



Structural Geology
& Tectonics Division



Winter 2012

<http://gac.esd.mun.ca/sgtd>

THE MAIN THRUST

**NEWSLETTER OF THE CANADIAN TECTONICS GROUP AND THE
STRUCTURAL GEOLOGY AND TECTONICS DIVISION OF THE
GEOLOGICAL ASSOCIATION OF CANADA**



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1. Students: apply for a grant of up to \$1000 to attend GAC-MAC in St. John's!

SGTD will once again provide support to enable students to attend the GAC-MAC annual meeting in St. John's. \$1000 is made available to support student travel to the GAC-MAC meeting. Priority will be given to a student or students who are presenting talks or posters, and who wish to attend either of the sponsored field trips (see below). Students should contact the chair (john.waldron@ualberta.ca), attaching a copy of a submitted abstract, together with a short cover letter outlining the costs associated with attendance, including travel.

Deadline: March 31st 2012.

2. 2011 CTG/SGTD Workshop

The 31st CTG meeting, co-hosted by the SGTD, was held at la Domaine Forget, Charlevoix, Québec from October 21-23 2011. The meeting was ably organized by Normand Goulet, Approximately 30 attended, and were treated to a broad variety of talks, good food and drink, and an excellent field trip in two parts along the beautiful north shore of the St. Lawrence, to examine structures associated with the Charlevoix meteorite impact, led by Alain Tremblay and Francine Robert.

A copy of the field guide, and a selection of fine photographs, are posted at the CTG/SGTD web site at <http://gac.esd.mun.ca/sgttd/>



3. Winners of Jack Henderson awards for best theses in 2010

It was decided at the 2010 fall meeting that more than one thesis award could be given in each category, if the submitted theses were of sufficient merit. Unsuccessful submissions in 2010 will be carried over to the 2011 competition.

The following awards were made for theses defended in 2010. Included below are some comments from the reviewers about the winning theses.

MSc award: Tasca Noela Santimano

Thesis Title: Kinematics and mechanisms of upper-crustal deformation in the Eastern Cordillera, southern Central Andes, NW Argentina

Supervisor: Ulrich Riller

University: McMaster University

"...This is a very innovative and thought-provoking thesis that goes well beyond the normal standard for a MSc degree. The thesis presents a modern morphotectonic and paleostress analysis of the kinematics of Cenozoic to recent faulting on the eastern margin of the Puna plateau. The results indicate that local conditions dictate the kinematics of faults and not the kinematics of the plate boundary. When published, the results will compel practitioners of fault-slip data analysis to rethink interpretations of kinematic data in terms of their relation to plate boundary forces...."

PhD award First prize: Dawn Anne-Marie Kellett

Thesis Title: Tectonic evolution of the South Tibetan Detachment System, Bhutan Himalaya

Supervisor: Djordje Grujic

University: Dalhousie University

"...Dawn Kellett is to be congratulated for her PhD thesis. The thesis is very well written. Data and observations in each of the four critical chapters, two of which are already published in reputed international journals (Lithosphere and Journal of Metamorphic Geology), are well documented and clearly separated from interpretations. The conclusions and interpretations reached with respect to the cause or causes for detachment of upper-crustal strata from low-angle normal faults within the "compressional" Bhutan Himalaya are all viable and of high scientific importance in my opinion. In this regard Dawn Kellett's PhD thesis follows the tradition of geodynamicists from Dalhousie University in significantly advancing our knowledge on the geodynamics of hot orogens, and the Himalaya in particular. I truly enjoyed reading the thesis and learned tremendously. Without doubt, this is a solid piece of work that deserves to be honoured...."

PhD award Second prize: Christoph Schrank

Thesis Title: Physical models of shear zones: On the relationship between material properties and shear zone geometry

Supervisor: Sandy Cruden

University: University of Toronto

"...This well-written, comprehensive thesis provides significant insights into the experimental study of shear zone localization and development. Through experiments and investigations into isothermal analog materials, it explores topics in localization and rheological controls on shear zones, and provides insights into how structures in natural shear zones may or may not yield qualitative information about rheology and material behaviour...."

