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Announcing the 20th Biennial Conference on Shock Compression of Condensed Matter (SCCM-2017) Denver, Summer of 2017 (See Page 8)

Message from the Chair

This year marked the holding of the 19th APS Conference on Shock Compression of Condensed Matter. While we have been known as the Topical Group on Shock Compression of Condensed Matter for over 30 years, this year's meeting truly highlighted how diverse we have become. Shock compression is just one of the many tools that our members use to reach the extreme states of stress and strain highlighted in this year's presentations. The plenary talk given by this year's winner of the George Duvall award, Jerry Forbes, described just how far this field has come since the topical group was formed, but I always leave this conference amazed at how much is left to do. It often seems that we have just scratched the surface in understanding the behavior of materials under the conditions we create (both real and simulated!). I look forward to seeing what this group can do over the next two years when we will meet again in Denver for our 20th meeting!

With this year's conference also came a significant bump in Group membership. Over the past decade, we have peaked at 398 members. As of September 1, I am happy to report we have 424 members. Unfortunately, by September 1, 2016 we are likely to see a significant decrease in our memberships as many members choose only to renew their membership at the time of conference registration. In fact, this year we only had 331 members before the conference. If our membership numbers were ever to drop below the threshold for topical group status, we would no longer be able to host a biennial meeting. If this meeting is as important to you as it is to me, then I encourage you to ensure that your membership with APS and GSCCM stays current and ask that you reach out to your friends and colleagues to ask them to do the same.

Paulo Rigg

News and Events

2015 George E. Duvall Shock Compression Science Award Recipient:

Jerry W. Forbes/Energetic Technology Center

Established in 1987 by the friends of the Topical Group on Shock Compression of Condensed Matter Physics and renamed as the **George E. Duvall Shock Compression Science Award** in 2007, the award recognizes contributions to understanding condensed matter and non-linear physics through shock compression.



Jerry W. Forbes

This award is to be presented biennially in odd-

numbered years and consists of a cash award of \$5,000, a plaque citing the accomplishments of the recipient, and an allowance for travel to the meeting at which it is to be presented.

2015 George E. Duvall Shock Compression Science Award Recipient was Jerry W. Forbes *“For his advances in shock-compression science involving phase-transformations, high explosives, and detonation physics; for extensive contributions to the shock physics community through mentorship and teaching; and for service to the Shock Compression Topical Group.”*

APS Accepting Applications for Travel Grant Programs with India and Brazil

The American Physical Society (APS) is accepting applications from Ph.D. students, postdocs and professors for its exchange programs with Brazil and India.

The programs provide physics Ph.D. students and postdocs with travel funds to pursue opportunities such as attending a summer school or working temporarily in a laboratory. Professors can apply to teach a short course or give a lecture series in physics.

The deadline for applications is 2 November 2015.

Specifically, APS is accepting proposals for the APS - Indo-U.S. Science and Technology Forum (IUSSTF) Travel Grant Program from applicants in the U.S. and India. APS is accepting proposals from applicants at U.S. institutions for the Brazil-U.S. Exchange Program, which is sponsored along with the Sociedade Brasileira de Física.

Application guidelines and additional details about the two programs are available on the APS website at:

<http://www.aps.org/programs/international/index.cfm>

Applications and any inquiries can be directed to Michele Irwin in the APS Office of International Affairs at Irwin@aps.org.

New APS Fellows

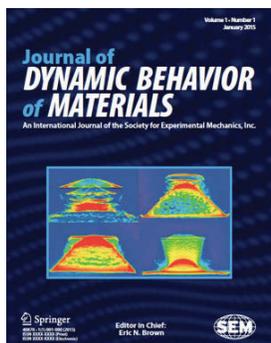
Nominated by the Topical Group on Shock Compression of Condensed Matter, **Dana Dattelbaum**, of the Shock and Detonation Physics group at Los Alamos National Laboratory, earned the prestigious rank of APS Fellow in 2014. She was recognized for pioneering studies of dynamic properties and excited state behavior of materials using advanced diagnostics techniques and for her leadership and service to the Society and the Shock Physics community. In 2015 the Topical Group was able to add two new Fellows. **Tariq Aslam** was recognized “for groundbreaking contributions to the computational physics of detonations and shock waves, including inventing/co-inventing the ghost fluid method, mapped weighted essentially non-oscillatory schemes, Runge-Kutta-Legendre time integration, applications of level set methods, and detonation shock dynamics.” **Damian Swift** was cited “for wide-ranging contributions to shock- and ramp-wave compression experiments using laser, pulsed-power, and explosive drivers, and for employing rigorous quantum and statistical mechanical principles to guide the formulation of theoretical solutions to experimental problems.” Two other members of our Topical Group achieved the status of APS Fellow in 2015 through the Division of Computation Physics: **Frederick Streitz** and **Ivan Oleynik**.

