



The
Geological
Society

servicing science & profession
英國地質學會香港分部



Structural controls and contributions to orogenic lode-gold deposits

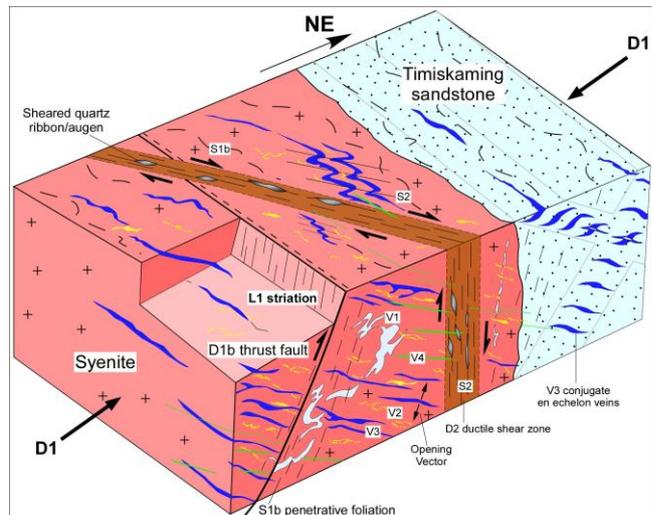
Including a case study of the Young-Davidson mine,
southern Abitibi Subprovince of Canada
Presented by Dr. Jason J. Zhang

Date: Wednesday 4th June 2014
Time: 6.30 pm – 7:30 pm
Venue: 3/F Meeting Room, Mariners Club, Middle Road, Tsim Sha Tsui
Seminar Fee: Free of charge
Registration: No prior registration is required. Seating capacity is limited to 50.
For enquiry, please email Ms Kitty CHAN at kitty.chan@arup.com.

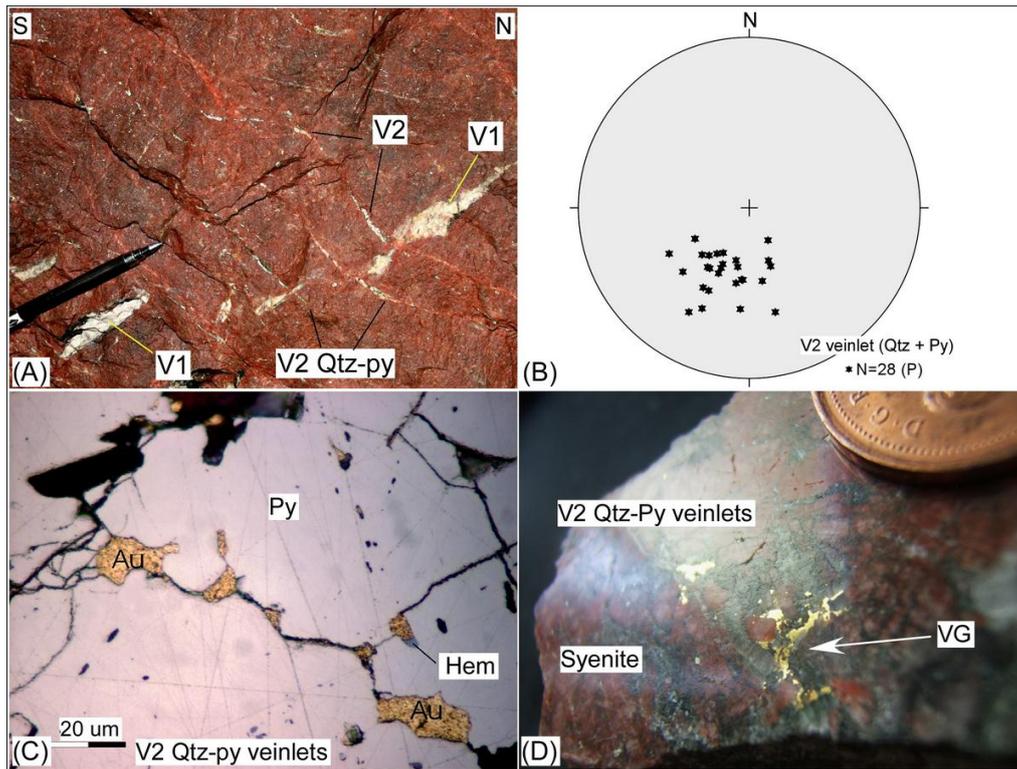
Synopsis:

“If a rock is deformed, its geometry before deformation must have been different from its current geometry. If we want to understand the relationships at a certain stage in the geological history, it is necessary to understand the geometry at that time”. A structural thinking is always the first priority in studying the mineral deposits of a deformed region.

As one of the ‘richest’ areas of the world, the Neoproterozoic (~2.7 billion years) southern Abitibi greenstone belt (subprovince) is well known for its lithological complexity, polyphase deformation, extensive hydrothermal alteration, and spatial association with world-class orogenic gold deposits. Within the subprovince, intrusion-related, in particular syenite-hosted gold deposits represent a significant type that is poorly understood. Whether the gold mineralization is genetically linked to the syenite intrusions (as in a magmatic model) or structurally associated with the subsequent crustal-scale shear zones remains very controversial. This talk will present the first-hand surface and underground mapping results, based on which we identify multiple generations of auriferous vein arrays. Combined with petrologic, petrographic and isotopic geochronologic data, we attempt to unravel their spatial and temporal relations to the regional polyphase deformational events and the major timing of gold mineralization. Outputs of this research will help understand other syenite- or small felsic intrusion-hosted gold deposits and guide gold explorations throughout the Abitibi subprovince and other greenstone belts worldwide.



Block diagram showing the spatial and overprinting relationships between different stages of veins and regional structures.



V₂veins. (A) NE-dipping V₂Qtz + Py veinlets crosscutting and overprinting V₁boudinaged veins. (B) Equal-angle lower-hemisphere projection of poles to V₂veins. (C) Visible gold in V₂ Qtz + Py veinlets in a polished hand specimen. (D) Photomicrograph of a V₂ Qtz + Py veinlet, with free gold along the cracks of or as inclusions within the pyrite. Abbreviations: Qtz – Quartz; Py – Pyrite; Hem – Hematite; VG – visible gold.

About the Speakers:

Dr. Jason J. Zhang

Dr. Zhang is a structural geologist specialising in structural geology and tectonic evolution of global-scale orogens through Archean (>2.5 billion years) to Phanerozoic, with interests ranging from microscopic structures to lithosphere-scale tectonics and from field based study to theoretical modelling. His research interest in economic geology deals with structural controls and modifications of the ore deposits in deformed regions. He obtained his bachelor and master degrees from the Peking University, and PhD degree from the University of Hong Kong, and then he worked as a postdoctoral fellow in the University of Waterloo in Canada. He is currently a lecturer of Earth System Science Programme in the Chinese University of Hong Kong. Dr. Zhang has published over thirty peer-reviewed journal papers with H-index of 24 and total 2000 citations (based on Google Scholar Citations). One paper is now the most cited publication in Journal of Structural Geology (ELSEVIER, since 2009).

