

Cascadia Meteorite Laboratory



Cascadia Meteorite Laboratory
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First newsletter: April 2007

Welcome to our first newsletter. We are sending this out in response to requests from supporters. We expect to be sending out a newsletter once or twice a year. These will include updates as to how the lab is doing, as well as information about meteorites in general.

For the first newsletter, we thought introductions would be in order. The three of us (Alex Ruzicka, Melinda Hutson, Dick Pugh) joined forces about four years ago to create a meteorite laboratory in the Dept. of Geology at Portland State University.

Alex Ruzicka and Melinda Hutson are a long-time (21 years) married couple who went through college together. Both of us received undergraduate degrees in geophysics (and for Alex, a second degree in geology) from the University of Minnesota. Both of us received M.S. degrees in Earth and Planetary Science from the State University of New York/Stony Brook. Our advisor was Robert Dodd, who specialized in the petrology and geochemistry of meteorites. Both of us did research on chondritic meteorites, and Melinda got experience classifying over 100 H-group chondrites. We then went on to the Planetary Science department at the University of Arizona for Ph.D.s. Alex worked with Bill Boynton on an eclectic variety of projects, including mesosiderites and carbonaceous chondrites. Melinda worked with John Lewis on enstatite chondrites and nebular modeling. After graduation, Alex went to the University of Tennessee to work on a three year post-doc,

doing research on the moon and a variety of meteorites (including irons and eucrites). Melinda came to Portland to teach at Portland Community College. Eventually, both of us wound up at Portland State University. As of this past fall, Alex was hired as a tenure-track Assistant Professor in the Dept. of Geology.



Alex



Melinda

This past February 22, Alex and Melinda welcomed the arrival of their first and

only children (Catherine and Christopher Ruzicka). They have proven to be quite a distraction, slowing down progress in the day-to-day operation of the lab (as well as a number of research projects). However, we feel they are more than worth it.



The third member of our lab is Richard (Dick) Pugh, a long-time meteorite enthusiast and educator. Dick received both his B.S. and his M.S.T. in physical science from Portland State University. He went on to teach science for 30 years at Cleveland High School in Portland. He has spent decades giving lectures to the public about meteorites in general, and how to identify meteorites. He has also looked at thousands (if not tens of thousands) of “meteor-wrongs” over the last few decades.

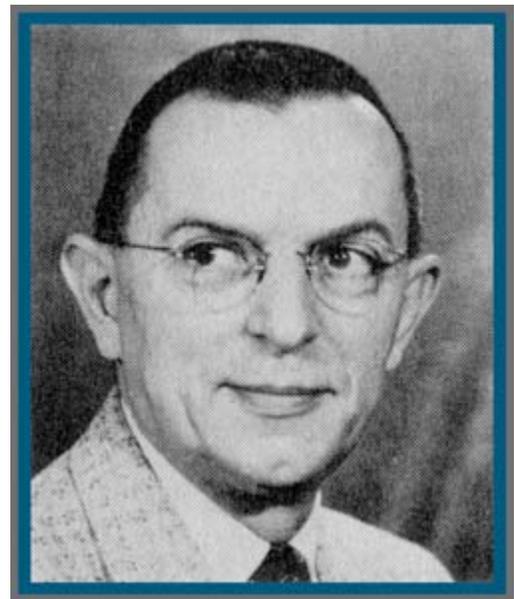


Tim Jull (on the left), the editor of Meteoritics and Planetary Science, with Dick Pugh (on the right) in Jull's lab at the University of Arizona.

Four years ago, when the Cascadia Meteorite Laboratory (CML) was formed, the Department of Geology owned one meteorite (which is a 35 lb Odessa iron meteorite, purchased in 1968 by Erwin F. Lange). Since the creation of the lab, we have built a collection containing slightly over 400 different individual meteorites (including multiple samples of individuals).

We have also established CML as an official repository for type specimens of newly classified meteorites.

Anyone familiar with the state of funding for higher education in Oregon will understand that Portland State University does not have any funds to directly support CML. We are supported by donations from the public and grants. In 2005, the Erwin F. Lange endowment was created through the PSU Foundation in order to fund the day-to-day operation of CML. This fund honors Erwin F. Lange, who was a meteorite enthusiast and mentor to Dick Pugh.



Picture of Erwin F. Lange from the Portland State College 1960 yearbook

Erwin F. Lange was a passionate scientist with an interest in meteorites and the history of science. He encouraged a number of his students, including Richard Pugh, to become science teachers.

He began his career as a chemistry instructor at Vanport College (a precursor to PSU) in 1948. When the college moved to downtown Portland and became Portland State College, Dr. Lange moved with it and became the Head of the General Sciences

Department. In the 1960s, Portland State College became Portland State University and Dr. Lange became the Assistant Dean of Science. He taught classes in physical science, the history of science, and meteorites, and was always on the lookout for potential teachers among his students. He also believed in educating the public about meteorites.

