

Cascadia Meteorite Laboratory



Cascadia Meteorite Laboratory
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Third newsletter: June 2009

Welcome to our third newsletter. For those of you who haven't been with us from the start, the Cascadia Meteorite Laboratory (CML) is staffed by Dr. Alex Ruzicka (director), Alex's wife Dr. Melinda Hutson (curator), and Dick Pugh (outreach). Quite a bit has happened since our previous newsletter, so much so that it is difficult to know where to begin.

We'd like to start by thanking everyone who has helped support our lab. Without your support there wouldn't be a Cascadia Meteorite Laboratory. Details about recent support are towards the end of this newsletter.

The CML collection continues to grow, and is becoming comparable to long established institutional collections (such as that at the University of New Mexico). As a result, we are beginning to attract researchers from other institutions to PSU.



Dr. Melissa Strait from Alma College in Michigan did research using CML samples at Portland State University during April and May 2009 as part of her sabbatical. Dr. Strait makes porosity measurements on meteorites using a scanning electron microscope.



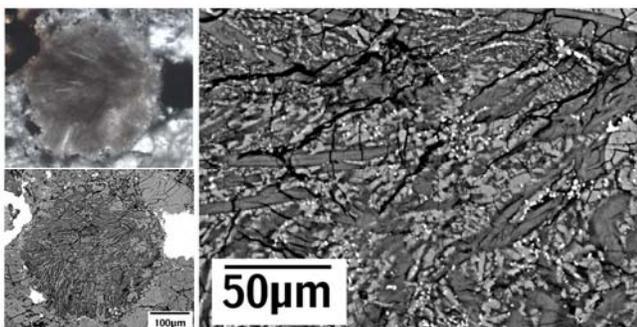
Dr. Alan Hildebrand and Ellen Milley hunched over a piece of the Buzzard Coulee (H4) meteorite at the site of its recovery.

On November 20, 2008, a bright fireball lit up the skies across several provinces of western Canada. The first meteorite from that fireball was collected by Dr. Alan Hildebrand and graduate student Ellen Milley of the University of Calgary. As neither of them are petrologists (people who specialize in studying the textures and chemistries of rocks), Alan contacted our lab to see if we could aid them in classifying this meteorite. Alan and Ellen flew to Portland on Sunday December 14, 2008 arriving just as snow began to fall in Portland. That evening, Alan, Ellen, and Alex braved a blizzard, black ice, and a blockade on I5 to drop off samples in Corvallis for analysis the next day. Alan and Ellen returned to Canada the next day, a few days before the airport closed.

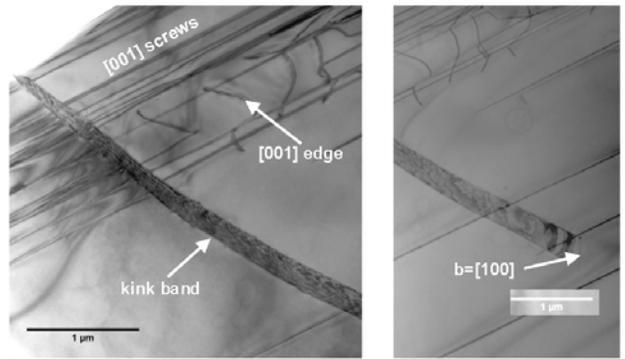


The Ruzicka house and car during late December 2008. We'll never hope for a white Christmas again.

Buzzard Coulee is an interesting meteorite, and we have had abstracts and presentations about it at two meetings in the last few months (Lunar and Planetary Science Conference in Houston in March 2009; American Geophysical Union Joint Assembly in Toronto in May 2009). We are still working on this meteorite and expect to submit a manuscript to a peer-reviewed journal later this year. We're extremely glad that Alan and Ellen didn't get stranded in Portland. We'll skip the details of trying to process data and write a classification description while being housebound with two-year-old twins for more than a week due to snow.



A cryptocrystalline chondrule in Buzzard Coulee. Optical (upper left) and backscattered electron (BSE) (lower left and enlarged-right) images of the same chondrule.



Dislocations and a kink band that formed at high temperatures in the Miller Range (MIL) 99301 chondrite. Bright-field transmission electron microscope (TEM) image.

A second collaborative study using PSU's high-resolution transmission electron microscope (HR-TEM) grew out of a request by Dr. Alan Rubin at UCLA. Dr. Rubin is a petrologist and had been studying an Antarctic meteorite (MIL 99301) that appeared to show contradictory shock indicators under an optical microscope. We used donated funds for a small pilot project on MIL99301 and presented the results of this study at the Lunar and Planetary Science conference in March 2009. At that conference, Alex met Dr. Jon Friedrich, an assistant professor in Chemistry at Fordham University and a Research Associate at the American Museum of Natural History in New York. Dr. Friedrich examines shock histories of meteorites using x-ray micro-tomography, and he had just looked at MIL 99301. Alex and Jon had a good discussion at the conference. As a result, Alex, Jon, and Dr. Rick Hugo of the department of Geology at Portland State have submitted a proposal to NASA for a study using optical petrography, TEM, and x-ray micro-tomography on a number of meteorites. We won't know until next December whether or not this study will be funded, but we're keeping our fingers crossed. The pilot study (funded by your donations) is a critical piece of the proposal, as it demonstrates that we are capable of doing the necessary work for the project.



