

# Curriculum Vitae

**Alexander Gysi**

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Economic Geologist

New Mexico Bureau of Geology and Mineral Resources

Assistant Professor

Department of Earth and Environmental Science

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## Research Interests

- *Hydrothermal ore-forming processes & crustal metasomatism*
- *Critical mineral deposits and geochemistry of rare earth elements (REE)*
- *Petrology of pegmatites, carbonatites and (per)alkaline rocks*
- *Thermodynamic modeling of fluid-rock equilibria*

## Academic Degrees

- 2011 **Ph.D. in Aqueous Geochemistry**, Institute of Earth Sciences, University of Iceland, Reykjavik, Iceland. Dissertation title: CO<sub>2</sub>-water-basalt interaction: experiments and modeling. Supervisor: Prof. Andri Stefánsson
- 2007 **M.Sc. in Mineralogy and Petrology**, Department of Earth Sciences, ETH Zurich, Switzerland. Thesis title: Petrogenesis of pyroxenites and melt infiltrations in the ultramafic complex of Beni Bousera, northern Morocco. Supervisors: Prof. Max Schmidt (ETH) and Prof. Oliver Jagoutz (MIT)
- 2001-2004 **Undergraduate Vordiploma**, ETH, Zurich, Switzerland.

## Appointments

- Economic Geologist, Bureau of Geology and Mineral Resources, New Mexico Institute of Mining and Technology, 2020–present.
- Assistant Professor, Department of Earth and Environmental Science, New Mexico Institute of Mining and Technology, 2020–present.

- Assistant Professor, Department of Geology and Geological Engineering, Colorado School of Mines, 2014–2020.
- Postdoctoral Fellow, Department of Earth and Planetary Science, McGill University, 2011–2014.

## Honors, Recognition and Outstanding Achievements

- National Science Foundation CAREER award (2019-2024)
- Swiss National Science Foundation (SNSF) fellowship for prospective researchers (2011-2013)
- AGU Fall Meeting Outstanding Student Poster Award (2009)

## Grants Awarded

- 2021-2024, PI: Gysi; co-PI/Is: Waters and Hurtig (NMT), Dub and Migdisov (LANL), Zhu (U. Indiana), U.S. Department of Energy (DOE), Molecular complexation of rare earth elements (REE) in high temperature and pressure supercritical geologic fluids, DE-SC0022269, **total \$2,700,000**
- 2021-2024, PI Hurtig; Co-PIs Gysi, Jones, Kalugin, Rubasinghege: National Science Foundation (NSF) Major Research Instrumentation (MRI), Acquisition of a high-resolution confocal Raman microscope with capabilities to perform liquid and solid experiments, EAR-2117061, **total \$396,934**
- 2020-2023, PI: Alexander Gysi, U.S. Department of Energy (DOE), An internally consistent thermodynamic database for the rare earth elements (REE) at hydrothermal conditions, DE-SC0021106, **total \$895,603**
- 2019-2024, PI: Alexander Gysi, National Science Foundation (NSF), CAREER: Partitioning of rare earth elements (REE) between minerals and aqueous fluids in ore deposits, EAR-2039674, **total \$577,485**
- 2017-2020 (no-cost extension to 2021), PI: Alexander Gysi, National Science Foundation (NSF), The thermodynamic properties of rare earth element (REE) minerals: a solid-solution model for xenotime-(Y) and monazite-(Ce), EAR-1649656/2032761, **total \$328,368**
- 2011-2013, PI: Alexander Gysi, Swiss National Science Foundation (SNSF) fellowship for prospective researchers, PBSKP2\_134329, **total CAD 61,500**

## Courses Taught

### New Mexico Tech (2020-present)

- GEOC/GEOL589-1 Lithogeochemistry of ore-forming processes (3 credits, graduate, new course at NMT for Spring 2022)
- GEOC/GEOL589-1 Lithogeochemistry of ore-forming processes (3 credits, graduate, new course at NMT for Spring 2022)
- GEOC571-01 Advanced Topics in Geochemistry (1-3 credits, graduate, every other year)
- GEOC/GEOL589-2 Thermodynamic modeling of fluid-rock interaction (1 credit, graduate, new course at NMT for Spring 2021)
- EARTH200 Mineralogy (4 credits, undergraduate, since Spring 2022)

### Colorado School of Mines (2014-2020)

- GEOL598 Introduction to linux and open source software in geosciences (1 credit, graduate, CSM)
- GEGN206 Earth Materials/Mineralogy (3 credits, undergraduate, CSM).
- GEGN330 Thermodynamics for Geoscientists (3 credits, undergraduate, CSM).
- GEOL535 Litho geochemistry of Ore Forming Processes (3 credits, graduate, CSM).
- Field School 2 weeks in 2015, Salida and Saguache, Colorado (undergraduate, CSM).

