

Emma J. Hunt – Curriculum Vitae

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ACADEMIC POSITIONS:

08 2020 – Present: FURMAN UNIVERSITY – Assistant Professor in the Department of Earth, Environment, and Sustainability Sciences.

05 2017 – 03 2018: THE UNIVERSITY OF THE WITWATERSRAND – NRF Innovation Postdoctoral Research Fellow. Concurrent holder of a DST-NRF CIMERA Postdoctoral Research Fellowship.

Research topic: Integrated geoscience: cutting edge techniques for understanding complex 3D geological structures. Host: Professor Rais Latypov.

05 2015 – 04 2017: THE UNIVERSITY OF THE WITWATERSRAND – NRF Postdoctoral Research Fellow.

Research topic: An innovative framework for understanding the Merensky Reef Potholes, Bushveld Complex. Host: Professor Rais Latypov.

EDUCATION:

2011 – 2015: THE UNIVERSITY OF ST ANDREWS – PhD in Geology.

Research topic: “Magma Chamber Dynamics in the Peralkaline Magmas of the Kakortokite Series, South Greenland” – development of layering in a peralkaline/agnaitic magma. Supervisors Professor Adrian Finch and Dr Colin Donaldson. Grant: NERC studentship – NE/J500276/1 (Natural Environment Research Council).

2007 – 2011: THE UNIVERSITY OF KEELE – Masters in Geoscience in Geology with Physical Geography (1st Class honours). 4th year research dissertation: Supra- to sub-solidus coalescence of Cr-spinel crystals within layered mafic-ultramafic intrusions. Supervisor: Dr Brian O’Driscoll.

RESEARCH INTERESTS:

Development of rocks from their origin, crystallisation, recrystallisation, composition, and structures at a range of scales. Major research themes include origins of magmatic layering in intrusive environments; development of ore deposits; responsible mining for the energy transition; and pedagogy for teaching mineralogy, petrology and mineral resources. Investigations have been completed through field, textural, mineralogical, geochemical and geothermobarometric techniques.

PROFESSIONAL PROFILES:

- <https://orcid.org/0000-0002-9713-7788>
- <https://scholar.google.com/citations?user=oYinuFIAAAAJ&hl=en>
- <https://www.researchgate.net/profile/Emma-Hunt>

CLASSES TAUGHT:

At Furman University:

- Mineralogy and Petrology I (undergraduate majors)
- Earth Systems (non-majors)
- Mineral Resources and Sustainable Development (undergraduate majors).

At the University of the Witwatersrand:

- Earth Materials (Mining Engineering undergraduate majors).
- Mineralogy (undergraduate majors)
- Internal & Surface Processes (Civil Engineering undergraduate majors)
- Vredefort Fieldtrip (undergraduate majors).

Tutoring, lab and field course demonstrating experience:

- Research Projects; Research Dissertations; Advanced Igneous Petrology; Analytical and statistical methods in earth science; Igneous and metamorphic geology; Advanced Geological Mapping; Geophysical surveying; Evolution of life and lithosphere; Dynamic Earth: Magma, Minerals, and Metamorphism; Dynamic Earth: Earth System Processes; Introduction to planet earth; Earth Resources and Environment
- Summer schools, TA in labs and field courses for international students.
- GeoBus outreach, teaching geology and physical geography to school students from the ages of 8 to 18.