Brother Guy Consolmagno (SJ) of the Vatican Observatory (left) and Dr. Dan Britt, Associate Professor of Physics, University of Central Florida.

A potentially new collaboration has just presented itself to Melinda. Guy Consolmagno contacted her about research she had done as a graduate student at the University of Arizona, which supports research being done by graduate student Robert (Bob) Macke (SJ). Bob, Guy, Melinda, and Dan Britt have submitted an abstract for the upcoming Meteoritical Society Meeting in Nancy France. Bob will be giving an oral presentation. Unfortunately, this year neither Alex nor Melinda will be able to attend this conference (although we'd like to—conferences are where new ideas are shared and new collaborations can be launched).

All of the projects above were funded by a combination of small internal grants from Portland State University, private donations, and funds from collaborators. Additionally, we are wrapping up and publishing research from expired or soon-to-expire NASA grants, and putting in proposals to receive new funding from NASA. Since the last newsletter, one peer-reviewed manuscript has been published:

Ruzicka, A., C. Floss, and M. Hutson (2008) Relict olivine grains, chondrule recycling, and implications for the chemical, thermal, and mechanical processing of nebular materials. *Geochim. Cosmochim. Acta* **72**, 5530-5557

and a second manuscript has been written, and submitted to a journal. We are waiting to hear back from reviewers:

Ruzicka, A. and M. Hutson (2009) Comparative petrology of silicates in the Udei Station (IAB) and Miles (IIE) iron meteorites: Implications for the origin of silicate-bearing irons. Submitted to *Geochim. Cosmochim. Acta*

At the moment, two more manuscripts are in preparation, with a third to follow shortly thereafter. Multiple research projects are in various stages of completion from just started to almost finished. In other words, work is going along as usual.

Classification work is also ongoing. We have three meteorites which have been approved by the nomenclature committee, but haven't been published (they will be in *Meteoritical Bulletin* 96); four meteorites which have been submitted, but not approved; and four meteorites which are ready to submit. We are starting work on another batch of meteorites. All of the above are stones as our lab lacks the equipment to analyze iron meteorites. But, we recently began to collaborate with Dr. Stephen Kissin at Lakehead University in Thunder Bay Ontario who has the equipment that we lack.

Alex is now advising three students: M.S. student Kristy Hauver (currently as part of a Creative Scholarship Grant she received, and formerly when she was a McNair Scholar); incoming M.S. student Thomas (T.J.) Schepker (who is now completing an undergraduate Honors Thesis with Alex); and undergraduate Niina Jamsja (who has been working on an independent research project for over a year) Based on the work Alex and Niina have been doing, they expect to have a manuscript with her as first author ready for peer review by *MAPS* this coming summer. Niina has informed Alex that she would also like to work on a separate Honors Thesis project involving meteorites next year.



Left: Niina Jamsja with Kristy Hauver's son Phoenix in the foreground. Right: Kristy Hauver.

Alex has received professional recognition in various ways this past year. In May 2009, he received the Outstanding Researcher Award in Earth Sciences from the Columbia-Willamette Chapter of Sigma Xi, the Scientific Research Society.

In late 2008 Alex was asked to serve as an Associate Editor (AE), for an indefinite term, by *Meteoritics and Planetary Science (MAPS)*, the main professional journal in our field. Assignment as an AE to *MAPS* reflects a collective judgment by Alex's research colleagues that he has sufficient breadth, balance, professional maturity, and skill sets to fairly and comprehensively evaluate and manage research articles submitted to the journal.

Also in late 2008, Alex was asked to serve for a three year term on the Membership Committee of the Meteoritical Society, the professional society that publishes *MAPS* and assigns formal meteorite names. Gary Huss, the current chair of the Committee, told Alex that he was nominated to serve because of his efforts related to education and public outreach (E/PO) and the high public visibility of the Cascadia Meteorite Laboratory (CML).



Drawing by a first-grade girl at Parkrose Shaver School in Portland, showing meteorites on a table in her classroom. She wrote a note on the other side which said that her "favorite part was when we hold the meteorites".

Speaking of education and public outreach: Dick has been busy driving all over the state on multi-day tours to schools and libraries in rural communities, including Ukiah, Seneca, John Day, Prairie City, Madras, Lakeview, The Dalles, Lone, Irrigon, Helix, culver, and Shaniko. He estimates

he has driven around 3000 miles on these tours alone. This doesn't count all of the talks he's given in the Portland area. He has also looked at a lot of rocks, most of them "meteor-wrongs", but a few real meteorites (all of them already known and classified).

