

## Previous GEO 392F/343Q Class Projects – Fundamentals and Applications of ICP-MS

\*Affiliated [abstracts](#) and [publications](#)

### Fall 2019

- Investigating Yttrium and REE Zonation in Garnets Adjacent to diffusive Accessory Minerals using LA-ICP-MS (Daniel Campos – GeoSci/Undergrad)
- When do standards actually expire? Developing a method to determine elemental concentrations of expired vs unexpired multi-element standards in ICP-MS (Heather Gunn – GeoSci/Undergrad)
- Method for Optimizing ICP-MS Analysis of Trace Elements and Calcium in Carbonates (Tyler Logie – GeoSci/Undergrad)
- LA-ICP-MS method for determining the redox state of zircon by U/Ce isobarometry (Paul Redman – GeoSci/Grad)
- Application of LA-ICPMS method to study taphonomy of Early Jurassic fishes from Strawberry Bank Formation, UK (Sinjini Sinha – GeoSci/Grad)
- A Method for Multi-Element Soil Analysis Through Microwave Digestion and Inductively Coupled Plasma Mass Spectrometry (Byron Smith – Geography/Grad)

### Fall 2018

- A method for analysis of hornblende amphibole in andesite from the Rumiqolqa Formation, Perú (Julia Earle – Anthropology/Grad)
- 2D trace element mapping of garnet by LA-ICP-MS: A new method toward enhanced petrochronology (Thomas Etzel – GeoSci/Grad)
- Sediment mixing in modern eolian environments with detrital zircon U-Pb geochronology and detrital feldspar REE geochemistry using LA-ICP-MS (Jaime Hirtz – GeoSci General)
- Trace element variations in cement and allochems of Pleistocene and Tertiary carbonate deposits, Little Cayman Island, Cayman Islands (Scarlette Hsia – GeoSci/Grad)
- A method for obtaining rare earth element concentrations in a speleothem and evaluating oxide correction in solution-mode ICP-MS (Hunter Manlove – GeoSci/Grad)
- Chemical characterization of Mendoza ceramics from Central Panama by ICP-MS and LA-ICP-MS (Ana María Navas Méndez – Anthropology/Grad)
- Using rare earth elements in clinopyroxenes of an ophiolite suite located in Dobsina, Slovakia (Gabriel Villasenor – GeoSci General)

### Fall 2017

- Method to analyze REE, HFSE, LILE and U-Th-Pb in acid leached minerals from the pore network of polycrystalline diamond aggregates – Carbonado (Scott Eckley – GeoSci/Grad)
- LA-ICP-MS method to precisely determine elemental concentrations of *Buchia* bivalve and belemnite fossil from the Jurassic-Cretaceous boundary section of Grindstone Creek, California (James Hall – Geo/Geo Sci General)
- Evaluation of Pt, Pd and Rh in particulate matter and urban dust from high traffic avenues in the Monterrey Metropolitan Area, Mexico (Susana Hinojosa – Grad/visiting scholar)
- Microwave-assisted quantification of Pd and Au in Pd<sub>x</sub>Au<sub>100-x</sub> alloy nanoparticle-based heterogeneous catalysts using ICP-MS (Pranaw Kunal – Chem/Grad)
- Analysis of Red River Saline Water by ICP-MS (Jorge Luna – Geo/Geo Sci General)
- An ICP-MS Method to Tentatively Identify Meteoritic Contamination in a Potential Distal Impact Layer in the Arbuckle Anticline, Oklahoma, USA (Andrew Parisi - GeoSci/Grad)

- A Provenience Study of Terminal Classic and Post-Classic Ceramics from the Maya Site of Colha Using LA-ICP-MS (Sheldon Smith – LA/ Anthropology)
- Laser Ablation ICPMS Study of Trace Element Geochemistry in Molybdenite, Cave Peak Porphyry Mo Deposit (Mert Ugurhan - GeoSci/Grad)

