TALKS

Monday 21 June 2010
Session I  PGE Deposits (Convenors: David Peck and Gordon Chunnett)

Session Ia
A.J. Naldrett (KEYNOTE)  Concentration of PGE and chromite in the Bushveld Complex
J. Kinnaird  Along-strike and down-dip variations in multiphase sills of the Platreef, Bushveld Complex
W.D. Maier  Formation of Bushveld PGE reefs due to magma chamber subsidence and mobility of cumulate slurries
A.H. Green (INVITED)  Braving the PGE Industry

Session Ib  Chair: Wolfgang Maier
J.G. Foster (INVITED)  Location and distribution of the PGE in magmatic sulfides: Implications for genesis and mineral processing
D. Hutchinson  Why is the Merensky Reef so enriched in precious metals compared to the Platreef? Magmatic processing efficiency, plain and simple
F.J. Stevens  Stratigraphic correlations of the Sheba's Ridge area, southeastern Bushveld Complex, South Africa
I. McDonald  The nature of PGE mineralization in the Aurora Project area, northern Bushveld Complex, South Africa
W. Kanitpanyacharoen  Sulfide-associated assemblages in the Bushveld Complex, South Africa: evidence for ore element transport beneath the Merensky Reef by chloride-carbonate fluids
R.R. Keays (INVITED)  Sulphide saturation history of the Stillwater Complex, Montana: chemostratigraphic variation in Platinum Group Elements

Session Ic  Chair: Alan Boudreau
A. Wilson (INVITED)  New Insight into the stratigraphy, emplacement, and evolution of the Basal Ultramafic Succession in the Eastern Bushveld Complex, South Africa
A.J. DuToit  Great Dyke Platinum in the Region of Ngezi Mine, Zimbabwe: Characteristics of the Main Sulphide Zone and variations that affect mining
A.U. Korchagin  Geology and ore composition of the Kievey PGE-bearing deposit of West-Pana Layered Intrusion
F. Melcher  Platinum-group element potential of chromite ores from southern Iran
J.M. González-Jiménez  Contemporaneous segregation of PGE- and BM-rich sulfide melts and chromite crystallization: the Caridad chromite deposit, Mayari-Baracoa Ophiolitic Belt (eastern Cuba)
D.C. Peck  Variability in platinum:palladium ratios in magmatic ore systems
D.J. Good  Applying multistage dissolution upgrading and 3D-GIS to exploration at the Marathon Cu-PGE Deposit, Canada

Session Id  Chair: James Scoates
D.M. Peterson (INVITED)  PGE-associated polymetallic deposits in the Mid-Continent Rift: An overview
C.J. Wall Refining the precise age and duration of magmatism related to the Stillwater Complex

V.R. Goodgame The Thunder Bay North Deposit: Chonolith-hosted Pt-Pd-Cu-Ni mineralization related to the Midcontinent Rift

S.-J. Barnes Composition of the Lac des Iles magma and implications for the origin of the ore

M.L.N. Djon Contrasting Pd-bearing phases from the mineralized zones of the Lac des Iles Complex, Ontario, Canada

R.E. Ernst (INVITED) Using large igneous provinces for mineral exploration

Tuesday 22 June 2010
Session II Ni-Cu-(PGE) Deposits (Convenors: Michael Lesher & Peter Lightfoot)

Session IIa Chair: Steve Barnes

E.M. Ripley (KEYNOTE) Recent advances and future directions in the study of magmatic Cu-Ni-(PGE) deposits

X. Ding PGE systematics of the conduit-related Eagle Cu-Ni-(PGE) deposit, Upper Michigan

J.E. Mungall The Eagle’s Nest komatiite-hosted Ni-Cu-PGE sulphide deposit in the James Bay Lowlands, Ontario

M. Zhang Volatile composition and carbon isotope constraints on ore genesis of the Jinchuan Cu-Ni Deposit, western China

P.C. Lightfoot S-saturation history of Nain Plutonic Suite mafic intrusions: Origin of the Voisey’s Bay deposit, Labrador, Canada

R. Piña Platinum-group element concentrations in pyrrhotite, pentlandite, chalcopyrite, and pyrite from the Aguablanca Ni-Cu ore deposit (SW Spain)