Dick hasn't been the only one out lecturing. Last summer, Melinda spoke at a teacher workshop as part of the Oregon Teachers Scholars Program organized by the Center for Science Education (CSE) at Portland State University. The CSE folk were apparently very happy with Melinda, as she was asked to be part of a lecture series entitled "Our Cosmic History" at PSU. Her entire lecture was filmed and is available (if you have Quicktime) at <http://oregonteacherscholars.pbworks.com/Our-Cosmic-History>.

Melinda has also been lecturing to her and Alex's twins (Catherine and Christopher), but they don't seem particularly impressed by what she has to say. They've reached the terrible twos, and their three most common utterances are "no!", "mine!", and "what's that?". We hope the latter indicates that we have budding scientists.



Catherine and Christopher viewing Latourell Falls in the Columbia Gorge. "What's that?"

We thank those of you who came to our fundraiser at the Department of Geology last year and hope that you enjoyed touring our new lab. However, we barely got unpacked before we had to start packing up again. Renovations of our building are about to begin, and we are being temporarily displaced.

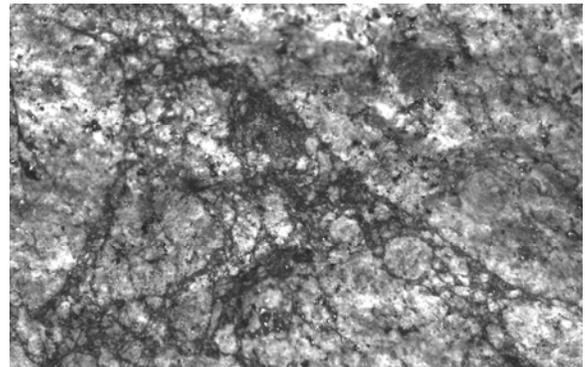
We would like to thank the following people for their financial support and apologize if we have overlooked anyone.

Peter Abrahams
Chuck Barrows
Bruce Bonnell
Terry Bristol
Philip Crosby
Carolyn diStasio
Oliver and Cynthia Ede
Joyce Follingstad
Walter and Margaret Gary
Ruben Gloria
Tim Gutschow
P.C. Hodgell
Sam Kimpton
Candace Kohl
John McKane
David and Judith Osgood
Larry Parker
Christopher and Kelley Platt
Dick Pugh
James D. Ray
M. Margaret Rogers
Blaine Schmeer
Barbara Stross
Edwin Thompson
La Vonne Ving
Bev Weber
Rob Wesel
Kay Westphal
Daniel Wheeler
Anonymous donations



Our lab also received a number of meteorite donations this past year. Patrick Thompson (left) went meteorite hunting in the area around West, Texas after a fireball dropped meteorites there in February 2009. He donated a sample of this fresh fall (Ash Creek – L6) to our lab, and we all wound up on television as a result.

Dick Pugh donated a large number of samples, including 29 northwest Africa stones (total weight = 977 grams), Dimmitt (H3-4), Lahoma (L5), Etter (L6), Aldama (b) (H5), Long Island (L6), Renford (L6), Roundtop (b) (H4), Thuathe (H4/5), and Nantan (IAB iron). Edwin Thompson donated four unclassified northwest African stones weighing 469 grams total. Blaine Reed donated pieces of NWA 5488 (lodranite) and NWA 2824 (provisional-eucrite). Art Ehlman donated pieces of Davy (b) (H4), Dawn (a) (H6), Forestburg (a) (L4) and Travis City (a) (H5). Luke Tison donated several tektites. Esther Wooldridge donated a number of fragments of the Gibeon iron meteorite from the Keith Wooldridge collection.



Shock veins in a hand specimen of the Ash Creek chondrite – image taken with a binocular microscope.

We want to thank all of you for your support!

Particularly during these economic times, your support is more important than ever. Donations make a huge difference in maintaining our lab, undertaking small research projects, promoting science education through public outreach, and involving students in meteorite research.

There are many ways you can help. You can leave samples or funds in your will to the Cascadia Meteorite Laboratory in the department of Geology at Portland State University, knowing that we are an official repository and your collection will be well-curated. You

can also donate samples now.

Also appreciated are donations of funds, which can be made either to our endowment or to our everyday operating account. The endowment principal cannot be spent, only interest that is generated by the endowment.

The form below is for the endowment:

Name: _____

Address: _____

Address: _____

Method of payment:

Check – make check payable to:

PSU Foundation/Erwin F. Lange Endowment.

Visa Mastercard

Amount charged: _____

Name on card: _____

Card number: _____

Exp. Date (m/y): _____

Signature: _____

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Portland State University is a 501(c)(3) non-profit organization. Your donation to the Cascadia Meteorite Laboratory is tax deductible.

You can also donate to an operating account in which all of the donated funds are immediately accessible for use

The form below is for donations to our operating account.

Name: _____

Address: _____

Address: _____

Method of payment:

Check – make check payable to:

**Portland State University/
Cascadia Meteorite Lab**

Visa Mastercard

Amount charged: _____

Name on card: _____

Card number: _____

Exp. Date (m/y): _____

Signature: _____

Mail to:

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