The EAPS Weekly News

April 18, 2016

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EAPS MEETINGS & EVENTS

EAPS AWARDS BANQUET
April 18, 2016
Buchanan Club of Ross-Ade Pavilion
Reception: 5:30 PM
Dinner at 6:00 PM

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CoS SPRING FACULTY MEETING SCHEDULE
Apr. 19, 2016
LWSN 1142
3:30-4:30 PM

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ALUMNI ADVISORY BOARD MEETING
April 19, 2016
HAMP 2201

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DEAN'S VISIT TO DEPARTMENT
April 21, 2016
1:30 - 4:00 PM

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SPRING FLING
May 25, 2016
11:30 AM-4:00 PM

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EAPS FACULTY & STAFF FALL RETREAT
August 18, 2016
Beck Ag Center, Rm 111
8:30 AM – 4:00 PM

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EAPS FALL WELCOME BACK PICNIC
August 18, 2016
Happy Hollow Park, Shelter 1
4:30 – 7:00 PM

EAPS DEFENSES

PhD Defense-Steeve Symithe
Monday, April 18, 2016
1:00pm
HAMP 3214
Advisor: Andrew Freed

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PhD Defense-Ruth Aronoff
Wednesday, April 20, 2016
2:30pm
HAMP 2244
Advisor: Christopher Andronicos

EAPS COLLOQUIA

Douglas McCarty
(Faculty Candidate)
Chevron Energy Technology Center
Monday, April 18, 2016
3:00-4:00 PM
ARMS 1109

EAPS NEWS

Dr. Chaubey, Professor of Agricultural & Biological Engineering and Department Head of Earth, Atmospheric, and Planetary Sciences was honored with the induction into Arkansas Academy of Biological and Agricultural Engineering on **Friday, April 8**.

UNDERGRADUATE AND GRADUATE STUDENT INFORMATION

PUPS
(PURDUE UNIVERSITY PLANETARY SCIENCE)

There is a new student club called PUPS (*Purdue University Planetary Science*)--to provide a sense of community for students who are interested in planetary sciences, as well as, providing encouragement and information about the future of planetary science. The goal is to increase awareness of and the interdisciplinary nature of planetary sciences. Advisor: Briony Horgan.
E-mail: briony@purdue.edu

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SUMMER REGISTRATION RESEARCH HOURS CHANGE

There has been a change in the registration of Summer research hours (EAPS 69800 and EAPS 69900). Research credits will now cover all three modules instead of just the second and third. Summer session now **begins May 16th**.

- It's very important that all graduate students conducting research – on or off campus – be appropriately registered. The number of 69800 and 69900 credits taken during the summer should reflect a graduate student's research and writing efforts.
- EAPS 69800 and 69900 are scheduled from **May 16** through **August 2**.
- A maximum of nine (9) credits taken during Summer Session are permitted to fulfill graduation requirements.
- Graduate staff **must** be registered for at least three (3) credits in order to hold their assistantships (i.e., if you are being paid, you **must** be registered).

As during the Fall/Spring semesters, a Form 23 is required in order to register for research hours. Failure to register by **May 16th** will invoke a **$200** late registration fee. If you have questions contact Kathy Kincade at kkincade@purdue.edu

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2016 CSU SACRAMENTO-GEOLOGY FIELD CAMP

Spring 2016 field course open to senior geology majors. Note that the entire class is conducted from:
June 1-July 10, 2016.

Application forms are available at www.csus.edu/geology. Email application PDF and materials to geoplogy@csus.edu (cc: hausback@csus.edu) or mail to:
Geology 188 Application
c/o Geology Department
California State University, Sacramento
6000 J Street
Sacramento, CA 95819-6043

See the attached flyer for more information, schedule, fees, and deadlines. Please contact Brian Hausck at haauscak@cusu.edu if you have questions.

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SHORT TERM STUDY ABROAD PROGRAMS

The GREEN Program offers accredited 8-10 day programs which take students to epicenters of clean tech, sustainability, and innovative industries. Programs available winter, summer, or spring break. See attached flyer.

- Engage in hands-on, experiential education with industry experts and professionals
- Gain behind-the-scenes access to innovative clean energy facilities and sustainability projects
- Supercharge resumes with a global perspective and unique cultural experience
- Network and develop relationships with powerhouse student leaders and professionals
- Bridge the gap between traditional textbook learning and real-time industry insight
- Participate on world-class bucket list adventure excursions
- Earn an academic transcript for transfer credit short term abroad programs for
- future clean energy & sustainability leaders

Apply: www.thegreenprogram.com

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SUMMER 3-CREDIT FIELD COURSE OPPORTUNITIES WITH ECOSYSTEM FIELD STUDIES!

