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Message from the Chair

As I approach the end of my year as chair of the topical group, I want to take the opportunity to update you on some of the things that have happened this year as well as some things that are planned for the future. Most notably, we held our biennial shock conference in Seattle in July. This meeting was notable for being held jointly with the static high pressure organization AIRAPT, something that last occurred in 1993. The shock and static high pressure communities are linked in important ways, so holding a meeting jointly every so often is a natural thing to do. I, for one, attended some excellent talks from the static community that I probably would not have been able to hear otherwise. Unfortunate travel restrictions limited, to varying degrees, the ability of U.S. DOE and DoD researchers to attend the conference. Nevertheless, Rip Collins, Choong-Shik Yoo, and Dave Moore did an outstanding job of organizing the confidence in the face of significant financial and attendance uncertainties. Our next meeting in 2015 is being organized by Ivan Oleynik, Su Peiris, and Ramon Ravello. They are still negotiating details, but we hope to have more specifics to provide in the next newsletter.

One of the highlights of the Seattle meeting was an expanded student program that included a special student symposium on Sunday prior to the main conference. This provided a low-pressure opportunity for students to gain experience in presenting their work. Additionally, Rick Kraus received the first early career award given by the group. Dave Moore and Dana Dattelbaum will be investigating ways to formalize the early career award for the future.

Several members of the group have raised the issue of NNSA's decision to discontinue academic access to the NIF and Z facilities as a response to sequestration cuts. In response, a group led by Dylan Spaulding and Sarah Stewart is drafting a public statement encouraging NNSA to maintain the academic programs at these facilities. To my knowledge, the topical group has never taken a public position on any issue, but I believe this is an area that is especially important to us and we can raise awareness of the issue at a higher level. The statement being drafted will be available to the membership of the group for comments prior to its release.

Also, thanks to Eric Brown, LANL, one can join the APS-SCCM group on LinkedIn: <https://www.linkedin.com/groups/APS-Topical-Group-on-Shock-4898994>

More information on the LinkedIn group will be forthcoming in the next newsletter.

Despite the fiscal challenges we face as researchers, the field of shock physics continues to be an exciting one with new experimental and modeling approaches emerging.

Finally, the duties of chair will soon be assumed by Bill Anderson. I wish him and the rest of the executive committee a successful tenure in 2014.

Tracy Vogler
Chair, APS Topical Group on Shock Compression of Condensed Matter
Sandia National Laboratories
Livermore, California

Obituary: Paul S. De Carli

It is with deep sadness that I report the death of Paul S. De Carli. Paul passed away on August 4th, 2013. He had recently been diagnosed with an aggressive stomach cancer.

Paul attended Stanford University from 1948 to 1956 and earned a BSc in Materials Science. He worked on shock effects in materials at the Stanford Research Institute, now known as SRI International. In his early career, he made many contributions to our understanding of shock effects on minerals using shock-recovery experiments. For example, he and his colleagues were the first to use shock to form amorphous quartz, and to synthesize diamond, maskelynite and stishovite. He and coauthors were the first to experimentally demonstrate the shock origin of melt veins in meteorites and the entrapment of noble gasses in shocked meteorites. These and many other contributions helped planetary scientists to recognize and use shock effects to interpret the impact history of our planet and solar system.

For much of his career with SRI, Paul worked on government contracts that involved large-scale shock experiments and material properties. When Paul retired in 1995, he returned his attention to meteoritics and planetary science to help others to better understand shock physics and shock effects in rocks. I learned a lot from Paul and thoroughly enjoyed working with him on shocked meteorites. Paul remained very active in science until the very end. He is a coauthor on a recent Nature Geoscience paper and on several scientific papers currently in preparation. He presented an hour-long lecture at the SETI institute last month entitled "Free Samples from Mars" and he had planned to attend the 2013 meeting of the Meteoritical Society in Edmonton to present results on the importance of shock veins in the survival of shocked meteorites.

Paul De Carli was a great man who was kind and generous. He was very active in his community, playing the bassoon in his local orchestra, participating in community events, tutoring kids in English and more. He will be greatly missed by his family, friends, his local community and by the global scientific community. Paul is survived

by his wife Anne, his son John, and his daughter Elizabeth.

