

Newsletter of the APS Shock Compression of Condensed Matter Topical Group

Welcome to the fourth 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 a revolving Lead Editor, with the current issue compiled by John Borg. Gerrit Sutherland will serve as the Lead Editor for the April issue, please email comments and contributions to gerrit.sutherland@navy.mil.

GSCCM Election Results

It is my pleasure to announce that the 2007 election for the Topical Group on Shock Compression of Condensed Matter has been completed. The executive committee and I would like to thank those members who agreed to stand for election. Thanks also to all the group members who took the time to vote.

The results of the election are:

Vice-Chair - Dave Moore

Executive Committee Members at Large - Eric Brown and Dana Dattlebaum

Dave will serve three years as vice-chair, chair elect, and then chair. Eric and Dana will serve a two year term. Congratulations to Dave, Eric, and Dana. Please contact them (or any of the other executive committee) with your ideas on how the topical group can be improved.

Tracy Vogler
Secretary-Treasurer APS GSCCM
tjvogle@sandia.gov

Database for APS-GSCCM Proceedings

At the topical group's business meeting in Hawaii, a suggestion came from Gerrit Sutherland (NSWC-IH)

that the group develop a database and index of all the papers from the shock conference proceedings over the years so that the information would be more readily available to researchers in the field. Bill Proud (Cambridge) informed the meeting that such a database already existed through the efforts of Stephen Walley and others at the Cavendish Laboratory at Cambridge. They have graciously agreed to share that database with the group. It has been posted to the group's website (www.shockphysics.org) and can be downloaded in Endnote or Excel formats. Thanks to Stephen and the Cavendish Laboratory!

As it currently exists, the database does not include keywords that would allow you to search for all work on a topic such as lithium fluoride, for example. Therefore, I would like to ask for volunteers from the group to add that information to the data base. Rather than give one individual or organization the task of tackling the whole database (unless someone really wants to do that), I suggest we break the 13 (14 once the 2007 volume is published) volumes into 3-6 chunks that are more manageable. If you or your organization would be able to help with this, please let me know.

Tracy Vogler
Secretary-Treasurer APS GSCCM
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APS March Meeting - DCOMP and GSCCM - 2008

New Orleans, Louisiana March 10-14, 2008

A wide variety of phenomena, such as a solid compressed by a shock wave, planetary interiors, a nanoparticle subjected to an



intense radiation field, or a cell membrane under large strain, all represent matter under extreme conditions. Matter

at extreme conditions is characterized by a strong perturbation of structure and dynamics far from ambient equilibrium by environmental factors. Despite the diversity of applications, strong commonality exists among the methods employed in the description of strongly

perturbed matter. This focus session concerns recent advances in theoretical and computational methodologies applied to metallic, organic, inorganic, and biological materials, as well as liquids, plasmas, and atomic or molecular clusters exposed to high pressures, strain rates (including shock loading), temperature extremes, or intense external fields. Presentations will include such diverse computational approaches as atomistic (quantum, semi-classical, and classical), mesoscopic (grain-scale), continuum, and multi-scale techniques. Representative scientific areas of interest are: (1) equations of state; (2) dynamical response of materials; (3) inelastic deformation, fracture, and spall; (4) high-pressure phase transitions; (5) electrical, optical, and other properties of shocked materials; (6) energetic materials; (7) shock-induced chemistry; (8) high energy density conditions; (9) intense external field interactions; and (10) biological or geophysical applications.

As you all know our topical group meets biennially. In order to foster more frequent communication we have been trying to obtain sponsorship of a focus session at the annual March meeting for the GSCCM, particularly for the off years. However, we have been told that our topical group attendance at the March meeting is too low to warrant a focus session.