Session IIb Chair: Jim Mungall

C.F. Ferriera-Filho (INVITED) Geological and Petrological Constraints on the Origin of Brazilian Ni-Cu Sulfide and PGE Deposits

S.M. Jowitt New Insights into the Geology and Mineral Potential of the West Raglan Ni-Cu-PGE project, Cape Smith Fold Belt, Quebec

G.J. Heggie The scale of mineralised Archaean komatiite systems: Vectoring in on the Long-Victor deposit, Western Australia

M.G. Houlé Localization of komatiite-associated Ni-Cu-(PGE) deposits in the Shaw Dome, Abitibi greenstone belt, Superior Province

S.J. Barnes Platinum-group elements and gold in highly deformed and metamorphosed komatiite-hosted nickel deposits of the Lake Johnston Greenstone Belt, Yilgarn Craton

S.-H. Yang The role of selective crustal contamination in the genesis of magmatic sulfide deposits: a case study of the Jingbulake sulfide-bearing intrusion, NW China

Session IIc Chair: Chris Davis

D.E. Ames (INVITED) Minor element composition of Sudbury ores: Implications for source contributions, genesis and exploration of Ni-Cu-PGE in diverse settings

R.C. Stewart Halogen geochemistry of footwall breccia and associated units of the main mass of the Sudbury Igneous Complex, Ontario
A.M. Gibson  Contrasting styles of low sulphide high precious metal mineralisation in the 148 and 109 FW zones: North and South Ranges of the Sudbury Igneous Complex, Ontario, Canada

A. Pentek  The significance of partial melting in hydrothermal “low-sulfide” mineralization within the contact aureole of the Sudbury Igneous Complex, Ontario, Canada

L. Hecht  Genesis of PGE-rich sulfide mineralization in Offset dikes of the Sudbury Impact Structure

M.C. Stewart  Diversity in Platinum Group Element (PGE) Mineralization at Sudbury: New Discoveries and Process Controls

G. Tuba  Distinguishing hydrothermal assemblages associated with and post-dating ‘low-sulfide’ Cu-Ni-PGE mineralization in the footwall of the Sudbury Igneous Complex: a possible tool in mineral exploration

Session IId  Chair: Reid Keays

C. Li  The Early-Permian Kalatongke Cu-Ni Deposit in the Paleozoic Chinese Altay Orogenic Belt: Ore Genesis and Tectonic Setting

N.A. Krivolutskaya  Maslovskoe deposit as a new important PGE-Cu-Ni source in the Noril’sk region (Siberia, Russia)

V. Kalugin  Two-stage formation of the Oktyabrsky sulfide orebody, Noril’sk: evidence from vertical chemical zonation

Y.V. Nazimova  Geology and PGE mineralisation of the Main Ridge intrusions in Monchegorsks district, Baltic Shield

A.V. Lygin  A new style of Ni-mineralization resulting from the interaction of ultramafic rocks with hydrothermal fluids derived from granites: Avebury Ni-deposit, Western Tasmania

X.-R. Luo  Geoelectrochemical Anomaly, Mechanism and Exploration of Copper and Nickel Deposit, Hongqiling, Jilin, China

Wednesday 23 June 2010
Session III  Geochemistry of Chalcophile and Siderophile Elements (Convenors: Sarah-Jane Barnes & James Brenan

Session IIIa

J.-P. Lorand (KEYNOTE)  Geochemistry of platinum-group elements in the mantle: What do peridotites tell us?

H. Becker  Melting and refertilization of peridotites: what are the implications for the HSE budget of the Earth’s mantle?

N.R. Bennett  Metal-silicate partitioning of rhenium: Implications for terrestrial accretion

V.S. Kamenetsky  Primary melts of Emeishan and Karoo flood basalts: Linking Ni potential of the magmas and their mantle sources

Y. Yang  Siderophile elemental constraints on sulfide-saturated fractionation of the Cenozoic basalts and andesites in the South China Sea region

J.-F. Gao  PGE and Re-Os isotope geochemistry of the Kalatongke Cu-Ni sulfide deposit, NW China

Session IIIb  Chair: Hazel Prichard

P.J. Jugo (INVITED)  Exponential increase of sulfur content at sulfide saturation with increasing oxygen fugacity: implications for Cu-Ni-PGE mineralization
A.W. McNeill  
The Siqueiros Transform Fault MORB; A tale of sulfur-saturation

