Marek Locmelis, Ph.D. – Curriculum Vitae

Associate Professor
Jackson School of Geosciences
Department of Earth and Planetary Sciences, 2275 Speedway Blvd C9000, Austin, Texas 78712
Bureau of Economic Geology, 10611 Exploration Way, Austin, Texas 78758
e-mail: locmelis@jsg.utexas.edu, phone: 512-232-2067

APPOINTMENTS

Since 08/24 **Associate Professor (with tenure),** Jackson School of Geosciences, Department of Earth and Planetary Sciences and Bureau of Economic Geology, University of Texas at Austin, Austin, Texas, USA.

- Focus areas (research and teaching): Economic geology, high-temperature geochemistry, mineralogy, petrology.
- Shared appointment between the Department of Earth and Planetary Sciences and the Bureau of Economic Geology.

2022-2024 **Associate Professor (with tenure)**, Geology and Geophysics Program, Department of Geosciences and Geological and Petroleum Engineering, Missouri University of Science and Technology Rolla, Missouri, USA.

- Associate Professor of 'Strategic Natural Mineral Resources'.
- Focus areas (research and teaching): Economic geology, high-temperature geochemistry, mineralogy, petrology.

2022-2024 **Faculty Fellow (50% FTE)**, Office of the Vice Chancellor for Innovation and Research, Missouri University of Science and Technology Rolla, Missouri, USA.

- Support S&T's research centers and constellations to achieve strategic goals.
- Aid the advancement of S&T's key initiatives including 'Roadmap to R1 Status', the S&T proposal review and mentoring panel, award capture, and large proposal support.
- Organization of the CAREER / Young Investigator proposal workshop series for NSF, ARMY, NAVY, AIR FORCE, NASA, NIH, DOE, DOD, and other federal agencies.

2016-2022 **Tenure Track Assistant Professor**, Geology and Geophysics Program, Department of Geosciences and Geological and Petroleum Engineering, Missouri University of Science and Technology Rolla, Missouri, USA.

- Assistant Professor of 'Strategic Natural Mineral Resources'.
- Focus areas (research and teaching): Economic geology, high-temperature geochemistry, mineralogy, petrology.

2014-2016 **NASA Postdoctoral Fellow**, NASA Goddard Space Flight Center, Solar System Exploration Division, Planetary Environments Laboratory, Greenbelt, Maryland, USA.

- Research investigating the redox evolution of the interiors of planets and protoplanets.

2011-2014 **Postdoctoral Fellow**, Centre for Exploration Targeting & ARC Centre of Excellence for Core to Crust Fluid Systems, The University of Western Australia, Perth, Australia.

- Research investigating the role of different fluids in the formation of ore deposits.
- Development of mineral-based geochemical exploration tools.

EDUCATION

2011 Ph.D., Earth and Planetary Sciences, Macquarie University, Sydney, Australia.
Advisors: Norman J. Pearson, Suzanne Y. O'Reilly.

2005 Diploma, Geosciences (M. Sc. equivalent), University of Hannover, Germany. Advisors: *Francois Holtz, Frank Melcher, Thomas Oberthür.*

2003 Pre-Diploma, Geosciences (B. Sc. equivalent), University of Hannover, Germany.

AWARDS, HONORS AND RECOGNITIONS

2023 Missouri S&T Faculty Research Award.

2022 Fellow of the Society of Economic Geologists.

2021 Missouri S&T 2020-2021 Outstanding Teaching Commendation.

2020 National Science Foundation CAREER Award.

2020 Missouri S&T 2019-2020 Outstanding Teaching Commendation.

2018 Missouri S&T Mines and Metallurgy Academy Junior Faculty Award.

2017 Missouri S&T 2016-2017 Outstanding Teaching Commendation.

2014 NASA Postdoctoral Program Fellowship Award.

2006 International Macquarie University Research Scholarship (iMURS) award.

GRANTS AND CONTRACTS

Current:

2026 ***Missouri Department of Natural Resources:*** Guiding Critical Mineral Exploration in Southeast Missouri Through an Advanced Critical Minerals Concept. Project total: $91,298. PI (100% shared credit, $91,298). July 2026 – May 2030.

2025 ***Railroad Commission of Texas, State of Texas, and Commercial Partner:*** Evaluation of Lithium Resources in the Smackover Formation of East Texas. Project total: $350,000. Co-PI (6% shared credit, $21,000). Oct. 2025 – Sept. 2026.

Past:

2025 ***NSF CBET:*** CONFERENCE – North American Workshop on Critical Mineral Research, Development and Education, August 13-14, 2025, Austin, Texas, USA. $49,988. PI (1 person month per year). Mar. 2025 – Feb. 2026.

2024 ***Missouri Department of Natural Resources:*** Developing a Mineral System Concept to Guide Critical Mineral Exploration in Missouri. Project total: $475,000. PI (75% shared credit, $363,750). Mar. 2023 – Feb. 2027.

2024 ***Missouri Department of Economic Development through Missouri House Bill HB7:*** Demonstrating Missouri's Potential as a National Leader in Critical Minerals Production. Project total: $15,520,000. Co-PI / Science-PI (30% shared credit; 4,656,000). Oct. 2023 – June 2025.

2024 ***NSF CBET:*** CONFERENCE – Fourth Annual Workshop on 'Resilient Supply of Critical Minerals'. August 7-8, 2024. Rolla Missouri S&T. $49,948. PI (40% shared credit, $19,979). Mar. 2024 – Feb. 2025.

2024 ***U.S. ARMY Combat Capabilities Development Command (DEVCOM) Analysis Center (DAC):*** Chemical Hazards Mitigation through Cold Plasma Treatment and Shielding. Project total: $300,000. Co-PI (33% shared credit; $99,000). Sept. 2022 – Sept. 2024.

2023 ***Rio Tinto:*** Recovery and separation of gallium and germanium from copper metallurgical waste at Kennecott Utah Copper. Project total: $875,000. Co-PI (25% shared credit, $218,750). Jan. 2024 – Dec. 2025.

2023 ***DOE ARPA-E MINER:*** Reduce Comminution Energy and Improve Energy Relevant Mineral Yield using Carbon-Negative Oxalatization Reactions. Project total: $1,729,839. Co-PI (15% shared credit; 259,476). Jan. 2023 – Jan. 2026.

2023 ***National Renewable Energy Laboratory:*** Selective and efficient recovery of tellurium from copper processing streams. Total: $374,979. Co-PI (35% shared credit; $131,243). Mar. 2023 – Aug. 2025.

