With the Fall AGU meeting just around the corner it is appropriate to start this letter by mentioning members of the PPEM and MRP community that received special recognition for their outstanding scientific contributions this year. Rajdeep Dasgupta received a 2010 Packard Fellowship. David Walker was awarded the Harry H. Hess Medal of the AGU. Robert C. Newton received the Mineralogical Society of America Roebling Medal, and Jillian F. Banfield (2010) and Ross John Angel (2011) received the Dana Medal. Maik Lang received the 2010 Alvin Van Valkenburg Award. Teng-fong Wong was the 2010 recipient of the European Geophysical Society Louis Néel Medal and Richard Sibson received the Wollaston Medal of the Geological Society of London.

Please join me in congratulating those mentioned above, and the PPEM and MRP members that became Fellows of the AGU (Yingwei Fei, Bradley R. Hacker, Louise H. Kellogg, Hans Keplner, Stephen J. Mackwell) and GSA (James P. Evans, Richard Wirth) in 2010.

It is also appropriate and with great pleasure that I thank our Fine Dining Team, Brian Bonner and Steve Blair for once again dedicating their time to organizing and executing the yearly PPEM dinner. Brian told me that he has found an enticing restaurant with a great menu that will come at affordable prices tailored for the employed, and starving students. Keep an eye on your inbox or see Page 8 for more information about reserving your seat at the table.

I would like to thank Joe Morris who has agreed to continue as the PPEM web master (http://www.ppem.org/), Andreas Kronenberg for offering to continue to keep the PPEM community informed about upcoming meetings, special publications and jobs, and Nick Beeler for maintaining the PPEM email list and serving as the PPEM treasurer. All of these activities are critical to keep our community connected.

Please welcome our new steering committee members, Phil Skeimer (Washington University in St. Louis), and Stephen Karner (ExxonMobil). Phil accepted the Newsletter Editor position without hesitation and I want to thank him for

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The 2010 Gordon Research Conference (GRC) in Rock Deformation (Aug 8th-13th, Tilton, New Hampshire) explored the cutting edge of this topic through the theme “Transient and transitional behavior in rock deformation: moving away from steady-state”. The meeting attracted 130 registered participants from across the globe; ninety of these were early-career researchers including 50 graduate students and this led to a great atmosphere with the next generation of researchers contributing significantly to the meeting through talks, posters, discussion and debate. The meeting was conducted in a fully inclusive manner and with plenty of time and opportunity for less formal discussion. The GRC in Rock Deformation always provides an excellent forum to shape the scientific debate and to fill the still extensive gaps in our knowledge of how the Earth deforms. The 2010 conference included 25 talks in 9 thematic sessions and around 80 posters. We are indebted to substantial funding from the Department of Energy and the National Science Foundation in support of the participation of Early Career Researchers, the Tectonic Studies Group in support of UK graduate students’ participation, the GRC in support of the speakers’ registrations and Oxford Instruments Plc in support of the bar bill. Information about past and future GRCs (in Rock Deformation and many other topics) and including the programme of the 2010 meeting can be found at http://www.grc.org/. Details of the 2012 GRC in Rock Deformation, chaired by Peter Keleman will start to appear at this same website in the summer of 2011.

A Note From The Chair
- Continued from Page 1 -

his superhuman effort to solicit contributions and put this newsletter together in record time! It is important to note that the steering committee turnover is not complete. Joanne Fredrich, David Goldsby, Joe Morris, and Francois Renard are scheduled to rotate off in 2011. If you are interested in volunteering, or would like to nominate someone for one of these posts, please contact me at chesterj@tamu.edu. The steering committee will meet during the Fall AGU meeting to discuss nominations for new committee members, and initiatives to help advance PPEM science and promote the physical properties community. We welcome all input in this regard. Please feel free to contact any PPEM steering committee member with your ideas.

Finally, on behalf of the entire community I would like to thank Steve Hickman (Chair), Ben Holtzman, and Shenghua Mei (Newsletter Editor) for serving on the PPEM steering committee for the past four years. Special thanks are extended to Shenghua for keeping the PPEM newsletter alive. I hope to see you in San Francisco!