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SUPERVISION OF UNDERGRADUATE SENIOR THESES:

- Kerry Black “Sustainability in mining, an ESG analysis of the platinum industries in South Africa”. 2023-2024
- Connor Gregory “Geothermobarometry of the Virginia Kyanite Deposit”. 2023-2024
- Kylie Gambrell “New Research into Environmental Contexts of Southeastern Rock Imageries”. 2022-2023, co-advised with Dr. Andrew Womack.
- Finn O’Neil “Mixed Classification Pegmatite Deposits: A Case Study On the Ray Pegmatite, Yancey County, North Carolina, and Pegmatites of the Boulder Batholith, Southwest Montana”. 2022-2023
- S. Isabelle Jarvis “Critical Mineral Potential of Pegmatites: how classifying their zonation can inform exploration”. 2022-2023
- Ethan Watson “Constraining the Genesis of the World’s Largest Kyanite Mine: effects of protolith and fluids”. 2022-2023

SUPERVISION OF UNDERGRADUATE RESEARCH PROJECTS:

- Ethan Watson “Geochemistry of Ore Deposits in the South Carolina Piedmont and Atlantic Coastal Plain”. Summer 2023
- Kerry Black “Sustainability in mining, a comparison of the platinum industries in South Africa and the U.S.”. Summer 2023
- Connor Gregory “Constraining the pressure and temperature conditions of formation of the worlds largest kyanite deposit”. Summer 2023
- Kylie Gambrell “New Research into Environmental Contexts of Southeastern Rock Imageries”. Summer 2022, co-advised with Dr. Andrew Womack.
- Finn O’Neil and S. Isabelle Jarvis: “Evolution of the Blue Ridge Pegmatites: a mineralogical, spatial and chemical analysis.”. Summer 2022
- Ethan Watson “Constraining the genesis of the world class Virginia kyanite deposit”. Summer 2022
- Thomas McCoy Bruce “Unravelling Corona Textures of Southern Appalachian Meta-troctolites – Buck Creek Complex, NC”. Summer 2021

RESEARCH GRANTS:

- NRF Innovation Postdoctoral Fellowship, award reference SFP160524166006. Two-year fellowship with total award amount of ZAR 710,000 (~56,000 USD)
- DST-NRF CIMERA Postdoctoral Fellowship. Project costs award of ZAR 60,000 (~5,000 USD).

SCHOLARSHIPS & AWARDS:

GSA Penrose Conference Travel Award (2016). AGU Student Travel Award (2014). EGU Young Scientists Travel Award (2014). Mineralogical Society Student Bursary (2014). Sam Mavor Travelling Scholarship, Mining Institute of Scotland (2013). VMSG Student Travel Bursary (2012). John Myers’ Special Award for best MGeoscience dissertation project (2011). IGRM student oral presentation, honourable mention (2011). VMSG student poster, honourable mention (2011).

PROFESSIONAL MEMBERSHIPS:

- Society of Economic Geology since 2013
- Council for Undergraduate Research (CUR) since 2020
 - CUR councillor for the Geoscience division from July 1st 2022.
- National Centre for Faculty Development and Diversity (NCFDD) since 2020
- National Association of Geoscience Teachers (NAGT) since 2020
- Geological Society of America (GSA) since 2020
- Mineralogical Society of America (MSA) since 2020

ADDITIONAL QUALIFICATIONS & SKILLS:

Petrography and mineral chemistry:

- Electron microprobe analysis (JEOL and CAMECA), including complex species such as eudialyte-group minerals (Ca,Zr-Silicate). With qualitative X-ray element mapping.
- Electron dispersive spectroscopy of minerals, including identification of REE-bearing minerals (e.g., britholite a rare earth-rich phosphate).

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- LA-ICP-MS analysis of zircon for U/Pb dating and trace element analysis.
- Cathodoluminescence, BSE and SEM imaging for small-scale chemical and textural analysis.
- Whole section photo-microscopy in reflected and transmitted light (plane, cross and circularly polarised).

Bulk chemical analysis:

- Sample preparation and analysis of XRF data.
- Analysis of micro-XRF data

Software:

- Use of online learning environments including SAKAI, WebCT/Blackboard and MOODLE.
- Textural analysis: ImageJ and CSDCorrections
- Adobe Creative Suite including Illustrator, Photoshop and Acrobat Professional.
- Microsoft Office.

