



DEPARTMENT OF GEOLOGY

CONTACT DETAILS

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OVERVIEW OF 2018

A total of 70 degrees were awarded by the department over the course of the year, with 41 students receiving BSc degrees, 23 honours degrees, and 6 MSc degrees. The department was responsible for presenting six undergraduate and three honours programmes, as well as the MSc (Mineral Resource Management) degree, and supervised the continued research of 27 students in Mineral Resource Management, 15 MSc candidates, and 5 PhD candidates over the course of the year.

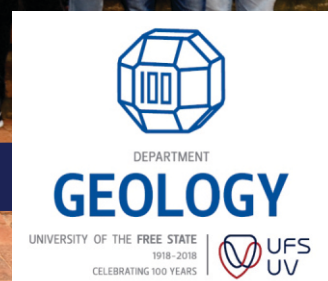
ACHIEVEMENTS

The department's centenary was celebrated with a mini-conference and celebratory dinner that took place on 12 and 13 April 2018 on the Bloemfontein Campus. The conference was attended by 64 delegates. Twenty talks were presented on a variety of topics, some scientific and some reflecting back on the history of the department. The guests of honour at the conference were past heads of department, Profs Willem van Biljon, Johan Visser, and Willem van der Westhuizen. The department's centenary was also celebrated by means of a special issue of the *South African Journal of Geology*, guest edited by Profs Frederick Roelofse and Aylva Schoch, and Dr Matthew Huber.



Delegates at the department's centenary conference

The Department of Geology centenary logo



Staff Achievements

Prof Marian Tredoux was invited to present a two-day course on the 'Economic Geology of the Kaapvaal Craton' at the University of Rome in May 2018. She also attended a workshop that was held in celebration of the naming of three new minerals by staff members of the Eugen F Stumpfl Electron Microprobe Laboratory at the University of Leoben in June 2018. The manuscript by one of her colleagues at the University of Leoben, describing the new mineral tredouxite – that was named in her honour – appeared online in the *European Journal of Mineralogy* on 10 January 2018.

Prof Frederick Roelofse served on the organising committee for the 13th International Platinum Symposium, and Prof Marian Tredoux, Dr Robert Hansen, and Ms Justine Magson served on the organising committee for the Iphakade Conference 2018.

RESEARCH

The department acquired a DJI Mavic 2 Pro drone that will be used for research, teaching, and outreach. Specific applications will include the development of techniques for the extraction of geological information from aerial imagery, primarily for mining and groundwater exploration. The development of this technology is the responsibility of Dr Martin Clark.

Researchers in the department managed to secure R255 000 from the Iphakade Programme to support the research of postgraduate students in the department. A generous financial contribution was made to the department by the Exxaro Chairman's Fund in order to support the expansion of our master's programme in Mineral Resource Management. The department also received extensive donations of drill core, totalling more than 8 km, from Impala and Marula Platinum. The core will be used for research and student training. A donation of a drill core was also received from Anglo American Kumba Iron Ore. Staff and students attended and presented their work at eight national and international conferences.



Part of the drill core donated by Marula Platinum being loaded for transportation to Bloemfontein

Staff members were also successful in obtaining a variety of grants in support of their research over the course of the year, including:

- NRF Freestanding Postdoctoral Fellowship (Dr Elizaveta Kovaleva).
- NRF Knowledge Interchange and Collaboration Local Travel Grant (Dr Elizaveta Kovaleva).
- NRF Incentive Funding for Rated Researchers (Profs Chris Gauert and Frederick Roelofse).

- Geological Society of South Africa Research, Education and Investment Funding (Dr Gerhard Meintjes).

Prof Frederick Roelofse attended a three-day training course on the planning, management, and execution of continental scientific drilling projects in Windischeschenbach (Germany). The course was presented and funded by the International Continental Scientific Drilling Programme (ICDP).

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 17 May 2018. Several schools, mostly from the Free State – each represented by three learners – took part in the competition. The learners were also afforded the opportunity to visit the Naval Hill Planetarium as part of the competition.

