EAPS MEETINGS & EVENTS

FALL FACULTY MEETING SCHEDULE
Tuesday, Oct. 27th and Dec. 1st
HAMP 3201
3:00-4:30 PM

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SEG 2015
October 18-23, 2015
New Orleans, LA

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GSA 2015
November 1-4, 2015
Baltimore, Maryland

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AGU 2015
December 14-18, 2015
San Francisco, California

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AMS 2016
January 10-14, 2016
New Orleans, LA

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LPSC 2016
March 21-25, 2016
The Woodlands, Texas

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

COLLOQUIA

Haylee Dickinson
PhD Candidate
“Inferred Rheology and Petrology of Southern California and Northwest Mexico Mantle from Postseismic Deformation Following the 2010 El Mayor-Cucapah Earthquake”
Tuesday, October 20, 2015
4:00 PM
HAMP 2201

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Victor Gensini
College of DuPage
“Tornadoes: Past, Present and Future”
Thursday, October 22, 2015
3:30 p.m.
HAMP 1252
*There will be a “Happy Hour” after the seminar, at 5:00 PM, at the Stacked Pickle across the street from HAMP (if 21 or older) to discuss tornadoes, firewhirls, and bubble vortices in glasses of rotating beverages.

EAPS NEWS

UPCOMING OUTREACH ACTIVITIES

November 1 - Purdue Convocations Event: Lighting pre show.
November 7 - Purdue Homecoming Celebration held on Stadium Mall between Pharmacy and Armstrong buildings.

These are some of the activities that are already on the books. They will be adding many more throughout the semester. If you would be interested in helping with any of the activities, please contact Steven Smith (mrsmith@purdue.edu)

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MATHEMATICAL CONTINUUM PHYSICS, MATH 598/EAPS 591
SPRING 2016 (Tues & Thurs. 1:30-2:45 PM)
Instructor: Dr. Jon Cushman
CRN: 15509

Lagrangian and Eulerian coordinate system representations are employed throughout all developments. We begin by constructing the fully non-linear strain tensor and analyze its component’s physical significance. This is followed by
development of the integral, and subsequently local forms, of conservation of mass, balances of linear and angular momentum and conservation of energy. The 2nd –law of thermodynamics is postulated for the entire body and employed to develop fully non-linear constitutive relations which are subsequently linearized near equilibrium for many classes of fluids and solids. Maxwell’s equations of electrodynamics are introduced, coupled with the conservation and balance laws and subjected to the 2nd –law to obtain generalized field equations. Averaging principles are employed to obtain the conservation and balance laws for mixtures of species and phases of relevance to porous media. Applications are presented for swelling biopolymers (foods and cells), drug delivery substrates, geophysical media (soils, aquifers and petroleum reservoirs), electro-active polymers (soft robotics), and fuel cells (flow batteries). The common structure of all these examples is highlighted.

GRADUATE NEWS

SHELL IDEAS360

Enter this global ideas competition and win the exciting opportunity to explore the world on a National Geographic Adventure. Shell Ideas360 is a way of foster innovation to turn your ideas into reality. Register today. Submit your ideas now. www.shellideas360.com

Please see attached flier for more information.

OTHER

DEPARTMENT OF MATHEMATICS
CENTER FOR COMPUTATIONAL & APPLIED MATHEMATICS

Distinguished Lecture Series
Professor James Demmel
“Communication-Avoiding Algorithms for Linear Algebra and Beyond”
Monday, Oct. 19, 2015
3:30 PM
LWSN 1142

Please see attached flier for more information.

OCTOBER WORKSHOPS OFFER INTRODUCTION TO UNIX AND HIGH-PERFORMANCE COMPUTING CLUSTERS


The Hands-on UNIX 101 Workshop, to cover topics ranging from logging in, files and directories to permissions, pipelines and scripts, will take place from 3:30-6:30 p.m. Tuesday, October 27, in the Hampton Hall of Civil Engineering, Room 3144. No previous UNIX experience is required to attend. Registration: https://purdue.qualtrics.com/SE/?SID=SV_9SOstn5xcxI2NL.