In an attempt to get our attendance above the threshold we are appealing to the topical group members to consider attending the March meeting this year. In addition to the focus session that DCOMP has generously offered us to co-host, I have included other topic areas that might be of interest:

- 01.5 Metals: mechanical and dynamical properties
- 02.5 Semiconductors: mechanical and dynamical properties
- 03.5 Insulators and dielectrics: mechanical and dynamical properties
- 09.3 Phase transitions and strongly correlated systems: structural phase transitions
- 11.3 Chemical physics: condensed phase dynamics, structure and thermodynamics
- 17.2 General theory: Electronic structure
- 17.3 General theory: Density functional theory
- 17.5 General theory: Computational methods: classical and quantum monte carlo
- 17.6 General theory: Computational methods: classical and quantum molecular dynamics
- 17.8 General theory: multi-scale modeling
- 19.1 High pressure physics: equation of state and phase transitions

There are also a few additional focus sessions that might be of interest:

- 11.8.3 Frontiers in electronic structure theory (DCP/DCOMP)
- 19.3.1 Earth and planetary materials (DMP/DCOMP)

Please consider attending the March meeting this year.

Marcus Knudson
Vice-Chair
GSCCM

George E. Duvall Shock Compression Science Award Name Approved

Steve Sheffield and I would like to inform the APS SCCM Topical Group that our request to the APS Prizes and Awards Committee that name of the Shock Compression Science Award be changed to the George E. Duvall Shock Compression Science Award was approved. The P&A Committee then sent their recommendation to the APS Executive Committee, who also approved the name change.

The APS has already updated the Prize web site to reflect the name change. Please see the following web page:

<http://www.aps.org/programs/honors/awards/shock.cfm>

I would like to thank all of the SCCM members, APS Fellows, previous Shock Compression Science Award winners, and Duvall family members who graciously provided Steve and me with supporting letters. I blind copied each of them on this message.

I would also like to profusely thank Steve Sheffield for his dogged pursuit of this goal and for producing the elegant and comprehensive name change proposal package.

David S. Moore
Vice-Chair APS GSCCM
moored@lanl.gov

REPORTS ON CONFERENCES OF INTEREST

The 2007 Hypervelocity Impact Symposium was held at the Williamsburg Lodge Conference Center in Williamsburg, Virginia from September 23 to the 27, 2007. The Symposium is a



biennial event that is dedicated to enabling and promoting an understanding of the basic physics of high-velocity impact and related technical areas. This

international event provides a forum for researchers to share and exchange a wealth of knowledge through oral and poster presentations, and commercial exhibits. There were 14 countries represented with just over 150 registrants, exhibitors and students attending. The proceedings are peer reviewed and published in a special edition of the *International Journal of Impact Engineering*. The next HVIS meeting will be held April 11-15, 2010, in Freiburg, Germany.

John Borg
Edition Editor

CONFERENCES TO COME

Call For Abstracts

The International Center for Applied Computational (ICACM) - 2008

The second US-France symposium on *Mechanics on Materials Under Extreme Loadings Application To Penetration And Impact*

Rocamadour, France - May 28-30, 2008

Abstract Submission Deadline: 15 January 2008

<http://icacm2008.hmg.inpg.fr/>

New Models and Hydrocodes for Shock Wave Processes in Condensed Matter

Lisbon, Portugal - May 18-23, 2008

Abstract Due Deadline - 01 February 2008

This Conference continues the sequence of workshops (St.Petersburg, 1995; Oxford, 1997; Washington, 1999; Edinburgh, 2002; Washington, 2004; Dijon, 2006) whose principal purpose has been and still remains to concentrate on accelerated development of more accurate and physically-based material models for the next generation hydrocodes and creation of these new hydrocodes on the basis of

most recent achievements in numerical modeling technology.