DOE NNSA Stewardship Science Graduate Fellowship Program

Applications for the DOE NNSA Stewardship Science Graduate Fellowship will be accepted beginning in mid-October 2015 and are due January 13, 2016. Fellowships cover three years of graduate study with a generous stipend and include a practicum at one of the three NNSA laboratories (Lawrence Livermore, Los Alamos, or Sandia). Fellowships are awarded for students in three areas: 1) High Energy Density Physics, 2) Materials Under Extreme Conditions and Hydrodynamics, and 3) Nuclear Science. Undergraduate seniors as well as students in their first or second year of doctoral studies are eligible to apply. For additional information on the fellowship, please see the website <http://www.krellinst.org/ssgf/>

Tracy Vogler

New Journal of Dynamic Behavior of Materials JDBM



The new *Journal of Dynamic Behavior of Materials* has been successfully launched by the Society for Experimental Mechanics and Springer Publishing in 2015. The first two outstanding issues are available at <http://link.springer.com/journal/volumesAndIssues/40870>, with the third issue appearing soon. Springer is making the

first two years of JDBM freely available and most accepted papers are appearing in print within three months of submission. The Society for Experimental Mechanics is sponsoring an annual best paper award for the *Journal of Dynamic Behavior of Materials*. The field is on the threshold of a new revolution, with increasing interdisciplinary

focus and numerous user facilities enhancing their capacities for studying materials in extremes and project to come online ranging from SLAC's Linac Coherent Light Source, the Dynamic Compression Sector at the Advanced Photon Source at ANL, The National Ignition Facility at LLNL, and Matter-Radiation Interactions in Extremes (MaRIE) at LANL. The *Journal of Dynamic Behavior of Materials* offers a single home to bring the broader field together. The *Journal of Dynamic Behavior of Materials* is a peer reviewed archival journal on the science and engineering of material and structural response to dynamic loading focused on high strain-rate, impact, blast, penetration, and shock response. The journal publishes experimental, theoretical, modeling & simulation, and interdisciplinary work focused both on advancement of new techniques and application of techniques to new materials and structures. Experimental techniques will include but not be limited to small-scale tests for constitutive response of material such as Split Hopkinson Pressure Bar, Kolsky Pressure Bar, gas-gun and powder-gun driven plate impact, direct and flier plate drive high-explosive experiments, direct and flier plate drive laser experiments, and drop tower; small-scale integrated tests for validation of material constitutive models such as Taylor Anvil, Dynamic-Tensile-Extrusion, high-explosive driven perturbed plate experiments, shock tube loading; and integrated structure level experiments as blast, impact, crash, and penetration mechanics. The journal will also cover diagnostics for dynamics experiments to include but not be limited to high-speed photography, dynamic radiography, velocimetry (PDV, mPDV, VISAR, lineVISAR, etc), gages, pins, etc. In addition to primary research articles, The *Journal of Dynamic Behavior of Materials* publishes review articles, brief technical notes, and applications articles that discuss important emerging technologies. Please consider submitting you best work on shock compression to the *Journal of Dynamic Behavior of Materials* at www.editorialmanager.com/jdbm

Eric N. Brown



APS 2016 March Meeting Focus Topic: Materials in Extremes

Call for abstracts

You are invited to submit abstracts to the focus topic “Materials In Extremes: Bridging Simulations And Experiment” of the APS 2016 March Meeting, which will be held in Baltimore, MD, March 14-18, 2016.

The focus topic sessions, consisting of several invited and contributed talks, will assess recent experimental and computational efforts in exploring the fundamental properties of materials at extreme conditions, including (1) high-pressure and high temperature synthesis and characterization of novel materials; (2) static and shock-induced materials behavior, including plasticity, phase transitions, and chemical reactions; (3) high strain rate phenomena occurring upon ultrafast energy deposition; (4) static and dynamic properties of energetic materials, including detonation phenomena; (5) properties of matter in the warm dense regime; and (6) new computational methods including development of interatomic potentials and multi-scale simulations.

The deadline for submission of abstracts is 5 p.m. November 6, 2015. Please use the sorting category **18.1.1**: “Materials in Extremes: Bridging Simulation and Experiment (DCOMP/DMP/GSCCM)”.

We look forward to receiving your abstracts and seeing you in Baltimore, Maryland.