2023 ***NSF CBET:*** CONFERENCE – Third Annual Workshop on 'Resilient Supply of Critical Minerals'. August 9-10, 2023. Rolla Missouri S&T. $49,989. PI (40% shared credit, $19,996). Mar. 2020 – Dec. 2023.

2023 ***Economic Development Administration:*** Critical Minerals and Materials for Advanced Energy (CM2AE) Tech Hub Phase 1. Project total: $450,000. Co-PI (17.5% shared credit, $78,750). Nov. 2023 – Oct. 2024.

2023 ***NSF ENGINES Type 1*** (as subaward from University of Missouri at Kansas City): Midwest Microelectronics Collective. Subaward total: $300,000 (PI of subaward, 20% shared credit, $60,000). May 2023 – April 2025.

2022 ***Rio Tinto*****:** Pilot Study - The deportment of indium, gallium, and germanium in smelter dust from the Kennecott Mine copper smelter, Utah, USA. Project total: $93,272. PI (34% shared credit; $31,712). Jan. 2023 – Dec. 2023.

2021 ***First Solar, Rio Tinto (co-sponsorship)*****:** Improved Recovery of Tellurium and Associated Copper and Precious Metals during Processing of Copper Porphyry Deposits at the Copperton Concentrator. $259,160. Co-PI (35% shared credit; $90,706). Sept. 2021 – Aug. 2023.

2021 ***Doe Run Company:*** Determining the source of sphalerite-hosted zinc in the Boss-Bixby deposit, southeast Missouri. $18,223. PI (100% shared credit; $18,223). Sept. 2021 – Aug. 2022.

2020 ***NSF EAR:*** CAREER – Investigating the source, transport and deposition of economically important metals in the lower continental crust. $546,648. PI (100% shared credit; $546,648). July 2020 – June 2026.

2019 ***NSF EAR:*** RAPID **–** Assessing the fate of flood-born contaminants. $44,888. PI (34% shared credit; $14,813). Sept. 2019 – Dec. 2020.

2020 ***NSF CBET:*** WORKSHOP – Resilient Supply of Critical Minerals Workshop Series (virtual due to COVID-19 pandemic). $49,886. PI (35% shared credit; $17,460). Jan. 2020 – Dec. 2022.

2019 ***Doe Run Company:*** Investigation of Missouri's Rare Earth Element and Cobalt Ore Potential. $24,258. PI (100% shared credit; $24,258). Dec. 2019 – Nov. 2022.

2018 ***NSF ICER:*** GEOPATHS-EXTRA Collaborative proposal – RiGS: Road Maps into the Geosciences. $306,716. Co-PI (33% shared credit; $101,216). Aug. 2018 – July 2022.

2017 ***NASA EPSCoR*****:** Fingerprinting the sulfur evolution of planetary bodies by laser ablation ICP-MS. $10,000. PI (100% shared credit; $10,000). Oct. 2017 – May 2019.

2017 ***University of Missouri Research Board*****:** Development of innovative geochemical redox proxies. University of Missouri Research Board. $11,000. PI (100% shared credit; $11,000). July 2017 – June 2019.

2013 ***Rio Tinto*:** The applicability of Ru-chromite signatures in the exploration for picrite-hosted Ni-Cu-PGE sulfide deposits. $ 92,381. PI (50% shared credit; $46,191). Aug. 2013 – June 2014.

PROFESSIONAL AFFILIATIONS AND SERVICE

Professional Affiliations:

Society of Economic Geologists (Fellow).

Professional Activities:

2026- Associate Editor. Journal of Geochemical Exploration (*ongoing*).

2026 Session Co-Chair: "Advancing Resource Estimation and Ore Body Precision", MINEXCHANGE 2026: Society for Mining, Metallurgy and Exploration Annual Conference & Expo, 22-25 February 2026, Salt Lake City, Utah, USA.

2025 Chair: North American Workshop on Critical Mineral Research, Development and Education, 13-14 August 2025, Austin, Texas, USA.

2025 Session Co-Chair: "Advances in Critical Materials for Sustainable Energy". 2025 Materials Research Society Fall Meeting, Boston, Massachusetts, USA, 30 Nov. - 5 Dec. 2025.

2025 Session Co-Chair: "Critical Mineral Resources and Recovery in the Americas: Emerging Methods in Exploration and Sustainable Extraction". 2025 Meeting of the Geological Society of America (GSA), San Antonio, Texas, 19-22 October 2025.

2024 Chair: 4th Annual Workshop on 'Resilient Supply of Critical Minerals'. Rolla, Missouri, USA, 7-8 August 2024.

2024 Session Co-Chair: Pardee Keynote Symposium on Attracting and Educating a 21st Century Mining Workforce: Addressing the Need for a Resilient Domestic Supply of Critical Minerals. 2024 Meeting of the Geological Society of America (GSA), Anaheim, California, 22-25 September 2024.

2023 Chair: 3rd Annual Workshop on 'Resilient Supply of Critical Minerals'. Rolla, Missouri, USA, 9-10 August 2023.

2023- Member: Missouri Department of Natural Resources State Mapping Advisory Committee (*ongoing*).

2022 Organizing committee member: 2022 Workshop Towards a Sustainable Future Use of Coal. Rolla, Missouri, USA, 19-20 October 2022.

2022 Chair: 2nd Annual Workshop on 'Resilient Supply of Critical Minerals'. Rolla, Missouri, USA, 4-5 August 2022.

2021- Chair: Society of Economic Geologists Graduate Student Fellowship Program (*ongoing*).

2021 Chair: 1st Annual Workshop on 'Resilient Supply of Critical Minerals' Rolla, Missouri, USA, 2-3 August 2021.

2019 Session Chair: '"Investigations of Hydrothermal Systems: Advances and Challenges" at the 2019 Meeting of the Geological Society of America (GSA), Phoenix, Arizona.

2018 Session Chair: '"Interdisciplinary investigations of mantle-crustal mass transfer" at the 2018 Meeting of the Geological Society of America (GSA), Indianapolis, Indiana.

Professional Service:

2025- Graduate Advisor, Energy and Earth Resources Program, Jackson School of Geosciences, UT Austin.

2024- Member: Jackson School Graduate Admissions and Support Committee, UT Austin.

2025 Member: University of Texas Graduate Assembly / GRE working group, UT Austin.

2024 Search committee member: Department Chair, Department of Geosciences & Geological & Petroleum Engineering, Missouri S&T.

2024 Search committee member: Proposal Developer, Office of the Vice Chancellor for Research and Innovation, Missouri S&T.

2024 Search committee member: Office Support Assistant, Office of the Vice Chancellor for Research and Innovation, Missouri S&T.