A.A. Ariskin  
Modeling sulphide solubility in MORB glasses and OI cumulate piles: the opposite effect of NiO vs FeO in the melt

A.G. Tomkins  
Formation of Magmatic Sulfide Deposits in Arcs by Reduction of Oxidized Basalt

J.L. Wykes  
The effect of FeO on the sulfur content at sulfide saturation (SCSS): A comparison between sulfur and selenium

I.V. Chaplygin  
Behaviour of Chalcophile and Highly Siderophile Elements (Au, PGE, Re) in volcanic gases of Kudriavy volcano (Kuriles)

**Session IIIc  Chair: Harry Becker**

B. Godel (INVITED)  
High-resolution X-ray computed tomography: a new technique to illuminate platinum ores

C. Patten  
Platinum-group elements and chalcophile elements content in sulphide droplets from MORB glass

S.A.S. Dare  
Platinum-group element (PGE)-bearing pyrites in pyrrhotite-rich sulfides from McCreedy and Creighton Ni-Cu-PGE sulfide deposits, Sudbury, Canada

H.M. Prichard  
Redistribution in the surface environment of Pt, Pd and Rh from road dust

X.-Y. Song  
Nature of mantle sources of magmatic sulfides mineralized intrusions in Palaeozoic convergent zones, Xinjiang, NW China

R.E. Botcharnikov  
The effects of fO2, Cl, and S on the geochemical behavior of Au in andesitic and rhyodacitic magmas

F.A. Blaine  
The role of Cl on the formation Pt micronuggets in experiments with hydrous haplobasalt: applications to ore-forming processes

**Session IIIId  Chair: Jacob Hanley**

M.L. Fiorentini  
Platinum-group element geochemistry of mineralized and non-mineralized komatiites and basalts

J.A. Coggon  
Dating platinum mineralisation using the 190Pt-186Os system: examples from the Bushveld Complex, RSA and the Meratus ophiolite, Borneo

J. Park  
The role of chromite crystallization on the PGE geochemistry of mafic magmas

C. Brough  
Trace element geochemistry of chromite as a pathfinder for anomalous PGE concentrations in the Al'Ays ophiolite

L.M. Zhitova  
Heterogeneity of chromium spinels of the Merensky Reef as the evidence of their origin, Bushveld Complex, South Africa

S.A. Linkermann  
Chrome and PGE behaviour from the Kemi Intrusion, Finland: geochemical and Sm-Nd isotopic implications

**Thursday 24 June 2010**

**Session IV  PGE Mineralogy and Beneficiation (Convenors: Michelle Huminicki & Paul Sylvester)**

**Session IVa**

L.J. Cabri (KEYNOTE)  
Process mineralogy in the Pt industry and future trends
C.C. Hamilton (INVITED) Process Mineralogy in the Pt Industry: An Evolution in Data Presentation, Interpretation and Added-Value, from the 1980’s to Present Day

T.L. Evstigneeva The “Non-Stoichiometry” of Platinum Group Minerals

M. Escayola Geochemistry and mineralogy of PPGE rich Middle Arm Brook chromitites (Newfoundland, Canada)

I. Uysal Cr-PGE mineralization in the Turkish ophiolites: The state of the art

T.L. Grokhovskaya PGE distribution and PGM assemblages in low-sulfide PGE deposits of the Paleoproterozoic Monchegorsk Complex, Kola Peninsula, Russia

Session IVb
F.D. Ford (INVITED) Process mineralogy of Sudbury platinum group minerals as determined by mineral liberation analyzer

I.M. Kjarsgaard Ore mineralogy of Cu-Ni-PGE deposits in the North Range footwall environment, Sudbury, Canada.