### Invited Lectures and Invited Conference Presentations

- October 2021 (keynote), Xplore Conference Quebec 2021, virtual attendance, [Rare Earth Elements \(REE\) in Critical Mineral Deposits – Frontiers in Science and Exploration for the Future Economy](#).
- April 2021 (invited presentation), G&G Seminar Series, Oregon State U., Hydrothermal experiments on rare earth elements, critical minerals for the future economy.
- June 2020 (invited speaker): Goldschmidt Conference, virtual. Fluid-mineral partitioning of REE in critical mineral deposits.
- Nov 2019 (keynote): 9th Russian young-scientists scientific school "New Knowledge in ore forming processes", Moscow, Russia. Hydrothermal partitioning of rare earth elements (REE): from fluids to ore deposits.
- Dec 2019 (invited speaker): 27th Hubbert Quorum Meeting, USGS Menlo Park, CA, USA. Hydrothermal partitioning of rare earth elements (REE): from fluids to ore deposits.
- Nov 2018 (invited lecture): U. Geneva, Switzerland. Hydrothermal partitioning of rare earth elements (REE): from fluids to ore deposits.
- Oct 2018 (invited seminar): student chapter Society of Economic Geologists, Colorado State U., CO, USA. Hydrothermal partitioning of rare earth elements (REE): from fluids to ore deposits.
- Oct 2018 (invited speaker): the Denver Region Exploration Geologists' Society (DREGS), Colorado School of Mines, CO, USA. Hydrothermal evolution of pyrite-quartz and gold-bearing base metal veins in the Central City district, Colorado.
- March 2018 (invited lecture): U. Toronto, Canada. Hydrothermal partitioning of rare earth elements (REE): from fluids to ore deposits.
- Jan 2018 (invited lecture): ETH Zurich, Switzerland. Hydrothermal partitioning of rare earth elements (REE): from fluids to ore deposits.
- Sep 2016 (invited speaker): Geological Society of America Meeting, Denver, CO, USA. Interpreting metasomatism and REE ore forming processes in peralkaline granitic systems.
- July 2016 (invited lecture): International Symposium on Solubility Phenomena and Related Equilibrium Processes, IUPAC, U. Geneva, Switzerland. Numerical simulations of CO<sub>2</sub> sequestration in basaltic rock formations: Challenges for optimizing mineral-fluid reactions.
- July 2016 (invited seminar): Laboratory for Waste Management (LES), Paul Scherrer Institute, Switzerland. Application of the MINES thermodynamics database to simulate crustal fluid-rock systems, Paul Scherrer Institute, LES (Invited Seminar).

## Workshops and Short Courses

- 2021, Goldschmidt conference virtual workshop (2 days, 70+ people worldwide), [Fluid-rock interaction and ore deposits in the Earth's crust: coupling of field observations and experimental methods with numerical modeling](#) (A. Gysi, N. Hurtig, G.D. Miron, D. Kulik, D. Harlov).
- 2020 Geochemical Society Online Workshops (2 days): An introduction to thermodynamic modeling of fluid-rock interaction and ore-forming processes using the GEMS code package (A. Gysi, N. Hurtig, D. Miron).
- 2019 Russian Academy of Sciences, Institute of Geology of Ore Deposits, Petrography, Mineralogy and Geochemistry, Moscow (1 day): Numerical modeling of fluid-rock interaction and ore-forming processes (A. Gysi).
- 2018 U. Iceland, Reykjavik (2 days): Numerical modeling of fluid-rock interaction in crustal systems (A. Gysi, N. Hurtig).
- 2018 Goldschmidt Conference, Boston (2 days): Metasomatism and ore deposits in the Earth's crust: experimental and modeling methods (A. Gysi, D. Kulik, D. Miron, Daniel Harlov).

