

# **Newsletter of the APS Shock Compression of Condensed Matter Topical Group**

**Welcome** to the second issue of the American Physical Society Shock Compression of Condensed Matter Topical Group Newsletter. This quarterly newsletter includes conference announcements, job advertisements, profiles of award winners, obituaries, and articles on the history of the field from the membership. Issues have revolving Lead Editor, with current issue has been compiled by Dr. Jennifer Jordan. Dr. Bill Proud will serve as the Lead Editor for the August issue, please email him your comments and contributions at [wgp1000@hermes.cam.ac.uk](mailto:wgp1000@hermes.cam.ac.uk).

## **“Note from the Chair”**

Aloha! I hope that spring is finding you all well. I would like to thank Marcus Knudson, our current Vice-chair. Marcus has agreed to spearhead our efforts for participation in the 2008 March meeting. As you know, the APS March meeting is *the* meeting for physics in the US each year. Because attendance from our topical group has been at about 35-45 people each year, APS leadership has limited our ability to hold “focus sessions” in our field of shock physics at this important meeting. However, our field is changing dynamically (pun intended), and with the rapid advances in both diagnostics and computational power, we are in an era where atomic and mesoscopic models will meet, and data to support this type of modeling will be acquired. Thus, I ask you to support Marcus, by providing suggestions for plenary talks and/or topics in the shock physics field that should be part of the 2008 March APS meeting. You may contact him via e-mail: [MDKnuuds@sandia.gov](mailto:MDKnuuds@sandia.gov).

Tracy Vogler, our Secretary/Treasurer has recently sent out a request for topics to be added to the agenda for the business meeting in Hawaii. Please send in your suggestions to him as soon as possible. I remind you that I would like to discuss having the Vice-chair head up a committee for the annual APS March meeting (as Marcus is doing this year), to ensure that we have strong participation at this important APS event.

Regarding the Hawaii conference, it seems that “confirmed” participation is down at this point. However, many folks wait until it is closer to the conference before they register. It would be very helpful if you are planning

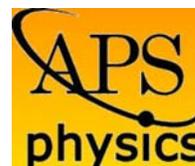
on attending to register as soon as possible. We (myself and the conference chairs) would very much appreciate it.

I am encouraged by the large student participation that we will have at the conference. Students/Post-docs are the life-blood of our field, and the more involvement we have the stronger our field will become. This year we are providing partial funding for 33 students. Again, it is shaping up to be a fine conference, with strong participation from around the world.

Aloha, and see you in Hawaii.

Dave

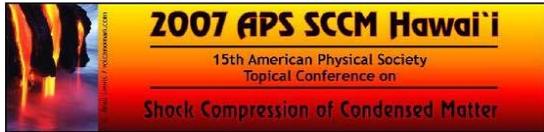
David J. Funk, 2007 Topical Group Chair



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## Hawaii Conference



**ALOHA FROM HAWAII!**  
**MARK YOUR CALENDARS FOR JUNE 24-29,**  
**2007!**

**REGISTER ONLINE AT:**  
<http://www.apshawaii07.com>

**Make your HOTEL reservations NOW! Space is limited for special conference rates!**

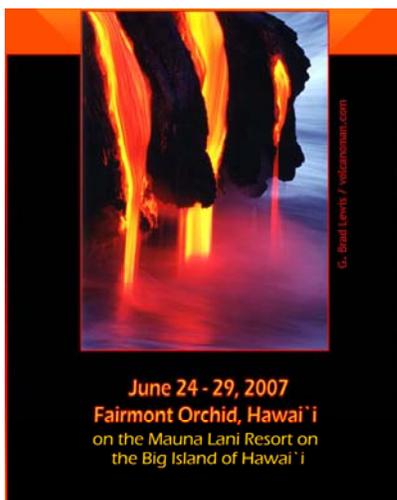
Plenary Speaker: *Kazuyoshi Takayama from Tohoku University*

Shockwave Award Winner: *Dennis Grady*

The conference will be held at the Fairmont Orchid Hotel, Waikoloa, Hawai'i. Waikoloa Beach Marriott Resort and Spa, which is approximately 10 minutes away, has been announced as official overflow hotel.

**5 extraordinary field trips!** Snorkeling In Kealahou Bay, Hawai'i Volcanoes National Park Tours, Historical Kailua-Kona Self-Guided Tour, Mauna Kea Summit & Stargazing Adventures, and Historic Hawi, Kapa'au, & Waimea Tour

**ENROLLMENT LIMITED! REGISTER NOW AT:**  
<http://www.apshawaii07.com/fieldtrips.html>



## Dennis E. Grady Selected to Receive 2007 Shock Compression Science Award



The American Physical Society 2007 Shock Compression Science Award will be presented to Dr. Dennis E. Grady, Associate and Principal Scientist, Applied Research Associates, Albuquerque, during the Fifteenth Biennial APS SCCM Meeting to be held in the Big Island of Hawaii from June 24 to 29, 2007. The award is in recognition for his "pioneering contributions into the fundamental principles controlling dynamic failure and fragmentation, developing a large database for the dynamic response of brittle materials, and identifying a universal relationship between shock wave structure and its amplitude."