2024 Session host: Missouri S&T K-12 Engineering Day. Session topic: 'Electronics Unearthed'.

2023 Search committee co-chair: Analytical Core Facility Manager, Office of the Vice Chancellor for Research and Innovation, Missouri S&T.

2022 Session Host: It's not Just Sci-Fi, Missouri S&T Women in STEM conference 'Expand Your Horizon', September 2002.

2022 Search committee member. Robert H. Quenon Professorship in Mining Engineering at MS&T.

2021-22 Search committee member. Inaugural Director for Kummer Institute Center for Resource Sustainability.

2021 Proposal panelist, National Science Foundation: Petrology & Geochemistry, April 2021.

2021 Proposal panelist, Society of Economic Geologists: Graduate student fellowships, March 2021.

2020-21 Member, The Chancellor's Kummer Institute Research Center Faculty Advisory Panel at MS&T.

2020- Member, Missouri S&T Discipline Specific Curricula Committee (ongoing).

2019 Judge, Missouri S&T's Junior Science and Humanities Symposium.

2019 Session host (Meteorites and the Stories They Tell), Missouri S&T's Jackling Summer Camp.

2019 Member, Department of Geosciences & Geological & Petroleum Eng. Workload Committee.

2018 Session host (Meteorites and the Stories They Tell), Missouri S&T's Jackling Summer Camp.

Reviewer of Manuscripts for:

American Journal of Science, American Mineralogist, Canadian Mineralogist, Chemical Geology, Geochimica et Cosmochimica Acta, Geology, GSA Today, International Journal of Analytical Chemistry, Journal of Geochemical Exploration, Lithos, Microscopy & Microanalysis, Mineralium Deposita, Mineralogy & Petrology, Nature, Nature Communications, Ore Geology Reviews, Resources, Conversation & Recycling, Terra Nova.

Reviewer of Proposals to:

National Science Foundation (EAR-CH; FAIROS-RCN; GRFP), German Academic Exchange Service Postdoctoral Researchers International Mobility Experience (DAAD-PRIME), German Science Foundation (DFG, Section: Geochemistry, Mineralogy and Crystallography), Society of Economic Geologists (Graduate Student Fellowship Program).

Peer-Reviewed Publications

**Indicates student (co-)advisee, **postdoctoral (co-)advisee*

38. Clark, S.*, **Locmelis, M.**, Moroni, M., Savard, D., Sessa, G. (2026): Carbon-sulfur interactions in the lower continental crust: Implications for Ni-Cu-PGE sulfide ore genesis. *Lithos,* 540-541: p.108668. https://doi.org/10.1016/j.lithos.2026.108668.

37. Scanlon, B.R., Reedy, R.C., Elliott, B.A., Hower, J.C., Kyle, J.R., **Locmelis, M.**, Theaker, N., Warwick, P.D. (2026): Rare earth element potential in coal and coal ash in the US Gulf Coast. *International Journal of Coal Science & Technology*, 13(1): 28. https://doi.org/10.1007/s40789-026-00872-y.

36. Lin, T-C., Mbanugo, V.S., Ojo, B.S., Huang, Y.W., **Locmelis, M.** and Han, D. (2025): Cold Atmospheric Plasma Induced Degradation of Organophosphate Pesticides on Kevlar Swatches. *Plasma Processes and Polymers*. e70070. https://doi.org/10.1002/ppap.70070.

35. Nakhaei, F., **Locmelis, M.**, Alagha, L., Moats, M. (2025): Characterization and leaching feasibility studies of copper flue dust for the recovery of main and trace metals. *Journal of Sustainable Metallurgy*. v. 11, p. 2215-2235. https://doi.org/10.1007/s40831-025-01158-4.

34. Dashtseren, K., ***Tunnell, B. N.,*****, Boldbaatar E., Sereenen J., **Locmelis, M.**, Yang, Y., Yang, M., Hames, W., Nakano, N., Adachi, T. (2025): Genesis and geochronology of the Bayanteeg Li-mineralized pegmatite in the Idermeg terrane, Central Mongolia. *Journal of Asian Earth Sciences.* v. 287, p. 106615. https://doi.org/10.1016/j.jseaes.2025.106615.

33. Mbanugo, V.S., Ojo, B.S., Lin, T-C., Huang, Y.W., **Locmelis, M.** and Han, D. (2025): Per- and Polyfluoroalkyl Substance (PFAS) Degradation in Water and Soil Using Cold Atmospheric Plasma (CAP): A Review. *ACS Physical Chemistry Au.,* v. 5, p. 117-133. https://doi.org/10.1021/acsphyschemau.4c00092.

32. Corchado-Albelo, J. L., **Locmelis, M.,** Moats, M.S. and Alagha, L. (2025): Approaches for Coprocessing Tellurides: A Critical Minerals Perspective with Emphasis on Mineralogy and Metallurgy. *Mineral Processing and Extractive Metallurgy Review*, pp.1-21. https://doi.org/10.1080/08827508.2024.2352508.

31. Willhite, L. N., Arevalo, Jr., A., Piccoli, P., Lassiter, J. C., Rand, D., Jackson, M. G., Day, J. M. D., Nicklas, R. W., **Locmelis, M.**, Ireland, T. J., Puchtel, I. S. (2024): Oxygen fugacity of global ocean island basalts. *Geochemistry, Geophysics, Geosystems (G-Cubed),* v. 25, no., p. e2023GC011249. https://doi.org/10.1029/2023GC011249.

30. Adesina, K., Lin, T-C., Huang, Y.-W, **Locmelis**, M., Han, D. (2024): A Review of Dielectric Barrier Discharge Cold Atmospheric Plasma for Surface Sterilization and Decontamination. *IEEE Transactions on Radiations and Plasma Medical Sciences*, v. 8, no. 3, p. 295-306 https://doi.org/10.1109/TRPMS.2024.3349571.

29. Xue, T., Peng, D., Liu, K. H., Obrist-Farner, J., **Locmelis, M.**, Gao, S. G., Liu, L. (2023): Ongoing Fragmentation of the Subducting Cocos Slab. *Geology*, v. 51, no. 12, p. 1106-1110. https://doi.org/10.1130/G51403.1

28. Altankhuyag, G., Boldbaatar, E., ***Tunnell, B. N.*****, Sereenen, J., **Locmelis, M.**, Li, X., Imai, A. (2023): Geology, Mineralization and Magma Evolution of the Zuun Mod Mo-Cu Deposit in Southwest Mongolia. P. 105857. *Journal of Asian Earth Sciences*. https://doi.org/10.1016/j.jseaes.2023.105857.

