

Building Strong Connections

Toronto Networking Event

November 15, 2016

5:30pm- 8:30pm

Twenty Toronto Street, 2nd Floor

Toronto, Ontario

Guest Speakers

Dr. Hernan Ugalde, Ph.D., P.Geo.

Dr. Iris Lenauer, Ph.D., P.Geo.

Presentation

“Beyond the Purple Blob – Geophysics & Structural Geology Data Integration”

Registration

Members \$20.00

Geoscience Students Free

Non-members \$50.00

Click on this [link](#) for online registration.

“Beyond the Purple Blob – Geophysics & Structural Geology Data Integration”

Geophysical and geological subsurface models are distinct in terms of their data distribution and resolution, modelling workflows, and the time of their creation in the mine life cycle. As a result of this, the district- to deposit-scale 2D-3D models developed in support of mineral exploration and mining projects suffer from a poor integration between geology and geophysics.

A distinct advantage of using data acquired through geophysical surveys for modelling is the even distribution of data over an area of interest. For this reason, geophysical models may be constructed for early-stage exploration programs where the subsurface geology is ill-constrained. For this purpose, 3D inversion of geophysical data and semi-automatic interpretation routines are becoming increasingly popular for building geophysical models. However, automated inversions do not always result in geologically sound models.

With increasing geological data collected during an early-stage exploration programs, the geophysical models need to be revisited to determine how well the models conform to the acquired data. However, geological data are commonly irregularly distributed as a result of the distribution of boreholes, or the availability of underground or surface exposures. The 2D-3D geological model is, therefore, constrained in its lateral and depth extents by the location and density of observation points.

Despite the complementary nature of geophysical and geological data, available geophysical data are often not integrated in geological models (and vice versa). Without their proper integration, reconciliation of geological data (faults, contacts, stratigraphy) with geophysical data (maps, sections and block models) will remain a challenge.

In the presented cases, limitations imposed on litho-structural model by irregular data distribution are counteracted by the regularly spaced data from geophysical surveys. The case studies show examples of how iterative modeling from geological and geophysical data results in an improved final product. The models presented herein aim to determine the position of rocks of distinct physical properties, to evaluate fault geometry and to extend structures from mapped locations into inaccessible/covered areas.

About Hernan Ugalde, Ph.D., P.Geo.

Hernan is a geophysicist with an interest in integrating geology into geophysical interpretations. Hernan Ugalde obtained a BSc and MSc in Geophysics at the University of Chile in Santiago. After 3 years at the Geological Survey of Chile (Sernageomin) he joined Paterson, Grant & Watson Limited’s Santiago office in 1997. In 2001 he moved to Canada to pursue a Ph.D. at the University of Toronto, which he obtained in 2006. Then he went to McMaster University as a postdoctoral research scientist from 2006 to 2011, working mostly in Bathurst, NB, Sudbury, ON and Newfoundland while keeping his links to PGW as a part-time consulting geophysicist. In 2011 he returned full time to PGW, where he has been processing, interpreting and modelling of geophysical data with a strong emphasis on obtaining geological information from various geophysical data. He has led and participated in numerous geophysical and geological training sessions in Chile, Argentina, Mexico, Nigeria, Ecuador, and Canada.

About Iris Lenauer, Ph.D., P.Geo.

Iris is a structural geologist with an interest in the role of structure in the formation of ore deposits. She obtained a B.Sc. in geochemistry at the University of Vienna. Her master’s thesis in structural geology at the University of Vienna involved mapping and petrographic analysis in a back-arc extensional system in Greece. From 2009 to 2012 Iris worked on her PhD thesis at McMaster University, studying deformation of the South Range of the Sudbury impact structure. In 2012 Iris joined SRK Consulting in Toronto, where she worked on regional structural interpretations as well as lithological and structural modelling. In April 2015 she joined PGW where she brings her experience in structural field mapping, fault analysis and integration of geology & geophysics into 3D geological & geophysical modelling. Iris is especially interested in brittle tectonics and the interaction between structures and mineralization.