Specialist field experience:

- Arctic fieldwork in Greenland during my PhD, both with and without helicopter support. With experience in logistics, e.g., shipment of supplies for 1 month of remote field work; ice axe and crampon use; polar bear awareness; arctic camping; and first aid.
- Underground fieldwork in South Africa. Over 30 days of mapping underground exposures at Lonmin Marikana, at depths of up to 850 m below surface.
- NERC funded and BGS-led course: Multidisciplinary fieldwork training in a professional geoscience environment, natural resources theme. An early career researcher training course in BGS field mapping software, remote sensing (including LiDAR and hyperspectral imagery), 3D visualization, exploration methodologies, sampling protocols, mineral deposit models and professional teamwork. 11 days during October and November 2014.
- Comprehensive surveying skills, aerial photograph interpretation, hazard and risk assessment.

Conference organisation:

- Student Organiser at the North Atlantic Craton Conference (St Andrews 2014). I contributed to preparing delegate welcome packs; registering delegates; organising posters and exhibitors' space, facilitating mixing during events; answering general questions; technical assistance with running presentations and any arising issues.
- Specialist volunteer at AGU 2014. I interviewed delegates as part of the careers centre program.
- Member of the organization committee for the 13th International Platinum Symposium 2018.

Certifications:

- "Introduction to Drilling Course" by Colin Rice of 'Colin Rice Exploration and Training'.
- Level 2 First Aid certificate of competence from Institute of Emergency First Aiders (IEFA), SAQA registered (120496, NQF level 2). Expired: June 2020.
- Full UK driving licence.
- USA South Carolina driving licence.
- British Passport holder.
- US permanent residency.

Emma J. Hunt – Publications List

PUBLICATIONS:

- Hunt, E.J., O’Driscoll, B. & Day, J.M.D. (2022). Sintering as a key process in the textural evolution of chromitite seams in layered mafic-ultramafic intrusions. *Canadian Mineralogist*, **59**(6), 1661-1692, doi: 10.3749/canmin.2100021
- van der Ven, M.A.J., Borst, A.M., Davies, G.R., Hunt, E.J. & Finch, A.A. (2019). Hydrothermal Alteration of Eudialyte-Hosted Critical Metal Deposits: Fluid Source and Implications for Deposit Grade. *Minerals*, **9**, 7, doi: 10.3390/min9070422
- Chistyakova, S., Latypov, R., Hunt, E.J. & Barnes, S. (2019). Merensky-type platinum deposits and a reappraisal of magma chamber paradigms. *Scientific Reports*, **9**, 8807, doi: 10.1038/s41598-019-45288-8
- Manzi, M.S., Hunt, E.J. & Durrheim, R. (2019). 3D Reflection Seismic for Gold and Platinum Exploration, Mine Development and Safety. In Ore Deposits. Eds: Decrée, S. & Robb, L. doi:10.1002/9781119290544.ch11
- Hunt, E.J., Latypov, R. & Horváth, P. (2018). The Merensky Cyclic Unit, Bushveld Complex, South Africa: reality or myth? *Minerals*, **8**, 144, doi: 10.3390/min8040144
- Latypov, R., Costin, G., Chistyakova, S. Hunt, E.J., Mukherjee, R. & Naldrett, T. (2018). Platinum-bearing chromite layers are caused by pressure reduction during magma ascent. *Nature Communications*, **9**, 462, doi: 10.1038/s41467-017-02773-w
- Hunt, E.J., Finch, A.A. & Donaldson, C.H. (2017) Layering in peralkaline magmas, Ilímaussaq Complex, S Greenland, *Lithos*, **268-271**, 1-15, doi: 10.1016/j.lithos.2016.10.023
- Latypov, R. Chistyakova, S Barnes, S.J. & Hunt, E.J. (2017). Origin of Platinum Deposits in Layered Intrusions by In Situ Crystallization: Evidence from Undercutting Merensky Reef of the Bushveld Complex. *Journal of Petrology*, **58**, 715-76, doi: 10.1093/petrology/egx032
- Hunt, E., O’Driscoll, B. & Daly, J.S. (2012). Parental magma composition of the syn-tectonic Dawros Peridotite chromitites, NW Connemara, Ireland. *Geological Magazine*, **149**, 590-605, doi: 10.1017/S0016756811000872