NATIONAL AND INTERNATIONAL COLLABORATION

Following negotiations between the UFS and the University of Johannesburg (UJ), the Department of Geology became a collaborating partner of the DST-NRF Centre of Excellence for Integrated Mineral and Energy Resource Analysis (CIMERA), jointly hosted by the Department of Geology at UJ and the School of Earth Sciences at the University of the Witwatersrand. This partnership will allow access to postgraduate student-funding opportunities in years to come.

Dr Matthew Huber concluded a collaborative agreement with De Beers that will see the company assisting with the analytical work necessary for several postgraduate research projects in the coming years.

Staff in the department actively collaborated with researchers at the following national and international academic and research institutions during 2018:

- Institute of Geology and Geochemistry, Ural Branch of Russian Academy of Sciences (Russia).
- Institute of Physics and Technology, Ural Federal University (Russia).
- University of Leoben (Austria).
- Department of Terrestrial Magnetism (Carnegie Institution for Science, USA).
- Deutsches GeoForschungsZentrum (GFZ - Germany).
- University of Vienna (Austria).
- Institute of Geological Sciences, Polish Academy of Sciences (Poland).
- University of Liverpool (UK).
- University of Lille (France).
- Martin-Luther University of Halle-Wittenberg (Germany).
- University of Saskatchewan (Canada).
- University of Extremadura (Spain).
- University of Hamburg (Germany).
- University of Gothenburg (Sweden).
- University of Oslo (Norway).
- University of Florence (Università degli Studi di Firenze – Italy).
- University of Manitoba (Canada).
- Ludwig Maximilian University (Germany).
- Vrije Universiteit Brussel (Belgium).
- Rieskrater Museum (Germany).
- Bavarian State Collection of Zoology (Zoologische Staatssammlung München – Germany).
- Institute of Geology, Czech Academy of Sciences (Czech Republic).
- Charles University (Czech Republic).
- Czech Geological Survey (Czech Republic).
- Eberhard Karls University (Germany).
- University of Johannesburg.
- University of the Western Cape.
- University of the Witwatersrand.
- University of Pretoria.
- University of Cape Town.

OTHER ACTIVITIES

Student Field Trips

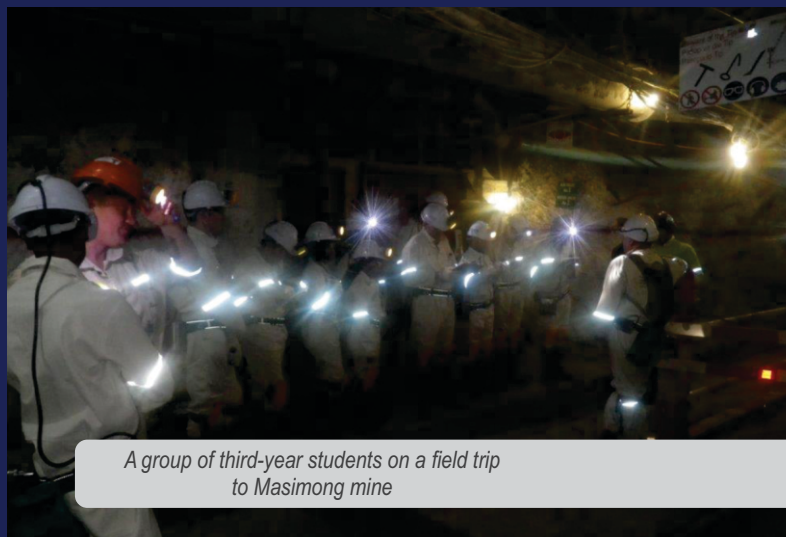
A number of field trips were undertaken during the course of the year.