The Focus Topic Co-Organizers

Ricky Chau, Tim Germann, Ivan Oleynik

Mail Delivery of the Newsletter

About 5-7% of the Topical GSCCM members remain opted out of receiving email communications from APS. We will continue mailing the hard copy of the Newsletter by First Class United States Postal Service (USPS) mail to these members. However, they can choose to opt for the email communications for instantaneous delivery as soon as the Newsletter is ready. Their positive gesture in this regard will prove eco-friendly by saving the paper and also budget friendly for the Topical Group. There are two options to change the E-Mail Preferences:



Preferred Option

- Login to your APS membership by visiting <http://www.aps.org>
- Click on the 4th tab “E-mail Lists”. This will display your current e-mail preferences
- Click on the “Edit your Email Preferences” near the top
- Scroll down and check the box (if unchecked) for “Unit Mailing Lists”
- Next, check the box for “Topical Group on Shock Compression of Condensed Matter”
- Finally, click on the “Submit” button

2. Alternate Option

If for some reasons, you are not able to follow the Preferred Option given above and still would like to opt for the E-mail delivery, please send an email to this effect to prigg@wsu.edu and elert@usna.edu with a copy to dwivedis001@yahoo.com



**Paulo Rigg
Mark Elert**

Past Meetings



19th American Physical Society Shock Compression of Condensed Matter Biennial International Conference

Tampa, FL June 14-19, 2015

<http://msl.cas.usf.edu/sccm-2015>

Post-Conference Wrap Up Report

The 19th APS Shock Compression of Condensed Matter Conference (SCCM-2015) took place from June 14th to 19th at the Waterside Marriot in Tampa, Florida. The SCCM-2015 conference brought together 541 attendees and over 40 companions from 16 countries.

The SCCM-2015 conference program spanned 13 technical areas: Detonation and shock induced chemistry; Energetic and reactive materials; Equations of State; Experimental developments; First-Principles and Molecular Dynamics; Geophysics and planetary science; Grain scale to continuum modeling; High Energy Physics/ Warm Dense Matter; Inelastic deformations, fracture and spall; Materials strength; Particulate, porous and composite materials; Phase transitions; Soft Matter; and 3 focus topics: X-ray Free Electron Lasers and Materials; Turbulence and Mixing; Velocimetry Diagnostics Development. More than 600 presentations were given within 5 plenary, 101 oral and 2 poster sessions. The highlights of the conference included 5 plenary talks by Tim Germann (Exascale computing and what it means for shock physics); Bruce Remington (New regimes of plastic flow); Jerry Forbes (Duval award talk: Materials response mechanisms are needed to obtain highly accurate experimental shock wave data); Betsy Rice (A perspective on modeling

the multi-scale response of energetic materials); and Dana Dlott (Shock compression dynamics under a microscope). A relatively new technical area “Grain Scale to Continuum Modeling” was also quite popular and provided a forum for discussion of new ideas in the field.

More than 100 posters presented at two poster sessions on Tuesday and Thursday evenings provided an informal setting for discussions enhanced by great food and beverages! The week’s events culminated by the banquet on Thursday night featuring a slide show documenting SCCM-2015 memorable events and peoples’ interactions during the week. The banquet audience was entertained by a wonderful Jazz quartet from the School of Music, University of South Florida.

A full-day Early Career Symposium was held on Sunday preceding the main conference, as an integral part of the SCCM2015 conference. Both travel scholarships and complimentary hotel guest rooms were given to most of the students thanks to generous support from DTRA, ONR, AFOSR and USF. This year’s Early Career Award was given at SCCM-2015 to June Wicks from Princeton University, who was selected by the nominating committee from the pool of student and postdoc applicants. The SCCM-2015 Conference Proceedings will be pub-

lished by the American Institute of Physics (AIP) as an online-only, open access volume, the conference papers will be available free of charge to the entire scientific community. Manuscripts prepared according to AIP guidelines should be submitted via the PXP website (<http://sccm.pearx-press.org/cgi-bin/main.plex>) ; further information is also available at the conference website (http://msl.cas.usf.edu/sccm-2015/submit_manuscript.html). Manuscripts will be accepted until July 31, the extension can be granted on case by case basis by the editors Tommy Sewell, Tim Germann and Ricky Chau (sccm-editors@missouri.edu).

The co-chairs thank many volunteers including students, our technical committee, the SCCM-2015 session chairs and especially the registration desk helpers for their invaluable help which made our conference such a memorable and scientifically productive event.