By Thomas Sharp, Arizona State University, and Planetary Science News and Announcement

Paul S. DeCarli, shock wave physicist in the Poulter Laboratory since 1954, died suddenly August 4 following surgery for stomach cancer. With a degree in metallurgy from Stanford, Paul forged an impressive career at SRI on the effects of explosions and high-speed impact on metallic and geologic materials. He was the first to synthesize diamonds from graphite, a shock wave process for which he held the patent. He developed a megabar stress gage, which was used extensively for 20 years to instrument underground nuclear tests. And he was an internationally recognized authority on meteorites and meteorite craters.

Paul "retired" in 1995, but came to the SRI campus almost every day, providing research ideas, consulting on projects, and performing shock-wave computations. He tutored students at M-A High School and served as PhD thesis advisor for several students in the US and abroad.

Paul was a great ambassador for SRI, active in the American Association for the Advancement of Science, the American Geophysical Union, the American Physical Society, the American Society for Materials, the Meteoritical Society, the Research Society of America, and the New York Academy of Sciences.

He continued to publish state-of-the-art research results in technical journals and present at technical symposia after his "retirement." Two weeks before his death at 83, he gave a lecture at the SETI meeting on Martian meteorites that was immediately posted on YouTube <http://youtu.be/vWFN8GktVpI>. And in his last week he submitted an abstract and began writing a paper for presentation at a symposium in San Diego in February. Truly, he lived fully until he died.

By Denise Grady, Applied Research Associate

News and Events

Shockers and Squeezers in Seattle APS-SCCM & AIRAPT-24 Joint Conference 2013

David S. Moore, Gilbert “Rip” Collins, and Choong-Shik Yoo, Conference Co-Chairs

For the first time in twenty years, the APS Topical Conference on Shock Compression of Condensed Matter joined forces with the International Association for the Advancement of High Pressure Science and Technology (AIRAPT) for a joint conference, which took place July 7-12, 2013 in Seattle, Washington, with more than 700 attendees. The first combined conference was held in Colorado Springs in 1993. This year’s combined conference explored fundamental and applied research topics related to the static or dynamic compression of condensed matter, encompassing experimental and computational physics, chemistry, materials science, mechanics, geophysics, planetary physics, and applied mathematics.

The conference sessions were organized to intertwine static and dynamic experimental work alongside computational and theoretical studies of similar materials, in an effort to encourage shockers, squeezers, and modelers to interact with each other as much as possible. While uncomfortable for some, the arrangement appeared to break down some barriers, hopefully with lasting effects.

The more than 200 posters presented at two poster sessions on Monday and Tuesday evenings served to gel the mixing of the disparate groups even further, encouraged

by the presence of food and beverage as well as a number of scientific instrument vendors at the co-located conference exhibition.

A major addition to this conference was a greatly expanded student program, modeled on the hugely successful High Pressure Gordon Research Conference student program of 2012. The student program was anchored by an all-day student symposium, presented and attended by more than 120 students, postdocs and very early career persons, on the day before the official start of the conference. Our intent was to encourage and enable collaboration and networking in a stimulating environment of free exchange. The process also served to integrate the students into the fabric of the general conference, effectively jumpstarting their participation.

The organizers wish to thank the many, many volunteers (including students), our technical committee, and especially Donna Medina, Amy Rohrbacker, and Carly Morse and her colleagues at Washington State University Conference Services, for their incalculable help putting together and running the conference.

Manuscript submissions to the conference proceedings, being published by the Institute of Physics in their Journal of Physics: Conference Series, will be accepted until October 15, 2013; access via the conference web site <http://www.apssccm-airapt24.org/> or directly at <http://sccmairapt.conferenceseries.iop.org/>

AWARDS to SCCM Members

Anderson, William, Los Alamos National Laboratory, APS Fellow 2012, Nominated by Topical Group on Shock Compression of Condensed Matter for significant contributions to the field of dynamic material properties research, and specifically for achieving a better understanding of the dynamic response of geophysical, planetary, and materials of importance to national security.