In Preparation

- Hunt, E.J. (In Preparation). The role of sustainability in mining: educating future scientists and policy makers. *To be submitted to GSA Today as a Groundwork Article.*
- Hunt, E.J., Latypov, R. & Horváth, P. (In Preparation). 3D reflection seismic to microstructure: the synmagmatic extensional control for potholes of the Bushveld Complex. *To be submitted to Lithos.*
- Hunt, E.J., Latypov, R. & Horváth, P. (In Preparation). Development of Brown Sugar Norite through Hot Tearing. *To be submitted to Ore Geology Reviews.*
- Hunt E.J., Finch, A.A. & Donaldson, C.H. (In Preparation). Magma mingling and mixing in the layered kakortokite series, Ilímaussaq Complex, S. Greenland. To be submitted to *Mineralogical Magazine.*
- McKenzie, K., McCarthy, W. & Hunt, E.J. (In Preparation). Development of pseudo-sedimentary structures in granites: insights from the Carna Pluton, Connemara Ireland. *To be submitted to Journal of Petrology.*

PRESENTATIONS:

*indicates Furman student author.

- **Oral Presentation at 3rd Annual Workshop: Resilient Supply of Critical Minerals**, Rolla, Missouri, 9-10th August 2023. Hunt E.J. (2023). Responsibility in Mining: Educating for Environmental, Social and Economic Awareness.
- **Oral Presentation at Geological Society of America (GSA) Joint Southeastern and Northeastern Section Meeting**, Reston, Virginia, 17-19th March 2023. Hunt E.J. (2023). A sustainable approach towards domestic critical mineral resources: educating environmentally, socially and economically aware scientists and policy makers. Geological Society of America Abstracts with Programs. Vol. 55, No. 2, 2023doi: 10.1130/abs/2023SE-385425
- **Poster Presentation at Geological Society of America (GSA) Joint Southeastern and Northeastern Section Meeting**, Reston, Virginia, 17-19th March 2023. Jarvis, S.I.* , O'Neil, F.* , Hunt, E.J., Aronoff, R., Ranson, W., Kelly, N. & Horvath, P. (2023). Critical mineral potential of pegmatites: how classifying their zonation can inform exploration. Geological Society of America Abstracts with Programs. Vol. 55, No. 2, 2023. doi: 10.1130/abs/2023SE-385524
- **Poster Presentation at Geological Society of America (GSA) Joint Southeastern and Northeastern Section Meeting**, Reston, Virginia, 17-19th March 2023. O'Neil, F.* , Jarvis, S.I.* , Hunt, E.J., Kelly, N., Horvath, P., Aronoff, R. & Ranson, W. (2023). AFC OF LCT, NYF & REE: Untangling the geologic processes behind the alphabet soup of pegmatite classifications. Geological Society of America Abstracts with Programs. Vol. 55, No. 2, 2023. doi: 10.1130/abs/2023SE-385522
- **Poster Presentation at Geological Society of America (GSA) Joint Southeastern and Northeastern Section Meeting**, Reston, Virginia, 17-19th March 2023. Watson, E.H.* , Hunt, E.J., Horvath, P., Kelly, N., Aronoff, R. & Ashlock, S. (2023). Forming the worlds largest kyanite mine: effects of protolith and fluids. Geological Society of America Abstracts with Programs. Vol. 55, No. 2, 2023. doi: 10.1130/abs/2023SE-385523
- **Oral Presentation at Geological Society of America (GSA) Connects**, Boulder, Denver, 9-12th October 2022. Hunt E.J., *Educating for our sustainable future: a mineral resources perspective*. Geological Society of America Abstracts with Programs. Vol. 54, No. 5, doi: 10.1130/abs/2022AM-380503
- **Oral Presentation at Geological Society of America (GSA) Joint North-Central & Southeastern Section Meeting**, Cincinnati, Ohio, 7-8th April 2022. Hunt E.J., *Petrology in a Pandemic: Virtual Optical Mineralogy*. Geological Society of America Abstracts with Programs. Vol. 54, No. 4, doi: 10.1130/abs/2022NC-373428
- **Poster Presentation at Geological Society of America (GSA) Joint North-Central & Southeastern Section Meeting**, Cincinnati, Ohio, 7-8th April 2022. McCoy-Bruce, T.* , Hunt E.J., Horvath, P., Ranson, W. *Multi-stage reaction controlled textures of meta-troctolites in the Buck Creek Complex, NC*. Geological Society of America Abstracts with Programs. Vol. 54, No. 4, doi: 10.1130/abs/2022NC-373427.
- **Oral Presentation at South Carolina Conference on Innovations in Teaching and Learning**, Online, 16th July 2021. Hunt E.J., Turning hands-on labs hyflex: landscape studies through virtual reality and field experiences. <https://digitalcommons.coastal.edu/sccitl/2021/fullconference/21>
- **Oral Presentation at 13th International Platinum Symposium**, Polokwane, June-July 2018. Hunt, E.J., Latypov, R., Manzi, M.S.D., Horváth, P. & Hoffmann, D. *Development of potholes in layered magic-ultramafic intrusions: insights from a multi-technique study, Bushveld Complex, South Africa*.