Best regards,
Judith
On October 1, 2010, the new GeoPRISMS Office opened its doors, chaired by Julia Morgan and hosted at Rice University. GeoPRISMS (Geodynamic Processes at Rifting and Subducting Margins) is a new cross-divisional NSF funding initiative following upon the highly successful MAR-GINS Program. As was MAR-GINS, GeoPRISMS is designed to facilitate coordinated, multidisciplinary research efforts that span the shoreline across continental margins, with the goal of building and sustaining a large, interdisciplinary community well-situated to carry out transformative studies of continental margin dynamics and evolution. GeoPRISMS Mission is to “investigate the coupled geodynamics, earth surface processes, and climate interactions that build and modify continental margins over a wide range of timescales (from s to My), and cross the shoreline, with applications to margin evolution and dynamics, construction of stratigraphic architecture, accumulation of economic resources, and associated geologic hazards and environmental management.”

The GeoPRISMS Science Program consists of two broadly integrated initiatives, distinguished by tectonic setting:

- Subduction Cycles and Deformation (SCD) takes a holistic approach to the deformation processes and material cycles governed by subduction. It integrates and expands the former MARGINS SEIZE and SubFac Initiatives, building on a growing recognition that the two systems are tightly linked and responding to many of the same forcing functions, although manifest in different ways. The SCD Initiative will focus on the coupled processes responsible for both long-term margin evolution and material transfer and short-term plate boundary deformation.

- Rift Initiation and Evolution (RIE) provides a new and broad perspective on the processes by which continents break apart. It expands the former RCL Initiative to include the full spectrum of stages of continental breakup, with increased emphasis on the interplay between surface processes, sedimentation, and continental evolution. It will include early-stage rifts but also the study of passive margins, which archive the entire history of rift zone construction and evolution.

Both initiatives highlight the interconnectedness among surficial, shallow crustal, and deep Earth processes and their roles in plate boundary deformation, mantle rheology, magmatic processes, and volatile fluxes. Both will engage interdisciplinary teams carrying out observational, experimental, and modeling studies to address their fundamental questions. A suite of five Overarching Themes serve as the basis for integrative studies and provide a framework for cross-initiative programs: (a) Origin and Evolution of Continental Crust; (b) Fluids, Magmas and Their Interactions; (c) Climate-Surface-Tectonic Feedbacks; (d) Geochemical Cycles; and (e) Plate Boundary Deformation and Geodynamics.

Implementation of GeoPRISMS will follow a “hybrid” approach, in which focus-site studies will be complemented by thematic investigations. While major field efforts will occur in designated focus sites, studies that address programmatic themes but cannot be done in those sites will be supported elsewhere. These sites will be chosen at two community implementation workshops scheduled for November 2010 (RIE) and January 2011 (SCD). Further information, copies of the GeoPRISMS Draft Science Plan, and opportunities to participate in upcoming GeoPRISMS activities, can be found at http://www.geoprisms.org. We look forward to seeing you in the very near future!
Ni hao from Beijing! This is Toshi Shimamoto. I have retired from Hiroshima University and started working for the Institute of Geology in Beijing in April 2010. This institute is part of the China Earthquake Administration (CEA), perhaps better known by its former name, the State Seismological Bureau. CEA is a big organization that conducts seismological and geodetic observations throughout China, and basic research on earthquakes, volcanoes, and tectonics. The Institute of Geology is one of several CEA research institutions. The Laboratory of Tectonophysics (one part of State Key Laboratory of Earthquake Dynamics), lead by Profs. Shengli Ma and Changrong He, works on experimental rock deformation and fluid flow. Totaling 14 faculty and staff, 4 postdocs, and 24 graduate students (above), this Laboratory seeks to improve understanding of earthquake dynamics and tectonic deformation. Three groups are studying a wide variety of problems from shallow brittle to deep ductile deformation including the behaviors of fault systems, using eight deformation and fluid-flow apparatus.

