

March 2017 News Notes

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Alumni Change Lives

Collin Oborn is an undergraduate student working with Prof Barton. Here he describes how Friends of Orton Hall helped further his studies.

Thanks to generous support from the Friends of Orton Hall I was able to travel to Iceland with two graduate students to collect samples for my ongoing research which aims to create one of the most complete pictures of the magma plumbing system that lies beneath Iceland, one of the most volcanically unique locations in the world. Under the direction of Dr. Barton I have been using a method he developed a few years ago, which uses chemical analysis of glassy basalt samples to determine depths and pressures of partial crystallization. From this information we can gain important insights into the underground structure of a volcano. On this trip we collected samples from the southern region as well as a location in the mid-western part of the country. This trip would not have been possible without the generosity of FOH and I look forward to a potential future trip to collect more data.



Campaign to Put a Dinosaur in Orton Hall ends Friday!

Our crowd funding campaign ([link](#)) to raise funds to purchase a dinosaur for the Orton Geological Museum in Orton Hall has been a successful endeavor, in that we have raised more than any previous buckeyefunder campaign, from hundreds of donors. Thank you to all of those who have given!

However, we still are short of our goal to get this dinosaur completely into Orton Hall. The campaign ends at midnight on Friday, March 31st.

Thanks to the generosity of an anonymous donor, **we have \$5,000 to match** for gifts given this week. Let's turn that \$5,000 into \$10,000!

This project has received an incredible amount of community support, from "Dough for Dinosaurs" a grassroots effort by Worthington toddlers and their parents, to being featured on two local television channels ([link](#)). Everyone loves dinosaurs!

If you have not contributed, please consider doing so ([link](#)). If you have, please encourage others to contribute. Or you may stop by the Museum to contribute.

Help us push the dinosaur all the way into the building!

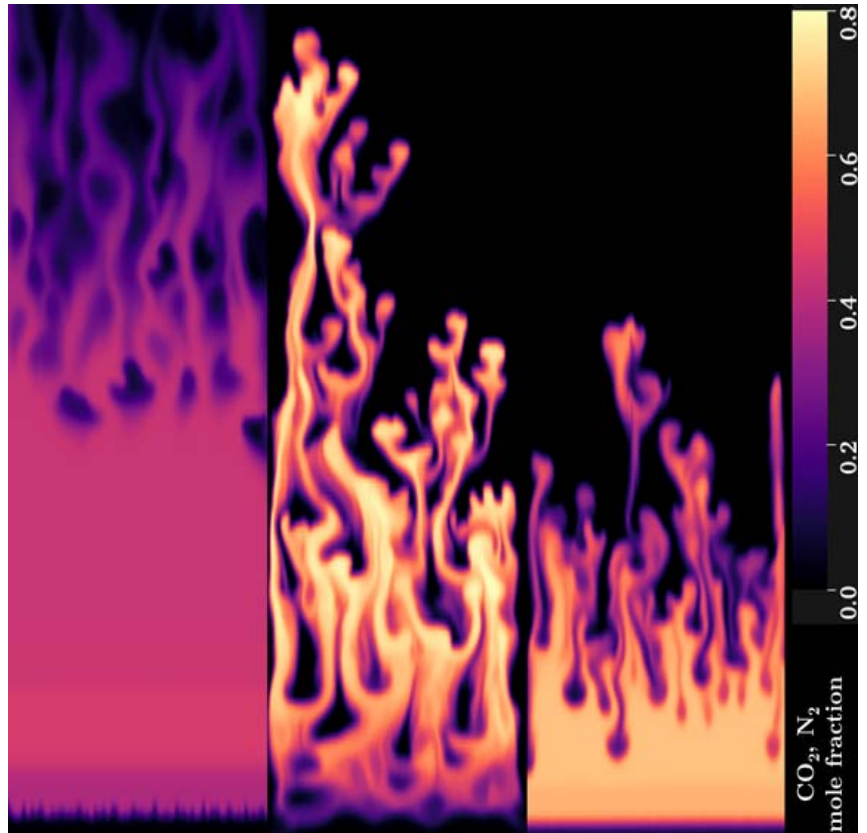


FOH Supported Student Publishes 1st Author Paper in GRL

When fluids propagate through subsurface porous media, flow instabilities can be either detrimental or advantageous depending on the application. The interplay between viscous instabilities and fluid mixing has been studied extensively for single-phase 2-component mixtures, but not for applications that involve two phases (e.g., oil and gas) that exchange multiple species. In this first study of mixing in two-phase flow, we find that the dynamics are profoundly different.

