



Structural Geology
& Tectonics Division



Winter 2015

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

THE MAIN THRUST

***NEWSLETTER OF THE CANADIAN TECTONICS GROUP DIVISION OF
THE GEOLOGICAL ASSOCIATION OF CANADA***



Group photograph at the Sudbury 2014 CTG Workshop (Photo: Z. Toth)

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1. 2014 Canadian Tectonics Group Annual Workshop

The 34th meeting of the Canadian Tectonics Group was held in Sudbury, Ontario (40 participants). Bruno Lafrance (Laurentian University) and Dazhi Jiang (University of Western Ontario) ably organized the meeting. The two-day meeting was divided into a day of talks and poster presentations (Oct. 4th) and a geological field excursion along the Grenville Front southeast of Sudbury and around the Sudbury structure focusing on pre- and post-impact shear zones and high strain zones in the Sudbury area (Oct. 5th). On behalf of the CTG community, thank you Bruno and Dazhi for making this happen!

2. Students: apply for a grant of up to \$600 to attend GAC-MAC-AGU-CGU Joint Assembly in Montreal, Quebec

CTG will once again provide support to enable two students to attend the GAC-MAC-AGU-CGU Joint Assembly. 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 Section 3 below). Students should contact the CTG Chair (godinl@queensu.ca), attaching a copy of a submitted abstract, together with a short cover letter including:

- A budget of the costs associated with attendance, including travel, and other sources of funding available;
- A statement indicating why you wish to attend the meeting and how you expect to benefit from it;
- A transcript or transcripts of your academic record.

Deadline: March 13, 2015

3. Tectonics and structural geology at the 2015 Montreal GAC-MAC-AGU-CGU Joint Assembly

The 2015 GAC-MAC-AGU-CGU Joint Assembly will be held in Montreal from May 3 to 7, preceded and followed by field trips. The following field trips are sponsored by the CTG:

- Tectono-Stratigraphy and late intrusive history of the northeastern Composite Arc Belt, Grenville Orogen, and the nature of the Central Metasedimentary Belt Boundary Tectonic Zone (April 30 to May 3)
- Anatomy of Ordovician volcanic arc and forearc Basin in the southern Québec Appalachians (May 7 to May 9).
- Tectono-stratigraphy of the Chibougamau mining camp and the nature of the Abitibi-Opatoca boundary (May 7 to May 10).

For further details, see the Conference website at: <http://ja.agu.org/2015/>

4. 35th CTG Fall Workshop in 2015

We are pleased to announce that Deanne van Rooyen (Cape Breton University) will host the 35th Annual Canadian Tectonics Group workshop in Sidney, Nova Scotia in

October 2015. Rumour has it that the Cabot Trail will be integrated into the field trip. Stay tuned for details.

According to the CTG historical geographical rotation, the 2016 meeting should be held in central Canada – we are currently accepting suggestions, nominations, and volunteers!



*Come celebrate 35 years of Canadian Tectonics Group Workshops in Nova Scotia!
(Map courtesy of J. Kraus)*

5. Winners of Jack Henderson awards for best theses

The following awards were made for theses defended in 2012 or 2013.

PhD thesis prize:

Jared Butler of Dalhousie University for his thesis “Crustal subduction and the exhumation of (ultra)high pressure terranes: Contrasting modes with examples from the Alps and Caledonides”

Co-supervised by Rebecca Jamieson and Chris Beaumont

MSc thesis prize:

Joel Angen, University of Waterloo for his thesis “Structural and geochronological investigation of the southern Alexander terrane in the vicinity of Porcher Island, northwestern British Columbia”

Co-supervised by Shoufa Lin and Cees van Staal

Congratulations to both winners and their supervisors!