Bourne, Neil K., APS Fellow 2012, Nominated by Topical Group on Shock Compression of Condensed Matter for seminal work enhancing understanding of the kinetics

of deformation mechanisms in condensed matter and their interaction to define the response of inert and energetic materials to extreme mechanical loading.

Boettger, Jonathan C., Los Alamos National Laboratory, Nominated by Division of Computational Physics for diverse contributions of profound impact on modern methods of simulating matter under extreme conditions, especially equations of state and properties of heavy element systems, and for synthesizing the computed results in ways significant to the success of experiments important to national security.

Shock Wave and Extreme Conditions Group (SWEC)

In December 2012, the Institute of Physics (UK) has formed the Shock Wave and Extreme Conditions Group (SWEC). The group is interested in the novel aspects of the fundamentals and applications of science, engineering and technology, in all forms of matter, applicable to;

- Static High Pressures, Shock Waves, Blast, Energetic Materials
- Materials characterization across a range of strain rates
- High pressure or high-rate Materials Synthesis
- Development of Equations of State and Constitutive Models
- Effects of high energy and high-rate energy deposition
- High-speed transient phenomena
- Pressure, Energy, Temperature and Extreme Rates ranging from biological, soft systems to dislocation behaviour in single crystals.

This group seeks to facilitate research and discussion in these fields in the form of experimental, numerical (modeling) or theoretical developments and to initiate and develop links between physicists and other researchers in this multi-disciplinary area. More details about SWEC can be found at:

<http://www.iop.org/activity/groups/subject/swec/index.html>

For further details, contact:

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Upcoming Meetings



Jan 12-16 2014

Call for Abstracts : Deadline 28 June 2013 (Past Due)

The Blast Impact and Survivability Research Unit (BISRU) is pleased to host the 4th International Conference on Impact Loading of Lightweight Structures. The conference, initiated by Prof Norman Jones (University of Liverpool) and Prof Tom Wierzbicki (MIT) in the 1980s, is a continuation of the conferences held in Florianapolis (Brazil - 2005), Trondheim (Norway - 2008) and Valenciennes (France - 2011).

The conference is planned to be a forum for scientists and engineers, from all over the world, to exchange ideas and experience on the behaviour, modelling, safety and design of light-weight structures with respect to high strain rate

loading – impact and blast loading in particular. The list of topics includes but not limited to:

- § Material characterisation including failure
 - Lightweight alloys
 - Polymers
 - High-strength steels
 - Foams
 - Composites
 - Biological materials
- § Structural failure and crashworthiness
- § Energy absorbing systems
- § Experimental techniques
- § Theoretical models
- § Numerical analysis

Links to Abstract submission, registration form and accommodation booking can be found online at www.icills2014.org

For more information, please contact:

UCT Conference Management Centre

Deidre Raubenheimer / Email: deidre.raubenheimer@uct.ac.za

Fatima Saban / Email: fatima.saban@uct.ac.za



Dynamic Behavior of Materials VI-An SMD Symposium in Honor of Professor Marc Meyers

February 16-20 • San Diego Convention Center, San Diego, California

www.tms.org/tms2014

PETER 2014

Pressure, Energy, Temperature and Extreme Rates
7-9th April 2014

Grand Connaught Rooms, Covent Garden
London, United Kingdom

REMIT: The behaviour of inert, reactive or biological material is strongly dependent on the range of load-ing-rate, pressure, energy densities and temperature. In many cases the simple linear relations found in introductory texts and academic courses are no longer obeyed. Commonly understood properties, such as e.g. strength, vary dramatically with these parameters. The function of this conference is to bring together interested scientists, researchers and students to present their recent research in this multidisciplinary area and discuss with colleagues in the same or adjoining research fields. The overlap between these seemingly diverse areas is provided by the theoretical understanding of material properties and the use of appropriate loading conditions and diagnostics.

