NORTHWEST GEOLOGICAL SOCIETY

A regional association of professionals, students & others interested in geology
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December 2015 Newsletter

Volume 29, Number 7

December 8 Program Speaker

Speaker: David R. Lageson, Montana State University

Title: The highest outcrop on Earth: What the summit limestone of Mount Everest tells us about the tectonic evolution of the Greater Himalaya

5:30pm: No-host social hour
6:30pm: Buffet dinner
7:30pm: Speaker program
All are welcome to attend – **reservations are required if coming for dinner.**
► Reservations here

Abstract: New samples collected across the summit limestone of Mount Everest (Ordovician Qomolangma Formation) show that multiple distinct deformational events are partitioned throughout this formation. Samples from the highest exposures of the Qomolangma Formation (Everest Summit, ~8848m) preserve a well-developed mylonitic foliation and microstructures consistent with deformation temperatures ³250°C. These fabrics were ingrained during initial contractile phases of Himalayan orogenesis, when crustal thickening was accommodated by folding and thrusting of the Tethyan sedimentary sequence. In, contrast, samples near the base of the formation (Everest's South Summit) preserve extensional shear deformation, indicate metasomatism at temperatures of ~500°C, and contain a synkinematic secondary mineral assemblage of muscovite + chlorite + biotite + tourmaline + rutile. Shear fabrics at the South Summit are associated with movement on the Qomolangma detachment (structurally highest strand of the South Tibetan Detachment), while crystallization of secondary phases was the result of reactions between the limestone protolith and volatile, boron-rich fluids that infiltrated the base of the formation. $^{40}Ar/^{39}Ar$ dating of synkinematic muscovite indicates the secondary assemblage crystallized at ca. 28 Ma and that shear fabrics were ingrained ³18 Ma. This research documents the first evidence that Everest's summit limestone records multiple phases of deformation associated with discrete stages of Himalayan orogenesis, and that the highest strand of the South Tibetan Detachment on Everest was initially active as a distributed shear zone before it manifested as a discrete brittle detachment at the base of the Qomolangma Formation.

NOTE – I also plan to show some photographs of earthquake damage from my recent fieldwork this past October in the Khumbu Himalaya (Everest region).

PROGRAM DINNER RESERVATIONS: NWGS members: **$40**; Non-members: **$45**; Full-time students : **$20**. Add $5 for LATE REGISTRATION. Make your reservation and payment on-line at **www.nwgs.org** (or mail your payment to ***Northwest Geological Society, 4616 25th Ave NE #397, Seattle, WA. 98105*** (must be received by Thursday prior to meeting). Contact Secretary Beth Tanner with questions about dinner reservations.
If attending the speaker program only, a $5 voluntary donation to help defray the meeting room cost is requested.
Location: Pacific Dining Hall at the Talaris Conference Center, 4000 NE 41st St., Seattle, WA., 98105. **Directions**: See on-line directions with map, or: from I-5 northbound or southbound in Seattle, take Exit 168B (NE 45th St.). Drive east on NE 45th St. past UW down the hill and past University Village. Turn south (right) onto Mary Gates Memorial Drive at the 5-way intersection. MGM Drive will curve east (left) and become NE 41st St. Continue several blocks to the Talaris Conference Center entrance on the north (left) side. We meet in the Pacific Dining room on the left.

Upcoming Speakers and Field Trips

Spring, 2016: There may be a field trip to a local quarry. Details TBA.
Summer, 2016 Field Trip: Chris Darmon, Down to Earth, Geology of Scotland, June 21—July 1, 2016. See *Announcements* below for more details.
Fall, 2016 Field Trip: Eric Cheney, Geology of the Republic area and the Okanogan Metamorphic Core Complex, September or October. Details TBA.

If you would like to volunteer to give a talk or lead a field trip for NWGS, please contact President Grace Winer.

Please see the NWGS website for detailed announcements.
Contact webmaster Julie Masura if you have any announcements to post on the website.

Announcements

- Some spots have opened up on the **Geology of Scotland** field trip on June 21—July 1, 2016!!! Please contact Kathleen Goodman to be added to the trip immediately if you wish to go!!! Trip cost will be ~$3,000 plus airfare.
- The 2018 NWGS Symposium is just a couple short years away. Please consider being part of the all-important planning team, including Chair of the committee.
- If you have an unusual rock, please bring it to show!
- Next Board Meeting: Tuesday, Dec. 8, 4:00pm, Talaris Conference Center.

YOU would like to be involved!

Photo Spotlight

The summit of Mt. Everest (left side of the photo) with speaker Dave Lageson in the foreground. (Photo submitted by D. Lageson.)

About NWGS

NWGS, a regional association of professionals, students & other persons interested in geology, provides a forum for the presentation and discussion of a wide range of geologic topics, emphasizing those of the Pacific Northwest of fundamental scientific interest. *YOU would like to be involved!*

Program meetings: 2nd Tuesdays, October through May in the Pacific Dining Hall at the Talaris Conference Center in Seattle (see 1st page). Anyone may attend the speaker program, but a reservation is necessary for those wanting dinner (see 1st page). **Field trips (members only):** one in late spring/early summer and one in late summer/early fall, usually of 1-3 days in length. **Membership** is open to anybody with a professional or amateur interest in geology. **Annual dues**: Professional: $30; Student: $5. **To join or pay annual dues**: send a check payable to NWGS to Secretary Beth Tanner, 4616 25th Ave NE #397, Seattle, WA. 98105. Please include your name, address, home phone, email, and employer/affiliation (if any). Professional dues may now also be paid at www.nwgs.org.

YOU would like to be involved!

Recommended Readings

Corthouts, T.D., **Lageson, D.R.**, and Shaw, C.A., 2015, Polyphase deformation, dynamic metamorphism, and metasomatism of Mount Everest's summit limestone, east central Himalaya, Nepal/Tibet: Lithosphere, Geological Society of America, published online on 16 November 2015 as doi:10.1130/L473.1.

Lageson, David R., 2013, The Birth of Everest, *in*, The Call of Everest: The History, Science, and Future of the World's Tallest Peak: National Geographic Society, Washington, D.C., p. 28-55.

Wong, I., Olig, S., Dober, M., Wright, D., Nemser, E., **Lageson, D.**, Silva, W., Stickney, M., Lemieux, M., and Anderson, L., 2005, Probabilistic earthquake hazard maps for the State of Montana: Montana Bureau of Mines and Geology, Special Publication 117, 72 p., 28 plates.

Please send your reading recommendations to Newsletter Editor Tom Bush.

To report a change of email or postal address or request to be removed from mailings, notify Membership Chair George Bennett . Questions or comments? Contact President Grace Winer.

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