6. 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 2014 calendar year are eligible. **Submissions must be received by February 20th, 2015**. The thesis supervisor, the student, or any member of the division can make a submission. It should include a “statement of nomination” letter from the supervisor or a thesis examiner, stating that the thesis was successfully defended in 2014, outlining the key contributions that it makes to structural geology and/or tectonics, and identifying a chapter or chapters in the thesis that are of particular

excellence. We also ask that the duration for completion of the thesis be included, and if necessary, a statement of any extenuating circumstances that may have delayed completion. 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 email (if 25 MB or less), a secure download site, or by mail on a CD or DVD. Please send the theses to:

Dan Gibson (SGTD Vice-Chair) Department of Earth Sciences, Simon Fraser University, 8888 University Drive, Burnaby, B.C. Canada V5A 1S6

E-mail:hdgibson@sfu.ca

Deadline: submissions must be received at the above address by Feb 20th, 2015

7. Winner of the David Elliott Best Paper award

The Dave Elliott award for best paper in Canadian structural geology and tectonics, with publication year 2013, was awarded to:

Reid Staples, Dan Gibson, Rob Berman, Jim Ryan & Maurice Colpron, for their paper entitled: “A window into the Early to mid-Cretaceous infrastructure of the Yukon-Tanana terrane recorded in multi-stage garnet of west-central Yukon, Canada” which appeared in *Journal of Metamorphic Geology*, 31(7), 729-753.

Congratulations and well done!

Abstract: *Amphibolite facies metasedimentary schists within the Yukon-Tanana terrane in the northern Canadian Cordillera reveal a two-stage, polymetamorphic garnet growth history. In situ U-Th-Pb Sensitive High Resolution Ion Microprobe dating of monazite provide timing constraints for the late stages of garnet growth, deformation and subsequent decompression. Distinct textural and chemical growth zoning domains, separated by a large chemical discontinuity, reveal two stages of garnet growth characterized in part by: (i) a syn-kinematic, inclusion-rich stage-1 garnet core; and (ii) an inclusion-poor, stage-2 garnet rim that crystallized with syn- to post-kinematic staurolite and kyanite. Phase equilibria modelling of garnet molar and compositional isopleths suggest stage-1 garnet growth initiated at ~600 °C, 8 kbar along a clockwise P–T path. Growth of the compositionally distinct, grossular-rich, pyrope-poor inner portion of the stage-2 overgrowth is interpreted to have initiated at higher pressure and/or lower temperature than the stage-1 core along a separate P–T loop, culminating at peak P–T conditions of ~650–680 °C and 9 kbar. Stage-2 metamorphism and the waning development of a composite transposition foliation (ST) are dated at c. 118 Ma from monazite aligned parallel to ST, and inclusions in syn- to post-ST staurolite and kyanite. Slightly younger ages (c. 112 Ma) are obtained from Y-rich monazite that occurs within resorbed areas of both stage-1 and stage-2 garnet, together with retrograde staurolite and plagioclase. The younger ages obtained from these texturally and chemically distinct grains are interpreted, with the aid of phase equilibria calculations, to date the growth of monazite from the breakdown of garnet during decompression at c. 112 Ma. Evidence for continued near-isothermal decompression is provided by the presence of retrograde sillimanite, and cordierite after staurolite, which indicates decompression below ~4–5 kbar prior*

to cooling below ~550 °C. As most other parts of the Yukon-Tanana terrane were exhumed to upper crustal levels in the Early Jurassic, these data suggest this domain represents a tectonic window revealing a much younger, high-grade tectono-metamorphic core (infrastructure) within the northern Cordilleran orogen. This window may be akin to extensional core complexes identified in east-central Alaska and in the southeastern Canadian Cordillera.

The Selection committee felt strongly that an Honourable Mention should go to **Rajesh Goteti, Christopher Beaumont and Steven J. Ings** for their paper “Factors controlling early stage salt tectonics at rifted continental margins and their thermal consequences”, which appeared in *Journal of Geophysical Research: Solid Earth*, 118(6), 3190-3220.

Forthcoming Dave Elliott Best Paper Award

We are also calling for submissions for the **Best Paper Award**. Your councillors will prepare a shortlist of papers written *by authors based in Canada or dealing with Canadian topics* and *with a publication date in the 2014 calendar year*. Priority will be given to peer-reviewed publications. Submissions from the membership are also welcome and should include a PDF file of the paper in PDF format. Submissions by the authors will also be considered. We will appoint a small committee of individuals not involved with any of the shortlisted papers to review the shortlisted papers and select a winner. These submissions should be sent before **February 27, 2015** to: Laurent Godin (CTG Chair): godinl@queensu.ca

8. CTG Business Meetings

Business meetings of the CTG were held at the GACMAC meeting in Fredericton, New Brunswick, and at the CTG workshop in Sudbury, Ontario. Minutes are included below.