M.A. Kelvin Characterization of PGE occurrences in the Ovoid of the Voisey’s Bay Ni-Cu-Co Deposit, Labrador, with applications to mineral processing

M. Yudovskaya Facies variability of PGE mineralization in Platreef chromitites

J.C.Ø. Andersen Platinum-group minerals in the Craignure Cu-Ni-sulfide deposit, Scotland

D.A. Holwell Marginal Cu-Au-PGE mineralization in the newly discovered Togeda Macrolyke, Kangerlussaqq region, east Greenland

POSTER PRESENTATIONS

PGE Deposits
B. A. Azar Geochemistry of the Blackbird Chromite Deposit, McFaul’d’s Lake, Ontario

R. E. Jones Micro-analysis of early magmatic Fe(Ni,Cu) sulphide inclusions in the Platreef, Northern Bushveld Complex, South Africa

T. Karinen The Rometölväs Reef of the Koillismaa Intrusion

C. M. Muñoz Distribution of Platinum Group Elements in the Hinterland’s Ebay claim, central part of the Bell River Complex, Matagami, Quebec, Canada.

M. M. Price Platinum group element mineralization in the River Valley Intrusion, Ontario, Canada: Characterization and Effects of Water-Rock Interaction

R. G. Ruthart Characterization of High-PGE Low-Sulphur Mineralization at the Marathon PGE-Cu Deposit, Ontario

Ni-Cu-(PGE) Deposits
C. T. Barrie Metal dispersion halo surrounding the Kabanga North Ni-Cu-Co deposit, Western Tanzania

L. M. Chen Abundances and distributions of platinum group elements of Segment I, the Jinchuan Ni-Cu-(PGE) deposit, NW China: Implication for its genesis

R. M. Easton New geological developments related to the Paleoproterozoic East Bull Lake intrusive suite, Superior and Southern Provinces, Ontario, Canada

P. Hu The Permian Huangshanxi Cu-Ni deposit in western China: Magma evolution and ore genesis

R. Latypov Was the parental magma of the Sudbury Igneous Complex really superheated?
A. Laverenchuk  The Sudbury Igneous Complex, Canada: Numerical modeling confirms fractionation of a single parental magma

M. Munteanu  Distribution and significance of the PGE contents in the Lengshuiqing Ni-Cu deposit, Sichuan, SW China

I. R. Prokopyev  Mineralogical and geochemical characteristics of the Maksut copper-nickel deposit (Eastern Kazakhstan)

T. M. Ramadan  Cu-Ni-PGE Mineralization in the Arabian-Nubian Shield, South Eastern Desert, Egypt, Using Remote Sensing Approach

J. S. Scoates  Recent progress in determining the precise age of ultramafic sills and mafic dikes associated with mineralization in the Thompson Nickel Belt, Manitoba, Canada

K. Shindo  Ni-Cu mineralization with the Oshirabetsu gabbroic complex in the Hidaka metamorphic belt, Hokkaido, Japan

S. F. Sluzhenikin  Gold and silver in ores of the Norilsk region

A. E. Stout  Genesis of the McCreedy East Ni-Cu-PGE contact-footwall ore system, Sudbury, Ontario

S. Su  The origin and evolution of the Wengeqi mafic-ultramafic complex and PGE mineralization, Guyang County, Inner Mongolia, China

C. J. White  Low-sulphide PGE-Cu-Ni mineralization of the Sudbury Igneous Complex, Canada

N. Zeng  Petrologic and geochemical studies of ultramafic and mafic intrusions in southern part of Jinchuan, Gansu, China

Geochemistry of Chalcophile and Siderophile Elements

A. Beyanu  Behaviour of Au-PGE in amphibolites and their weathered equivalents in the NW border of the Congo Craton (South-Cameroon)

L. A. Bardeggia  Laser ablation ICP-MS element distribution maps as a tool to unravel the spatial distribution and chemical association of highly siderophile elements in sulfide assemblages: Examples from the Merensky Reef and the J-M Reef

J. M. Brenan  An experimental study of spinel- and chromite-melt partitioning of platinum group elements

T. Ciborowski  Internal anatomy of the dissected ~2.5-2.45Ga Matachewan-East Bull Lake and Mistassini large igneous provinces: Geochemical and tectonic implications for petrogenesis and economic mineralisation

D. M. Evans  Large-scale platinum-palladium enrichment of the mantle-crust transitional zone in the Nkenja mafic-ultramafic body, Tanzania

C. Galdames  Platinum-group elements in ultramafic rocks from La Cabaña area, Coastal Cordillera of South-Central Chile

S. Goderis  Detection and identification of projectile traces in a terrestrial impact structure using platinum group element ratios