Research Areas include:

- Static High-Pressures – Diamond Anvil Pressure Systems
- Dynamic Loading – strain rates from static up to strain rates of 10¹⁰ s⁻¹
- Biological Systems – e.g. cells under pressure, extremophiles and the human body under blast
- Non-Linear Materials – granular, polymeric, composite

- Diagnostic Techniques – velocity Interferometry, stress and strain, temperature and pressure
- Materials modelling – from ab-initio, constitutive to fitted models

This meeting is organised through the offices of the Institute of Physics/**Shock Wave and Extreme Conditions Group**

<http://www.iop.org/events/scientific/conferences/calendar/index.html>



2nd Call for Abstracts: Due by 10 August 2013

Scope

The Electromagnetic Launch (EML) Symposium is a biennial event that serves as the principal forum for the discussion, interchange, and presentation of research on critical technologies for accelerating objects or projectiles to hypervelocities using electromagnetic or electrothermo-chemical launchers. During the Symposium, researchers share their latest results through oral and poster presentations. The Symposium’s proceedings are the major archival source of papers published in this field.

The Organizing Committee is pleased to announce that the 2014 event will be held in San Diego, California. The 17th EML Symposium will start with a welcoming reception on May 26th; oral and poster presentations will be held from the 27th-29th; and the 30th will feature a tour, if possible, to an EML facility.

Guidelines

- Abstracts should be at least 150 words but limited to a single page.
- The official language is English.
- Abstracts must be unclassified and cleared for public release with unlimited distribution.
- An abstracts booklet of accepted papers will be distributed at the conference.

Formatting Instructions

- Paper Size: A4
- Margins: top and bottom - 1.0 inch | sides - 1.25 inch
- Preferred Font: 11 point; Times New Roman
- File Format (if sent in by email): Microsoft Word
- INCLUDE: Primary Author, Affiliation, Phone Number and E-mail Address; Secondary Author(s) and Affiliation(s);
- Appropriate Topic and Keywords

Abstract Submission Types

Submit Abstract Online: <http://www.emlsymposium.com/abstracts/form/asub.html>

Send Abstract in Email: 17th.emlsymposium@gmail.com

Topics

Electric Light Gas Guns|Coilguns|EM Railguns|Electrotherma /ETC Launchers|Armatures|Integrated Launch Package|Launch Package Components|High-G Sensors, Guidance, Nav and Control|Energy Storage|Power Conditioning|Switching|Controls|Computational Techniques |Modeling|Simulation|Comparison|Diagnostic Techniques |Land, Sea, Air and Space|EM Aircraft Launchers|Magnetic Levitation|EM Armor|Industrial|High Power Micro-waves|High Energy Lasers

Open Registration: Due by Symposium Reception

(prices to go up as the Symposium gets closer)

The 17th EML Symposium registration is now open. Please visit www.emlsymposium.com/registration/index.html to fill out the form online.

Early Registration and Accommodation Upgrade

To promote early registration for the Symposium and for the hotel accommodations, the Symposium will be taking the names of the first 50 registrants to be placed in a drawing for a room upgrade to a special room (equivalent to a value of \$ 50.00 per day for as many days as desired). Please fill out the REGISTRATION form and include your planned arrival and departure dates. If you are one of the first 50 to register, you will automatically receive free wireless internet and a place in the drawing for the room upgrade.

After submitting your registration, you will receive an email with detailed instructions:

- How to book your room
- How to pay for the Symposium (based on your choice from registration form)
- Your Drawing Number

If you have any questions or concerns, contact:

Melody Hummel
 17th EML Symposium Coordinator
 The Institute for Strategic and Innovative Technologies
 Austin, TX 78758



The 6th International Conference on High Speed Forming (ICHSF 2014) will be held in Daejeon, Korea on May 26th to May 30th, 2014. The conference is organized as a joint event of the Computational Solid Mechanics and Design Lab. of KAIST (Korea Advanced Institute of Science and Technology) and the Institute of Forming Technology and Lightweight Construction of TU Dortmund University.

In addition to the presentation of new research results regarding high speed forming, the conference's intention is to provide a forum for the exchange of experiences and the discussion between industrial operators and researchers on an international stage.