#### Fall 2016

- Determination of U-Pb and Pb-Pb ages of zircon using LA-ICP-Q-MS (Christian Baker - Geo/Geo Sci General)
- Determination of soil nutrient deposition and loss in fire effecting ecosystems (Sol Cooperdock – Geo Sci/Grad)
- Digestion and Dilution Method Comparison of Cell Samples for ICP-MS Analysis for Investigation of Native Metal Concentration (Audrey Fikes – Chem/Grad)
- Geochemical Characterization of Natural Waters at the Eel River Critical Zone Observatory by ICP-Q-MS (Katherine Meek – GeoSci/Grad)
- A Method for Elemental Analysis Including REE+ Y and Patterns in Carbonates Using ICP-Q-MS: A case study of basin water geochemistry using Permian shoreline deposits from West Texas and New Mexico (Ben Smith – Geo Sci/Grad)
  - [Smith, B.P. and Kerans, C., 2017. Assessing the Heterogeneity of Volcanic Ash Beds Through Trace Element Concentrations of Zircon Grains. Geological Society of America Abstracts with Programs. Vol. 49, No. 6.](#)
- (Stephanie Suarez – Geo/Geo Sci General)
- Is there a genetic connection between copper sulfides and free-gold grains in the Ertzberg-Grasberg District, Papua, Indonesia? An LA-ICP-MS trace element analysis of copper sulfides in porphyry and skarn deposits (Kylie Wright – Geo Sci/Grad)
  - [Wright, K.A., Miller, N.R., and Kyle, J.R., 2017. Correlating Cu-Fe Sulfides and Au Mineralization in the Ertzberg-Grasberg District of Papua, Indonesia using LA-ICP-MS: Comparing Bornite, Chalcopyrite, and Native Gold Trace Element Variation. Submitted for 2nd North American Laser Ablation Workshop, May 25-27, 2017, Jackson School of Geosciences, University of Texas at Austin, Austin, TX.](#)
  - [Wright, K.A., Miller, N.R., Ketcham, R. A., Kyle, J.R., 2016. Correlating Cu-sulfide and Au mineralization in the Ertzberg-Grasberg District using LA-ICP-MS and HRXCT. Submitted for 2016 AGU Fall Meeting, 12-16 December, San Francisco, California, USA.](#)
  - [Wright, K.A., Miller, N.R., Ketcham, R. A., Kyle, J.R., 2016. Correlating Cu-sulfide and Au mineralization in the Ertzberg-Grasberg District using LA-ICP-MS and HRXCT. Geological Society of America Abstracts with Programs. Vol. 48, No. 7](#)

#### Fall 2015

- Trace and REE analysis of hydrothermal tourmaline (Nemazgah aplitic intrusion, NW Turkey), by LA-ICP-MS (Kimberly Aguilera – Geo/Geo Sci General)
  - [Aguilera, K.N., Catlos, E.J., Oyman, T., Miller, N.R., and Etzel, T.M. 2016. Documenting trace elements in hydrothermal tourmaline: Nemazgah pluton, western Turkey. Geological Society of America \*Abstracts with Programs\*. Vol. 48, No. 7, doi: 10.1130/abs/2016AM-284552](#)
  - [Aguilera, K., Catlos, E.J., Oyman, T., Eylul, D., Bulvari, C. and Miller, N.R., 2015. Documenting rare earth and trace elements in hydrothermal tourmaline: Nemazgah pluton, western turkey. South-Central Section - 50th Annual Meeting \(21-22 March 2016\). \*\*BEST STUDENT POSTER AWARD\*\*](#)
- Element distribution in deformed amphiboles showing subgrain boundaries using LA-ICP-MS (Christian Black – Geo/Geo Sci General)
- Geochemical analysis of wetland soils near the Maya site of Akab Muklil, Belize by ICP-MS (Samantha Krause – Anthropology/Grad)
- Element distribution through a fault-related pseudotachylyte vein using LA-ICP-MS (Daniel Ortega-Arroyo – Geo/Geo Sci General)
- Water chemistry in an active volcanic zone: ICP-MS analysis of the Jökulsá á Fjöllum Watershed, Eastern Iceland (Greta Wells – Anthropology/Grad)