## Session Convenor

- Goldschmidt 2022, Hawai'i (upcoming), session 7F. Quantifying hydrothermal transport, fractionation, and deposition in the Earth's crust. (convenors: A. Migdisov, A.P. Gysi, Y. Mei, H. Xu, A. Yapparova).
- Goldschmidt 2021, Virtual, session 7L. Hot fluid frontiers: thermodynamics, molecular dynamics, and reactive transport in ore deposits and geothermal systems. (convenors: A.P. Gysi, N. Hurtig, T. Driesner and S. Jahn).
- AGU 2019, San Francisco, session V33C. Fluid-Rock Reactions in the Crust: New Data and Methods in Mineralogy, Geochemistry, Thermodynamics, and Kinetics (convenors: A.P. Gysi, C. Zhu, P. Lecumberri-Sanchez, S. Ingebritsen).
- Goldschmidt 2018, Boston, session 05m. Geochemical Vectors to Ore: How to Link Fundamental Understanding of Ore-Forming Processes to Mineral Exploration (convenors: A. Gysi, Z. Zajacz, N. Hurtig).
- Goldschmidt 2017, Paris, session 18h. Advances and Challenges in Numerical Simulations of Ore Deposits: From Ore Forming Processes to Mine Closure (convenors: A. Gysi, J. Declercq, R. Bowell).
- AGU Fall Meeting 2015, San Francisco, chair sessions V52B (Oral) and V53C (Poster). Mineralization, Metasomatism, and Mass Transfer Associated with Crustal Magmas (convenors: A. Gysi, D. Harlov, J. Chadwick, J. Saunders).

## Editorship and Reviewer for Scientific Journals

- Guest Editor, special issue in Minerals: Migdisov A., Gysi A.P., Liu W. (2021-2022) [Metal Transport and Deposition in Ore-Forming Hydrothermal Fluids](#).
- Lead guest editor, special issue in Geofluids: Gysi A.P., Mei Y., Driesner T. (2020) Advances in numerical simulations of hydrothermal ore forming processes. [Geofluids 2020, Article ID 7649713 \(Open Access\)](#).

- Reviewer for the following journals: *Geochimica et Cosmochimica Acta*, *Chemical Geology*, *Economic Geology*, *American Mineralogist*, *Canadian Mineralogist*, *Contributions to Mineralogy and Petrology*, *Environmental Science and Technology*, *Applied Geochemistry*, *Energy and Fuels*, *Solid Earth*, *Nanoscale*, *Geochemical Perspectives Letters*, *Nature Science Communication*.

## **Review Panels Funding Agencies**

- Served on National Science Foundation (NSF) and U.S. Department of Energy (DOE) NEUP review panels.
- Ad hoc reviewer: National Science Foundation (NSF; 5 proposals); U.S. Department of Energy (DOE, 5 proposals); Natural Sciences and Engineering Research Council of Canada (NSERC, 1 proposal); Swiss National Science Foundation (2 proposals); Deutsche Forschungsgemeinschaft (DFG, 2 proposals).

## **Synergistic Activities**

- Maintainer of the open access [MINES thermodynamic database](#)
- Author [Gitbook: A tutorial for geochemical modeling of fluid-rock interaction using GEM-Selektor and the MINES thermodynamic database](#)
- Contributor to the [GEMS geochemical modeling code package](#)

## Publication list A.P. Gysi

\* Students advised.