At undergraduate level, the first-year students visited Musgrave Koppie to study aspects of the local geology as part of Introductory Geology. Second-year students went on several day trips to Austin's Post southwest of Bloemfontein as part of their Geological Field Techniques module. They also visited landfill sites around Bloemfontein to study the impact of geology on waste disposal activities as part of the module Environmental Geology and Environmental Management. During the October recess, students enrolled for the Field School had the opportunity to study a variety of aspects regarding the geology around Bloemfontein on a series of visits to study rocks of the Ventersdorp Supergroup, glacial pavements, rocks of the Dwyka and Beaufort Groups, Lystrosaurus fossils and the Quaternary deposits, fossils and salt deposits at Florisbad.

Third-year students visited the Big Hole Museum in Kimberley to learn more about the geology of diamonds and the rocks in which they occur as part of the Igneous Petrology module. The third-year students enrolled for Economic Geology spent several days in the field in the Vredefort Dome, followed by underground visits to the Tshepong, Phakisa, Masimong and Joel gold mines of Harmony Gold.



Third-year students studying an exposure of pseudotachylite



A group of third-year students on a field trip to Masimong mine

Honours students enrolled for Advanced and Applied Mineralogy went on a four-day excursion to study the mineral wealth of the Northern Cape, while those enrolled for Advanced Structural Geology undertook a five-day trip to Namaqualand where they conducted structural mapping. The Advanced Sedimentology students undertook a five-day fieldtrip to the Vanderkloof area, where they mapped and compiled sedimentary profiles. Honours students enrolled for Advanced Economic Geology visited the Northern Cape to learn more about its geology and the exploitation and exploration of Fe-ore, diamonds, and industrial minerals.



Honours students on the Advanced Economic Geology field trip in front of a drill



Honours students studying drill core at one of the operations of Kumba Iron Ore in the Northern Cape

Kovsie GeoTalks

The following Kovsie GeoTalks were presented during the course of the year:

- 'Tredouxite, another new mineral from the Bon Accord oxide body' presented by Prof Marian Tredoux.
- 'Tectonic versus impact deformation in zircon: Implications for the Vredefort impact structure and for lunar zircon from Apollo 17' presented by Dr Elizaveta Kovaleva.
- 'The wave power potential of the South African coastline' presented by Dr Stoffel Fourie from Walter Sisulu University.
- 'The role of the Minerals Education Trust Fund in promoting quality education and minerals industry outlook' presented by Mr Anre Vorster from De Beers.
- 'Lowermost termination of Vredefort Granophyre Dyke results in unusual features' presented by Dr Matthew Huber.
- 'Geochemistry of U and Th in the Witwatersrand gold tailings – Where is all the Th?' presented by Dr Robert Hansen.

- 'Analytical geochemistry as an enabler of diamond exploration' presented by Dr Louise Coney from De Beers.
- 'Assessment of the applicability of South African waste classification legislation on mineral waste with special reference to gold mine tailings on the Witwatersrand basin – A geochemical perspective' presented by Mr Marvin Nicholas (MSc student of Dr Robert Hansen).
- 'Pegmatites in the Namaqua Metamorphic Province' presented by Dr Hendrik Minnaar.
- 'Geology for societal benefit' presented by Ms Tshiamo Legoale from Mintek.
- 'The tectonic evolution of the East Range of the Sudbury Basin, Ontario, Canada' presented by Dr Martin Clark.
- 'The Platreef – nothing is set in stone' presented by Ms Jarlen Beukes.
- 'Distributive fluvial systems' presented by Mr Adriaan Odendaal.
- 'Assessment of groundwater quality in the vicinity of two municipal solid waste disposal sites' presented by Ms Rinae Makhadi.

Alex du Toit Memorial Lecture

The department also hosted Prof Lewis Ashwal, from University of the Witwatersrand, who presented the 2018 Alex du Toit Memorial Lecture, held under the auspices of the Geological Society of South Africa. The lecture was titled 'Wandering continents of the Indian Ocean'.