The next business meeting will be held at the GAC annual meeting 2015 in Montreal, Quebec

CTG business meeting Fredericton NB; May 22 2014

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

Acting Chair: Joseph C. White

Minutes taken by: Jürgen Kraus

1. Approval of Minutes of last meeting at CTG, Victoria

Cees van Staal moved acceptance, Robert Dokken seconded. All were in favour so that the Victoria minutes were unanimously approved.

2. Matters arising, not covered below

Normand Goulet, Lori Kennedy, and Deanne van Rooyen submitted one item each (see 8. Other business).

3. Financial report

The current financial report was not to be available at the meeting. However, the updated report (as of December 31 1014) is included herewith as a record:

Treasurer's report (Submitted by A.V. Okulitch)

<i>Balance, 31 Dec 2013:</i>	\$ 5949.50
<i>Bank charges:</i>	- 25.00
<i>Interest:</i>	+ 5.70
<i>Membership dues 2012:</i>	+ 1170.00
<i>Membership dues 2013:</i>	+ 1160.00
<i>PhD thesis award:</i>	- 500.00
<i>Student travel to CTG:</i>	- 1500.00
<i>MSc thesis award:</i>	- 400.00
<i>Best paper prize:</i>	- 200.00
<i>Balance, 31 Dec 2014:</i>	\$ 5658.19

4. Awards presentations

GAC Student support:

The following two students are awarded \$750 to subsidize their participation at GAC and Field trip A2 (led by Cees van Staal and Reg Wilson)

- **Robert Dokken** Department of Earth and Atmospheric Sciences, University of Alberta (dokken@ualberta.ca)
- **John Wesley "Wes" Buchanan II**, Colorado School of Mines (jbuchana@mymail.mines.edu)

Dave Elliott award for best paper:

The paper by Reid Staples, Dan Gibson, Rob Berman, Jim Ryan & Maurice Colpron, entitled *A window into the Early to mid-Cretaceous infrastructure of the Yukon-Tanana terrane recorded in multi-stage garnet of west-central Yukon, Canada which appeared in Journal of Metamorphic Geology, 31(7), 729-753*, has been selected as the winner of the Dave Elliott award for best paper, the annual award of the Structural Geology and Tectonics Division of the Geological Association of Canada. Congratulations to Reid and co-authors.

Honourable mention goes to Rajesh Goteti, Christopher Beaumont and Steven J. Ings for their paper *Factors controlling early stage salt tectonics at rifted continental margins and their thermal consequences*, which appeared in *Journal of Geophysical Research: Solid Earth*, 118(6), 3190-3220.

Jack Henderson prizes for best theses:

The PhD thesis prize goes to: Jared Butler, Dalhousie University for the thesis: *Crustal subduction and the exhumation of (ultra)high pressure terranes: Contrasting modes with examples from the Alps and Caledonides*, co-supervised by Rebecca Jamieson and Chris Beaumont

The MSc thesis prize goes to: Joel Angen, University of Waterloo for the thesis: *Structural and geochronological investigation of the southern Alexander terrane in the vicinity of Porcher Island, northwestern British Columbia*, co-supervised by Shoufa Lin and Cees van Staal.

5. CTG fall meeting 2014 announcement

Bruno Lafrance and Dazhi Jiang will be organizing the 2014 fall workshop in Sudbury, Oct. 4-5. Details to be announced soon.

6. GAC 2015 – Montreal. CTG sponsorship of Special Sessions

Lyal Harris had submitted a request for a special session on 'Archean Tectonics'. Shoufa Lin moved it; John Waldron seconded it; all were in favour.

7. Bylaws update

Joe White updated the audience on the recently change bylaw according to which the group is now formally called 'Canadian Tectonics Group'. Details are found on the [Canadian Tectonics Group website](#).

8. Other business

Deanne van Rooyen offered to host the 2015 fall workshop including a field trip to Cape Breton. It will be scheduled for early October.

Norman Goulet asked for an explanation of the student travel award modus: how many students are funded. Joe White replied that two students are funded; they are eligible if they give a paper at the conference. John Waldron added that typically 8-10 students apply and described the process for selecting winners. The awards typically amount to ca. \$1000, and contribute to complete or partial subsidy of field trip costs. It was asked whether such funding supports the supervisors and not the students. It was recommended to form a small committee to review the student funding modus.

Lori Kennedy proposed the installation of a dropbox in order to share structural geology labs and possibly lecture notes. She will set it up.

