

TECHNICAL PROGRAM

TUESDAY MAY 15, 2018

Field trips 1 and 2 begin and end at the Pine Mountain Lodge, Iron Mountain, Michigan

8:00 am - 5:00 pm **PRE-MEETING FIELD TRIPS**

1) Archean and Paleoproterozoic Geology of the Felch District, Central Dickinson County, Michigan

Bill Cannon, Klaus Schulz, Robert Ayuso - U.S. Geological Survey

Tom Mroz – BSGE, MSPG, CPG

2) Geology of the Hemlock Formation

Tom Waggoner – Consulting Geologist

4:00 pm - 10:00 pm **Registration** (Pine Mountain Lodge)

7:00 pm - 10:00 pm **Welcoming Reception** (Pine Mountain Lodge)

Poster Session (Pine Mountain Lodge)

WEDNESDAY MAY 16, 2018

7:30 am – 11:30 am **Registration** (Pine Mountain Lodge)

8:00 **OPENING REMARKS** (Pine Mountain Lodge)

Laurel Woodruff, Bill Cannon, Esther K. Stewart, Co-Chairs, 2018 ILSG

TECHNICAL SESSION I

Session Chairs:

Shannon Zurevinski – Lakehead University

Ben Drenth – U.S. Geological Survey

8:10 **Christian Schardt and Mady David**

High-technology metal behavior in ore-forming environments and its implication for the Vermilion District, northern Minnesota

8:30 **Andrea Reed**

Pilot study results for potential lithium mineralization on state-managed mineral rights in Minnesota

- 8:50 ***Matthew W. Matko and Christian Schardt**
Microanalysis of rock and mineral textures and its relationship to mineralization and ore comminution
- 9:10 **Jeffrey L. Mauk**
Geochemical signatures of hydrothermal alteration in clastic sedimentary rocks: theory, recognition, and application
- 9:30 **COFFEE BREAK**
- 9:50 **Robert Cundari, Mark Smyk, Dorothy Campbell, and Mark Puumala**
Possible emplacement controls on diamond-bearing rocks north of Lake Superior
- 10:10 ***Joseph Rasmussen, Esther Kingsbury Stewart, John Skalbeck, and Madeline Gotkowitz**
Modeling the Precambrian topography of Columbia County, Wisconsin using two-dimensional models of gravity and aeromagnetic data and well construction reports
- 10:30 **David Southwick, Val Chandler, and Mark Jirsa**
Geophysical, structural, and tectonic interpretation of the Yellow Medicine and Appleton shear zones, SW Minnesota and SE South Dakota: A work in progress
- 10:50 **Val Chandler, David Southwick, and Mark Jirsa**
Recent gravity and magnetic investigations of the Minnesota River Valley Subprovince: New insights into ancient problems
- 11:10 **Benjamin J. Drenth, Laurel G. Woodruff, Klaus J. Schulz, William F. Cannon, and Robert A. Ayuso**
On the source(s) of the Felch-Arnold gravity anomaly, Upper Peninsula, Michigan
- 11:30 **End of Technical Session I**
- 11:30 **LUNCH BREAK**
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TECHNICAL SESSION II

Session Chairs:

Dean Peterson – Natural Resources Research Institute

Suzanne Nicholson – U.S. Geological Survey

- 1:00 ***Kira Arnold, Pete Hollings, Seamus Magnus, Shannon Zurevinski, and Robert Creaser**
Geology and geochemistry of the Terrace Bay Batholith, N. Ontario