### Articles in peer-reviewed Journals (published)

1. Gysi A.P., Harlov D. (2021) Hydrothermal solubility of TbPO<sub>4</sub>, HoPO<sub>4</sub>, TmPO<sub>4</sub>, and LuPO<sub>4</sub> xenotime endmembers at pH of 2 and temperatures between 100 and 250 °C. *Chemical Geology* 567, 120072.
2. Pauly\* C., Gysi A.P., Pfaff K., Merkel I. (2021) Beryl as indicator of metasomatic processes in the California Blue Mine topaz-beryl pegmatite and associated miarolitic pockets. *Lithos* 404-405, 106485.
3. Perry\* E., Gysi A.P. (2020) Hydrothermal calcite-fluid REE partitioning experiments at 200 °C and saturated water vapor pressure. *Geochimica et Cosmochimica Acta* 286, 177–197.
4. Van Hoozen\* C.J., Gysi A.P., Harlov D.E. (2020) The solubility of monazite (LaPO<sub>4</sub>, PrPO<sub>4</sub>, NdPO<sub>4</sub>, and EuPO<sub>4</sub>) endmembers in aqueous solutions from 100 to 250 °C. *Geochimica et Cosmochimica Acta* 280, 302–316.
5. Alford\* L., Gysi A.P., Hurtig N.C., Monecke T., Pfaff K. (2020) Porphyry-related polymetallic Au-Ag vein deposit in the Central City district, Colorado: Mineral paragenesis and pyrite trace element chemistry. *Ore Geology Reviews* 119, 103295.
6. Pierre\* S., Gysi A.P., Monecke, T. (2018) Fluid chemistry of mid-ocean ridge hydrothermal vents: A comparison between numerical modeling and vent geochemical data. *Geofluids* 2018, Article ID 1389379 (open access).
7. Gysi A.P., Harlov D., Miron, D. (2018) The solubility of monazite (CePO<sub>4</sub>), SmPO<sub>4</sub>, and GdPO<sub>4</sub> in aqueous solutions from 100 to 250 °C. *Geochimica et Cosmochimica Acta* 242, 143–164.
8. Hurtig N., Hanley J., Gysi A.P. (2018) The role of hydrocarbons in Pillara Mississippi Valley-Type Zn-Pb ore formation, Canning Basin, Western Australia. *Ore Geology Reviews* 102, 875–893.
9. Perry\* E., Gysi A.P. (2018) Rare earth elements in mineral deposits: speciation in hydrothermal fluids and partitioning in calcite. *Geofluids* 2018, Article ID 5382480 (open access).
10. Gysi A.P. (2017) Numerical simulations of CO<sub>2</sub> sequestration in basaltic rock formations: challenges for optimizing mineral-fluid reactions. *Pure and Applied Chemistry* 89, 581–596.
11. Gysi A.P., Williams-Jones A.E., Collins P. (2016). Lithogeochemical vectors for hydrothermal processes in the Strange Lake peralkaline granitic REE-Zr-Nb Deposit. *Economic Geology* 111, 1241–1276.
12. Gysi A.P., Harlov D., Costa Filho D., Williams-Jones A.E. (2016) Experimental determination of the high temperature heat capacity of a natural xenotime-(Y) solid solution and synthetic DyPO<sub>4</sub> and ErPO<sub>4</sub> endmembers. *Thermochimica Acta* 627-629, 61–67.
13. Gysi A.P., Williams-Jones A.E., Harlov D. (2015) The solubility of xenotime-(Y) and other HREE phosphates (DyPO<sub>4</sub>, ErPO<sub>4</sub> and YbPO<sub>4</sub>) in aqueous solutions from 100 to 250 °C and psat. *Chemical Geology* 401, 83–95.
14. Gysi A.P. and Williams-Jones A.E. (2015) The thermodynamic properties of bastnäsite-(Ce) and parisite-(Ce). *Chemical Geology* 21, 87–101.

15. Gysi A.P. and Williams-Jones A.E. (2013) Hydrothermal mobilization of pegmatite-hosted REE and Zr at Strange Lake, Canada: A reaction path model. [Geochimica et Cosmochimica Acta 122, 324–352](#)
16. Gysi A.P. and Stefánsson A. (2012) CO<sub>2</sub>-water-basalt interaction. Low temperature experiments and implications for CO<sub>2</sub> sequestration into basalts. [Geochimica et Cosmochimica Acta 81, 129–152](#).
17. Gysi A.P. and Stefánsson A. (2012) Experiments and geochemical modeling of CO<sub>2</sub> sequestration during hydrothermal basalt alteration. [Chemical Geology 306–307, 10–28](#).
18. Gysi A.P. and Stefánsson A. (2012) Mineralogical aspects of CO<sub>2</sub> sequestration during hydrothermal basalt alteration – An experimental study at 75 to 250 °C and elevated pCO<sub>2</sub>. [Chemical Geology 306-307, 146-159](#).
19. Gysi, A.P. and Stefánsson A. (2011) CO<sub>2</sub>-water-basalt interaction. Numerical simulation of low temperature CO<sub>2</sub> sequestration into basalts. [Geochimica et Cosmochimica Acta 75, 4728-4751](#).
20. Gysi A.P., Jagoutz O., Schmidt M.W., Targuisti K. (2011) Petrogenesis of pyroxenites and melt infiltrations in the ultramafic complex of Beni Bousera, northern Morocco. [Journal of Petrology 52, 1679-1735](#).
21. Gysi A.P. and Stefánsson A. (2008) Numerical modeling of CO<sub>2</sub>-water-basalt interaction. [Mineralogical Magazine 72, 55–59](#).