Prof Marian Tredoux, Prof Lewis Ashwal, and honours student, Snegugu Ziqubu, at the Alex du Toit Memorial Lecture presented by Prof Ashwal

POSTDOCTORAL RESEARCH FELLOWS

The Department of Geology hosted two Postdoctoral Research Fellows during 2018 – Dr Elizaveta Kovaleva from Russia, and Dr Martin Clark from Canada.

Dr Kovaleva undertook a short research visit to the Laboratory for Scanning Electron Microscopy and Focused Ion Beam Applications at the Faculty of Earth Sciences, Geography and Astronomy at the University of Vienna. She received a travel grant for early-career scientists from the Meteoritical Society Travel Award Committee to attend the 81st Annual Meeting of the Meteoritical Society in Moscow, as well as a travel grant from the open-access journal of mining and mineral processing, Minerals, to attend the European Geosciences Union General Assembly in Vienna.

STAFF MATTERS

Ms Jarlen Beukes joined the department in January as Lecturer on the nGAP (next Generation of Academics Programme) scheme funded by the Department of Higher Education and Training, while Mr Justin Nel was appointed as Junior Lecturer in Structural Geology.

Mr Raimund Rentel, Junior Lecturer in Mineralogy, tendered his resignation in mid-2018 in order to pursue greener pastures in Namibia.

Mr Jonas Choane, Assistant Officer responsible for sample preparation,

announced his early retirement from the university, having been in the employ of the university since 1975. He was replaced by Mr Pelele Lehloenya, an *alumnus* of the department.

The post-retirement contracts of Profs Marian Tredoux and Willem van der Westhuizen concluded in December 2018. Application has been made to retain both as Research Fellows.

Dr Frederick Roelofse was promoted to Associate Professor in January 2018.

RESEARCH OUTPUTS

RESEARCH ARTICLES

Bindi, L, Zaccarini, F, Miller, DE and Garuti, G. 2018. Tredouxite, NiSb₂O₆: Another new Ni-bearing mineral from the Bon Accord oxide body, South Africa. *European Journal of Mineralogy* 30: 393-398.

Buatois, LA, Almond, J, Gabriela Mangano, M, Jensen, S and Germs, GJB. 2018. Sediment disturbance by Ediacaran bulldozers and the roots of the Cambrian explosion. *Nature Scientific Reports* 8: 4514.

Burron, I, Da Costa, G, Sharpe, R, Fayek, M, Gauert, C and Hofmann, A. 2018. 3.2 Ga detrital uraninite in the Witwatersrand Basin, South Africa: Evidence of a reducing Archean atmosphere. *Geology* 46: 295-298.

Clark, MD and Riller, U. 2018. 3-D kinematic restoration of the eastern Sudbury Igneous Complex, Canada, and its importance for Cu-Ni-PGE sulphide exploration. *Ore Geology Reviews* 101: 199-210.

Cornell, DH, Minnaar, H, Frei, D and Kristofferson, M. 2018. Precise microbeam dating defines three Archaean granitoid suites at the southwestern margin of the Kaapvaal Craton. *Precambrian Research* 304: 21-38.

Hansen, RN. 2018. An assessment of the geochemical impacts of greenfields mining projects in South Africa on both sides of the mine drainage pH divide – A geochemical modelling approach. *South African Journal of Geology* 121: 487-494.

Hansen, RN. 2018. Inter-comparison geochemical modelling approaches and implications for environmental risk assessments: A Witwatersrand gold tailings source term characterisation study. *Applied Geochemistry* 95: 71-84.

Huber, MS and Byerly, GR. 2018. Volcanological and petrogenetic characteristics of komatiites of the 3.3 Ga Saw Mill Complex, Weltevreden Formation, Barberton Greenstone Belt, South Africa. *South African Journal of Geology* 121: 463-486.

Jacobson, L and Noli, D. 2018. New finds of engraved whole ostrich eggs from southern Namibia and the Northern Cape Province of South Africa. *Southern African Humanities* 31: 55-61.

Kovaleva, E, Huber, MS, Fourie, F and Pittarello, L. 2018. Comparative study of pseudotachylite microstructures in felsic and mafic rocks from the Vredefort impact structure, South Africa. Implications for the experimental studies. *South African Journal of Geology* 121: 403-420.