R. S. Hiebert  Multiple sulfur isotopes: a new tool for identification of sulfur source in magmatic sulfide deposits

N. Leawood  Determination of PGE in sulfide ore deposits by isotope dilution-inductively coupled plasma mass spectrometry using hydrogen in collision reaction interface

P. Page  Chromite does not control IPGE (Os, Ir, Ru)

H. M. Prichard  Redistribution in the surface environment of Pt, Pd and Rh from road dust
E. V. Pushkarev  Primary magmatic and secondary postmagmatic compositional trends of chromian spinel from dunite of Uralian-Alaskan type complexes

M. Queffurus  The use of S/Se ratios in magmatic Ni-Cu-PGE sulfide deposits

E. V. Sharkov  PGE-Cu-Ni ore deposits in large igneous provinces: Why are they so rare? Evidence for Northern Eurasia

S.-Y. Yu  Effects of melt percolation on the Re-Os systematics of continental mantle lithosphere: A case study of spinel peridotite xenoliths from Yong’an, NE China

**PGE Mineralogy and Beneficiation**

H. R. Barrueto  Main features of the Pt-Pd chromitite-type ore deposit, Tróia Unit, Cruzeta Complex, NE Brazil: insights provided by microscopic and chemical approaches

A. Culaj  Mineralogy of the platinum group elements in the chrome mines in Albania

M. L. Dora  Ni-Cu-PGE mineralisation in the mafic-ultramafic rocks of western part of Bastar Craton, Central India and their petrogenesis

B. I. Gongalskiy  Platinum mineralization in the titanomagnetite and sulfide ores of the Chineyskiy Layered Massif, Northern Transbaikalia, Russia

R. J. Kaukonen  Mineralogical investigations of small scale beneficiation tests of some sulfide-poor PGE occurrences

H. Kozlu  Geochemistry of the platinum-group minerals (PGM) in the chromitites from Elbistan-Berit mantle/transition zone and Kızıldağ (Hatay) Ophiolite, SE-S Turkey

H. Miettunen  The method for PGM synthesis

V. Mitkin  Application of fluoroxidants for arbitration analyses of persistent PGE-bearing chromites, sulfides, carbonaceous rocks and tailing materials from exploration deposits (Review)

T. Oberthuer  Advances in the study of platinum mineralization by combining novel and classic mineralogical and geochemical methods

A. V. Okrugin  Origin of platinum-group minerals from dispersed elements to nuggets in mafic-ultramafic intrusive rocks.

L. Perevozhikov  Platinum group elements in sulfide bearing black shale ores, process materials and enrichment tailings from Zun-Kholba gold deposits (Russia)

S. V. Petrov  Applied PGE mineralogy and ore beneficiation of the Galmoenan deposit, Northern Kamchatka

J. A. Proenza  Platinum group minerals in the saprolitic horizon of Falcondo Ni-laterite deposits, Dominican Republic

P. V. Raju  Using Magnetite as an Indicator Mineral, Step 1: Calibration of LA-ICP-MS

M. Satya  PGE Mineralization in the late Archaean Sittampundi Layered Complex, Southern India

N. D. Tolstykh  Platinum lode deposits in the Galmoenanskiy and Svetloborskiy massifs (Ural-Alaskan type)

F. Zaccarini  Unusual PGE-rich chromitite in the “Butyrin-veins” of the Kytlym Ural-Alaskan complex, Northern Urals
Core Displays

The following companies had cores on display outside Alumni Hall on Monday, Tuesday, and Wednesday during coffee breaks and the poster sessions:

Duluth Metals Ltd.
Magma Metals Ltd.
Marathon PGM Corporation
Noront Resources Ltd.
North American Palladium Ltd.
Peck Geoscience
QuadraFNX Mining Ltd.
Wallbridge Mining Company Ltd.
Xstrata Nickel

Exhibits

The following sponsors had exhibits on display in the Fraser Auditorium Lobby on Monday, Tuesday, and Wednesday:

Mineral Exploration Research Centre
Mineralogical Association of Canada
Society of Economic Geologists
LOCAL ORGANIZING COMMITTEE

Chairman
Prof. Michael Lesher (Laurentian University)