Caribbean Ecosystem Field Studies - Study, snorkel & SCUBA dive along the Caribbean coast of Mexico
May 21- June 9

Colorado Ecosystem Field Studies – Study, camp, & hike in the Colorado Rocky Mountains from
June 21 - July 10 or **July 18 - August 6**

An opportunity to apply classroom & textbook learning while immersed in an incredible ecosystem setting! Gain valuable career skills in hands-on ecosystem field research. Earn 3 undergraduate transfer credits. Also offering post-course, extended credit options of Independent Research & Conservation Internship
Open to students from all universities & majors. Accredited by the University of Montana at Missoula's Environmental Studies. Program: ENST 391- for 3 undergraduate semester transfer credits.

For all course information visit the course website: www.EcoFS.org or see the attached flyer.

Direct any further questions to Professor Steve Johnson, Course Director at steve@EcoFS.org

MERIT-BASED SUPPORT TO GRADUATE STUDENTS

The EAPS Department provides the opportunity for merit-based support to graduate students to present their research at professional conferences. The maximum yearly amount of department support is $400 per graduate student (each fiscal year). Submit your form to Kathy Kincade (Room 2169D/HAMP) no later than one month prior to the start of the conference you plan to attend. Requests after the fact or after that timeframe will not be accepted.

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10th ANNUAL GRADUATE CLIMATE CONFERENCE

The 10th Annual Graduate Climate Conference, which will be held **October 28-30, 2016** at the University of Washington Pack Forest Conference Center.

The Graduate Climate Conference (GCC) is an interdisciplinary climate conference run by graduate students, for graduate students, with the goal of assembling a broad range of talks and posters featuring high-quality research focused on past, present, and future climate change and its impacts.

They encourage students at all stages of their graduate career to apply and we seek abstracts on climate research from a variety of disciplines from the physical, natural, and social sciences and humanities, including: anthropology, atmospheric sciences, biology, Earth and environmental sciences, economics, engineering, ethics, geography, law, oceanography, public policy, and resource management.

They highly encourage abstracts from students with traditionally under-represented backgrounds.

The abstract submission period opens **April 11** and closes **June 1**. Lodging and meals are covered for all participants. Limited travel funding is also available. Please see our website for more information and for submitting abstracts: www.graduateclimateconference.com

The GCC 2016 organizing committee.

UNIVERSITY NEWS

SPRING FLING SET FOR MAY 25

Spring Fling and many of its traditional events will return this year to Memorial Mall.

The annual appreciation day for faculty, staff, graduate student staff and retirees will be
11:30 a.m. - 4:00 p.m.
May 25, 2016.

Spring Fling will offer many of the same activities as in years past, including lunch, a car show, fitness walk, DJ, and yard games. "Purdue's Got Talent," a talent-show activity, will be held in Stewart Center with several other indoor activities, including bingo, zumba and others to be determined later. The registration table and finish line for the annual fitness walk will be in Stewart Center.
Food service and eating space will be outside.
Participants also will have the opportunity to give back by donating blood at the bloodmobile or to the Food Finders canned food drive.
http://www.purdue.edu/springfling/Register/index.html
http://www.purdue.edu/springfling/Events/#freePlay

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"SKILLS PERFORMANCE" TRAINING OPPORTUNITIES AVAILABLE FOR STAFF

Purdue University - Training offers a wide selection of extension courses for both personal and professional growth. Taught by experts in their fields, the courses provide practical, hands-on experience. And, best of all, anyone can afford them. Take a look through their online catalog for courses that interest you. Then, register for the courses you want right now using the web site below!

Please click here to sign up for upcoming classes:
https://www.eventreg.purdue.edu/training/Home.aspx

OTHER NEWS

COEUSLITE IRB TRAINING FOR INVESTIGATORS AT WL CAMPUS

CoeusLite training sessions for Purdue research faculty and staff are scheduled during the months of April and May. Human Research Protection Program (HRPP) and Coeus staff will demonstrate how to submit a new Institutional Research Board (IRB) protocol application through CoeusLite, followed by a question-and-answer session and one-to-one assistance on submissions.

The training sessions are scheduled, as follows:

April 18: (M): 9:30 a.m. – 12:00 p.m.
April 27 (W): 8:30 – 11:00 a.m.
May 5 (TH): 1:00 - 3:30 p.m.
May 13 (F): 9:30 a.m. – 12 p.m.
May 16 (M): 8:30 – 11:00 a.m.
May 26 (TH): 9:30 a.m. – 12:00 p.m.
June 3 (F): 10 a.m. - 12:30 p.m.

Registration is needed. Click here to register for CoeusLite IRB trainings. Individuals will be notified of corresponding training locations after registration is initiated.

Group trainings may be requested by sending an email to IRBCoeusLiteTraining@purdue.edu, or calling the HRPP office at 765-494-5942.

SUMMER WORKSHOP IN MATHEMATICAL MODELING OF EARTH'S DYNAMIC SYSTEMS

This workshop will be an intense, hands---on introduction to the creation and use of numerical models as a method for investigating the dynamics of Earth systems. Participants will learn how to translate their understanding of Earth processes into systems of differential equations, and solve them to test hypotheses concerning both modern and ancient systems. In addition, participants will learn how to apply and evaluate selected existing Earth system models. The short course is open to graduate students and faculty. The event is from **July 31- Aug 5**, **2016** in University Park, PA. See the attached flyer for additional details and registration information.

