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Overview of 2016

Seventy-four degrees were awarded by the Department of Geology over the course of the year; with 27 students receiving BSc degrees, 28 honours degrees, four MSc degrees, and 15 master’s in Mineral Resource Management degrees. The department was responsible for the presentation of six undergraduate and three honours programmes, as well as the master’s degree in Mineral Resource Management (that was reintroduced mid-2016 as the MSc Mineral Resource Management degree), and supervised the continued research of 33 students in the Mineral Resource Management programmes, 14 MSc candidates, and six PhD candidates over the course of the year.

Ms Susan Serfontein joined the department during the year as a National Research Foundation (NRF) intern under the joint supervision of Dr Freddie Roelofse and Mr Adriaan Odendaal. The department was saddened by the loss of Dr Johann Claassen and Prof Chris Gauert, who decided to pursue greener pastures, and excited by the appointment of Dr Robert Hansen as lecturer in Environmental Geochemistry. Both Dr Claassen and Prof Gauert were retained as affiliate researchers. Prof Marian Tredoux was retained on contract for the year. Dr Matthew Huber, postdoctoral research fellow under the joint supervision of Prof Tredoux and Dr Roelofse, was appointed as temporary part-time lecturer, as was Dr Gerhard Meintjes (affiliate researcher) for the presentation of undergraduate and postgraduate modules in economic and exploration geology due to the resignation of Prof Gauert.

Activities

The year was characterised by numerous field trips across the country and with staff members travelling both locally and abroad. Staff members and students presented their work at several conferences, including the IMSG Meeting (UCT, January 2016), the 35th International Geological Congress (Cape Town, August to September 2016) and the 13th International Ni-Cu-PGE Symposium (Perth, Australia, September 2016). Undergraduate and honours students undertook field trips to the Big Hole Museum in Kimberley, the Vredefort Dome, the Vanderkloof area, and to various localities in and around Bloemfontein as part of their training. Unfortunately, several planned field trips had to be adapted or cancelled due to the spates of student unrest that characterised the year.

Achievements

Dr Elizaveta Kovaleva, postdoctoral researcher under the supervision of Dr Roelofse, won the prize for the best presentation by a PhD student at the annual Igneous and Metamorphic Studies Group (IMSG) meeting hosted by the University of Cape Town (UCT) with a talk titled “The geometric relationship of plastically-deformed zircon grains with the kinematic framework of a shear zone”. Ms Justine Magson, a junior lecturer in the department, obtained her MSc degree at the summer graduation ceremony with a dissertation titled “Platinum-group elements within the Merensky Reef, Western Limb, Bushveld Complex: Results of a high resolution mineralogical and geochemical study”. Prof Gauert and Dr Roelofse were informed that they had obtained C3 and Y2 NRF ratings respectively towards the end of the year.

The visiting investigator appointment of Dr Roelofse at the Department of Terrestrial Magnetism, Carnegie Institution for Science, was extended until the end of 2017.
The following Kovesi GeoTalks were presented over the course of the year:

- “Bending zircons and breaking ages: Effects of plastic deformation on microstructures, re-distribution of trace elements and retention of radiogenic isotopes in zircon”, presented by Dr Kovaleva, postdoctoral research fellow in the department.
- “Minerals exploration Greenland style: Lessons us Africans can learn”, presented by Prof Jock Harmer, Rhodes University.
- “New insights into the development of the Kakamas Terrane”, presented by Prof Jan van Bever Donker, University of the Western Cape.
- “30 years of earth sciences at Vaalputs, South Africa: Some proposed research guidelines for the disposal of high-level radioactive waste in South Africa”, presented by Dr Marco Andreoli, University of the Witwatersrand.

Prof Harmer also presented a two-day short course on “Carbonatites – Markets, mineral exploration and rare-earth elements” to honours students. A drilling practice short course was again presented to honours students by Mr Colin Rice.

Mr Pelele Lehloenya, MSc student of Dr Roelofse, had the opportunity to spend three weeks at the Department of Terrestrial Magnetism, Carnegie Institution for Science in Washington, D.C., where he conducted in situ Sr-isotopic determinations on plagioclase from the Bushveld Complex.