- 1:20 ***Simon Dolega and Philip Fralick**
Geochemistry of shallow and deep water Archean meta-iron formations and their post depositional alteration in Western Superior Province, Canada
- 1:40 ***Victoria Stinson and Y. Pan**
Neoproterozoic to Paleoproterozoic reconstructions using metamorphic core complexes as evidence of continental transform plate motion and their implications in Archean tectonics
- 2:00 **Wouter Bleeker**
Archean BIF clasts vs. Paleoproterozoic jasper clasts? The proof is in the pudding (stone)
- 2:20 **COFFEE BREAK**
- 2:40 **Paul Eger, Courtney Bot, Dave Meineke, and Dave Adams**
What to do after the bull has left the china shop- Picking up the community relation pieces
- 3:00 ***Vittoria Smith and Shannon Zurevinski**
Petrology and 11B composition of tourmaline within the 2685 Ma Ghost Lake Batholith and Mavis Lake Pegmatites
- 3:20 **Klaus J. Schulz, William F. Cannon, and Laurel G. Woodruff**
Geochemistry of mafic rocks in Dickinson County, Michigan: Evidence for ~2.1 Ga Rifting
- 3:40 **Thomas W. Buchholz, Alexander U. Falster, and Wm. B. Simmons**
Possible aluminotantite from the Nine Mile pluton, Wausau Complex, Marathon County, WI.
- 4:00 **POSTER VIEWING- AUTHORS WILL BE PRESENT AT THEIR POSTERS**
- 5:00 **END OF TECHNICAL SESSION II**

6:00 **RECEPTION AND CASH BAR** (Pine Mountain Lodge)

7:00 **ANNUAL BANQUET** (Pine Mountain Lodge)

- Announcement of 65th Annual Meeting Location
- **2018 Goldich Award Presentation to Val Chandler**
- Banquet Presentation - **Nancy Langston** (Michigan Technological University)
Presentation title: *Sustaining Lake Superior*

THURSDAY MAY 17, 2018

8:00 **OPENING REMARKS, UPDATES** (Pine Mountain Lodge)
Laurel Woodruff, Bill Cannon, Esther K. Stewart, Co-Chairs, 2018 ILSG

TECHNICAL SESSION III

Session Chairs:

Amy Radakovich – Minnesota Geological Survey

Daniel Holm – Kent State University

8:10 **Daniel Holm, Terrence J. Boerboom, and Scott Scheiner**

Reinterpretation of the ages of deposition and folding of Animikie Basin metasedimentary units in east-central Minnesota

8:30 **Joshua J. Schwartz, Esther Kingsbury Stewart, and L. Gordon Medaris Jr.⁺**

Detrital zircons in the Waterloo Quartzite, Wisconsin: Implications for the ages of deposition and folding of supermature quartzites in the Southern Lake Superior Region

8:50 **Brad Gottschalk, Caroline Rose, and M. Carol McCartney**

Geologic history meets the web – online data of the Lake Superior Division of USGS

9:10 **William J. Hinze**

Mapping the Midcontinent Rift System

9:30 **COFFEE BREAK**

9:50 **Jennifer Smith, Wouter Bleeker, Dean Rossell, and Justin Laberge**

Compositional and geochemical characteristics of the Crystal Lake intrusion, Ontario

10:10 **Sean O'Brien, Pete Hollings⁺, and Jim Miller**

Geology of the Crystal Lake Gabbro and the Mount Mollie Dyke, Midcontinent Rift, Northwest Ontario

10:30 ***Dustin A. Liikane, Wouter Bleeker, Mike Hamilton, Sandra Kamo, Jennifer Smith, Peter Hollings, Robert Cundari, and Michael Easton**

Controls on the localization and timing of mineralized intrusions within the ca. 1.1 Ga Midcontinent Rift system

10:50 **David Good**

Petrogenesis of mafic magmatism in the Coldwell Complex Part 1. Geochemical model to explain origin of metabasalt by partial melting in the SCLM

11:10 **Evgeniy Kulakov, Theodore J. Bornhorst⁺, Chad Deering, and James B. Moore**
The youngest magmatic activity of the Midcontinent Rift at Bear Lake, Keweenaw Peninsula, Michigan

11:30 **End of Technical Session III**

11:30 **LUNCH BREAK**

TECHNICAL SESSION IV

Session Chairs:

Marcia Bjørnerud – Lawrence University

John Esch – Michigan Department of Environmental Quality

1:00 **Kelli McCormick, Kevin Chamberlain, and Colin Paterson**
An 1149 Ma U-Pb baddeleyite crystallization age and geochemistry of gabbroic intrusions at the southwestern margin of the Superior Craton, southeastern South Dakota

1:20 **Jim DeGraff and B.T. Carter**
Thrust Kinematics of the Keweenaw Fault North of Portage Lake, Michigan

1:40 **John A. Yellich**
Michigan Geological Survey six years after assignment to Western Michigan University, where are we today?