The first group, lead by Jin Ma and Liqiang Liu, is studying brittle deformation of rocks using a biaxial servo-controlled apparatus (Fig. 1, left), a large specimen triaxial apparatus, and a 32 channel AE monitoring system. Recent studies focus on the effects of geometry and material heterogeneity of fault systems on their mechanical behavior, changes in stress-strain fields, microfracture distribution, and thermal field. The second group, led by Changrong He and Yongsheng Zhou, focuses on frictional behavior and creep property of diorite, gabbro and their constituent minerals in order to better understand the fault rheology in the middle to lower crust, using two gas apparatuses (one of them shown

- Continued on Page 5 -
in Fig. 1, right) and a solid pressure medium apparatus. The third group, lead by Xiaosong Yang, focuses on anisotropy in elastic and electrical properties of rocks to understand the mechanisms of “abnormal layers” in the crust and their effect on mechanical properties, using a piston cylinder apparatus. Jianye Chen and others are extending research to include permeability measurements and fluid flow analyses. A drilling project into the Longmenshan fault zone, which caused the 2008 disastrous Wenchuan earthquake, is a major project we have started recently. We are hoping to reproduce this earthquake based on measured fault-zone properties.

Now what am I going to add to this laboratory? A rotary-shear low to high-velocity friction apparatus was just installed to the institute (Fig. 2). This is my third-generation machine, which covers 60 mm/year to several m/s in slip rates. A unique feature is a large space allocated for specimen assembly where users can put whatever they want. Our challenges are to conduct high-velocity friction experiments with controlled pore-water pressure using a pressure vessel, to cover plate velocity to seismic slip rates seamlessly in a single machine and to extend high-velocity experiments to deeper conditions.

The Institute of Geology is close to the “Big Nest”, the main stadium of Beijing Olympic, with an easy access from the airport. You are all welcome to visit us here.

Figure 2 - A rotary-shear low to high-velocity friction apparatus installed to Institute of Geology in October 2010. The machine is 3.2 meters tall and is equipped with a 22 kW servo-motor with a gear/belt train system that allows changes in slip rates up to 9 orders of magnitude, including step changes up to 6 orders, at axial forces to 10 tones. The second machine, now at Hiroshima University, was built with similar scopes. But making pressure vessels was not easy and many variations are possible. We thus left large space for installing a variety of specimen assemblies as users’ option for the third-generation machine. The machine was built by Marui Co. Ltd., Osaka, Japan and machines are commercially available from this company at reasonable cost. Similar machines will be installed at University of Padova, University of Durham and National Central University of Taiwan.
Deformation, Rheology, and Tectonics (DRT)

~ Sergio Llana-Fúnez ~
~ Marco Antonio López-Sánchez ~
~ Francisco José Fernández ~
Universidad de Oviedo

~ Miguel Gutiérrez-Medina ~
Universidad de Cantabria

Organizing Committee, DRT 2011

The DRT conference is a series of meetings dedicated to the study of deformation processes in rocks at various scales, from the microscopic to the lithospheric scale.

The meetings are hosted every two years by different European universities. The tradition was started by Prof. HJ Zwart, who organized the first meeting in Leiden in 1976. They were known the "Leiden meetings" for some time (see PPEM Newsletter from October 2000). Spanish geology benefitted substantially from the geological mapping the group of Leiden did in various parts of the Iberian Peninsula and, partly for that reason in the last meeting in Liverpool 2009 we proposed to bring DRT to one of Leiden’s natural structural geology laboratory: northwestern Spain.

The meeting will be held in Oviedo, Spain, starting formally the 31st of August and finishing the 2nd September. Oviedo is strategically located to visit tectonic structures formed at different depths in the crust within an orogenetic wedge: two short field trips will be organized to visit in the field two segments of the exposed Variscan Orogen.

The range of topics and the focus of previous DRT meetings will remain in Oviedo. We propose six general Conference Topics for the next meeting:

1. Brittle-ductile and/or frictional-plastic transition in the crust
2. Fluids, metamorphism and deformation
3. Tectonics and earth surface processes
4. Microstructure of deformed rocks
5. Folding mechanisms
6. Applied aspects of structural geology and geomechanics

Information about the meeting will be updated periodically on the meeting website.