4. Winners of the David Elliott Best Paper award

The Dave Elliott award for best paper in Canadian structural geology and tectonics was awarded to:

Kyle P. Larson, Laurent Godin, William J. Davis, and Don W. Davis

for their paper, title and abstract below:

Out of sequence deformation and expansion of the Himalayan orogenic wedge: insight from the Changgo culmination, south central Tibet, published in *Tectonics*, 29, TC4013, doi:10.1029/2008TC002393

The Changgo culmination, one of the North Himalayan domes in south central Tibet, consists of a multiphase granite core surrounded by a deformed metasedimentary carapace. The granitic core records general non-coaxial shear with a top-to-the-south sense shear component. The contact between the core and the carapace is a shear zone, characterized by general non-coaxial shear with a top-to-the-north shear sense, interpreted to be the northern continuation of the South Tibetan detachment system (STDS). The shear zone contains lenses of leucogranite dated at 35.4 Ma. This is interpreted to reflect Eocene crustal thickening, coeval with the earliest shortening event recorded in the carapace. The main phase of the Changgo granite crystallized at 23.5 Ma, while undeformed aplite dikes, the youngest phase observed in the granite, were intruded at 22.1 Ma. Aplite dikes crosscut the main deformation fabric within the Changgo granite; therefore, that deformation and associated south directed shearing must have ended between 23.5 Ma and 22.1 Ma. The dikes are strained within the STDS, indicating that final displacement along the STDS must post-date 22 Ma, yet be older than 18.4 Ma, the cooling age of muscovite in the shear zone. It is proposed that the exhumation of the Changgo culmination is related to tectonically driven erosion in response to crustal thickening and rebuilding of the orogenic critical taper wedge. Subsequently, deformation in the wedge migrated toward the foreland, expanding the orogenic wedge laterally and moving the locus of displacement from the Main Central thrust structurally downward to the Main Boundary thrust.

5. Call for Submissions for the Jack Henderson Best MSc Thesis Award and Best PhD Thesis Award.

We are calling for submissions for the **Best MSc Thesis Award** and the **Best PhD Thesis Award**. Theses submitted to a Canadian university and successfully defended in the 2011 calendar year are eligible. **Submissions must be received by February 28th, 2012.** A submission can be made by the thesis supervisor, by the student, or by any member of the division. It should include a “statement of nomination” letter from the supervisor or a thesis examiner, stating that the thesis was successfully defended in 2011, outlining the key contributions that it makes to structural geology and tectonics, and identifying a chapter or chapters in the thesis that are of particular excellence. In the case that the student submits a copy of the thesis, the onus is on the student to make sure that the supervisor (or a member of the examination committee in the case that the supervisor is not available) submits the nomination letter. Theses for which we receive no nomination letters will not be considered for an award.

We prefer to receive theses as pdf documents by mail on a CD or DVD. Please send the theses to:

Bruno Lafrance (SGTD Vice Chair) Department of Earth Sciences Laurentian University Sudbury, Ontario, P3E 2C6 Telephone: (705) 675-1151 ext 2264 Fax: (705) 675-4898 E-mail:blafrance@laurentian.ca.

Deadline: submissions must be received at the above address by Feb 28th, 2012

6. Dave Elliott Best Paper Award

We are also interested in submissions for the **Best Paper Award**. Your councilors will prepare a shortlist of papers written by authors based in Canada or dealing with Canadian topics and *with publication date in the 2011 calendar year*. Priority will be given to peer-reviewed publications. Submissions from the membership are also welcome, and should if possible include a PDF file of the paper. Submissions by the authors will be considered. We will then appoint a small committee (of individuals not involved with any of the shortlisted papers, or course) to review the shortlisted papers and select a winner. These submissions should go, before February 28, to: John Waldron (SGTD Chair) john.waldron@ualberta.ca

7. Tectonics and structural geology at the St. John's GAC general meeting

The 2012 GAC-MAC joint annual meeting will be held in St. John's from May 27-29, preceded and followed by an impressive selection of field trips.

The following sessions, sponsored by the Structural Geology and Tectonics Division, may be of particular interest to our division members.

Sessions:

- Unravelling the Tectonic Evolution of Deeply Exhumed Orogens, with Special Reference to the Proterozoic Grenville and Sveconorwegian Orogens (organized by Toby Rivers, Aphrodite Indares, Jenny Andersson and Bernard Bingen.)
- Evolution of the northern Appalachians in honour of Hank Williams (organized by Cees van Staal, Stephen Johnson, Dennis Brown and John Waldron.)

For further details see the GAC MAC website: <http://stjohns2012.ca/>

Several field trips may also be of interest CTG/SGTD members. In particular, the following are sponsored by the division:

- Accreted terranes of the Appalachian orogen in Newfoundland: in the footsteps of Hank Williams (led by **Cees van Staal and Alexandre Zagorevski**).
- **Stratigraphy, Tectonics and Petroleum Potential of the Deformed Laurentian Margin and Foreland Basins in Western Newfoundland** (led by John Waldron and Larry Hicks).