The meeting was adjourned at 13:14.

CTG business meeting Sudbury ON; Oct 4 2014

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

Chaired by Laurent Godin; Minutes taken by Jürgen Kraus

12 eligible members present

1. Approval of Agenda

Shoufa Lin moved, Dazhi Jiang seconded. All were in favour.

2. Approval of Minutes of last meeting at GAC in Fredericton

Jean Goutier moved, Bruno Lafrance seconded. All were in favour.

3. Matters arising, not covered below.

No such other matters arose.

4. Awards – Discussion on Awards level and

5. GAC student sponsorship – Discussion on student funding combined

Laurent Godin pointed out that an approx. \$10,000 excess in funds 2 years ago has been eroded to \$5000. Considering the CTG's annual intake of ca. \$1200 through membership fee (118 paying members and 140 non-paying student members), the current annual expenses cannot be sustained.

These annual expenses (2013) are \$2400:

Award for best M.Sc. thesis: \$200

Award for best Ph.D. thesis: \$500

Award for best journal paper: \$200

Support for 2 students attending GAC/MAC field trips: \$1,500 (2 x \$750)

Laurent Godin suggested raising the annual CTG fee from \$10 to \$15, which would yield a projected annual revenue of ca. \$1700. Simultaneously, he suggested reducing the GAC/MAC field trip funding to 2*\$450, lowering the CTG's total annual expenditure to \$1800. This would almost balance the budget.

Laurent quoted the non-present Dan Gibson, who had suggested reducing the award for the best Ph.D. thesis from \$500 to \$200, as the main incentive is the recognition (and not the money).

The question was raised whether GAC/MAC field trip funding should be continued as some feel that this supports the supervisor and not the student. Bruno Lafrance, Laurent Godin, Norman Goulet and Nils Backeberg spoke up in favour of maintaining this GAC/MAC student field trip support. No changes were demanded.

Paul Williams suggested to re-design the field trip support as a floating percentage of the annual intake minus the fixed expenses so that the budget balances approximately.

Laurent Godin suggested to decrease the GAC/MAC student funding from \$1500 to \$1200 (2x\$600), to reduce the best Ph.D. award from \$500 to \$200, while keeping best M.Sc. thesis and best journal paper at \$200 each.

This resulted in 2 votes:

The 1st vote related to the increase of the annual CTG membership fee from \$10 to \$15. Normand Goulet moved, David Corrigan seconded. All were in favour. This motion will have to be approved by the membership at the Annual Business Meeting at the GAC Montreal Assembly.

The 2nd vote related to the decrease of the GAC/MAC student field trip support to \$1200 and the best Ph.D. thesis to \$200. Bruno Lafrance moved, Shoufa Lin seconded. 10 were in favour, 1 voted against, and 1 abstained.

The CTG's new annual expenses (for 2015) are therefore projected to be \$1800:

Award for best M.Sc. thesis: \$200

Award for best Ph.D. thesis: \$200

Award for best journal paper: \$200

Support for 2 students attending GAC/MAC field trips: \$1,200 [\$600 each]

6. GAC 2015 – Montreal. CTG sponsorship of Special Sessions

Lyal Harris asked to have an Archean Tectonics session sponsored by the CTG.

7. CTG fall meeting 2015 announcement

Deanne van Rooyen of the University of Cape Breton in Sydney, N.S. will organize the 35th CTG workshop in 2015. Details will follow.

According to the CTG pattern, the 2016 workshop will be held in central Canada.

8. Other business

The participants thanked the organizers Bruno Lafrance and Dazhi Jiang for preparing the meeting and field trip. The executive expressed their gratitude for the excellent student participation.

9. Current CTG Executive and Councillors

Chair: *Laurent Godin*, Queen's University, Kingston

Vice Chair: *Dan Gibson*, Simon Fraser University, Burnaby

Secretary: *Jürgen Kraus*, Franconia Geoscience Ltd., Calgary

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

Councillors:

Kathryn Bethune, University of Regina

Normand Goulet, Université Québec à Montreal

Lyal Harris, Institut national de la recherche scientifique, Québec
Mary Louise Hill, Lakehead University, Thunder Bay
Lori Kennedy, University of British Columbia, Vancouver
John Waldron, University of Alberta, Edmonton
Joseph C. White, University of New Brunswick, Fredericton