Dennis is widely recognized for his creativity, independence, and willingness to venture into challenging and un-chartered research activities. He has made important research contributions developing scientific concepts, physical models, and experimental methods, in several areas of shock compression and high-pressure science. His seminal work on dynamic fracture and fragmentation, and localized heterogeneous deformation, has provided the basis for physics-based models for computer simulations. These have been quite instrumental in establishing long-term research directions at institutions across the world. His formulation of the fourth-power relation between shock rise time and peak stress, has had a significant impact on predictions in computational simulations of shock propagation. His work on generation of dynamic material property data and their physical effects, for brittle solids and geological media, over a wide range of pressures and temperatures, loading rates, and strain-rate effects, has become a principal source of information for many scientific studies. In addition to these scientific contributions, Dennis has also demonstrated leadership by participating in national and international committees, and many DoE and DoD sponsored workshops on advanced armor and other materials. He has played an active role in advancing the interests of the shock compression and high pressure

science communities, having served as the Chairman of our APS-SCCM Topical Group, a member of the Board of Directors of the Hypervelocity Impact Society, and the first US delegate on the Board of the European DYMAT organization.

After enlisting in the United States Navy from 1958-63, Dennis obtained his undergraduate degree in physics and mathematics from Lewis and Clark College in 1967. He joined the graduate program in physics at Washington State University, and obtained his Ph.D. in 1971, under Professor George Duvall. From 1971 to 1974, he was a member of the scientific staff at the Stanford Research Institute, in Menlo Park, before moving to Sandia National laboratories in Albuquerque. In his 22 years, initially as member and later as Distinguished Member of the Technical Staff at Sandia, he worked on and led a number of defense, nuclear, and energy related programs. From 1996 to the present, he has worked as an Associate and Principal Scientist at Applied Research Associates, Inc., where, he is responsible for providing technical and programmatic guidance for DoD and DoE weapons programs in a number of areas of ultra-high-pressure shock wave research. Dennis is a fellow of the APS, author of more than 200 publications, and two books published by Springer-Verlag.

Submitted by:

Naresh Thadhani, Chair, 2007 APS Shock Compression Science Award Selection Committee.

### **Town Hall Meeting - Dynamic High Pressure Research**

At the APS Conference in Kona, a Town Hall Meeting will be held on Future Directions in Dynamic High Pressure Research. Persons wishing to make suggestions for new directions will have a few minutes to do so. This session is being organized by Bill Nellis (nellis@physics.harvard.edu).

Dynamic compression research began in the U. S. sixty years ago. The motivator was national defense and compression was accomplished by a single shock wave. Since that time the world has changed substantially. New issues, in addition to military ones, threaten international stability in the twenty-first century. Isentropic and quasi-isentropic compression techniques have now been developed, which means temperature can be tuned independent of pressure between that on the Hugoniot and that on the isentrope. States can be achieved by dynamic compression that cannot be achieved by other methods. Dynamic and static compression with laser heating can now be used to measure different properties at the same conditions. The time is right for a national user facility in an unclassified University environment that achieves

extreme conditions of high-energy density in condensed matter.

Such facilities currently exist mainly in National Laboratories and should be developed in an open, unclassified University environment for fundamental and applied research. A user facility is for every one, national labs and universities. In fact, this is one way to facilitate involvement of people from national and military laboratories in basic research. The purpose of this town hall meeting is to solicit input from the community on what new things should be done in the future with dynamic compression. Anyone who would like to present a suggestion will have about five minutes to do so, depending on the number of people wishing time and the time available.

### **DYMAT Meeting**

The DYMAT Association was created on October 29th, 1983, on the initiative of a group of French scientists with a view to promoting the study of the dynamic behaviour of materials. Originally it was a solely French Organization, a non-profit making Association registered under the French law of 1901. In 1991, DYMAT was expanded to become a European Organization, including members from various European countries on its governing board

The DYMAT Association involves a large number of laboratories focussed on the modelling of the dynamic behaviour of materials (metals, polymers, composites, rocks) using various experimental techniques and numerical methods. By contacting DYMAT, a research group or industrial company can get in touch with these labs which are ready to offer their experience in performing specific studies on dynamic constitutive laws, damage, impact and shock wave phenomena.

The theme of the 17<sup>th</sup> DYMAT technical meeting, to be held Sept. 6-7, 2007 at the Cavendish Laboratory, Cambridge, UK, is "the High Rate Mechanical Properties of Energetic Materials, their Binders, and Simulants." The goal meeting is to present and discuss recent progress in the study of the dynamic behaviour of energetic materials leading to the development of constitutive relations which can be used in Finite Element Codes in order to model these materials in the uses to which they are put. The conference will cover theoretical, experimental & numerical approaches to the mechanical behaviour of energetic materials and simulants at high strain rates.