27. ***Sullivan, B.****, **Locmelis, M**., Tunnel, B. N., Seeger, C., Moroni, M., Dare, S., Mathur, R., (2023): The genesis of the 1.45 Ga Kratz Spring Iron Oxide Apatite Deposit Complex in Southeast Missouri, USA. *Economic Geology*, v. 118, no. 5, p. 1149-1175. https://doi.org/10.5382/econgeo.5003.

26. Schoneveld, L., Barnes, S.J., Puchtel, I. S., Tessalina, S., **Locmelis, M.,** (2022): Distributions of PGE and Os Isotopes in Chromite from the Coobina Chromitite deposit in Western Australia: Implications for chromite as a sulfide mineralization indicator, *Canadian Mineralogist*, v.60, p. 1045-1069. https://doi.org/10.3749/canmin.2200006.

25. ***Tunnell, B. N.****, **Locmelis, M.**, Seeger, C., Moroni, M., Dare, S., Mathur, R., *Sullivan, B.** (2022): The Shepherd Mountain Iron Ore Deposit in Southeast Missouri, USA – An Extension of the Pilot Knob Magmatic-Hydrothermal Ore System: Evidence from Iron Oxide Chemistry. *Ore Geology Reviews*, p. 104633. https://doi.org/10.1016/j.oregeorev.2021.104633.

24. Puchtel, I. S., Nicklas, R. W., Slagle, J., Horan, M., Walker, R. J., Nisbet, E. G., **Locmelis, M.** (2022): Early global mantle chemical and isotope heterogeneity revealed by the komatiite-basalt record: The Western Australia connection. *Geochimica et Cosmochimica Acta*, v. 320, p. 238-278. https://doi.org/10.1016/j.gca.2021.11.030

23. Obrist-Farner, J., Brenner, M., Stone, J. R., Wojewódka-Przybył, M., Bauersachs, T., Eckert, A., **Locmelis, M.**, Curtis, J. H., Zimmerman, et. al. (2022): New estimates for the magnitude of the sea-level jump preceding the 8.2-ka event. *Geology*, v. 50, no. 1, p. 86-90. https://doi.org/10.1130/G49296.1

22. ***Tunnell, B. N.****, **Locmelis, M.**, Seeger C., Mathur, R., Dunkl, I., *Sullivan, B.**, Lori, L. (2021): The Pilot Knob Iron Ore Deposits in Southeast Missouri: A High-To-Low Temperature Magmatic-Hydrothermal Continuum. *Ore Geology Reviews*, p. 103973. https://doi.org/10.1016/j.oregeorev.2020.103973

21. **Locmelis, M.**, Moroni, M., Denyszyn, S., Webb, L., Fiorentini, M. L., Sessa, G., Caruso, S., Mathur, R., *Nanzad, B.** (2021): On the formation of magmatic sulfide systems in the lower crust by long-lived mass transfer through the lithosphere: Insights from the Valmaggia ultramafic pipe, Ivrea Verbano Zone, Italy. *Terra Nova*, v. 33, no. 3, p. 17-149. https://doi.org/10.1111/ter.12499

20. ***Tunnell, B. N.****, Conder, J. A., Anderson, K. B., **Locmelis, M.** (2021): A cycle-jumping method for multicyclic Hubbert modeling of resource production. *Natural Resource Modelling*, v. 34, no.1, e12296. https://doi.org/10.1111/nrm.12296

19. Obrist-Farner, J., Eckert, A., **Locmelis, M.**, Crowley, J. L., Mota-Vidaure, B., Lodolo, E., Rosenfeld, J. and Duarte, E. (2020): The role of the Polochic Fault as part of the North American and Caribbean Plate boundary: Insights from the infill of the Lake Izabal Basin. *Basin Research.* v. 32, p. 1347-1364. https://doi.org/10.1111/bre.12431

18. **Locmelis, M.**, Arevalo Jr, R., Puchtel, I. S., Fiorentini, M. L., Nisbet, E. (2019): Transition metals in komatiitic olivine: Proxies for mantle composition, redox conditions, and sulfide mineralization potential. *American Mineralogist*, v. 104, no. 8, p. 1143-1155. https://doi.org/10.2138/am-2019-6914

17. Holwell D., Fiorentini, M., McDonald, I., Lu, Y., Giuliani, A., Smith, D., Keith, M, **Locmelis, M.** (2019): A metasomatized lithospheric mantle control on the metallogenic signature of post-subduction magmatism. *Nature Communications,* v. 10, no. 1, p. 1-10. https://doi.org/10.1038/s41467-019-11065-4

16. Boldbaatar, E., ***Nanzad, B.****, Sereenen, J., **Locmelis, M.**, Osanai, Y., Batsaikhan, N., Dashtseren, K. and Zorigtbaatar, A. (2019): Geochronology and geochemistry of the intrusive suite associated with the Khatsavch porphyry Cu-Au (Mo) deposit, South Mongolia. *Ore Geology Reviews*, 111, p.102978. https://doi.org/10.1016/j.oregeorev.2019.102978

15. **Locmelis, M.**, Fiorentini, M.L., Barnes, S.J., Hanski, E.J. and Kobussen, A.F. (2018): Ruthenium in chromite as indicator for magmatic sulfide liquid equilibration in mafic-ultramafic systems. *Ore Geology Reviews*, v. 97, pp.152-170. https://doi.org/10.1016/j.oregeorev.2018.05.002

14. Fiorentini, M. L., LaFlamme, C., Denyszyn, S., Mole, D., Maas, R., **Locmelis, M.**, Caruso, S., Bui, T-H. (2018): Post-collisional alkaline magmatism as gateway for metal and sulfur enrichment of the continental lower crust. *Geochimica and Cosmochimica Acta*, v. 223, p. 175-197. https://doi.org/10.1016/j.gca.2017.11.009

13. Funderburg, R., Arevalo Jr. R., ***Locmelis, M.***, Adachi, T. (2017): Improved Precision and Accuracy of Quantification of Rare Earth Element Abundances via Medium-Resolution LA-ICP-MS. *Journal of The American Society for Mass Spectrometry*, v. 28, no. 11, p. 2344–2351. https://doi.org/10.1007/s13361-017-1745-5

12. Baumgartner, R. J., Fiorentini, M. L., Baratoux, D., Ferrière, L., **Locmelis, M.**, Tomkins, A., Sener, A. K. (2017): The variability of Ru in chromite from Chassignite and olivine-phyric Shergottite meteorites: constraints on the behavior of PGE and sulfur in Martian magmatic systems. *Meteoritics & Planetary Science,* v. 52, no. 2, p. 333-350. https://doi.org/10.1111/maps.12795