The Hands-on Clusters 101 Workshop, which will hit subjects including job submission, queues and cluster environments and include a simple hands-on lab, will take place from 3:15-6:30 p.m. Thursday, October 29, in the Hampton Hall of Civil Engineering, Room 3144, followed by a tour of Purdue’s research computing data center. Registration: https://purdue.qualtrics.com/SE/?SID=SV_1Y6QF4T3l7zNvQ9.

BIRTHDAYS

Kathy Kincade Oct. 24th
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 www.purdue.edu/eas/ and Click on News to access active links as needed. Material for inclusion in the newsletter should be submitted to Fallon (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.purdue.edu/eas/info_tech/index.php.

Also, as an additional resource for information about departmental events, seminars, etc., see our departmental calendar at http://calendar.science.purdue.edu/eas/seminars.
Sept. 22  Subashini Subramanian, PhD Candidate  Advisor: Niyogi  “Land Surface Effects on the Post Landfall Characteristics of Tropical Cyclones”  
**Tuesday, 4:30PM, Room 2201/HAMP**

Sept. 24  Dr. Joseph Morris, Lawrence Livermore National Laboratory  Host: Cushman  “Hydraulic Fracture Simulation: Rising to the Challenge of Unconventional Reservoirs”  
**EAPS Energy Colloquium**

Oct. 1  Prof. Nathan Sheldon, University of Michigan  Host: Horgan  Title: TBA

Oct. 8  Prof. Blair Schoene, Princeton University  Host: Caffee  “Constraining Crustal Evolution on Very Short and Very Long Timescales”

Oct. 15  Prof. Qianlai Zhuang, Purdue University  Host: Caffee  Title: TBA

Oct. 20  Haylee Dickinson, PhD Candidate  Advisor: Freed  “Inferred Rheology and Petrology of the Southern California and Northwest Mexico Mantle from Postseismic Deformation Following the 2010 El Mayor-Cucapah Earthquake”  
**Tuesday, 4:00PM, Room 2201/HAMP**


Oct. 27  Anthony Ingrafea, Cornell University  Host: Cushman  Title: TBA  
**EAPS Energy Colloquium**  
**Tuesday, 7:00PM, Room 112/PHYS**

Oct. 29  Prof. Jerry DeGraaff, AEG-Jahns Lecturer,  Host: West  “Effective Monitoring for Environmental and Engineering Geology Projects, Case Histories in Mining, Groundwater Contamination and Hot Springs Migration”

Nov. 5  Prof. Kim Novick, Indiana University  Host: Welp  “Mechanisms Limiting Forest Carbon Uptake and Water Use During Drought”

Nov. 10  Kimberly Hoogewind, PhD Candidate  Advisor: Baldwin  Title: TBA  
**Tuesday, 4:00PM, Room 2201/HAMP**
Nov. 12  Dr. Dave Finnegan, US Army Corps of Engineers  Host: Elliott
“Automated LiDAR Scanning of a Tidewater Glacier: Helheim Glacier, Southeast Greenland”

Nov. 19  Prof. Susan Brantley, Pennsylvania State University  Host: Melosh
Title: TBA

Dec. 3  Prof. Paul Staten, Indiana University  Host: Wu
“Metrics, Mechanisms, and Magnitudes of Tropical Widening in a Warming Climate”
Inferred Rheology and Petrology of Southern California and Northwest Mexico Mantle from Postseismic Deformation Following the 2010 El Mayor-Cucapah Earthquake