SCCM-2015 Co-Chairs
Suhithi Peiris, Ivan Oleynik and Ramon Ravelo

MaRIE at SCCM 2015

Los Alamos National Laboratory sponsored a booth at the 19th American Physical Society Shock Compression of Condensed Matter Biennial International Conference in Tampa, Florida highlighting Matter-Radiation Interactions in Extreme (MaRIE). Cris Barnes the MaRIE Capture Manager and Lucy Maestas (pictured) the MaRIE program office strategic coordinator spreads the word about MaRIE’s research possibilities. For more information, please visit <http://www.lanl.gov/science-innovation/science-facilities/marie/>



Eric N. Brown

Upcoming Meetings and Conferences

International Conference on Dynamic Mechanical Behaviour of Materials

Feb 25-26, 2016
 MNIT, Jaipur, India.

An international conference on Dynamic Mechanical Behaviour of Materials is being organized from Feb 25-26, 2016 at MNIT, Jaipur, India. The theme of the conference is restricted to high strain rate behaviour of materials. The study on high strain rate behavior of materials is gradually coming up in India. The conference is planned to exchange knowledge and guidance from experts in this field. Please contact the undersigned for further information.

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**International Conference on
Experimental Mechanics–ICEM17**
July 3-7, 2016
Rhodes, Greece

Dear Colleague:

Next year, we will have the next issue of ICEM.

Prof. Pengwan Chen and Prof. D. Rittel are co-organizing a session on “**Dynamic behavior of metals under impact and blast**”. The goal of this session is to bring together experimentalists in the field for an informative and fruitful exchange of views. While the conference is centered on experimental work, we welcome numerical and/or analytical work that has a strong experimental support as well.

In view of your activity in the field of Dynamics of Materials, we would like to invite you to present your work in this session.

Your abstract (exactly 2 pages in MS word format, including figures and references) should be uploaded using the online submission system at your earliest confidence, but no later than August 31, 2015. When you are submitting your abstracts, please kindly select “Track 3 special symposia and sessions-**Dynamic behavior of metals under impact and blast**”.

Additional information on the conference can be found on <http://www.icem17.org>

Pengwan and Daniel look forward to seeing you in Rhodes.

Best regards

Prof. Pengwan Chen

Beijing Institute of Technology

Prof. D. Rittel

Technion, Israel Institute of Technology

2016 Gordon Research Conference
July 17-22, 2016

Holderness School, Holderness, NH

The 2016 Gordon Research Conference on Research at High Pressure will be held on July 17-22, 2016 at the Holderness School in Holderness, NH, chaired by Prof. Shanti Deemyad and Dr. Jon Eggert.

High pressure provides the largest-range tunable thermodynamic variable over which to study material properties. Applications span physics, biology, chemistry, and earth and planetary sciences, as well as food processing and material synthesis. This conference aims to assemble a wide range of scientists, both experimental and theoretical, from across the associated disciplines to share new research discoveries, discuss collaborations, and plan the future.

Prior to the conference, July 16-17, there will be an associated High Pressure Gordon Research Seminar for students and early career scientists, which is chaired by Dr. Richard Kraus and Dr. Amalia Fernandez-Panella. This seminar will highlight the importance of the wide-ranging timescales of our techniques, from picosecond quantum molecular dynamic calculations, to nanosecond laser driven shocks, to microsecond gas gun shots, and to seconds of integration in static diamond anvil cells. Representatives of students and early career scientists (less than 5 years from completion of their PhD) will present unpublished results from the many fields in high-pressure research in an environment that aims for collaboration and interaction between the fields and techniques.

Applications must be submitted by June 18, 2016. Please apply early as the meeting can be oversubscribed. The associated URL's for the conference and seminar are below.

<https://www.grc.org/programs.aspx?id=12110>

<https://www.grc.org/programs.aspx?id=15297>

Richard G. Kraus



9th International Symposium on Impact Engineering, ISIE 2016
September 5-9, 2016

Dear Colleagues,

We are pleased to announce that the Ninth International Symposium on Impact Engineering, ISIE 2016, (<http://isie2016.web2.ncku.edu.tw>) will be held in National Cheng Kung University (NCKU), Tainan, Taiwan on September 5th to 9th, 2016. This international symposium features keynote and technical sessions, and a cultural excursion program.

You are cordially invited to contribute papers and/or distribute the call-for-papers among your friends, colleagues, students and scientists who you think may be interested.