In single-phase flow, viscous fingering increases the interface between two fluids (of the same phase) and diffusion across that interface drives the mixing. In two-phase flow, mass exchange between the phases creates a two-phase mixing zone. In this zone, two phases coexist that have different velocities, which leads to an expansion of the mixing zone. Diffusion occurs both within each phase and between the phases, and the inter-phase mass exchange significantly enhances mixing. Because this thermodynamic mixing is extremely efficient, viscosity contrasts are quickly homogenized and hydrodynamic instabilities (fingering) are less pronounced. In fluid mechanical terms, dissipation drives mixing in single-phase while production is dominant in two-phase flow.

These findings have broad implications for the prediction of instabilities or mixing behavior in subsurface applications that involve multiple partially-miscible fluid phases.



Citation: “Hydro-Thermodynamic Mixing of Fluids Across Phases in Porous Media”. Mohammad Amin Amooie, Mohamad Reza Soltanian, Joachim Moortgat, *Geophysical Research Letters*, in press.

Lyons Awarded Fulbright U.S. Scholar Grant

SES Director Berry Lyons is the recipient of a prestigious Fulbright U.S. Scholar Grant by the U.S. Department of State. Lyons will be affiliated with the National University of Ireland Galway, where he will be researching and teaching from January to June 2018. His research will involve the collection and analysis of stream and bog water samples to determine chemical weathering rates and provide aid in environmental management. He will teach courses focusing primarily on Antarctic research and the climatic status of polar regions today. Congratulations, Berry!



Recent SES Graduates

Ted Langhorst (BS Spring 2016) will be attending graduate school at the University of North Carolina, Chapel Hill, working with Dr. Tamlin Pavelsky. Ted received a "Masters Merit Assistantship" from UNC to cover his first academic year. Congratulations, Ted!

Elsa Saelens was recently selected for a Geoscientists-In-the-Park Internship. She will be working as an interpretive intern at Mount Rainier National Park and prepare and present educational programs to park visitors about the geologic and ecological features of the Park from 30 May through 2 September of this year. She was one of the three interns selected from over 200 applicants. This program was established in 1996 by the National Park Services' Geologic Resources Division, and it is run in partnership with the Geological Society of America. Elsa will graduate with a BS with Research Distinction in Earth Sciences in May. Professor W. Berry Lyons served as her BS thesis advisor. Congratulations, Elsa!



John M. Jones, BS, Fall 2016 (pictured), has secured a job with the Penhall Company in Atlanta, Georgia. John will be working as a Ground Penetrating Radar (GPR) Analyst for Penhall. John will be interpreting GPR data to find buried utilities and other subsurface features before renovation and demolition projects. John said Penhall told him that his thesis proved to be one of the major reasons he was chosen for the position. John's thesis, "Utilizing Noble Gas Geochemistry to Trace Hydrocarbon and Fluid Migration in the Northern Appalachian Basin," was supervised by Assistant Professor Tom Darrah. Congratulations to John on the new position!

Jeff the Orton Sloth is Famous in Sweden

In January, 2017 the Swedish popular science magazine 'Allt om Vetenskap' ('All about Science') ran a story on the damage to Jeff, the Orton Museum ground sloth, several years ago. Because we felt that it is of obvious interest to OSU alumni, the author Dr. Mats Eriksson kindly agreed to translate it into English; you can read the translation here ([link](#)). The author is Professor of Geology at Lund University in Sweden and a global specialist on fossil annelid worms. He has also published extensively on a variety of other subjects, some of the projects having been in cooperation with Orton Hall workers.

In Europe he is widely known also as a specialist on the relations between 'rock and rock' (rock music and geology). As noted in the article, he spent a year as a post-doc at OSU and he has been back several times during the past 15 years.