FUN FACT OF THE WEEK

The Moon (or Luna) is the Earth's only natural satellite and was formed 4.6 billion years ago around some 30–50 million years after the formation of the solar system. The Moon is in synchronous rotation with Earth meaning the same side is always facing the Earth. The first unmanned mission to the Moon was in 1959 by the Soviet Lunar Program with the first manned landing being Apollo 11 in 1969.

IMPORTANT NOTICE ABOUT THIS NEWSLETTER

This newsletter is used as the primary information source for current and upcoming events, announcements, awards, grant opportunities, and other happenings in our department and around campus. Active links to additional information will be provided as needed. Individual email announcements will no longer be sent unless the content is time-sensitive. We will continue to include our publications, presentations and other recent news items as well. Those using paper copies of the newsletter should go to our newsletter archive on the EAPS website at http://www.eaps.purdue.edu/news/newsletters.html **and Click on News** to access active links as needed. Material for inclusion in the newsletter should be submitted to Fallon McQuern (fmcquern@purdue.edu) by **5:00pm on Thursday** of each week for inclusion in the Monday issue.

If it is in the newsletter, we assume you know about it and no other reminders are needed. For answers to common technology questions and the latest updates from the EAPS Technology Support staff, please visit http://www.eaps.purdue.edu/resources/information_technology/index.html.

Also, as an additional resource for information about departmental events, seminars, etc., see our departmental calendar at http://www.EAPS.purdue.edu/events-calendar.html

Purdue University
Earth, Atmospheric, and Planetary Sciences
Unconventional Energy Colloquium

Clay Minerals and Oil and Gas in nm Scale Pore Systems

Douglas McCarty

Chevron
Energy Technology Center

Faculty Candidate

Monday, April 18
3:00-4:00 PM
ARMS Rm 1109

Refreshments at 2:30 in HAMP Rm 2201

Abstract: Over the past decade interest in mudstone and shale properties has increased due to the commercial success of oil and gas shale production from horizontal drilling and hydraulic fracture completions. Despite the economic importance of these unconventional formations, porosity measurements from tight-rock core samples are still challenging and the lack of an accurate measurement technique contributes to uncertainty in estimated ultimate recovery (EUR). The most common industry method is the crushed rock technique developed by the Gas Research Institute (GRI). A liquid saturation and immersion technique with deionized water was resurrected and developed at Chevron, which has proven to be accurate and effective in determining total porosity in low permeability unconventional rock types. This water immersion porosimetry (WIP) technique has been used on hundreds of samples from around the world that were also characterized for whole rock quantitative mineral content, detailed clay species characterization, cation exchange capacity (CEC) and organic matter type and content along with liquid hydrocarbon and water saturation. The hydration enthalpy of exchange cations and the negative polar charge of clay mineral surfaces forming the walls of nm-scale pores can result in a significant volume of pore space occupied by strongly bound irreducible water. The capillary pressure in these nm-scale pore systems is thought to be two to three orders of magnitude higher than that in conventional reservoirs, which significantly impacts phase behavior. In addition, the polar functional groups of organic molecules may compensate negative (polar) charge on clay mineral pore wall surfaces and contribute to an oil wetting or a mixed wetting character and thus inhibit transport out of the matrix.

The evolution of nm-size pore networks within organic matter or hosted in the mineral components of these formations are not well understood. A comparative study of the pore-size distribution (PSD) in a burial diagenetic sequence from the Baltic Basin revealed that pore networks in organic matter (kerogen) develop episodically at a thermal threshold corresponding to RockEval pyrolysis hydrogen index (HI) values of less than ~100 mg of hydrocarbon per gram of total organic carbon (mg HC/g TOC). Methods of unconventional reservoir characterization include clay mineral analysis by X-ray diffraction (XRD) and computer simulation, RockEval pyrolysis, and subcritical N_2 gas-adsorption (SGA) analysis at 77.3 K and other complimentary techniques. SGA-N_2 is effective in quantifying the volume of small pores that are below the detection limit of imaging techniques. Analyses were performed on aliquot samples in the natural state and after OM removal by treatment with buffered sodium hypochlorite (NaOCl). OM exists as separate particles or laminations where clay porosity may be open to adsorption, or OM can partially or completely occupy the space between clay aggregates within dimensions < 5 nm. The relative abundance of micro- (<2 nm) and fine mesopores (2-50 nm) in the thermally mature mudrocks is controlled by both the clay and the OM content.

Analytical methods will be presented that are related to porosity, specific surface area, and clay mineral structure and composition; including thermal analysis, mass spectrometry, subcritical gas and vapor adsorption, organic chemistry and dynamic molecular model simulations, which can reveal insights into mechanisms important to producing oil and gas out of the low permeability rock matrix.

Earth
Atmospheric
Planetary
Sciences