#### Fall 2014

- Determination of metal binding properties of proteins by ICP-MS (Christopher Crittenden – Chemistry/Grad)
- Characterization of fluid-rock interactions by analyzing Li, B, Sr, Ba and Rb using ICP-MS (Rebecca deGraffenried – Geo/Geo Sci General)
- ICP-MS for measuring gadolinium in wastewater treatment plant effluent (Curtis Feronti – Environmental and Water Resources Engineering/Grad)
- Investigation of dissolution in Late Holocene planktonic foraminifer utilizing trace metals (Victoria Fortiz – Geo/Geo Sci General)
- Characterization of otolith Sr/Ca and Ba/Ca in a commercially important fish species (*Cynoscion othonopterus*) from the Gulf of California (Erin Reed – Marine Science/Grad)
- Trace and REE measurement and detection in biotite: LA-ICP-MS study on thin sections, Menghai granite batholith, SW China (Enrique Reyes – Geo/Geo Sci General)
- Slipping through the cracks: using LA-ICP-MS to determine trace element concentrations (Mn and REEs) as proxies for fluid source and evolution in fractured carbonates from the North Anatolian Fault, Turkey (Colin Sturrock - Geo Sci /Plan II Honors)
  - Sturrock, C.P., Catlos, E.J., Miller, N.R., Akgun, A., Fall, A., Gabitov, R., Yilmaz, I.O., and Larson, T., I., accepted. Fluids along the North Anatolian Fault, Nixsar Basin, north central Turkey: Insight from stable isotopic and geochemical analysis of calcite veins. *Journal of Structural Geology*.
- An examination of ancient Mayan ceramic specialization through LA-ICP-MS (Angelina Sweeney – Anthropology/Grad)

### Fall 2013

- Seasonal temperature reconstruction using trace-element values of a stalagmite (Richard Casteel – Geo Sci/Grad)
  - Casteel, R.C. and J.L. Banner, 2015, Temperature-driven seasonal calcite growth and trace element variations in drip waters from a well-ventilated cave in central Texas, U.S.A.: Implications for speleothem paleoclimate studies, *Chemical Geology* 392, 43–58.
- Spatial constraints on rare earth and high field strength elements in Alpine serpentinites: Progress on a LA-ICP-MS method to quantitatively measure concentrations in magnetite and chromite (Emily Goldstein– Geo Sci/Grad)
- Trace elements in plate calcite by solution mode and laser ablation ICP-MS (Rosemary Hatch)
- Characterizing Guam groundwater composition using geochemical data from and ICP-MS (Michelle Hulewicz– Geo Sci/Grad)
- A new method for concentrating fresh to slightly-brackish acid mine drainage (AMD) for ICP-MS analysis of rare earth elements (REEs) (L. Joy Mercier– Geo Sci/Grad)
- Identifying spatial heterogeneity in the elemental concentration of Early Jurassic dinosaur bones: Implications for the direct radiometric dating of fossil bone (Adam Marsh– Geo Sci/Grad)
- Use of trace elements for establishing least-altered Neoproterozoic carbonate compositions in the Kahar Formation, Northern Iran (Riken Patel– Geo/Geo Sci General)
- Geochemical tracers and stable isotope analysis of scales reveal variation in diadromy in Atlantic Tarpon *Megalops atlanticus* (Matthew Seeley– Marine Sci/Grad)
  - Seeley, M., Miller, N.R., and Walther, B., 2015. High resolution profiles of elements in Atlantic tarpon (*Megalops atlanticus*) scales obtained via cross-sectioning and laser ablation ICP-MS: a review and novel approach for scale analyses. *Environmental Biology of Fishes*. doi:10.1007/s10641-015-0443-z

### Fall 2011

- U-Pb and Lu-Hf zircon geochronology and Ti-in-zircon thermometry of the Salta Rift basement, Argentina (Mariya Levina– Geo Sci/Grad)

- Analytical comparison of relative ages of detrital zircons using zircon standards of drastically different ages (Caleb Rhatigan– Geo Sci/Grad)
- Improved methods of laser ablation ICP-MS for apatite: determining uranium content for fission-track chronometry (Sean Sanquineto– Geo Sci/Grad)
- Rare earth element analysis of zircon by LA-Q-ICP-MS (Spencer Seaman– Geo Sci/Grad)
- Can a trend for cationic tracers of urbanization be established corresponding to a watershed experiencing outdoor watering regulations? A study examining Cu, Ni and Pb via ICP-Q-MS (Jeff Senison– Geo Sci/Grad)

### Summer 2011

- What do rare earth element distributions in pelagic and hemipelagic sequences reveal about deposition and diagenesis? (Ryan Cahalan – Geo/ Geo Sci/ Honors program)
  - [Miller, N.R. and Cahalan, R., 2011. What do rare earth element distributions in pelagic and hemipelagic sequences reveal about deposition and diagenesis? Geological Society of America Abstracts with Programs 43, 610.](#)
  - [Cahalan R C, Kelly E D, Carlson W D, 2014. Rates of Li diffusion in garnet: Coupled transport of Li and Y+REEs. American Mineralogist 99, 1676-1682.](#)