Abstracts of papers (1-3 pages) in Word format must be sent to the Organizing Committee:

Igor Plaksin: igor.plaksin@dem.uc.pt

Vladimir Klimenko: klimenko@center.chph.ras.ru

Marvin Zocher: zocher@lanl.gov

The 28th International Congress on High-Speed Imaging and Photonics hosted by the School of Aerospace, Civil and Mechanical Engineering, University of New South Wales / Australian Defence Force Academy, Canberra, Australia - November 9-14, 2008

Deadline for Expression of Interest - January 31, 2008

Deadline for abstracts - March 31, 2008

<http://ichsip28.unsw.adfa.edu.au/>

10th International Conference on Structures Under Shock and Impact

The Algarve, Portugal – May 14-16, 2008

<http://www.wessex.ac.uk/conferences/2008/susi08/>

Society For Experimental Mechanics (SEM) 11th International Congress & Exposition on Experimental and Applied Mechanics

Shock and High Pressure Response of Materials
Rosen Plaza Hotel, Orlando, Florida- June 2-5, 2008

Organizers:

Eric N. Brown, (LANL), en_brown@lanl.gov and

Tracy J. Vogler (SNL), tjvogle@sandia.gov

http://sem.org/PDF/08s_CFP_web.pdf

6th International Conference on Mechanics of Time-Dependent Materials 2008

Monterey, California – March 30 - April 1, 2008.

<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/

APS March Meeting – DCOMP and GSCCM - 2008

New Orleans, Louisiana March 10-14, 2008

<http://www.aps.org/meetings/march/index.cfm>

Gordon Research Conference on Energetic Materials

TILTON, New Hampshire (USA) – June 15-20, 2008

www.grc.org

Gordon Research Conference on Research at High Pressure

University of New England, Biddeford, Maine, USA.

June 29 - July 4, 2008

www.grc.org

**SCCM 2009
June 29th - July 3rd 2009 -
Nashville, TN**

The City - Music City, USA. Settled on Christmas Day, 1779. Capitol of the State of Tennessee. Population (2004) City - 595,805, MSA: 1,541,659
Elevation Lowest: 550 ft (168 m) Highest: 1100 ft (336 m) Central Time Zone. Served by 16 Airlines.



The Sights - Outdoor 107 City and County Parks, 7 Municipal golf courses, 9 Greenways, 11 State Parks and 3 National Park Service units within 1 hour. Entertainment, Live music (country, jazz, classical, etc.), Live Theatre, Nashville Zoo. History and Culture - Art Galleries, (Frist Center for the Visual Arts), The Parthenon, Cheekwood Botanical Gardens, The Hermitage (Home of Andrew Jackson), Fort Negley, Stones River National Battlefield

The Venue - Gaylord Opryland Hotel - Largest non-gaming hotel property in the United States. Completely enclosed and climate-controlled complex includes 9 acres of gardens. 10 Restaurants and bars. Two outdoor and one indoor swimming pools. Next to Opry Mills, a 1.2 million sq. ft. entertainment and shopping complex.

Co-Chairs Mike Furnish (Sandia National Laboratory), Bill Anderson (Los Alamos National Laboratory), Bill Proud (Cavendish Laboratory, Cambridge).

And for those of you with money to spare, some recent publications...

SHOCK COMPRESSION OF CONDENSED MATTER - 2007: Proceedings of the Conference of the American Physical Society Topical Group on Shock Compression of Condensed Matter

Mark Elert, U.S. Naval Academy; Michael D. Furnish, Sandia National Laboratories; Ricky Chau,

Lawrence Livermore National Laboratory; Neil Holmes, Lawrence Livermore National Laboratory; Jeffrey Nguyen, Lawrence Livermore National Laboratory

AIP Conference Proceedings **955**

Conference Location and Date: Waikoloa, Hawaii, 24-29 June 2007

Subseries: [Materials Physics and Applications](#)
Published December 2007; ISBN 978-0-7354-0469-4
Two Volume Print, CD-ROM included; 1560 pages; 7x10 inches; Hardcover; \$435.00 (Note: the topical group has a few copies available for purchase for \$100. Contact Tracy Vogler at tjvogle@sandia.gov to place an order)

Readership: Research scientists in the fields of condensed matter physics and chemistry, materials science, planetary science, astrophysics, and mechanics of materials with a particular interest in the behavior of matter at extreme conditions.