11. **Locmelis, M.**, Fiorentini, M. L., Rushmer, T., Arevalo Jr., R., Adam, J., Denyszyn, S. W. (2016): Sulfur and metal fertilization of the lower continental crust. *Lithos*, v. 244, p. 74-93. https://doi.org/10.1016/j.lithos.2015.11.028

10. Gonzalez-Jimenez, J. M., **Locmelis, M.**, Belousova, E., Griffin, W. L., Gervilla, F., Kerestedjian, T. N., O'Reilly, S. Y., Pearson, N. J., Sergeeva, I. (2015): Genesis and tectonic implications of podiform chromitites in the metamorphosed Ultramafic Massif of Dobromirtsi (Bulgaria). *Gondwana Research,* v. 27, no. 2, p. 555-754. https://doi.org/10.1016/j.gr.2013.09.020

9. Adam, J., **Locmelis, M.**, Afonso, J. C., Rushmer, T., Fiorentini, M. L. (2014): The capacity of hydrous fluids to transport and fractionate incompatible elements and metals within the Earth's mantle. *Geochemistry, Geophysics, Geosystems (G-cubed),* v. 15, no. 6, p. 2241-2253. https://doi.org/10.1002/2013GC005199

8. Zaccarini, F., Garuti, G., Fiorentini, M. L., **Locmelis, M.**, Kollegger, P., Thalhammer, O. A. R. (2014): Mineralogical residence of platinum group elements (PGE) and rhenium in the magmatic Ni-Fe-Cu sulfide deposits of the Ivrea Verbano Zone (Italy): An electron microprobe study. *Journal of Mineralogy and Geochemistry (Neues Jahrbuch für Mineralogie - Abhandlungen)*, v. 191, no. 2, p. 169-187. https://doi.org/10.1127/0077-7757/2014/0255

7. **Locmelis, M.**, Fiorentini, M. L., Barnes, S. J., Pearson, N. J. (2013): Ruthenium variation in chromite from komatiites and komatiitic basalts - a potential mineralogical indicator for nickel-sulfide mineralization. *Economic Geology*, v. 108, no. 2, p. 355-364. https://doi.org/10.2113/econgeo.108.2.355

6. Oberthür, T., Melcher, F., Bucholz, P., **Locmelis, M.**, (2013): The oxidized ores of the Main Sulfide Zone, Great Dyke, Zimbabwe. Turning resources into minable reserves – mineralogy is the key: *The Journal of The Southern African Institute of Mining and Metallurgy,* v. 113, p. 191-201. ISSN 2411-9717

5. **Locmelis, M.**, Pearson, N. J., Barnes, S. J., Fiorentini, M. L. (2011): Ruthenium in komatiitic chromite. *Geochimica et Cosmochimica Acta*, v. 75, no. 13, p. 3645-3661. https://doi.org/10.1016/j.gca.2011.03.041

4. Barnes, S. J., Godel, B., **Locmelis M.**, Fiorentini, M. L., Ryan, C. (2011): Extremely Ni-rich Fe-Ni sulphide assemblages in komatiitic dunite at Betheno, Western Australia: results from synchrotron X-ray fluorescence mapping. *Australian Journal of Earth Sciences,* v. 58, no. 7, p. 691-709. https://doi.org/10.1080/08120099.2011.586048

3. Dadd, K. A., **Locmelis, M.**, Higgins, K., Hashimoto, R. Daniell, J. (2011): Cenozoic volcanism of the Capel-Faust Basins, Lord Howe Rise, SW Pacific Ocean. *Deep Sea Research Part II: Topical Studies in Oceanography,* v. 58, no.7-8, p. 922-932. https://doi.org/10.1016/j.dsr2.2010.10.048

2. **Locmelis, M.**, Melcher, F., Oberthür, T. (2010): Platinum-group element distribution in the oxidized Main Sulfide Zone, Great Dyke, Zimbabwe. *Mineralium Deposita*, v. 45, 93-109. https://doi.org/10.1007/s00126-009-0258-y

1. **Locmelis, M.**, Barnes, S. J., Pearson, N. J., Fiorentini, M. L., (2009): Anomalous sulfur-poor Platinum-group element mineralization in komatiitic cumulates, Mount Clifford, Western Australia. *Economic Geology*, v. 104, no. 6, p. 841-855. https://doi.org/10.2113/gsecongeo.104.6.841

PEER-REVIEWED EXTENDED ABSTRACTS AND REPORTS

**Indicates student (co-)advisee, **postdoctoral (co-)advisee*

xx. Gale, J. F. W., Elliott, B. A., Elliott, S. J., Kyle, J. R., **Locmelis, M.**, Ugurhan, M., Rogers, H. H. III, Averett, A., Scanlon, B., Dunlap, D. (under review): Economic Mineral Resources of Texas. Bureau of Economic Geology Report of Investigations.

8. Asem, P., Gardoni, P., **Locmelis, M.**, Elliott, B. (2026): Mobility of rare earth elements (REEs) in aqueous environment at low temperature and ionic strength. American Rock Mechanics Association (ARMA) p. D032S049R007.

7. ***Clark, S.****, **Locmelis, M.**, Moroni, M., Sessa, G., Pistone, M, Elliott, S. (2025): Understanding lower crustal sulfide ore systems: Insights from ultramafic pipes in the Ivrea-Verbano Zone, Italy. 2025. In: Proceedings of the 18th Biennial Meeting of the Society of Geology Applied to Mineral Deposits, Boulder, Colorado, USA, 2: 583-586.

6. ***Swain, R.****, **Locmelis, M.**, ***Clark, S.****, Seeger, C., Elliott, S. (2025): The Origin of the Bourbon Iron Ore Deposit in Southeast Missouri, USA. In: Proceedings of the 18th Biennial Meeting of the Society of Geology Applied to Mineral Deposits, Boulder, Colorado, USA, 2: 959-962.

5. **Locmelis, M.,** ***Tunnell, B. N.*****, *Sullivan, B.****, Seeger. C., Dare, S., Moroni, M., Mathur, R., (2023): The Formation of the Pilot Knob Iron Ore Cluster in Southeast Missouri, USA: Implication for the Exploration for Iron Oxide Apatite Deposits. In: Proceedings of the 17th Biennial Meeting of the Society of Geology Applied to Mineral Deposits, Zurich, Switzerland,

4. ***Clark, S.****, **Locmelis, M.**, Savard, D., Moroni, M., Fiorentini, M. (2023): The role of carbon in the formation of Ni-Cu-PGE mineralization in the Valmaggia ultramafic pipe: Insights from laser-ablation-time-of-flight ICP-MS. In: Proceedings of the 17th Biennial Meeting of the Society of Geology Applied to Mineral Deposits, Zurich, Switzerland, 2: 129-132.