Kovaleva, E, Huber, MS, Roelofse, F, Tredoux, M and Praekelt, H. 2018. Pseudotachylite vein hosted by a clast in the Vredefort Granophyre: characterization, origin and relevance. *South African Journal of Geology* 121: 51-68.

Kovaleva, E, Huber, MS and Zaccarini, F. 2018. Petrography and geochemistry of coarse-crystalline veins within Vredefort Granophyre, Vredefort Impact Structure, South Africa. *South African Journal of Geology* 121: 383-402.

Kovaleva, E, Klötzli, U, Wheeler, J and Habler, G. 2018. Mechanisms of strain accommodation in plastically-deformed zircon under simple shear deformation conditions during amphibolite-facies metamorphism. *Journal of Structural Geology* 107: 12-24.

Magson, J, Tredoux, M and Roelofse, F. 2018. Association of platinum-group elements with chromitite within the Merensky reef, Western Limb, Bushveld Complex: Results of a high-resolution mineralogical and geochemical study. *Journal of African Earth Sciences* 144: 161-175.

Mathee, HLM and Colliston, WP. 2018. Stratigraphy of the Koekoepkop thrust sheet in the Grünau Terrane, Mesoproterozoic Namaqua Province. *South African Journal of Geology* 121: 431-450.

Meintjes, PG and Van der Westhuizen, WA. 2018. Stratigraphy and geochemistry of the Goedgenoeg and Makwassie Formations, Ventersdorp Supergroup, in the Bothaville area of South Africa. *South African Journal of Geology* 121: 339-362.

Meintjes, PG and Van der Westhuizen, WA. 2018. Borehole LLE1 – an intracaldera succession of the Goedgenoeg and Makwassie Formations, Ventersdorp Supergroup. *South African Journal of Geology* 121: 363-382.

Mueller, SB, Kueppers, U, Huber, MS, Hess, K-U, Poesges, G, Ruthersteiner, B and Dingwell, DB. 2018. Aggregation in particle rich environments: a textural study of examples from volcanic eruptions, meteorite impacts, and fluidized bed processing. *Bulletin of Volcanology* 80: 32.

Nel, R, Germs, GJB, Praekelt, HE and Odendaal, AI. 2018. Re-examination and reinterpretation of the stratigraphy of the Matjies River Formation, Cango Caves Group, Neoproterozoic to early Palaeozoic Saldania Belt, South Africa. *South African Journal of Geology* 121: 451-462.

Schouwstra, R, Mocke, J, Duncan, M, Bramdeo, S and Scharneck, Y. 2018. An investigation into the theft of concentrates and their upgrading to saleable platinum-products. *Geosciences* 8:411.

Steenekamp, JMA, Van der Westhuizen, WA, Bateman, MD, Jacobson, L and Nel, L. 2018. A Pleistocene thrust fault in anorthosite of the Rustenburg Layered Suite near Mooiooi, North West Province, South Africa: Neotectonic Implications. *South African Journal of Geology* 121: 421-430.

Trubac, J, Ackerman, K, Gauert, C, Durisova, J and Hrstka, T. 2018. Platinum-Group Elements and Gold in Base Metal Sulfides, Platinum-Group Minerals, and Re-Os Isotope Compositions of the Uitkomst Complex, South Africa. *Economic Geology* 113: 439-461.

CHAPTERS IN BOOKS

Borg, G, Gauert, C. 2018. The African Metallotects of Southwest Gondwana. In: *Geology of Southwest Gondwana*. Regional Geology Reviews, edited by S. Siegesmund et al. Springer International Publishing. pp. 615-676.

CONFERENCE CONTRIBUTIONS

Beukes, JJ, Roelofse, F, Gauert, CDK and Grobler, DF. 2018. *Petrochemical investigation of the Flatreef of the Northern Limb, Bushveld Complex*. Paper delivered at the 4th Iphakade Conference, Clarens, South Africa. 22-25 October.