1968: The Year of the Meteorite

In 1968, he published "A Collection of Articles on Meteorites" as Miscellaneous Paper #11 in *The Ore Bin*, a publication of the State of Oregon's Department of Geology and Mineral Industries.

In his introduction, he states: "The year 1968 has been designated in Oregon as the year of the meteorite by a committee consisting of Hollis M. Dole, State Geologist, Phil F. Brogan, science writer and former associate newspaper editor at Bend, and the writer. This group firmly believes that there are in Oregon undiscovered meteorites that might be found if many people became more observing of their surroundings, and the group also feels that there may be undescribed or unreported meteorites in the possession of people who are unfamiliar with their importance to science."

Recent Accomplishments by CML members

So what have we been doing for the last few months (besides having twins)?

Publications:

Two papers on silicate inclusions in iron meteorites were published in the November and December issues of *Meteoritics and Planetary Science*. This research was funded by a NASA grant.

Ruzicka A. and M. Hutson (2006) Differentiation and evolution of the IVA meteorite parent body: Clues from pyroxene geochemistry in the Steinbach stony-iron, *Meteoritics and Planetary Science* **41**, 1959-1987.

Ruzicka A., M. Hutson, and C. Floss (2006) Petrology of silicate inclusions in the Sombroete ungrouped iron meteorite. *Meteoritics and Planetary Science* **41**, 1797-1831.

A paper on relict olivine grains was accepted for publication by *Earth and Planetary Science Letters*. We just finished returning the proofs and this paper should be in print in the next month or so. This research was funded by a NASA grant.

Ruzicka A., H. Hiyagon, M. Hutson, and C. Floss (2007) Relict olivine, chondrule recycling, and the evolution of nebular oxygen reservoirs. In press, *Earth and Planetary Science Letters*.

A paper on a newly classified meteorite from Arizona was accepted for publication by *Meteoritics and Planetary Science* this past January. We are awaiting proofs, and have been informed that this should be published in either the May or June issues of the journal. This research was funded by donations from the public.

Hutson M., A. Ruzicka, R. Pugh, L. Sloan, and E. Thompson (2007) Complex brecciation and shock effects in the Buck Mountain Wash (H3-5) chondrite. In Press, *Meteoritics and Planetary Science*.

Classifications accepted by the Nomenclature Committee:

Buck Mountains 003, a 75 lb stone (L6 chondrite) from Arizona, found by Dennis Asher, was accepted by the Nomenclature Committee, and the classification published in the *Meteoritical Bulletin* #91. This is the largest stone that has been found in the Franconia area of Arizona (which has produced over one hundred meteorites). The work on this sample was funded by donations from the public.

Some current research projects:

We are working on a number of research projects that are at various stages of completion. These include:

1) a study of olivine aggregates in ordinary and carbonaceous chondrites, funded by a NASA grant.

2) a transmission electron microscope (TEM) study of olivine in the Portales Valley meteorite, funded by donations from the public.

3) a collaborative study with M. Fries of Carnegie to examine dark inclusions with Raman spectroscopy and a scanning electron microscope (SEM), with the work at PSU funded by donations from the public.

4) a collaborative study of the angrite NWA 2999, with D. Mittlefehldt of Johnson Space center, with the work at PSU funded by donations from the public.

5) an undergraduate student (Thomas J. Schepker) is working with Alex on a research project on two of our unclassified HED samples. TJ will be classifying these samples and then going on to look at igneous and metamorphic processes in these meteorites. This pilot project will be funded by donations. We plan on using the pilot project to demonstrate the viability of a larger project on HEDs when we submit a grant proposal to NASA for future research.

Public Outreach "Meteorites on the Road":

We have received a NASA Education/Public Outreach Grant to bring meteorite and space science to rural communities in Eastern Oregon. Melinda and Dick are creating Powerpoint presentations for Dick to show in schools and libraries, and Dick also brings meteorites with him for hands-on demonstrations. He also encourages people to bring rocks that may be meteorites.



Dick Pugh at a Science Fair in October 2006.

Since October 1, 2006, Dick has spoken to around 1400 children and 250 adults. He has looked at over 100 rock samples brought by people who thought they had a meteorite. Only eight of these rocks were meteorites. Six were not new discoveries, but were meteorites bought on the web by people who wanted to be sure they had not been swindled. Two people from southeastern Oregon brought what appear to be two bona fide new unknown iron meteorites. We are currently working to verify that these are new meteorites and not paired with known samples, and if so, to classify them and make them available to the scientific community.

We want to thank you for all of your support.

We greatly appreciate all of the past support for the Cascadia Meteorite Laboratory. Your support makes a huge difference. No donation is too small. We often get checks for \$10 or \$20. If you want to help, please make your check out to:

**PSU Foundation/ Erwin F. Lange
Endowment**

and mail it to

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Future newsletters will include articles about classifying meteorites, the history of northwest meteorites, and other topics.