- **Oral Presentation at 13th International Platinum Symposium**, Polokwane, June-July 2018. Chistyakova, S., Latypov, R. & Hunt, E.J. *New insights into the origin of platinum deposits from the overhanging Merensky Reef, Bushveld Complex.*
- **Oral Presentation at Wager & Brown Workshop, 13th International Platinum Symposium**, Polokwane, June 2018. Latypov, R., Costin, G., Chistyakova, S., Hunt, E.J., Mukherjee, R. & Naldrett, T. *Decompression during magma ascent as a trigger for the formation of monomineralic rocks in layered intrusions.*
- **Oral Presentation at Wager & Brown Workshop, 13th International Platinum Symposium**, Polokwane, June 2018. Latypov, R., Chistyakova, S., Hunt, E.J. & McIntosh, R. *Bushveld Complex, lessons for magma chamber processes.*
- **Oral Presentation at Joint AMREP & DST-CIMERA Symposium**, Johannesburg, March 2018. Hunt, E. J., Latypov, R., Manzi, M.S.D., Horváth, P. & Hoffman, D. *An innovative geological framework for understanding the Merensky Reef potholes.*
- **Oral Presentation at Igneous and Metamorphic Studies Group Meeting**, Belville, January 2018. Hunt, E. J., Latypov, R. & Horváth, P. *Cyclicity in the Bushveld Critical Zone – do cyclic units exist?*
- **Oral Presentation at Igneous and Metamorphic Studies Group Meeting**, Belville, January 2018. Latypov, R., Costin, G., Chistyakova, S., Hunt, E.J., Mukherjee, R. & Naldrett, T. *Pressure reduction during magma ascent causes the formation of platinum-bearing chromite layers.*
- **Oral Presentation at Igneous and Metamorphic Studies Group Meeting**, Belville, January 2018. Maghdour-Mashour, R., Latypov, R. & Hunt, E.J. *Lower / Upper Critical Zone Boundary: differentiation or replenishment?*
- **Oral Presentation at Igneous and Metamorphic Studies Group Meeting**, Johannesburg, January 2017. Hunt, E. J., Latypov, R., Manzi, M.S.D., Horváth, P. & Hoffman, D. *Formation of potholes in conjunction with syn-magmatic extension.*
- **Oral Presentation at 35th IGC**, Cape Town, August 2016. Hunt, E.J., Latypov, R., Manzi, M.S.D. & Hoffmann, D. *A step forward in understanding 3D magmatic structures and ore deposits.*
- **Oral Presentation at 35th IGC**, Cape Town August 2016. Hunt, E.J., Finch, A.A. & Donaldson, C.H. *Peralkaline Igneous Complexes: The Frontier of REE Deposits.*
- **Oral Presentation at GSA Penrose Conference**, Montana, August 2016. Hunt, E.J., Latypov, R., Manzi, M.S.D. & Hoffmann, D. *Extending geological insights into 3D magmatic structures and ore deposits.*
- **Poster Presentation at EGU General Assembly**, Vienna, April 2016. McKenzie, K., McCarthy, W. & Hunt, E.J. *Development of modal layering in granites: a case study from the Carna Pluton, Connemara, Ireland.*
- **Poster Presentation at North Atlantic Craton Conference**, University of Edinburgh, March 2016. McKenzie, K., McCarthy, W. & Hunt, E.J. *Modal layering in granites: a new model for understanding mineralization.*
- **Oral Presentation at Igneous and Metamorphic Studies Group Meeting**, Langebaan, January 2016. Hunt, E. J. & Latypov, R. *A Geological Framework for Understanding Pothole Development.*
- **Oral Presentation at Volcanic and Magmatic Studies Group Meeting**, Dublin, January 2016. Hunt, E. J. & Latypov, R. *Development of Merensky Reef Potholes at Karee Mine.*