Beukes, JJ, Roelofse, F, Gauert, CDK and Grobler, DF. 2018. *Petrographical, mineralogical and geochemical investigation of the Flatreef and its hanging wall and footwall at Turfspruit and Macalakaskop, Northern Limb, Bushveld Complex*. Paper delivered at the 13th International Platinum Symposium, Polokwane, South Africa. 30 June-6 July.

Clark, MD. 2018. *Harnessing the multidisciplinary value of Geospatial Data*. Paper delivered at the 176th Provincial Spatial Planning and Land-use Management (SPLUM) Forum for the Free State, Bloemfontein, South Africa. 23 November.

Hansen, RN. 2018. *An assessment of the geochemical impacts of greenfields mining projects on both sides of the mine drainage pH divide – A geochemical modelling approach*. Paper delivered at the UFS Geology Centenary Conference, Bloemfontein, South Africa. 12-13 April.

Huber, MS and Byerly, GR. 2018. *Komatiites from the Saw Mill Complex, Barberton greenstone belt, South Africa*. Paper delivered at the UFS Geology Centenary Conference, Bloemfontein, South Africa. 12-13 April.

Huber, MS and Kovaleva, E. 2018. *Clast distribution in the Daskop granophyre dyke, Vredefort impact structure*. Paper delivered at the UFS Geology Centenary Conference, Bloemfontein, South Africa. 12-13 April.

Huber, MS, Kovaleva, E, Dixon, RD and Pittarello, L. 2018. *Impact-generated pseudotachylites do not necessarily have the composition of their host*. Paper delivered at the 49th Lunar and Planetary Science Conference, The Woodlands, Texas, United States of America. 19-23 March.

Huber, MS, Kovaleva, E and Fourie, F. 2018. *Lowermost termination of Vredefort granophyre dyke results in unusual features*. Paper delivered at the 81st Annual Meeting of the Meteoritical Society, Moscow, Russia. 22-27 July.

Huber, MS, Kovaleva, E and Zaccarini, F. 2018. *Analysis of unusual coarse-crystalline veins within the Vredefort granophyre*. Paper delivered at the 10th Igneous and Metamorphic Studies Group Meeting, Cape Town, South Africa. 14-17 January.

Huber, MS, Tredoux, M, Kovaleva, E and Roelofse, F. 2018. *Revisiting Bon Accord: New Field and petrographic data*. Paper delivered at the UFS Geology Centenary Conference, Bloemfontein, South Africa. 12-13 April.

Klötzli, U, Kusiak, MA, Kovaleva, E, Wirth, R, Yi, K. 2018. *Pb nano-spheres in seismically deformed zircon from the Ivrea-Verbano Zone*. Paper delivered at Pangeo Austria 2018, Vienna, Austria. 24-26 September.

Kovaleva, E. 2018. *In situ granular zircon from the Vredefort impact structure*. Paper delivered at the 81st Annual Meeting of the Meteoritical Society, Moscow, Russia. 22-27 July.

Kovaleva, E, Huber, M and Habler, G. 2018. *Shock microtwins in zircon: An in situ EBSD study of pseudotachylites, Vredefort impact structure*. Paper delivered at the 10th Igneous and Metamorphic Studies Group Meeting, Cape Town, South Africa. 14-17 January.

Kovaleva, E, Huber, M, Habler, G and Pittarello, L. 2018. *Tectonic vs impact zircon deformation: from the Vredefort impact structure to the Moon tectonics, a possible key to understand different geological processes*. Paper delivered at the European Geosciences Union General Assembly, Vienna, Austria. 8-13 April.

Loock, JC. 2018. *History of the Department of Geology at the University of the Free State*. Paper delivered at the UFS Geology Centenary Conference, Bloemfontein, South Africa. 12-13 April.

Mapholi, T and Hansen, RN. 2018. *Presence of PGEs in mine tailings, Western Bushveld: Implications for potential re-processing*. Paper delivered at the UFS Geology Centenary Conference, Bloemfontein, South Africa. 12-13 April.

