

Metamorphic extravaganza in Calgary

May 8-16, 2010

A 'metamorphic extravaganza' was held in Calgary between May 8 and May 16, 2010 in association with the GeoCanada 2010 meeting. Sponsored by the Mineralogical Association of Canada, it consisted of three events:

- a two-day pre-meeting short course on the "**Theriak-Domino**" phase equilibrium modeling software, presented by its developer, Christian de Capitani of the University of Basel, Switzerland;
- a two-day special session at the meeting entitled "**Interplay between Thermodynamics, Kinetics and Deformation in Metamorphism**";
- a four-day field trip to metamorphic localities in southeastern British Columbia entitled "**Metamorphism and tectonics in the southern Purcell anticlinorium and Kootenay Arc, southeastern British Columbia**".

The *Theriak-Domino* short course was held at the Department of Geoscience, University of Calgary. It was attended by 35 geoscientists, over half of whom were students (*see photo*). Christian de Capitani ('Capi' as he is known by many) led attendees through the calculation of: pressure-temperature isochemical phase-diagram sections (often referred to as 'pseudosections') for different bulk compositions; various types of isolines (e.g., isopleths, modal and density contours) on these sections; log-activity diagrams; temperature-log-activity diagrams; binary and ternary diagrams; 'pixel maps' allowing rapid visualization of hundreds of compositional and physical parameters in a given phase diagram section; and a number of specialized applications available in the software. The attendees were enthusiastic about the rapidity, flexibility and ease of use of the software, and by the possibilities it affords to experiment with different chemical systems and bulk compositions. A senior attendee after the first day said "I am filled with joy" and after the second day said "I wish I were starting my career in metamorphic petrology over again". Attendees got a taste of Canada's national Spring ritual when they gathered for a lively group meal at a pub with televisions on all sides showing the Stanley Cup playoffs (ice hockey for the uninitiated).

The two day special session "*Interplay between Thermodynamics, Kinetics and Deformation in Metamorphism*" was organized by Dave Pattison, Fred Gaidies and Ed Ghent. Twenty-eight talks and eight posters were presented by individuals from 11 countries. The geographic diversity was represented by the three invited speakers: Rainer Abart from University of Vienna ("Chemical mass transfer in polycrystals and polycrystalline aggregates"), Dave Hirsch from Western Washington University ("An experimental inquiry into grossular nucleation: first results"), and Dave Waters from University of Oxford ("Equilibrium calculations and real metamorphic processes: scenes from a troubled relationship"). The session was well attended and featured much discussion. Following the session, another lively group meal ensued at a different pub, this time without any hockey (except for those who disappeared upstairs...).

The four-day post-meeting field trip "*Metamorphism and tectonics in the southern Purcell anticlinorium and Kootenay Arc, southeastern British Columbia*", led by Dave Pattison, David Moynihan and Chris McFarlane, took 27 participants across the leading edge of the Canadian Cordilleran orogen, through the famous Rocky Mountain fold and thrust belt, and into the metamorphic-magmatic orogenic hinterland, the southern Omineca belt. The trip took the group through the towns of Cranbrook, Creston and Nelson. A theme of the trip was the varying character of, and interfaces between, Barrovian-type and Buchan-type metamorphic domains ranging in age from Mesoproterozoic to Cretaceous. Participants saw this beautiful part of British Columbia at its finest under sunny skies and pleasant temperatures. The diversity of the participants (*see photo*) made for excellent outcrop discussions.

Of several impressions left by the events at the 'metamorphic extravaganza', a lasting one was the vitality, enthusiasm, internationality and high scientific calibre of the younger attendees, broadly including graduate students, recent PhDs, and relatively new faculty in petrology positions at various institutions across the globe. This, combined with the range of novel techniques being brought to bear on metamorphic petrology, and the application of broadly metamorphic techniques to numerous other areas of Earth Science, speak to a discipline that is flourishing and forward-looking.

Theriak-Domino Short Course
Department of Geoscience, University of Calgary
May 8-9, 2010

Instructor: Christian de Capitani (Capi)



Back row: Doug Tinkham, Chris Daniel, Howard Day, Linc Hollister, Peter Nabelek, Ian Fitzsimons, Rob Hunter, Melanie Meyer, Mauricio Ibanez-Mejia, Fred Gaidies, Jamie Kraft, Chloe Bonamici, Reid Staples, Sam Morfin, Ed Sawyer, Jerry Magloughlin, Dave Pattison.

Middle row: Hisako Shimizu, Toshiaki Tsunogae, Yoonsup Kim, Helen Lang, Christian de Capitani, Julie Baldwin, Leanne Smar, Kristin Dorfler, Jared Butler.

Front row: Brett Hamilton, David Moynihan, Annie Greenfield, Darrell Henry, Dave Mogk, Chris Coueslan, Tania Martins, Joel Cubley, Chris McFarlane, Rajeev Nair.

**Metamorphism and tectonics in the southern Purcell anticlinorium
and Kootenay Arc, southeastern British Columbia**
May 13-16, 2010

Leaders: Dave Pattison, David Moynihan and Chris McFarlane



Back row: Joel Cubley, Dave Waters, Peter Nabelek, Ben Collins, Sam Morfin, Dave Pattison, Ed Sawyer, Ron Uken, Ian Fitzsimons, Linc Hollister, Chris Daniel, Barb Dutrow, David Moynihan, Sergey Malyshev.

Front row: Darrell Henry, Chris McFarlane, Melanie Meyer, Chris Harrison, Julie Baldwin, Brett Hamilton, Leanne Smar, Stephanie Moore, Tania Martins, Chris Coueslan, Yoonsup Kim (above Chris Coueslan), Felix Gervais, Andrei Khudoley.

Metamorphism and tectonics in the southern Purcell anticlinorium and Kootenay Arc, southeastern British Columbia

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- Above left:** Stop 1-1: entry into the Rockies - the McConnell thrust and Mt. Yamnuska.
- Above right:** Examining chlorite (biotite??) grade middle Aldridge turbidites, Stop 3-2a, Creston.
- Middle left:** Link Hollster figuring out the order of veining and folding, Stop 3-2b, near Creston.
- Middle right:** David Moynihan holding forth on the metamorphic contrast across Kootenay Lake.
- Lower right:** Giant diopside! Kootenay Lake, near Crawford Bay.

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Above left: Examining sillimanite knots in schists on Riondel peninsula, Stop 3-7.
Above right: Taking in the views on the Kootenay Lake ferry.
Middle left: Crossing a scree slope along Coffee Creek, Stop 4-1.
Middle right: View south down Kootenay Lake from Coffee Creek forest road, Stop 4-4.
Lower left: Returning to the vans from Coffee Creek.
Lower right: Brett Hamilton, Joel Cubley, David Moynihan, Dave Pattison, Chris McFarlane in front of the rainy Purcell Mountains, return trip to Calgary.