ABOUT THE WORKSHOP
The Lake Superior region has long been recognized for hosting world class ore deposit of native copper and Cu(-Ni) sulfides associated with igneous rocks of the 1.1Ga Midcontinent Rift. The production of low-sulfide palladium-rich ores from the Archean Lac des Iles intrusion near Thunder Bay since 1993 has added a new deposit type to the area. However, some of the most stimulating mineral discoveries in the past decade have been magmatic Ni-Cu-PGE sulfide deposits associated with small ultramafic-mafic conduit-type intrusions, such as Eagle (MI), Tamarack (MN) and Current Lake (ON), emplaced during the early stages of Midcontinent Rift magmatism.

This is the sixth in a series of professional workshops organized by UMD’s Precambrian Research Center. The PRC welcomes the Society of Economic Geologists as a cosponsor of this year’s workshop. The goal of the workshop is to familiarize participants with 1) the geological setting, mineralogy, textures, geochemistry and geophysical attributes of magmatic ore deposits, 2) how such deposits are explored, mined, processed, and remediated, and 3) the types and characteristics of Cu-Ni-PGE deposits that occur in the Lake Superior region.

As detailed in the schedule inside this pamphlet, the workshop includes two days of short course lectures presented by internationally and regionally renowned experts on Cu-Ni-PGE deposits. It also includes five days of field excursions showcasing core displays and mine visits to the most important deposits in the Lake Superior region - including an underground tour of Rio Tinto’s new Eagle Mine.

REGISTRATION
Participants have the choice of registering for the full seven days of the workshop or for only the short course lectures and 2-day field trip to Michigan. Registration for the complete workshop is limited to 50 participants with preference given to PRC members*. Up to seven students enrolled in MS or PhD programs may register at a discounted rate. Registrations will be accepted to the workshop on a first come – first served basis, contingent upon receipt of the registration form and full payment of the workshop fee. After August 30, if space is available, registration costs will increase by $200.

Professional Registration (full workshop)  $1850
Student Registration (full workshop)  $ 1000
Partial Workshop (Sun-Thurs)  $ 1400

*To learn about PRC membership visit www.d.umn.edu/prc/membership

ABREVIATED INFORMATION CIRCULAR
PRECAMBRIAN RESEARCH CENTER PROFESSIONAL WORKSHOP SERIES

Copper, Nickel, & Platinum Group Element Deposits of the Lake Superior Region

October 6-13, 2013
Duluth, Minnesota
Sponsored by:

www.d.umn.edu/prc/workshops
WORKSHOP SCHEDULE

Sunday (10/6, PM)  Welcoming Reception/Workshop Overview

Monday (10/7) Short Course I: Attributes of Magmatic Sulfide Deposits
   Classification and Metallogenic Models - Tony Naldrett, Emeritus Professor of Economic Geology, U. Toronto
   Mineralogy and Textures - Sarah-Jane Barnes, Professor, Canada Research Chair Magmatic Ore Deposits, U. Quebec-Chicoutimi
   Geochemistry - Ed Ripley, Professor, Indiana University, Bloomington
   Geophysical Attributes - Alan King, Geoscience North Ltd. (formerly Chief Geophysicist, Vale Global Exploration)
   Exploration Strategies - Dean Peterson, Senior VP of Exploration, Duluth Metals Ltd.
   Options for Mining - Vern Baker, President, Duluth Metals Ltd
   Processing and Beneficiation - Louis Cabri, Cabri Consulting Inc., formerly with Canada Centre for Mineral & Energy Technology
   Mineral Economics - Henry (Rick) Sandri, President, Pathfinder Minerals and Vermilion Gold
   Environmental Mitigation - Rens Verburg, Principal Geochemist, Golder Associates
   Evening Banquet Presentations
   Eagle Ni-Cu-PGE Deposit – Dean Rossell, Rio Tinto Exploration
   Upper Michigan Cu Deposits – Ted Bornhorst, Michigan Tech U.

Tuesday (10/8) Field Trip 1: Copper Deposits of Upper Michigan
   Copperwood Cu-sulfide Deposit, Ironwood, MI, Orvana Minerals
   Caledonia Native Cu Mine, Ontonagon, MI, Red Metal Minerals

Wednesday (10/9) Field Trip 2: Ni-Cu-PGE Eagle Deposit
   Eagle Ni-Cu-PGE Underground Mine, Marquette, MI, Rio Tinto-Eagle
   Humboldt Processing Plant/ Core Shack, Ishpeming, MI, Rio Tinto-Eagle

Thursday (10/10) Short Course II: Cu-Ni-PGE Deposits in the Lake Superior Region
   Geology and Mineral Deposits of the Midcontinent Rift - Jim Miller, Precambrian Research Center, University of Minnesota Duluth
   Maturi/Birch Lake Cu-Ni-PGE deposit, Duluth Complex - Dean Peterson, Duluth Metals Ltd. and Precambrian Research Center
   Mesaba Cu-Ni-PGE deposit, Duluth Complex - Mark Severson, Teck American
   NorthMet Cu-Ni-PGE deposit, Duluth Complex- Jim Tieberg, PolyMet
   Potential for PGE reef deposits, Duluth Complex - Jim Miller, UMD
   Great Lakes Nickel Cu-Ni-PGE deposit, Crystal Lake Gabbro, Ontario - Mark Smyk, Ontario Geological Survey
   Marathon Cu-Ni-PGE Deposit, Coldwell Complex, Ontario - David Good, Stillwater Canada
   Tamarack Ni-Cu-PGE deposit, Minnesota - Dean Rossell, Rio Tinto-Kennecott
   BIC Cu-Ni-PGE deposit, Michigan - Dan Foley, Rio Tinto-Kennecott
   Thunder Bay North Ni-Cu-PGE deposit, Current Lake Intrusion, Ontario - Al MacTavish, Panoramic Resources
   Seagull Ni-Cu-PGE deposit, Ontario - Geoff Heggie, Panoramic Res.
   Rare Metal Mineralization in Carbonatitic and Alkaline Intrusions - Shannon Zurevinski, Ontario Geological Survey
   Pd Mineralization in the Archean Lac des Iles Comple, Ontario - Dave Peck, North American Palladium
   New Frontiers for Ore Deposits in the Lake Superior Region - Klaus Schulz, US Geological Survey, Reston, VA
   Evening tour of Rio Tinto’s core facilities for the Tamarack Ni-Cu-PGE deposit, Minnesota

Friday (10/11) Field Trip 3: Duluth Complex Cu-Ni-PGE Deposits
   NorthMet deposit, Hoyt Lakes, MN, PolyMet Mining
   Mesaba deposit, Babbitt, MN, Teck American
   Maturi deposit , Ely, MN, Twin Metals Minnesota

Saturday (10/12) Field Trip 4: NW Ontario PGE-Ni-Cu Deposits
   Lac des Iles Pd Mine, Thunder Bay, ON, North American Palladium
   Evening Banquet and Evening Core Display, Thunder Bay, ON
   • Thunder Bay North (Panoramic)
   • Seagull (MinFocus/Black Panther/Panoramic)
   • Marathon (Stillwater Canada)

Sunday (10/13) Field Trip 5: North Shore Geology
   Thunder Intrusion, Thunder Bay, ON, Rio Tinto-Kennecott
   Classic North Shore Volcanic Locality, Taconite Harbor, MN
   Classic Lake Superior Anorthosite Locality, Silver Bay, MN