Minnaar, H. 2018. *The UFS Geology Department and its research on the Namaqua Metamorphic Province*. Paper delivered at the UFS Geology Centenary Conference, Bloemfontein, South Africa. 12-13 April.

Nel, J and Colliston, WP. 2018. *Geology and structure of an area south of Pofadder*. Paper delivered at the UFS Geology Centenary Conference, Bloemfontein, South Africa. 12-13 April.

Nel, R, Germs, GJB, Praekelt, AE and Odendaal, AI. 2018. *Stratigraphy of the Congo Group north of Oudtshoorn*. Paper delivered at the UFS Geology Centenary Conference, Bloemfontein, South Africa. 12-13 April.

Odendaal, AI, Nel, L, Van der Westhuizen, WA and Loock, JC. 2018. *Lungfish burrows in the lower Beaufort Group in the southwestern part of the Karoo basin*. Paper delivered at the UFS Geology Centenary Conference, Bloemfontein, South Africa. 12-13 April.

Rentel, R. 2018. *Science at Sea – the importance of iron*. Paper delivered at the UFS Geology Centenary Conference, Bloemfontein, South Africa. 12-13 April.

Tredoux, M. 2018. *The Bon Accord NiO body, Barberton: A remarkable source of new minerals*. Paper delivered at the UFS Geology Centenary Conference, Bloemfontein, South Africa. 12-13 April.

Tredoux, M, Magson, J and Roelofse, F. 2018. *The chromitite layers of the Merensky Reef, Bushveld Complex: The Devil is in the Detail*. Paper delivered at the 13th International Platinum Symposium, Polokwane, South Africa. 30 June-6 July.

Van der Westhuizen, WA, Steenekamp, JMA, Nel, L and Jacobson, L. 2018. *Neotectonics in the Bushveld Complex*. Paper delivered at the UFS Geology Centenary Conference, Bloemfontein, South Africa. 12-13 April.

Wheeler, J, Mariani, E, Tielke, J, Gardner, J, Prior, D, Piazzolo, S, Hildyard, R, Trimby, P, Drury, M, Kovaleva, E, Montagnat, M, Journaux, B, Chauve, T, Mainprice, D, Tommassi, A and Barou, F. 2018. *Teasing new ideas out from EBSD data: a view from geoscience*. Paper delivered at the Electron Backscatter Diffraction Topical Conference 2018, Ann Arbor, Michigan, United States of America. 23-25 May.

STAFF (2018)

Head of Department: Prof F Roelofse

Professor: Prof WA van der Westhuizen

Affiliated Professors: Prof GJB Germs, Prof DE Miller, and Prof R Scheepers

Associate Professors: Prof F Roelofse and Prof M Tredoux

Affiliated Associate Professors: Prof CD Gauert and Prof RP Schouwstra

Senior Lecturers: Dr R Hansen, Dr M Huber, and Dr H Minnaar

Affiliated Senior Lecturer: Dr A Bisnath

Lecturers: Mr J Beukes, Ms J Magson, and Mr A Odendaal

Affiliated Lecturers: Mr AC Dunne, Mr PJ Grobler, Mr I Hunt, Mr PG Laurens, Dr H Prinsloo, Mr PJ Viljoen, and Mr MJAR Vrijens

Junior Lecturers: Mr J Nel, Ms R Makhadi, Ms T Mapholi, and Mr R Rentel

Research Fellows: Prof WP Colliston, Dr PG Meintjes, Dr L Nel, Dr HE Prækelt, and Prof AE Schoch

Affiliated Researchers: Dr JO Claassen, Ms HCF Pretorius, and Dr MJ van der Merwe

Administrative Officers: Mr A Felix, Ms R Immelman, Ms P Swart, and Ms C van der Vyver

Technical Officers: Mr J Choane, Mr P Lehloeny, Ms M Purchase, and Mr D Radikgomo