Treasurer
Edward Debicki (Geoscience Laboratories)

Abstracts
Dr. Pedro Jugo (Laurentian University)
Dr. James Mungall (University of Toronto)
Heather Brown (Ontario Geological Survey)

Poster Displays
Nicole Tardif (Laurentian University)

Field Trips
Dr. Michael Easton (Ontario Geological Survey)
David King (QuadraFNX Mining)

Core Displays
David King (QuadraFNX Mining)

Registration
Merilla Clement (Geoscience Laboratories)

Website
Jennie Byron (Laurentian University)

Transportation
Dr. Phil Thurston (Laurentian University)

Catering
Ruth Debicki (Ontario Geological Survey)

Accommodation
Dr. Bruno Lafrance (Laurentian University)

Facilities
Dr. Douglas Tinkham (Laurentian University)

Guest Program
Olga Brinkman, Juliet McDonald, and Lynda James

Photographer
Beatrice Ulrich

Session Organizers
Prof. Sarah-Jane Barnes (Université du Québec à Chicoutimi), Dr. James Brenan (University of Toronto), Dr. Gordon Chunnett (Consultant), Dr. Michelle Huminicki (Brandon University), Prof. Michael Lesher (Laurentian University), Dr. Peter Lightfoot (Vale), Dr. David Peck (Consultant), and Dr. Paul Sylvester (Memorial University)

Workshop Leaders
Dr. Stephen Barnes (CSIRO) and Dr. Marco Fiorentini (University of Western Australia), Dr. James Mungall (University of Toronto), and Dr. James Miller (University of Minnesota–Duluth) and Dr. James Scoates (University of British Columbia)

Surface Field Trips
Brian Atkinson, Dr. Michael Easton, Sonia Préfontaine, and Mark Smyk (Ontario Geological Survey), Dr. Paul Golightly (Golightly Geoscience), Dr. Jacob Hanley (St. Mary’s University), Dr. Michel Houlé (Geological Survey of Canada), Dr. Richard James (Laurentian University), Dr. Scott Jobin-Bevans (Caracle Creek International Consulting), Dr. James Miller (University of Minnesota–Duluth), Edward Pattison (Wallbridge Mining Company Ltd.), Dr. Richard Sutcliffe (Ursa Major Minerals Inc.), Dr. Walter Peredery (Consultant)

Underground Trips
Steve Dunlop, Steven Gregory, and Renée Parry (Levack Mine); Roger Lichty, Mynyr Hoxha, and Thomas Maxwell (McCreedy West Mine); Judd Fee and Chelsey Protulipac (Podlosky Mine)

Laboratory Tours
Bob Anderson and Pavel Vasak (MIRARCo), Ed Debicki and Marcus Burnham (Geoscience Laboratories), Prof. Balz Kamber (Laurentian University), and Lori Kormos (Xstrata Process Support)

Advisory Committee
Paul Davis (First Nickel Inc.), Sergei Diakov (BHP–Billiton), Dr. Catharine Farrow (QuadraFNX Mining), Nic Fenner (Xstrata Nickel), and Dr. Andy Fyon (Ontario Geological Survey)
DEDICATION

The 11th International Platinum Symposium is dedicated in honour of Professor Reid R. Keays. Professor Keays is well known to everyone in the international PGE community for his pioneering work on various aspects of PGE geochemistry for the past 30 years (including some of the initial work on the first recovered lunar samples), for having mentored over 40 graduate students and post-doctoral fellows (many of whom are now leaders in the field), for having published over 120 papers in peer-reviewed internationally circulated journals and books, and for having organized the 1st International Platinum Symposium in 1971 in Melbourne, Australia, with John Lovering. Reid has inspired all of us in one way or another, and we are especially delighted to be able to honour him in Sudbury - the location of some of his very earliest and very latest research on Ni-Cu-PGE mineralization.

IN MEMORIAM

The international PGE community was greatly saddened by the death of Professor Tuomo Alapieti in August 2007. Professor Alapieti, who spent most of his academic career at the University of Oulu, is best known for his work on the Koillismaa and Kemi igneous complexes in Finland. He organized the 10th International Platinum Symposium in 2005 in Oulu with Markku Iljana. His leadership will be greatly missed.