3. **Locmelis, M.,** Obrist-Farner, J., Eckert, A., Fiorentini, M. L., Barnes, S. J., Hanski, E. J., Kobussen, A., F., Arevalo Jr., R. D., Puchtel, I. S., (2019): Mineral trace element chemistry in the exploration for magmatic sulfide deposits. In: Proceedings of the 15th SGA Biennial Meeting of the Society of Geology Applied to Mineral Deposits, Glasgow, United Kingdom, 3: 1302-1305.

2. Fiorentini, M., Denyszyn, S., Dering, G., Holwell, D., Blanks, D., Maas, R., **Locmelis, M.**, LaFlamme, C. (2019): In: Proceedings of the 15th SGA Biennial Meeting of the Society of Geology Applied to Mineral Deposits, Glasgow, United Kingdom, 2: 1302-1305.

1. **Locmelis, M.**, Pearson, N.J., Fiorentini, M.L., Barnes, S.J. (2009): Platinum-group element mineralization in sulfide-poor komatiites – a case study from Mt. Clifford, Western Australia. In: Proceedings of the 10th Biennial Meeting of the Society of Geology Applied to Mineral Deposits, Townsville, Australia, 1:185-187.

INVITED SEMINAR PRESENTATIONS AND PANELS

2026 UT Energy Week 2026, Energy Institute at the University of Texas at Austin. 4/8/26. Panelist: Critical Minerals and Their Importance to Geopolitical Stability.

Western University, London, Ontario Canada. Department of Earth Sciences Colloquium Series. 2/27/26. Title: Removing Materials from the 'Critical Minerals List'.

Seabridge Gold, Vancouver, British Columbia, Canada. Pre-AME Roundup Seabridge Gold Exploration Technical Session. 1/24/26. Title: Critical Mineral Exploration on SE Missouri, USA: A Mineral Systems Approach.

2025 National Academy of Engineering. Critical Resources Seminar-Panel Event. Washington D.C. 10/07/25. Title: Review of NSF Critical Minerals Workshop Series.

University of Georgia, Athens, Georgia, USA. Department of Geology Seminar Series. 09/12/25. Title: Removing Materials from the 'Critical Minerals List'.

Santé Ventures, Austin, Texas, USA. Senior Advisory Board Meeting invited keynote. 06/11/2025. Title: Critical Minerals: Threats and Opportunities.

University of Texas at Austin, Austin, Texas, USA. Bureau of Economic Geology Seminar Series. 04/22/25. Title: Removing Materials from the 'Critical Minerals List'.

University College London, United Kingdom. Department of Earth Sciences Spring Seminar Series, 03/11/25. Title: Removing Materials from the 'Critical Minerals List' – The Mineral Exploration Perspective.

2023 Cornell University, Department of Earth and Atmospheric Sciences, Ithaca, New York, USA. 03/27 20/23. Title: Increasing Critical Element Supply for a Sustainable Future.

2022 Missouri University of Science and Technology Trustee Board Meeting, St. Louis, Missouri, USA. 09/16/22. Title: Critical Minerals Research at Missouri S&T.

Montana Technological University, Butte, Montana. Public Lecture Series. 04/20/22. Title: Resilient Supply of Critical Minerals: The Mineral Exploration Perspective.

2021 Oregon State University, College of Earth, Ocean, and Atmospheric Sciences. 10/18/21. Title: Research Pathways Towards a Steady Metal Supply in the Future.

The University of Texas at El Paso. Geological Sciences Seminar Series. 03/01/21. Title: Critical Mineral Exploration: Teaching an Old Dog New Tricks.

National Science Foundation. Emerging Frontiers in Research and Innovation (EFRI) presentation. 01/13/21. Title: Interdisciplinary Research to Ensure Secure and Reliable Supply of Critical Minerals.

2018 University of Missouri at Columbia. Department of Geological Sciences Williamson Family Colloquium Series. 28/09/18. Title: The Science Behind Exploration Targeting: Bridging the Industry-Academia Gap.

2017 Missouri State University. Department of Geography, Geology and Planning Seminar Series. 09/11/17. Title: The Science Behind Exploration Targeting: Bridging the Industry-Academia Gap.

Missouri University of Science & Technology. Department of Mining and Nuclear Engineering Graduate Seminar Series. 06/11/17. Title: How to Find the Mineral Deposits that Mining Engineers are Mining.

Missouri University of Science & Technology. Department of Chemistry Graduate Seminar Program. 18/09/17. Title: Geochemistry and the Exploration for New Metal Deposits.

SELECTED PRESENTATIONS AT CONFERENCES INCL. STUDENTS AND POSTDOCS

**Indicates student (co-)advisee, **postdoctoral (co-)advisee*

2025 **Locmelis, M.**, ***Clark, S.**** (2025): The Complex Critical Mineral Assemblage of Lower Crustal Sulfide Deposits – A case study from the Ivrea-Verbano Zone in Italy. GSA Annual Meeting, San Antonio, Texas, USA, 10/19-22/2025. *Oral presentation, invited.*

Swain, R.*, **Locmelis, M.**, ***Clark, S.**** (2025): The Genesis of the Bourbon Iron Ore Deposit in Southeast Missouri, USA. GSA Annual Meeting, San Antonio, Texas, USA, 10/19-22/2025. *Oral presentation.*

Clark, S.*, **Locmelis, M.**, ***Swain, R.****, Oyler, I. (2025): Automating Modal Abundance Analysis Methodologies for Fast and Accurate Phase Classification. GSA Annual Meeting, San Antonio, Texas, USA, 10/19-22/2025. *Poster presentation.*

Clark, S.*, **Locmelis, M.**, Moroni, M., Sessa, G., Pistone, M, Elliott, S. (2025): Understanding lower crustal sulfide ore systems: Insights from ultramafic pipes in the Ivrea-Verbano Zone, Italy. 2025. In: Proceedings of the 18th Biennial Meeting of the Society of Geology Applied to Mineral Deposits (SGA), Boulder, Colorado, USA, 2: 583-586, 08/03-07 2025. *Oral presentation.*

Swain, R.*, **Locmelis, M.**, ***Clark, S.****, Seeger, C., Elliott, S. (2025): The Origin of the Bourbon Iron Ore Deposit in Southeast Missouri, USA. 18th Biennial Meeting of the Society of Geology Applied to Mineral Deposits (SGA), Boulder, Colorado, USA, 2: 959-962, 08/03-07 2025. *Poster presentation.*