We are particularly honored to invite you to the 6th International Conference on High Speed Forming in Science Town of Daejeon, Korea during the spring of 2014.

The ICHSF 2014 will cover all major topics on impulse and high speed forming, its processes and industrial applications.

Process Technologies

Energy based high velocity forming: Electromagnetic

forming, High velocity hydroforming: Electrohydraulic forming, explosive forming and hydropunch forming, High velocity mechanical forming: Explosively driven machines, electromagnetically driven machines and pneumatically driven machines

- **Tools and Equipment**
Tool design, Tool manufacturing, Machine design, Pulsed power equipment
- **Energy**
Process efficiency, Emissions, Life cycle analysis
- **Materials and Measurement Techniques**
Material characterization, Material behavior, High speed testing methods, Process monitoring and quality assurance
- **Modeling and Simulation**
Finite and boundary element methods, Physical modeling, Analytical techniques, Contact and impact modeling,
- **Industrial Applications**
Impulse forming applications, Joining by high speed forming, e.g. magnetic pulse welding and crimping, Process combination, e.g. combination of quasi-static forming and impulse forming

Important Dates

October 30th, 2013

Abstract submission deadline

November 15th, 2013

Notification of abstract acceptance

January 30th, 2014

Manuscript submission deadline

February 28th, 2014

Notification of manuscript acceptance

May 26th - 30th, 2014

5th International Conference on High Speed Forming

We are looking forward to welcoming you to Daejeon in May.

Prof. A. Erman Tekkaya

Institute of Forming Technology
and Lightweight Construction (IUL)

Prof. Hoon Huh

Korea Advanced Institute of Science and Technology (KAIST) ichsf2012

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International Conference on Extrusion and Benchmark – ICEB 2013

October 8th – 9th, 2013 in Dortmund

www.ice-b.net

Bookshelf



Bubble Dynamics and Shock Waves

Editor Prof. Can F. Delale

Springer

ISBN: 978-3-642-34296-7

Dynamic Failures of Composite Sandwich Structures

Edited by S. Abrate, B. Castanié and Y. Rajapakse

Springer

ISBN 978-94-007-5329-7

High Temperature Phenomena in Shock Waves

R. Brun (Ed.)

Springer

ISBN: 978-3-642-25118-4

Introduction to Computational Materials Science: Fundamentals to Applications

R. LeSar

ISBN:9780521845878

Shock Wave Compression of Condensed Matter-A Primer

J. Forbes

Springer

ISBN 978-3-642-32534-2

ShockWave Science and Technology Reference Library, Vol.6 Detonation Dynamics

F. Zhang (Ed.)
Springer
ISBN978-3-642-22966-4

Thermo-Gas Dynamics of Hydrogen Combustion and Explosion

B.E.Gelfand, M.V Silnikov, S.P.Medvedev, and
S.V. Khomik
Springer
ISBN 978-3-642-25352-2

The Fracture of Brittle Materials: Testing and Analysis

By S. Freiman, and J. Mecholsky, Jr.
Wiley
ISBN 978-0-470-15586-8

Proceedings Offer

Proceedings of the Conference of the American Physical Society Topical Group on Shock Compression of Condensed Matter – A complete set of the APS-SCCM Proceedings from 1981 to 2007 is available for purchase at discounted price. All hardcover books are in excellent condition with accompanying CDs for the recent years proceedings. Price for the set is \$1000 with shipping cost extra. Set will be shipped by UPS or FedEx COS after payment. For more information and how to order, please contact: Dr. J. Michael Boteler, PhD / Fibonacci1@myfairpoint.net / 603.763.6065

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*Lead for this and next issues

Please send any questions or comments about the newsletter to any of the editors.

Special thanks to Kerry Johnson and Nancy Bennett-Karasik of APS Special Publications.

The APS Topical Group on Shock Compression of Condensed Matter (GSCCM) was founded in 1984 to promote the development and exchange of information on the dynamic high-pressure properties of materials. The Topical Group sponsors biennial technical meetings on shock compression and detonation physics research, including experimental, theoretical and computational studies, and new experimental methods and developments