Topics of Interest:

- Dynamic Deformation and Constitutive Relations
- High Speed Forming/Machining/Processing
- Dynamic Failure and Fracture
- Experimental Techniques and Measurements in Impact Engineering
- Microstructural Effects of Dynamic Loading
- Biomechanics in the context of Impact Engineering
- Structural Crashworthiness and Diagnostics
- Micro- and Nanostructure Characterization of Materials
- Hypervelocity Impact Mechanics
- Modeling and Numerical Simulation in Practice of Impact Engineering
- Industrial Applications related to Impact Engineering

Paper Submission:

Prospective authors are invited to submit one page abstract describing the original work in PDF format to ISIE 2016 website by November 30, 2015. A 4-page full-length paper including figures and tables should be submitted for accepted abstract. All reviewed and accepted papers will be included in the conference proceedings, published by Trans Tech Publications (TTP) in a special volume of Key Engineering Materials (EI indexed).

We hope to welcome you in the symposium! Should you have any question, please feel free to contact us via isie2016@email.ncku.edu.tw.

With our best regards,
 ISIE 2016, National Cheng Kung University, Tainan, Taiwan
<http://isie2016.web2.ncku.edu.tw>



22nd Technical Meeting
Experimental testing and modelling of brittle materials at high strain-rates
October 12–14, 2016
Grenoble – France

Scope

Brittle materials such as ceramics, concrete, glass or rocks are involved in various applications implying dynamic conditions or impact loadings (armour configurations, rock blasting, impact drilling, concrete structures, hail impact...). In these conditions the brittle materials experience extreme damage mechanisms: plasticity, microcracking, fragmentation and collapse of pores and may exhibit complex mechanical response: pressure or loading-rate sensitivity, anisotropic and non-linear behaviour...

This workshop aims at gathering senior researchers as well as PhD students studying experimentally, developing models and numerical approaches to improve the knowledge in this area.

Registration

For registration, go to Technical Meeting website (under-construction): <http://projects.3sr-grenoble.fr/dymat>

Announcing 20th Biennial Conference on Shock Compression of Condensed Matter (SCCM-2017)

Following on an outstanding topical group meeting in Tampa, the 20th American Physical Society Shock Compression of Condensed Matter Biennial International Conference is being scheduled to be held in Denver, Colorado in the summer of 2017. This conference is the premier interdisciplinary forum for discussion of world-wide efforts in exploring fundamental science and applications of matter at extreme conditions including shock-induced physics and chemistry, energetic materials and detonation phenomena. In the foothills of the Rocky

Mountains, Denver has an international airport with a new train opening to provide convenient access to the downtown. Denver has a wonderful walking down town with lots of restaurant, coffee shops and breweries. We welcome your help and suggestions.

SCCM-2017 Co-Chairs

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Jon Eggert

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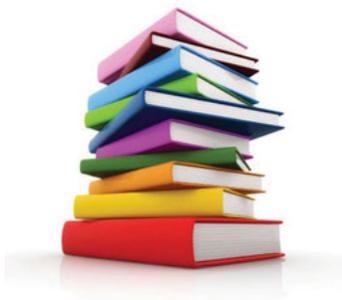
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Bookshelf

Books and Proceedings



Building the H Bomb: A Personal History

Author: Kenneth W. Ford

ISBN: 9789814632072 (print) 9789814618816 (eBook)

Demystifying Explosives, 1st Edition

Concepts in High Energy Materials

Author: S. Venugopalan

ISBN: 9780128015766 (print) 9780128017562 (ebook)

Energetic Polymers: Binders and Plasticizers for Enhancing Performance

Authors: How-Ghee Ang and Sreekumar Pisharath

ISBN: 9783527331550

Fracturing Across the Multi-Scales of Diverse Materials

Editors: R. W. Armstrong, S. D. Antolovich, J. R. Griffiths, and J. F. Knott

Philosophical Transactions A, The Royal Society Publishing, Online Access: bit.ly/PTA2038

Handbook of Materials Structures, Properties, Processing and Performance

Author: Lawrence E. Murr

ISBN: 9783319018140

Proceedings of the 11th International Conference on the Mechanical and Physical Behaviour of Materials under Dynamic Loading – DYMAT 2015

DynaMat SUPSI, Lugano, Switzerland, September 7-11, 2015

Editors: E. Cadoni, H. Couque, and S. Hiermaier

The European Physical Journal, EPJ Web of Conference

Proceedings of the Fifteenth International Detonation Symposium

San Francisco, California, USA, July 13-18, 2014

Office of Naval Research Publication Number 43-280-15

Rapid Penetration into Granular Media, 1st Edition

Visualizing the Fundamental Physics of Rapid Earth Penetration

Author: M. Iskander

ISBN: 97801228008683

Scientific Foundations of Engineering

Authors: S. McKnight and C. Zahopoulos

ISBN: 9781107035850

Structures Under Shock and Impact XIII

Proceedings of the 13th International Conference of

Structures under Shock and Impact

Editors: G. Schleyer and C. A. Brebbia

ISBN: 9781845647964

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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