2024 **Locmelis, M., *Clark, S**.**, Moroni, M., Savard, D. (2024): The Search for Lower Crustal Magmatic Sulfide Deposits. Gordon Research Conference: Geochemistry of Ore Deposits for a Low Carbon Society, Newry, Main, USA, 06/23-28/24. *Oral presentation / Invited.*

***Clark*, S.*, Locmelis,** M., Savard, D., Fiorentini, M., Moroni, M., (2024): Carbon-sulfur relationships in magmatic sulfide deposits: Implications for metal transfer between the mantle and crust. 37th International Geological Congress, Busan, South Korea, 08/25-31 2024. *Oral presentation.*

Tunnell, B. N., Dashtseren, K., Boldbaatar E., **Locmelis, M.,** Yang, Y., Nakano, N., Adachi, T., Hames, W., Sereenen J., Arribas, A. (2024): Genesis and geochronology of the Bayanteeg LCT pegmatite in the Idermeg terrane, Central Mongolia. 2024 Goldschmidt Conference, Chicago, Illinois, USA. 08/18-23 2024. *Oral presentation.*

Tunnell, B. N., Dashtseren, K., Boldbaatar E., **Locmelis, M.,** Hames, W., Adachi, T., Nakano, N., Sereenen J. (2024): Genesis and geochronology of the Bayanteeg Li-mineralized pegmatite in the Idermeg terrane, Central Mongolia. Geological Society of America 2024 Joint North-Central and South-Central Section Meeting. Springfield, Missouri, USA. 04/21-23 2024. *Oral presentation.*

2023 **Locmelis, M., *Tunnell, B. N.**, Sullivan, B.**, Seeger. C., Dare, S., Moroni, M., Mathur, R., (2023): The Formation of the Pilot Knob Iron Ore Cluster in Southeast Missouri, USA: Implication for the Exploration for Iron Oxide Apatite Deposits. 17th Biennial Meeting of the Society of Geology Applied to Mineral Deposits (SGA), Zurich, Switzerland, 08/28-09/01 2023. *Oral presentation.*

***Clark, S.**, **Locmelis, M.**, Savard, D., Moroni, M., Fiorentini, M. (2023): The role of carbon in the formation of Ni-Cu-PGE mineralization in the Valmaggia ultramafic pipe: Insights from laser-ablation-time-of-flight ICP-MS. In: Proceedings of the 17th Biennial Meeting of the Society of Geology Applied to Mineral Deposits (SGA), Zurich, Switzerland, 2: 129-132. 08/28-01/09 2023. *Oral presentation.*

2021 **Locmelis, M., *Tunnell, N.** (2021): The origin of the Pilot Knob IOA cluster in southeast Missouri, USA – Insight from iron oxide mineral chemistry. International Online Workshop on Mineral Systems with IOCG, IOA and affiliated Critical Mineral Deposits, 2-6 December 2021. O*ral presentation /* Invited.

Locmelis, M. (2021): Roadblocks for Sustainable Supply of Critical Minerals in the U.S.A. Workshop on Resilient Supply of Critical Minerals. Virtual Workshop hosted by Missouri S&T. 2-3 August 2021. Oral presentation. Workshop chair.

2019 **Locmelis, M.,** Obrist-Farner, J., Eckert, A., Fiorentini, M. L., Barnes, S. J., Hanski, E. J., Kobussen, A., F., Arevalo Jr., R. D., Puchtel, I. S., (2019): Mineral trace element chemistry in the exploration for magmatic sulfide deposits. 15th SGA Biennial Meeting on Life with Ore Deposits on Earth, pp. 1302-1305, 27-30 August 2019, Glasgow, UK. *Oral presentation.*

Locmelis, M., *Nanzad, B., Mathur, R., (2019): Hydrous mantle metasomatism and the formation of deep lithospheric magmatic sulfide deposits. GSA Annual Meeting, Phoenix, USA, 22-25/09/19. *Oral presentation*. Session convener.

***Sullivan, B.*,* Locmelis., M.,** Nanzad, B*, Mathur, R. (2019): A Melt Interaction Model for the Formation of the Kratz Spring Iron Oxide Rare Earth Element Deposit, Missouri, USA. GSA Annual Meeting, Phoenix, USA, 22-25/09/19. *Oral presentation*.

***Ramirez, G. Y.**, **Locmelis, M.**, Obrist-Farner, J. (2019): Platinum-group element concentrations in tropical lake sediments in the exploration for nickel laterite deposits. GSA Annual Meeting, Phoenix, USA, 22-25/09/19. *Poster presentation, student poster award winner*.

***Tunnell, K.*, Hassler A.**, **Locmelis, M.,** Arevalo Jr. R., Piccoli, P. (2019): Mineral Chemistry of Olivine from Martian, Vestan and Chondritic Meteorites – Implications for the Evolution of Extra-Terrestrial Rocky Bodies. GSA Annual Meeting, Phoenix, USA, 22-25/09/19. *Poster presentation*.

2018 **Locmelis, M.,** Moroni, M., Fiorentini, M. L. (2018): The role of carbonated hydrous fluids in the transport of metals in the deep Earth. *GSA Annual Meeting, Indianapolis*, USA, 04-07/11/18. *Oral presentation.* Session convener.

2017 **Locmelis, M.**, Arevalo Jr., R., Puchtel, I. S., Fiorentini, M. L. (2017): V/Sc in olivine as a proxy for magma redox conditions. *AGU Fall Meeting, New Orleans, USA*, 11-15/12/2017. *Poster.*

Locmelis, M., Fiorentini, M. L. (2017): The role of hydrous fluids in the formation of magmatic sulfide deposits in the lower continental crust. *GSA Annual Meeting*, Seattle, USA, 22-25/10/17. *Oral presentation.*

Locmelis, M., Hogan, J. P. (2017): Collaborative Digital Microscopy – Transforming the Pedagogy of Lab-based Sciences. *Focus on Teaching and Technology Conference*, St. Louis, USA, 28-29/08/17. *Oral presentation.*

2015 **Locmelis, M.**, Arevalo Jr., R., Puchtel, I. S., Barnes, S. J., Fiorentini, M. L. (2015): First Row Transition Metals in Olivine – Petrogenetic Tracers for the Evolution of Mantle-Derived Magmas. *AGU Fall Meeting*, San Francisco, USA, 14-18/12/2015. *Poster.*