Haylee Dickinson
PhD Candidate

The Mw 7.2 El Mayor-Cucapah (EMC) earthquake ruptured a ~120 km long series of faults striking northwest from the Gulf of California to the Sierra Cucapah. Five years after the EMC event, a dense network of GPS data in southern California and a sparse array of sites installed after the earthquake in northern Mexico measure ongoing surface deformation as coseismic stresses relax. We use 3D finite element models of seismically inferred crustal and mantle structure with earthquake slip constrained by GPS and InSAR range change and sub-pixel offset measurements to infer the rheologic structure of the region. Model complexity, including 3D Moho structure and distinct geologic regions such as the Peninsular Ranges and Salton Trough, enable us to explore vertical and lateral heterogeneities of crustal and mantle rheology. We find that postseismic displacements can be explained by a laterally varying, stratified rheologic structure controlled by temperature and crustal thickness. In the Salton Trough region, a strong, but thin (22 km thick) crust and high temperatures lead to a relatively weak mantle column, where viscosities decrease with depth. Whereas beneath the neighboring Peninsular Ranges a strong, thick (up to 35 km) crust and cooler temperatures lead to a rheologically stronger mantle column. Thus, we find that the inferred rheologic structure corresponds with seismic structure and thermal variations. Combined with isochemical phase diagrams, our results enable us to go beyond rheologic structure and infer some basic properties about the regional mantle, including composition, water content, and the degree of partial melting.
This talk will focus on recent substantial progress that relates the large-scale climate system and hazardous convective weather (HCW; tornadoes, hail, and damaging wind), particularly over the USA where there are large societal impacts and a long observational record. Despite observational data limitations, HCW has shown to be influenced by the climate system and the tropical atmosphere via the Madden-Julian Oscillation, El Nino-Southern Oscillation, and global relative angular momentum. Analysis of the atmospheric environments favorable to HCW (e.g., convective available potential energy and vertical wind shear) avoids observational and model limitations. While few robust trends are seen over recent decades, future climate projections indicate increased frequency of such environments over the USA, Europe, and Australia, suggesting increased future HCW activity. A recent increase in the year-to-year variability of US tornado occurrence is striking, but not yet understood. Dynamical downscaling to convection-permitting resolutions promises improved understanding of the relationships between large-scale climate and HCW occurrence. Challenges in long-range forecasting of tornado frequency (and the current tornado outlook, watch, and warning process) will also be discussed.

Thursday, October 22, 2015
3:30 p.m.
Room 1252 HAMP
Enter this global ideas competition and win the exciting opportunity to explore the world on a National Geographic Adventure.

Even the simplest of ideas have the power to transform lives and positively impact society. At Shell, we believe human ingenuity holds the key to unlocking innovative thinking across our society, now and for the future.

Shell Ideas360 is our way of fostering innovation to turn your ideas into reality.
So here’s your chance to work with Shell mentors, be part of an international community of like-minded innovators and own your idea that could change the world.

Register today. Submit your ideas now.
www.shellideas360.com
Would you like to win the exciting opportunity to explore the world on a National Geographic Adventure?

Even the simplest of ideas have the power to transform lives and positively impact society. At Shell, we believe human ingenuity holds the key to unlocking innovative thinking across our society, now and for the future. Shell Ideas360 is our way of fostering innovation to turn your ideas into reality.

Why take part?

Once you have registered:

• It’s a great opportunity to connect with other student innovators around the world
• By joining our Hangouts, you can be inspired and learn about innovation, teamwork, business planning and other skills that could improve your cv, and help you in your future career.

Submitting an idea:

• **Stage 1:** Submitting your initial idea is very simple, and all submissions will receive a 3 month subscription to WIRED’s interactive digital magazine
• All Stage 2 teams will be supported by a Shell Mentor, access to further training and a subscription to National Geographic magazine

If you are selected for the Final:

• You will be invited to present to a Panel of Shell and industry leaders in London, UK at
the end of June 2016

- The Winners will each receive a National Geographic Adventure of their choice and the Shell Ideas360 Trophy

So here’s your chance to think of an idea that could help to solve an energy, food or water-related challenge in your university, community, country, or even the world. Whatever your idea or vision, we’d love to hear it...and help you to bring it to life through business mentoring and support.

Click here for more information.

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What if your idea could change the world?