## Comments

1. Gysi A.P. and Williams-Jones A.E. (2016) Comment on “Synthesis of ceria (CeO<sub>2</sub> and CeO<sub>2-x</sub>) nanoparticles via decarbonation and Ce(III) oxidation of synthetic bastnaesite (CeCO<sub>3</sub>F)” by Montes-Hernandez et al. [Materials Chemistry and Physics 183, 1-5](#).

## Editorial

1. Gysi A.P., Mei Y., Driesner T. (2020) Advances in numerical simulations of hydrothermal ore forming processes. [Geofluids 2020, Article ID 7649713 \(Open Access\)](#).

## Book Reviews

1. Gysi A.P. (2019) Book review: thermodynamics of natural systems: theory and applications in geochemistry and environmental science, 3rd edition (2017) by Greg Anderson. [American Mineralogist 104, p. 630](#).
2. Gysi A.P. (2014) Book review: ore deposit geology (2013) by John Ridley. [American Mineralogist 99, pp. 2159-2160](#).

## Conference Abstracts

1. Gysi A.P. (2021) Hydrothermal REE fluid-mineral reaction paths in critical mineral deposits. Goldschmidt Abstracts, Virtual Goldschmidt Conference. (Oral Presentation)
2. Gysi A.P. (2021) Ore-Forming Processes in Critical Mineral Deposits: Can We Link Hydrothermal Experiments to Exploration in the Field? SEG conference, 100th Anniversary, ST.167. (Online Speed Talk)

3. Filho\* D.C, Gysi A.P. (2021) Simulation of REE mobility and evolution of F-NaCl-CO<sub>2</sub>- bearing fluids. Goldschmidt Abstracts, Virtual Goldschmidt Conference. (Online Flash Talk)
4. Payne\* M.R., Gysi A.P., Hurtig N.H. (2021) Hydrothermal REE partitioning between fluorite and aqueous fluids: insights from experiments and natural fluid inclusions. Goldschmidt Abstracts, Virtual Goldschmidt Conference. (Online Speed Talk)
5. Chappell\* J.C., Gysi A.P., Monecke T., Chang. (2021) Fluorapatite-fluid alteration: REE mobility and its implications for apatite as an exploration tool. Goldschmidt Abstracts, Virtual Goldschmidt Conference. (Online Speed Talk)
6. Owen\*, E., Gysi, A.P., McLemore, V.T. (2021) Lithogeochemical Vectors and Mineral Paragenesis of Hydrothermal REE-Bearing Fluorite Veins and Breccia Deposits in the Gallinas Mountains, New Mexico. SEG conference, 100th Anniversary, ST.180. (Online Speed Talk)
7. Gysi A.P. (2020) Fluid-Mineral Partitioning of REE in Critical Mineral Deposits. Goldschmidt Abstracts, Goldschmidt Conference Virtual. ([Invited Presentation](#))
8. Gysi A.P., Hofstra A.H., Harlov D.E., Miron G.D. (2019) Rare earth element (REE) metasomatism in iron-oxide-apatite mineral deposits: stability of hydrothermal monazite and xenotime. AGU, Fall Meeting San Francisco, V33C-0244. (Poster)
9. Gysi A.P., Hurtig N., Monecke T. (2018) Numerical Modeling of Hydrothermal Ore-Forming Processes and the Link to Lithogeochemical Vectors for Exploration. SEG Keystone, Sep, P. 138. (Poster)
10. Perry\* E., Gysi A.P. (2018) Rare Earth Element Partitioning in Calcite as a Vector in Critical Metal Deposits. SEG Keystone, Sep, P.242. (Poster)
11. VanHoozen\* C., Gysi A.P. (2018) Fingerprinting the Hydrothermal Mobility of Rare Earth Elements (REEs) in Ore Deposits from the Stability of Monazite-(Ce). SEG Keystone, Sep, P. 248. (Poster)
12. Alford\* L., Gysi A.P., Monecke T., Pfaff K., Hurtig N. (2018) Hydrothermal Evolution of Au-Bearing Pyrite Veins and Their Association With Base Metal Veins in the Central City District, CO, USA. SEG Keystone, Sep, P.149 (Poster).
13. MacIntyre\* T.J., Hitzman M.W., Gysi A.P (2018) Structural Geology of the Kansanshi Cu-Au Deposit, Northwestern Province, Zambia. SEG Keystone, Sep, SP2.03. (Poster)
14. Pierre\* S, Gysi A.P., Monecke T. (2018) Geochemical Controls on the Composition of Midocean Ridge Hydrothermal Vent Fluids: A Numerical Modeling Approach. SEG Keystone, Sep, P. 122. (Poster)
15. Gysi A.P., Harlov D., Miron G.D. (2018) The hydrothermal solubility of monazite-(Ce) and xenotime-(Y). Goldschmidt Abstracts, Goldschmidt Conference Boston. (Oral Presentation)
16. Perry\* E., Gysi A.P. (2018) Rare earth element partitioning in calcite as a vector of hydrothermal processes in mineral deposits. Goldschmidt Abstracts, Goldschmidt Conference Boston. (Oral Presentation)
17. Van Hoozen\* C., Gysi A.P. (2018) The thermodynamic stability of monazite for vectoring the hydrothermal mobility of REE in ore deposits. Goldschmidt Abstracts, Goldschmidt Conference Boston. (Oral Presentation)
18. MacIntyre\* T.J., Gysi A.P., Hitzman M.W. (2018) Geochemistry of the Kansanshi Cu-Au deposit, Zambia. Goldschmidt Abstracts, Goldschmidt Conference Boston. (Oral Presentation)