- **Poster presentation at AGU Fall Meeting**, San Francisco, December 2014. Hunt, E.J., Finch, A.A. & Donaldson, C.H. *Magma Mixing in Layered Kakortokites, Ilímaussaq Complex, S. Greenland.*
- **Pico Presentation at EGU General Assembly**, Vienna, April 2014. Hunt, E.J., Finch, A.A. & Donaldson, C.H. *Development of Peralkaline Rhythmic Layering, Ilímaussaq Complex, S. Greenland.*
- **Oral Presentation at North Atlantic Craton Conference**, University of St Andrews, March 2014. Hunt, E.J., Finch, A.A. & Donaldson, C.H. *Peralkaline magmatic layering: development of the eudialyte-rich Unit 0 marker horizon. Ilímaussaq Complex, S. Greenland.*
- **Oral Presentation at GAC®-MAC Joint Annual Meeting**, Winnipeg, May 2013. Hunt, E.J., Finch, A.A. & Donaldson, C.H. *Magmatic layering in a peralkaline intrusion: an example from Layer 0, Ilímaussaq Complex, S. Greenland.*
- **Poster Presentation at 22nd V. M. Goldschmidt**, Montreal, June 2012. Hunt, E.J., Finch, A.A. & Donaldson, C.H. *Hydrothermal REE enrichment, Ilímaussaq Complex, S. Greenland.*
- **Poster presentation at EGU General Assembly**, Vienna, April 2014. Hunt, E.J., Finch, A.A. & Donaldson, C.H. *How do Kakortokites form? Additional evidence from the Ilímaussaq Complex, S. Greenland.*
- **Poster presentation at Volcanic and Magmatic Studies Group Meeting**, Durham, January 2012. Hunt, E., O'Driscoll, B., Donaldson, C.H. & Day, J.M.D. *Processes of sintering of Cr-spinel crystals within layered intrusions.*
- **Oral presentation at Irish Geological Research Meeting**, NUI Galway, February 2011. Hunt, E., O'Driscoll, B. & Daly, J.S. *Parental magma composition of the syn-tectonic Dawros Peridotite chromitites, NW Connemara, Ireland.*
- **Poster presentation at Volcanic and Magmatic Studies Group Meeting**, Cambridge, January 2011. Hunt, E., O'Driscoll, B. & Day, J.M.D. *Sub-solidus coalescence of Cr-spinel crystals within layered intrusions.*