For further details, see the GAC MAC website at:

<http://stjohns2012.ca/program/field-trips/>

8. CTG/SGTD 32nd Fall Workshop

Plans for the next fall workshop of the CTG are at a preliminary stage. At the fall meeting it was agreed that Wouter Bleeker would organize a meeting and field trip based in either Timmins Mining Camp or the Ottawa Graben.

9. SGTD Business Meeting

A business meeting of the SGTD was held at the CTG held at Domaine Forget, Charlevoix, Québec. Minutes are included below.

The next business meeting will be held at the GAC annual meeting 2012 in St. John's NL.

10. Minutes of the SGTD Business Meeting at CTG/SGTD 2011, Domaine Forget, St-Irénée, Quebec

(Minutes remain unofficial until approved at the following business meeting.)

Meeting held at the Domaine Forget, St-Irénée, Quebec on 22 Oct. 2011, during the 29th annual joint fall workshop of the Canadian Tectonics Group

Chaired by SGTD chair John Waldron. Minutes recorded by SGTD secretary Jürgen Kraus

10 members in attendance:

Agenda:

1. Approval of the minutes of the last business meeting
2. Matters arising
3. Appointment of a committee to nominate a new chairperson for May 2012
4. Sponsorship of sessions and field trips GAC/MAC 2012
5. Report on prizes
6. Sponsorship of students to meetings
7. CTG 32 workshop in 2012
8. Other business

Meeting called to order at 21:00

1& 2. Approval of the minutes of the last business meeting, and matters arising

Minutes were not available so this was deferred to the next meeting

3. Appointment of a committee to nominate a new chairperson for May 2012

A new chairperson will have to be voted in during the next business at GAC/MAC 2012 according to bylaws. Local chairpersons for the nominating committee are required. Suggested are Dan Gibson (West), Dazhi Jiang (Central), and Joe White (East).

4. Sponsorship of sessions and field trips GAC/MAC 2012

Two sponsored sessions and two field trips were suggested:

Sessions:

- Unravelling the Tectonic Evolution of Deeply Exhumed Orogens, with Special Reference to the Proterozoic Grenville and Sveconorwegian Orogens (Organized by Toby Rivers, Aphrodite Indares, Jenny Andersson and Bernard Bingen.)
- Evolution of the northern Appalachians in honour of Hank Williams (organized by Cees van Staal, Stephen Johnson, Dennis Brown and John Waldron.)

Field Trips:

- Accreted terranes of the Appalachian orogen in Newfoundland: in the footsteps of Hank Williams (led by **Cees van Staal and Alexandre Zagorevski**).
- **Stratigraphy, Tectonics and Petroleum Potential of the Deformed Laurentian Margin and Foreland Basins in Western Newfoundland** (led by John Waldron and Larry Hicks).

5. Report on prizes

The question was raised whether we should keep the prizes as they are. Everybody was in favour.

6. Sponsorship of students to meetings

No sponsorship had been applied for for the present meeting. One student had been sponsored for a 2011 GAC/MAC field trip. In the future, sponsored students should receive a free one

year GAC membership for the following year. It was also suggested to keep the sponsorship for student field trips the same as the previous year or to sponsor a second student at GAC/MAC 2012. Treasurer Andy Okulitch has to be consulted on whether there is enough money available.

It was decided to advertise the sponsorship details on the website and on the mailing list a.s.a.p.

7. CTG 32 workshop in 2012

Where should it be held and who should organize it? Wouter Bleeker could host it either in the Timmins Gold Mining Camp or around Ottawa.

8. Other business

Shoufa Lin mentioned a medal by the Canadian Federation of Earth Sciences, created in 2008 to honour excellence in mentoring, which we should take advantage of. Normand Goulet was thanked for organizing the workshop.

The meeting was adjourned at 22:05.

11. Current SGTD Executive and Councillors

Chair: *John Waldron*, University of Alberta, Edmonton

Vice Chair: *Bruno Lafrance*, Laurentian University, Sudbury

Secretary: *Jürgen Kraus*, Mortal Oil Ltd. Calgary

Treasurer: *Andy Okulitch*, Geological Survey of Canada (Vancouver)

Dan Gibson, Simon Fraser University, Vancouver

Normand Goulet, Université Québec à Montreal

Mary Louise Hill, Lakehead University, Thunder Bay

Lyal Harris, Institut national de la recherche scientifique, Québec

Edith Martel, Northwest Territories Geoscience Office, Yellowknife

Joseph C. White, University of New Brunswick, Fredericton