur and iron, chemicals are produced naturally to make metals soluble. The metals left after the feeding frenzy are then easier to extract through dump or heap bioleaching and stirred tank technology.

Biomining is not an invention of modern microbiologists, but rather enhanced and optimised by them. The technique is known since the Romans mined copper in Spain's Rio Tinto region. While leaching minerals from ore, the Romans did not know

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"Microbiologists, chemists and metallurgists are all involved,"

Prof Rawlings, who has done biomining research for the past 25 years, explained in a recent BBC radio interview.

His career started in the hide and skin industry with a doctorate degree on the treatment of strong and toxic effluents. In the late 1970s, with the expansion of mining technology in South Africa, he became involved in biomining research while working at the University of the Witwatersrand.

He is recognised as a world leader in the field and has been evaluated as an A-rated scientist by the National Research Foundation since 1992.

Prof Rawlings and fellow-researchers contributed immensely to understand the role of microorganisms in these processes.

Although few biomining plants are found in South Africa, our local knowledge is used by South African technologists to start up new plants in Brazil, Chile, Ghana, the USA, Australia and Peru. Mintek, Gold Fields and Billiton are amongst the companies that use these innovations.

With copper, zinc and cobalt, biomining bacteria directly attack the mineral ore to gobble up the rock around it, leaving the metals behind to be washed out. With gold, bacteria are used to pre-treat and open up the molecular structure of the mineral ore in which gold is encased so that cyanide can be added to extract all traces of the lucrative metal.

In the early 1980s, while at the University of Cape Town, Prof Rawlings began pioneering work on the molecular biology of *Acidithiobacillus* (then *Thiobacillus*) ferrooxidans and its plasmids which works in temperatures under 40°C. Since joining the Stellenbosch unit in 1998, his research also extends to other useful organisms.

His work in the gold industry is ongoing. A question currently occupying much of his research time is how certain bacteria manage to become resistant to the large quantities of arsenic released when gold-bearing arsenopyrite ores and concentrates are treated.

"Because the process is not sterile, it seems that through natural selection they can tap into the horizontal gene pool of other organisms to acquire extra genes to make them fitter for the purpose they are currently used for."

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