Locmelis, M., Arevalo, Jr., R., Puchtel, I., Barnes, S. J. (2015): First Row Transition Metals, Ga and Ge in Komatiitic Olivine. *1st North American Laser Ablation Workshop 2015*, Austin, USA, 27-28/05/2015. *Oral presentation.*

2013 **Locmelis, M.**, Fiorentini M. L., Rushmer, T., Adam, J., Zaccarini, F., Garuti, G., Turner, M., Turner, S.: Mass Transfer of Fluids and Metals in the Deep Earth. *23rd Goldschmidt Conference*, Florence, Italy, 25-30/08/2013. *Oral presentation.*

2012 **Locmelis, M.**, Adam, J., Zaccarini, F., Fiorentini M. L., Rushmer, T., Garuti, G., Turner, S. P., Kollegger, P., Davies, E. (2012): Metal Transport between the Upper Mantle and the Lower Crust. *AGU Fall Meeting 2012*, San Francisco, USA, 03-07/12/2012. *Poster.*

Locmelis, M., Fiorentini, M.L., Barnes, S.J., Pearson, N.J. (2012): Laser ablation ICP-MS analysis of ruthenium in chromite - a new tool in the exploration for komatiite-hosted nickel-sulphide deposits. *34th International Geological Congress*, Brisbane, Australia, 05-10/08/2012. *Oral presentation.*

2009 **Locmelis, M.**, Pearson, N.J., Fiorentini, M.L., Barnes, S.J. (2009): Platinum-group element mineralization in sulfide-poor komatiites – a case study from Mt. Clifford, Western Australia. *10th Biennial Meeting of the SGA*, Townsville, Australia, 17-20/08/2009. *Oral presentation.*

Locmelis, M., Pearson, N.J., Fiorentini, M.L., Barnes, S.J. (2009): In-situ laser ablation ICP-MS analysis of Ruthenium in chromite. *19th Goldschmidt Conference,* Davos, Switzerland, 21-26/06/2009. *Oral presentation.*

GRADUATE STUDENTS SUPERVISED

Regan Swain – Ph. D. (expected graduation: SP 2030, UT). Thesis: Guiding Critical Mineral Exploration in Southeast Missouri Through an Advanced Critical Minerals Concept.

Holiday O'Bryan – Ph. D. (expected graduation: SP 2030, UT): Thesis: Constraining controls of critical mineral enrichments in Mississippi Valley Deposits.

Paola Salas Riviera – M. Sc. (expected graduation: FS 2028, UT). Thesis: The timing of ore-forming mantle metasomatism in the Ivrea-Verbano Zone, Italy.

Shelby Clark – Ph.D. (expected graduation: SP 2028, UT). Thesis: Mantle metasomatism and the formation of deep lithospheric sulfide ore systems.

Regan Swain – M. Sc. (2024, UT). Thesis: The Genesis of the Bourbon Iron Ore Deposit within the Context of the Geodynamic Evolution of the St. Francois Mountains Terrane in Southeast Missouri, USA

Shelby Clark – M. Sc. (2024, MS&T). Thesis: The role of carbonated hydrous fluids in the formation of Ni-Cu-PGE-Au-Te sulfide deposits in the Ivrea-Verbano Zone, Italy.

Brandon J. Sullivan – Ph. D. (2023, MS&T). Thesis: "Re-evaluating Missouri's strategic element potential: A geochemical study of the Mesoproterozoic Fe-Cu-Co-REE deposits in southeast Missouri, USA".

Gabriela Y. Ramirez – M. Sc. (2022, MS&T). Thesis: "Using Lake Sediment Chemistry in the Exploration for Nickel Laterite Deposits in Tropical Regions".

Bolorchimeg N. Tunnell – Ph. D. (2021, MS&T). Thesis: "The Pilot Knob, Shepherd Mountain, and Cedar Hill Iron Oxide Deposits in Southeast Missouri – Local Expressions of a Magmatic-Hydrothermal Plumbing System?".

Kaylin A. Tunnell – M. Sc. (2020, MS&T). Thesis: "Mineral Compositions of Meteorite Samples ALHA 77005, NWA 7397, NWA 5480 and Ausson: Implications for Geodynamic Processes on their Parent Bodies and Reclassification.".

Daniel J. Warbritton – M.Sc. (2019, MS&T). Thesis: "Exploration for Alteration Halos Around the Ag-W Deposits in Southeastern Missouri, USA.".

POSTDOCTORAL FELLOWS SUPERVISED

Bolorchimeg N. Tunnell, Missouri S&T, 2023-2024.

TEACHING AND COURSE DEVELOPMENT

At UT Austin:

Fall 2026

- GEO 386R / EER 396: Geology of Earth Resources
- GEO 416E: Solid Earth Processes (co-lecturer)

Fall 2025

- GEO 386R / EER 396: Geology of Earth Resources

Fall 2024

- GEO 386R / EER 396: Geology of Earth Resources

At Missouri S&T:

Spring 2024

- Geology 2731: Astronomy & Planetary Science (previously Geology 4731)

Fall 2023

- Geology 3511: *Introduction to Mineral Deposits*

Spring 2023

- Geology 2731: Astronomy & Planetary Science (previously Geology 4731)

Fall 2022

- Geology 2610: *Mineralogy & Crystallography*

Spring 2022

- Geology 6531: *Advanced Geochemistry* (previously Geology 5411)

Fall 2021

- Geology 3511: *Introduction to Mineral Deposits*

Spring 2021

- Geology 4521: *Ore Microscopy*

Fall 2020

- Geology 3511: *Introduction to Mineral Deposits*

Summer 2020

- Geology 4731: *Astronomy & Planetary Science*

Spring 2020

- Geology 5411: *Advanced Geochemistry*

Fall 2019

- Geology 3511: *Introduction to Mineral Deposits*

Summer 2019

- Geology 4731: *Astronomy & Planetary Science*

Spring 2019

- Geology 4521: *Ore Microscopy*

Fall 2018

- Geology 3511: *Introduction to Mineral Deposits*
- Geology 5411: *Advanced Geochemistry*

Summer 2018

- Geology 4731: *Astronomy & Planetary Science*

Spring 2018

- Geology 2611: *Physical Mineralogy & Petrology* (for non-geology majors)

Fall 2017

- Geology 3511: *Introduction to Mineral Deposits*
- Geology 6551: *Global Tectonics and Metallogeny*

Summer 2017

- Geology 4731: Astronomy & Planetary Science

Spring 2017

- Geology 4521: *Ore Microscopy*

Fall 2016

- Geology 3511: *Introduction to Mineral Deposits*
- Geology 6551: *Global Tectonics and Metallogeny*