http://www.geol.uniovi.es/drt2011

GSL Special Publication

A special publication of the Geological Society of London entitled “Deformation Mechanism, Rheology & Tectonics: Microstructures, Mechanics & Anisotropy” will go to print soon and should be available in 2011. The volume stems from the 17th meeting of the bi-annual Deformation Mechanisms, Rheology & Tectonics international conference, held in Liverpool in September 2009. The volume will be dedicated to the memory of Dr. Martin Casey and this collection of nineteen papers reflects Martin’s scientific interests. The volume presents recent advances in the study of deformation mechanisms and rheology and their applications to tectonics. Several papers exploit new petrofabric techniques, particularly electron backscatter diffraction analysis, to help understand evolution of microstructure and mechanical properties. The papers reflect the growing emphasis on the determination of elastic properties from petrofabrics, from which acoustic properties can be computed for comparison with in-situ seismic measurements. The papers in this volume make use of combinations of laboratory experiments, field studies and computational methods, and several seek to relate microstructural evolution to large-scale tectonic processes observed in nature.

David Prior and Dan Tatham, University of Liverpool and Ernie Rutter, University of Manchester, Editors

Oviedo, Spain
August 31st - September 2nd
2011
A workshop on the Spectrum of Fault Slip Behaviors was held in Portland, Oregon on October 11th through 14th. This was part of the first of a planned series of EarthScope Institutes focusing on topics of interest to the broader EarthScope science community. The Institutes will continue in virtual form, after the meeting, using web tools managed by the EarthScope National Office, see: www.earthscope.org/institutes.

The principle goal of the EarthScope Institute on the Spectrum of Fault Slip Behaviors is to improve understanding of the mechanisms responsible for these phenomena and to foster critical thinking about the underlying physical processes involved in the different types of observed slip (Figure 1). The workshop was attended by 150 scientists and covered topics ranging from the role of fault zone structure on slip style, to the onset of frictional slip, and models of fault creep and slow slip events. Participants were treated to three days of keynote talks, poster presentations, and high-level discussion. Several themes emerged from the discussion, including the need to understand the factors that limit fault slip speed in slow and quasi-dynamic rupture events, and the relationship between processes that produce earthquakes, tremor, and other forms of transient fault slip. An emerging consensus is that components of the spectrum of fault slip behaviors has a distinct and systematic distribution with depth, with a shallow seismogenic zone separated by a region of slow slip from a deeper zone of tremor. In this sense, even Figure 1, produced one year ago, is out of date. Workshop participants discussed recent works that reveal new features of tremor migration and possible mechanisms for slow slip events and related phenomena. Fruitful discussions were enhanced by the variety of viewpoints offered by geologists, geodesists and geophysicists. The EarthScope National office did a wonderful job of organizing the logistics for the workshop, which was sponsored by the NSF EarthScope program. Additional information about the workshop can be found online at: www.earthscope.org/workshops/fault_slip10.

Figure 1 - Upper panel shows a range of fault slip behaviors illustrated in a subduction zone setting. Episodic tremor and slip (ETS) are often observed at the down-dip end of the seismogenic zone. Earthquakes that are deficient in high frequency energy, so-called low (or very low) frequency earthquakes VLF occur in a variety settings and possibly in association with slow earthquakes or aseismic transients. Lower panel shows the corresponding range of characteristic durations for TFS and normal earthquakes. (from Saffer, Marone and Bilek: NSF-MARGINS Decadal Review 2009)
2010 PPEM Dinner Reservation Form

Reservations must be made and payments received before 1 December 2010.

Send this form or reasonable facsimile by e-mail to: scblair@sbcglobal.net or make a hardcopy and send by posted mail to the address below.

Please reserve:

_______  places at $52.00 each

_______  student places at $28.00 each

Payment: (due 1 December 2010)

_______  I am mailing a check made out to "PPEM"
          (Please do not make checks out to Steve Blair)

          Mail check to:    Dr. Stephen Blair
          3700 Lakeshore Ave
          Oakland, CA 94610
          USA

_______  I will pay using PayPal
          Recipient's Email: scblair@sbcglobal.net
          Subject: 2010 PPEM dinner
          Note: Please include your name on the paypal message
          (Since PPEM does not have a business account, we can NOT
          accept credit card payment. You must establish your own
          PayPal cash account, which takes about two weeks)

_______  I will pay Steve Blair at the AGU meeting BEFORE the dinner
          (please: non-U.S. residents only)

Name: ________________________________

Affiliation: ________________________________

Other information, comments, special dietary requests, etc:

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______________________________
______________________________