2:00 **John M. Esch**
LiDAR Revolutionizing Geological Mapping

2:20 **COFFEE BREAK**

2:40 **Dean M. Peterson**
Assembling Minnesota: Integration of 140 years of government, academic, and industry geologic studies into a seamless statewide GIS database

3:00 **Mark A. Jirsa and others**
On-going geologic mapping in Minnesota's Arrowhead Region by the Minnesota Geological Survey

3:20 **John M. Esch, Alan Kehew, Sebastian Huot, and John Yellich**
Surficial geology of the Iron Mountain 7.5 Minute Quadrangle, Dickinson County, Michigan, Florence & Marinette Counties, Wisconsin

3:40 **Phil Larson, George Hudak, Al Mactavish, Peter Hinz, Amy Radakovich, Juk Bhattacharyya, Paula Engelhardt, Steve Engelhardt, Brigitte Gelnias, David Good, Emily Gorner, Sheree Hinz, Peter Jongewaard, Deb Kroch, Matt Svensson, and Andrew Tims**

Land of fire and ice: Summary of the 2017 ILSG field trip to Iceland

4:20 **BEST STUDENT PAPER AWARDS**
STUDENT TRAVEL AWARDS

4:40 **END OF TECHNICAL SESSIONS**

* denotes a student eligible for Best Student Paper Award. To be eligible students must have graduated no more than one month before the ILSG meeting, be first author, and present the paper at the meeting.

+ denotes author that will present abstract, if different than the first author.

FRIDAY MAY 18, 2018

8:00am – 5:00pm **POST-MEETING FIELD TRIPS**

Field trips 2 and 3 begin and end at the Pine Mountain Lodge, Iron Mountain, Michigan

3) Geology and Iron Ores of the Menominee Iron Range, Dickinson County, Michigan

Tom Mroz – BSGE, MSPG, CPG

Bill Cannon – U.S. Geological Survey

4) Granitoid rocks of the Pembine-Wausau Terrane in northeastern Wisconsin

Klaus Schulz – U.S. Geological Survey

Marcia Bjørnerud – Lawrence University

POSTER PRESENTATIONS

ANDERSON, Eric, SCHULZ, Klaus, DRENTH, Benjamin, CANNON, William, and QUIGLEY, Thomas

New gravity and high-resolution aeromagnetic data provide insights into Precambrian geology in the eastern Pembine-Wausau terrane

***ASHAUER, Zachary, CURRIER, Ryan, NORFLEET, Mark**

Textural analyses of rapakivi mantles: Evidence for semi-selective replacement in Proterozoic rapakivi granites

AYUSO, R.A., SCHULZ, K.J., CANNON, W.F., WOODRUFF, L.G., VAZQUEZ, J.A., FOLEY, N.K., and JACKSON, J.

New U-Pb zircon ages for rocks from the Granite-Gneiss Terrane in Northern Michigan: Evidence for events at ~3750, 2750, and 1850 Ma

***BLOTZ, Kaelyn E., LODGE, Robert W.D.**

Ore petrography of the Flambeau volcanogenic massive sulfide deposit, northwestern Wisconsin: Implications for hydrothermal fluid composition

BOERBOOM, Terrence J.

Fault-controlled dike emplacement in the Grand Marais, Minnesota area

***DRAZAN, Jacqueline, BRENGMAN, Latisha, FEDO, Christopher**

Preliminary petrographic and geochemical investigation of silicified volcanic rocks and silica-rich exhalative rocks from the ~2.7 Ga Abitibi Greenstone Belt, Canada

EASTON, Robert M.