## **Other Upcoming Conferences**

### **PLASTICITY 2007**

"13<sup>th</sup> International Symposium on Plasticity"  
Alyeska Prince Hotel, Alaska – June 2-6, 2007  
[www.neat-plasticity.com](http://www.neat-plasticity.com)

### **ASME Applied Mechanics and Materials Conference (McMat)**

Austin, Texas – June 3-7, 2007. Abstract deadline Feb. 16, 2007,  
<http://www.ae.utexas.edu/MCMAT07/>

### **SEM Annual Conference on Experimental and Applied Mechanics**

Springfield, Massachusetts - June 3-6 2007  
[www.sem.org](http://www.sem.org)

### **Multi-phases and multi-components materials under dynamic loading**

Kazimier Dolny (Poland) – June 11-14, 2007  
[www.lmt.ens-cachan.fr/emmc10](http://www.lmt.ens-cachan.fr/emmc10)

### **ICEM 13 International Conference on Experimental Mechanics**

Alexandroupolis (Greece) – July 1-6, 2007  
[www.icem13.gr](http://www.icem13.gr)

### **21<sup>st</sup> Int. Colloquium on the Dynamics of Explosions and Reactive Systems**

Poitiers (France) - July 23-27, 2007  
[www.icders2007-poitiers.org](http://www.icders2007-poitiers.org)

### **IMPLAST'07 9<sup>th</sup> International Symposium on Plasticity and Impact Mechanics**

Bochum (Germany) – August 21-24, 2007  
[www.tm.bi.rub.de/implast07](http://www.tm.bi.rub.de/implast07)

### **DYMAT - 17<sup>th</sup> Technical Meeting, The High Rate Mechanical Properties of Energetic Materials, their Binders or Simulants**

Cambridge (UK) – September 6-7, 2007  
[www.dymat.org](http://www.dymat.org)

### **Hypervelocity Impact Symposium**

Williamsburg, Virginia - September 23-27, 2007  
[http://www.hvis.org/HVIS\\_07/index.html](http://www.hvis.org/HVIS_07/index.html)

### **Sixth Int. Symp. on Impact Engineering**

Daejeon (Korea) - September 16- 19, 2007

### **High Speed Industrial Manufacturing Processes**

Senlis (France) – November 13 -15, 2007  
[www.hsimp.com](http://www.hsimp.com)

### **ASME International Mechanical Engineering**

### **Congress and Exposition (IMECE07)**

Seattle, Washington –November 10-16, 2007. Abstract deadline March 5, 2007.

<http://www.asmeconferences.org/congress07/>

### **Workshop on “Constitutive relations and numerical simulation of industrial dynamic processes”**

Metz (France) – November 2007

[rusinek@lpm sciences.univ-metz.fr](mailto:rusinek@lpm sciences.univ-metz.fr)

### **6<sup>th</sup> International Conference on Mechanics of Time-Dependent Materials 2008**

Monterey, California – March 30 - April 1, 2008. Abstract deadline March 20, 2007

<http://www.ae.utexas.edu/MTDM08/>

### **International Congress on Theoretical and Applied Mechanics**

Adelaide (Australia) – August 24-30, 2008

[prandtl.maths.adelaide.edu.au/ictam2008/](http://prandtl.maths.adelaide.edu.au/ictam2008/)

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## **Jobs**

### **POSITION AVAILABLE**

Institute for Advanced Technology at the University of Texas-Austin, TX is seeking candidates for Post Doctoral and Engineering Scientist Associate positions in impact physics and electrodynamic areas. Responsibilities: (a) Impact physics area: Conduct theoretical and numerical analysis of high speed impact events; (b) Electrodynamics area: Conduct scientific and engineering research in electromechanics to support development of electromagnetic launchers and associated components. Required Qualifications: Doctoral degree in engineering, or physics for post-doctoral position, and Bachelor degree in engineering or physics for ESA position. Familiarity with computational methods and modelling. Must be US Citizen to receive security clearance required by sponsor. Preferred Qualifications: Relevant experience in numerical modelling and code development, or impact physics and hydrocodes, or electromechanics. Functions Conduct theoretical and numerical analysis, work with experimentalists on design and data analysis. Email [lovell@iat.utexas.edu](mailto:lovell@iat.utexas.edu) for more details and to apply for the positions. Security sensitive position; conviction verification conducted on applicant selected. Equal Opportunity / Affirmative Action Employer.

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## **Announcements**

Jean-Paul and Angela Davis announce the birth of their first son Pascal Alexander Davis on February 28, 2007 at 7:04 PM. Pascal weighed 7 pounds, 12 ounces, and measured 20" long at birth.