19. Alford\* L., Gysi A.P., Monecke T., Pfaff K., Hurtig N. (2018) Hydrothermal evolution of Au-bearing pyrite veins and their association to base metal veins in the Central City district, CO, USA. Goldschmidt Abstracts, Goldschmidt Conference Boston. (Oral Presentation)
20. Costa-Filho\* D., Botelho N.F., Gysi A.P. (2018) Characterization of xenotime-(Y) from the Goiás Tin Province, Brazil. Goldschmidt Abstracts, Goldschmidt Conference Boston. (Poster Presentation)
21. Piurkowsky\* S.E., MacIntyre\* T., Gysi A.P., Hitzman M. (2018) Petrologic characterization of metasediments at the Kansanshi Mine, Zambia. Geological Society of America Meeting, Indianapolis, paper 243-8. (Poster Presentation)
22. Gysi A.P. (2017) The role of pegmatites and acidic fluids for hydrothermal Zr and REE transport in the Strange Lake peralkaline granitic pluton. Society for Geology Applied to Mineral Deposits (SGA) 2017, Quebec City, August 20-23, Mineral Resources to Discover, paper 173-pggW-63. (Oral Presentation)
23. Gysi A.P. (2017) The MINES Thermodynamic Database for Simulating the Chemistry of Complex Crustal Fluid-Rock Systems. Goldschmidt Abstracts (gold2017:abs:2017002757), Goldschmidt Conference Paris. (Oral Presentation)
24. Alford\* L. and Gysi A.P. (2017) Hydrothermal Evolution of Au-bearing Quartz-pyrite Veins and their Association to Base Metal Veins in Central City, Colorado. Gold and Silver deposits in Colorado Symposium, Golden CO, July 20-24, 2017. (Poster Presentation)
25. Gysi A.P. (2016) Numerical simulations of CO<sub>2</sub> sequestration in basaltic rock formations: Challenges for optimizing mineral-fluid reactions. International Symposium on Solubility Phenomena and Related Equilibrium Processes (ISSP17), IUPAC, Geneva, Switzerland, 2016. (Invited Presentation)
26. Gysi A.P. (2016) The role of pegmatites and acidic fluids for hydrothermal Zr and REE transport in the Strange Lake peralkaline granitic pluton. 2nd Eugene E. Foord Pegmatite Symposium, Golden CO, July 15-19, 2016. (Oral Presentation)
27. Gysi A.P. (2016) Interpreting metasomatism and REE ore forming processes in peralkaline granitic systems. Geological Society of America (Denver), Abstracts with Programs Vol. 48, No. 7. (Invited Presentation)
28. Gysi A.P. (2016) The MINES thermodynamic database for modeling crustal fluid-rock systems. Geological Society of America (Denver), Abstracts with Programs Vol. 48, No. 7. (Poster Presentation)
29. Randall\* E.P. and Gysi A.P. (2016) Experimental derivation of the REE partitioning between fluid-calcite as a tracer of hydrothermal metal transport and mineralization processes. Geological Society of America (Denver), Abstracts with Programs Vol. 48, No. 7. (Poster Presentation)
30. Berger\* M. L., Wendlandt R., Hitzman M., Pfaff K., Gysi A. P. (2016) Controls on REE-Y-Zr mineralization in the Pajarita Mountain peralkaline syentie complex, Mescalero Apache Reservation, Otero County, New Mexico. Geological Society of America, Abstracts with Programs Vol. 48, No. 7.
31. Gysi A.P., Williams-Jones A.E., Harlov D.E. (2015) Experiments and numerical modeling of hydrothermal REE ore forming processes in the crust. Goldschmidt Abstracts, Goldschmidt Conference (Prague 2015), p. 1139. (Oral Presentation)