Honours students at the Annual Plate Tectonics showcase organised by Prof Wayne Colliston as part of his “Plate Tectonics” honours module.
Second-year students sketching an outcrop containing sandstone, mudstone, and dolerite occurring in the vicinity of Thaba Nchu.

Honours students on their sedimentology field trip to Vanderkloof.
Community Service

The department, in particular Ms Rinae Makhadi, again hosted the Free State leg of the Minquiz National Science Competition that was held on 19 May 2016. A total of 21 schools (mostly from the Free State), each represented by three learners, participated in the competition. The learners were also afforded the opportunity of visiting the departments of Chemistry, Physics, and Geology to see what these departments have on offer for prospective students.

A public lecture titled “Dust to planets: How the solar system was born” was presented by Dr Huber at the Naval Hill Planetarium in September.

National and International Collaboration

Staff in the department actively collaborated with the following researchers at national and international institutions over the course of the year:

- Dr David Cornell, University of Gothenburg (Prof Willem van der Westhuizen)
- Profs F Zaccarini and G Garuti, University of Leoben (Prof Tredoux)
- Dr Iain McDonald, Cardiff University (Prof Tredoux)
- Prof Dr Chris Ballhaus, Steinmann Institute, Bonn University (Prof Tredoux)
- Drs Rick Carlson and Timothy Mock, Department of Terrestrial Magnetism, Carnegie Institution for Science (Dr Roelofse)
- Dr Bob Trumbull, Deutsches GeoForschungsZentrum (GFZ) (Dr Roelofse)
- Ms Shiona Moodley, National Museum (Bloemfontein) (Drs Huber and Kovaleva)
- Mr Stuart Bateman, Innov-X Africa (Drs Huber and Kovaleva)
- Mr Andrew Somers, SciAps Australia (Drs Huber and Kovaleva)
- Drs Rick Carlson and Timothy Mock, Department of Chemistry, Physics, and Geology to see what these departments have on offer for prospective students.

Research Outputs

Research Articles


Conference Contributions


delivered at the 35th International Geological Conference (IGC), Cape Town, South Africa. 27 August – 4 September.


Magsøn, J., Tredoux, M. & Roelofse, F. 2016. Results of a high resolution mineralogical and geochemical study within the Merensky Reef, Western Limb, Bushveld Complex. Paper delivered at the 35th International Geological Conference (IGC), Cape Town, South Africa. 27 August – 4 September.


Nguye, J-C. & Gauert, C. 2016. Chemistry of cassiterite, ferberite, and columbite-tantalite samples from Rwinkwavu, Bugarura-Kuluti and Musha-Ntunga mineral districts of the South-Eastern Rwanda. Paper delivered at the 35th International Geological Conference (IGC), Cape Town, South Africa. 27 August – 4 September.

Roelofse, F., Mangwegape, M. & Lehloeny, P. 2016. Trace element and Sr-isotopic variations in plagioclase of the Main and Upper zones, Northern and Western limbs, Bushveld Complex. Paper delivered at the 35th International Geological Conference (IGC), Cape Town, South Africa. 27 August – 4 September.


Schoch, Drs H Prinsloo, JC Loock, and PG Meintjes, Messrs AC Dunne, PJ Grobler, I Hunt, PG Laurens, PJ Viljoen, and MJAR Vrijens, and Ms HCF Pretorius.

Postdoctoral Research Fellows: Drs M Huber and E Kovaleva.

Secretary: Mrs PS Swart.

Administrative Officers: Mss R Immelman and C van der Vyver.

Technical Support Staff: Messrs J Choane, A Felix, and D Radikgomo, and Ms Megan Purchase.

Staff

Professor: Prof WA van der Westhuizen.

Associate Professors: Profs WP Colliston, CDK Gauert, and M Tredoux.

Senior Lecturers: Drs JO Claassen, HE Praekelt, and F Roelofse.

Lecturers: Dr RN Hansen and Mr Al Odendaal.

Junior Lecturers: Mss J Magson, R Makhadi, and T Mapholi, and Mr R Rentel.