GEON 12 to 11 history of the Lake Superior Region and speculation about the relationships between the Midcontinent Rift and the Grenville Orogen

ESCH, John M, KEHEW, Alan, HUOT, Sebastien, YELLICH, John

Surficial geology of the Iron Mountain 7.5 Minute Quadrangle, Dickinson County, Michigan, Florence & Marinette Counties, Wisconsin

***FITZPATRICK, William, HOOPER, Robert, and LODGE, Robert, Gélinas, Brigitte**

Mineral chemistries of the Tower Mountain Intrusive Complex Au-deposit, Ontario

GRAUCH, V.J.S., BEDROSIAN, Paul A., STEWART, Esther Kingsbury, and HELLER, Samuel

Inferences on the subsurface distribution of Oronto and Bayfield Groups north and west of the Douglas Fault, Northwestern Wisconsin

GREEN, Carlin J., SEAL, Robert, R., II, CANNON, William F., PIATAK, Nadine, and MCALEER, Ryan J.

Origin, distribution, morphology, and chemistry of amphiboles in the Ironwood Iron-Formation, Gogebic Iron Range, Wisconsin, U.S.A.

***HAFFTEN, Doug and RADWANY, Molly**

Geothermobarometry of a Precambrian amphibolite from Cornell WI

***HANNACK, Gina, and RADWANY, Molly**

Hornblende-plagioclase thermometry of the Eau Claire River Complex, western Wisconsin

***HONE, Samuel V. and ZIEG, Michael J.**

Olivine crystal size distribution in the Black Sturgeon Sill, Nipigon, Ontario

***JACOBSON, Regan E., LODGE, Robert W.D**

Reconstructing Paleoproterozoic volcanism in northwestern Wisconsin: Geochemistry of the Flambeau Cu-Zn-Au Mine

JIRSA, Mark A., STARNES, Edward C., and SCHMITZ, Mark D.

Geology and geochronology of the 2006 Cavity Lake forest fire area, Boundary Waters Canoe Area Wilderness, NE Minnesota

KINGSBURY STEWART, Esther, STEWART, Eric D., and ROUSHAR, Kathy

New bedrock geologic mapping of Dodge County, Wisconsin provides evidence for Paleozoic reactivation of Precambrian structures

***LIKANE, Dustin A., BLEEKER, Wouter, HAMILTON, Mike, KAMO, Sandra, SMITH, Jennifer, HOLLINGS, Peter, CUNDARI, Robert, and EASTON, Michael**

Controls on the localization and timing of mineralized intrusions within the ca. 1.1 Ga Midcontinent Rift system

MATTOX, Stephen, BOLHUIS, Chris, and SOBOLAK, Christina

Using credit-by-exam to connect advanced high school geology courses to university geology departments: Current status of a state-wide program in Michigan

***OLSEN-VALDEZ, Juliana and BJØRNERUD, Marcia**

The Brussels Hill Structure, Door County, Wisconsin: Impact crater, diatreme or other?

***OLSON, Maile J., LODGE, Robert W. D.**

Komatiite-hosted nickel-copper mineralization potential in the eastern Shebandowan Greenstone Belt, Ontario, Canada

*** ROSE, Katharine; ESSIG, Espre, and THAKURTA, Joyashish**

Variation trends in sulfur isotope ratios at the Eagle and East Eagle intrusions and the surrounding country and basement rocks of the Baraga Basin, Upper Peninsula, Michigan

***RUPP, Kevin, THAKURTA, Joyashish, and MAHIN, Robert**

Preliminary investigation of the East Eagle Intrusion Gabbro in Marquette County, Michigan.

*** TYRRELL, C.W., HUBBELL, G.E., and DEGRAFF, J.M.**

Keweenaw Fault geometry and kinematics along Bête Grise Bay, Michigan

***UPTON, Margaret, SCHARDT, Christian, HUDAK, George, QUIGLEY, Eric**

Alteration mineral zonation and geochemical characteristics of the Back Forty Deposit, MI; a replacement-style zinc- and gold-rich volcanogenic massive sulfide deposit

*** VALL, Kathryn G., STEINMAN, Byron A., POMPEANI, David P., SCHREINER, Kathryn M., DEPASQUAL, Seth**

Reconstruction of paleoenvironmental conditions and temporal patterns of ancient mining on Isle Royale using biogeochemical analyses of lake sediment

YELLICH, John A.

Michigan Geological Survey Six years after assignment to Western Michigan University, Where are we today?

ZIEG, Michael J. and HONE, Samuel V.

The Origin of Layering in the Olivine Zone, Black Sturgeon Sill, Nipigon, Ontario

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