32. Gysi A.P. (2015) Hydrothermal REE and Zr Ore Forming Processes in Peralkaline Granitic Systems. AGU Fall Meeting (San Francisco 2015), V52B-06. (Oral Presentation)
33. Gysi A.P., Williams-Jones A.E., Collins P. (2014) Reaction paths and scale of hydrothermal mineralization in the Strange Lake peralkaline granitic REE-Zr-Nb deposit. SEG 2014 Conference, Building Exploration Capability for the 21st Century, Keystone, Colorado. (Poster Presentation)
34. Gysi A.P. and Williams-Jones A.E. (2013) Hydrothermal REE and Zr mobilization in the Strange Lake peralkaline granitic system: a reaction path model linked to petrological and geochemical observations. Abstract V33B-2746, American Geophysical Union, Fall Meeting 2013, San Francisco, USA. (Poster Presentation).
35. Gysi A.P. and Williams-Jones A.E. (2012) The role of pegmatites and acid fluids for REE/HFSE mobilization in the Strange Lake peralkaline granitic pluton, Canada. Abstract V32B-06, American Geophysical Union, Fall Meeting 2012, San Francisco, USA. (Oral Presentation)
36. Gysi A.P. and Williams-Jones A.E. (2012) Fluid-rock interaction in the Strange Lake peralkaline granitic pluton, Canada: Implications for REE/HFSE mobility. *Mineralogical Magazine* 76, 1793, Goldschmidt Conference Montréal, Canada. (Oral Presentation)
37. Gysi A.P. and Williams-Jones A.E. (2012) The role of fluid-rock interaction for REE/HFSE mobility in the Strange Lake peralkaline granitic pluton, Canada. Gordon Research Conference, Geochemistry of Mineral Deposits, July 15-20, Andover NH. (Poster Presentation)
38. Gysi A.P. and Stefánsson A. (2011) CO<sub>2</sub> sequestration and hydrothermal basalt alteration at 40 to 250 °C. *Mineralogical Magazine* 75, 961, Goldschmidt Conference Prague, Czech Republic. (Oral Presentation).
39. Arnórsson S., Hurtig N.C., Gysi A.P., Bird D.K., O'Day P.A. (2010) Carbon dioxide waters in Iceland: a natural analogue to CO<sub>2</sub> sequestration in basaltic aquifers. In 13th International Symposium on Water–Rock Interaction, Guanajuato, Mexico.
40. Gysi A.P. and Stefánsson A. (2009) CO<sub>2</sub>-water-basalt interaction: Geochemical modeling and experiments. *Geochimica et Cosmochimica Acta* 73, A483, Goldschmidt Conference, Davos, Switzerland. (Oral Presentation)