



## NORTHWEST GEOLOGICAL SOCIETY

A regional association of professionals, students & others interested in geology  
Please browse [www.nwgs.org](http://www.nwgs.org) for more about us



### February 2012 Newsletter

Volume 26, Number 2

#### February 14 Program Speaker

**Speaker:** Eric Cheney, Prof. Emeritus, UW Earth & Space Sci.  
**Title:** Ores of Rare Earth Elements: Geologic, Economic, and Political Issues

**Abstract:** Rare Earth Elements (REEs) have various sophisticated and critical industrial and military uses. REEs have been much in the news in the past two years because (1) China has a monopoly on production, and (2) USA, Europe, Japan, EU, etc. have no producing mines.

Geochemically, REE are not rare compared to many other elements, but known ore deposits are. The major cost of production is not the mining but the subsequent chemical refining (separation) of the very similar REEs. Additionally, major mining companies are not interested in small deposits and specialty metals. The economic geology of REEs today is much like uranium was through the 1960s before major deposits were discovered.

Vein-type deposits of all types, including those in alkaline and peralkaline igneous complexes, are too small, too low grade (commonly < 0.8 % REE), and/or too radioactive to be significant. Presently, the largest known REE deposits are carbonatites (intrusions), with  $10^7$  tonnes of ore of about 8 % REE in the carbonate mineral bastnasite or in apatite; the US example is Mountain Pass, CA, which is being revived at a cost of \$781,000,000. Alkaline igneous rocks have  $10^8$  tons of mineralization, but they are too low grade (< 2% REE) and have such poor recoveries (< 50%) that they are not yet economic. The economics of placer deposits, typically with  $\leq 0.09$  % REE as by-product monazite, depend upon the prices of their major products (Ti, Zr, Sn, etc.).

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](#) 

**PROGRAM DINNER RESERVATIONS:** NWGS members: **\$40**; Non-members: **\$45**; Full-time students : **\$20**. \$45 for LATE REGISTRATION. Make your reservation and payment on-line at [www.nwgs.org](http://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 [Dan Smith](mailto:Dan.Smith@nwgs.org) at 206-937-5313 or [nwgeo@yahoo.com](mailto:nwgeo@yahoo.com).

*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. Ph 206-268-7000. **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

**March 13:** Steve Reidel, formerly of Battelle, The Late Cenozoic Evolution of the Columbia River System in the Columbia River Flood Basalt Province

**April 10:** TBA.

**May 8:** TBA.

**Spring, 2012 Field Trip:** Steve Reidel, formerly of Battelle, The Late Cenozoic Evolution of the Columbia River System in the Columbia River Flood Basalt Province, date TBA.

Please see the [NWGS website](http://www.nwgs.org) for detailed announcements.

Contact webmaster [Julie Masura](mailto:Julie.Masura@nwgs.org) if you have any announcements to post on the website.

## Announcements

- The January 19, 2012 joint AEG meeting at Ivor's with speaker Tom Pratt (USGS) was **cancelled** due to weather, but will likely be rescheduled.
- The **dinner charge has now been reduced to \$40** for members following successful negotiations with Talaris for 2012. Unfortunately, the student rate had to be raised to \$20. **See details p.1.**
- The 25 year anniversary symposium is now **rescheduled for May 4, 2013.** Please mark your calendar!
- NWGS Historian [Donn Charnley](#) requests any pre-1980s NWGS information. Contact him at [donncharnley@frontier.com](mailto:donncharnley@frontier.com) or 206.546.3868.
- **Next Board meeting: TBA.**

*YOU would like to be involved!*

## Photo Spotlight



Photo of bastnäsite crystal from Pakistan (no scale). Bastnäsite is a cerium-lanthanum-bearing carbonate mineral ( $(\text{Ce},\text{La})\text{CO}_3(\text{F},\text{OH})$ ) that occurs in alkaline igneous rocks, especially carbonatites (carbonate rocks of magmatic origin), and is a source of Rare Earth Elements (AGI Glossary of Geology). (Photo from the Khyber Mineral Company.)

## 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:** 2<sup>nd</sup> Tuesdays, October through May in the Pacific Dining Hall at the [Talaris Conference Center](#) in Seattle (see 1<sup>st</sup> page). Anyone may attend the speaker program, but a reservation is necessary for those wanting dinner (see 1<sup>st</sup> 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 [Dan Smith](#), 10203 40<sup>th</sup> Ave SW, Seattle, WA. 98146. Please include your name, address, home phone, email, and employer/affiliation (if any). Professional dues may now also be paid at [www.nwgs.org](http://www.nwgs.org).

*YOU would like to be involved!*

## Recommended Readings

- Barker, J.C., and Van Gosen, B.S., 2012, Alaska's rare earth deposit and resource potential: Mining Engineering v. 64, no. 1, p. 20-32.
- Berger, V.I., Singer, D.A., and Orris, G.J., 2009, Carbonatites of the World, Explored Deposits of Nb, and REE -- Database and grade and tonnage models: U. S. Geological Survey Open-File Report 2009-1137, 17 p.
- Long, K.R., Van Gosen, B.S., Foley, N.K., and Cordier, D., 2019, The Principal Rare Earth Elements Deposits of the United States -- A Summary of Domestic Deposits and a Global Perspective: U. S. Geological Survey Scientific Investigations Report 2010-5220, 96 p.
- Orris, G.J., and Grauch, R., 2002, Rare Earth Element Mines, Deposits, and Occurrences: U.S. Geological Open-File Report 02-189, 174 p.

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 Secretary [Dan Smith](#) at 206.937.5313. Questions or comments? Contact President [Julie Masura](#).

## NWGS Board

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