All papers have been peer-reviewed. This volume embodies the most recent research on shock compression of condensed matter, and includes 335 plenary, invited and contributed papers on topics including equation of state, phase transitions, chemical reactions, warm dense matter, fracture, geophysics and planetary science, energetic materials, optical studies, materials modeling, and recent experimental developments in the field of shock compression of condensed matter.

**ZABABAKHIN SCIENTIFIC TALKS - 2005:
International Conference on High Energy Density Physics**

Zababakhin Scientific Talks - 2005: International Conference on High Energy Density Physics

Evgeniy N. Avrorin, Federal State Unitary Enterprise, Russian Federal Nuclear Center; Vadim A. Simonenko, Federal State Unitary Enterprise, Russian Federal Nuclear Center

AIP Conference Proceedings **849**

Conference Location and Date: Snezhinsk, Russia, 5-10 September 2005

This conference highlights recent achievements in high energy density physics. Topics included are: shock waves and high intensive processes; convergent flows and collapsing cavities; high explosives; detonation and

explosion phenomena (chemical and thermonuclear); thermodynamic and transport properties of matter (experiments and theory); dense plasma properties; intensive electromagnetic processes; pulsed electric currents and strong magnetic fields; lasers and particle beams and their interaction with matter; hydrodynamic instability and turbulent mixing; as well as mathematical models.

Recent Patents On Material Science

Bentham Science, publishers of journals in material science, nanotechnology, computer & engineering announced the launch of a new review journal entitled *Recent Patents On Material Science*

The journal is applicable for all researchers involved in material science, nanotechnology, computer and engineering sciences.

View a free inaugural issue online at www.benthamscience.org/mats

A special thanks to Steven Walley for suggesting recent book selections!

Job Opportunities:

Post-doc Positions in Energetic Materials Research

The Florida Institute for Research in Energetics (FIRE), located in Shalimar, FL, is searching for post-doctoral candidates in energetic materials research. The missions of the Institute are 1) to achieve predictive capability of explosive sensitivity and performance with focus on multi-scale and multi phase modeling of energetic materials, 2) characterization of explosives and explosives systems with focus on bench scale spectroscopy, and morphology/property of nano constituents, 3) synthesis of new materials with focus on nanoenergetic materials, vapor deposition and new synthesis techniques, to name a few. The candidate must be U.S. citizens. If interested, please contact

Stephen C. Korn
Director of Interdisciplinary Research
UF Research and Engineering Educational Facility (UF-REEF)
Office: 850-833-9355 Ex 225
Cell: 850-218-9410
skorn@ufl.edu

The Institute for Shock Physics at Washington State University has several positions:

Postdoctoral Research Position – Computational Mechanics

The Institute for Shock Physics at Washington State University has an immediate opening for a postdoctoral research associate to undertake modeling and simulation activities related to the dynamic response of materials.

Postdoctoral Research Position – High Pressure Scientist

The Institute for Shock Physics at Washington State University has immediate openings for several postdoctoral positions for outstanding experimental scientists in high-pressure and materials research activities, utilizing state-of-the-art laser spectroscopy, x-ray diffraction and spectroscopy, and static and dynamic high-pressure technologies available at the Institute, as well as at the national synchrotron and other user facilities.

Postdoctoral Research Position – Materials Science

The Institute for Shock Physics at Washington State University has immediate openings for postdoctoral research associates to carry out research on dynamic and quasi-static mechanical response of materials including metals, metallic glasses, ceramics, and composites.

Postdoctoral Research Position – Nanocomposite Synthesis

The Institute for Shock Physics' (ISP) Applied Sciences Laboratory (ASL) at Washington State University has an immediate opening for a Postdoctoral Research Associate to synthesize nanocomposite materials and to study their morphological and optical properties.

Research Engineer – Advanced Materials Processing

The Applied Sciences Laboratory, a multidisciplinary research organization, invites applications from strongly self-motivated, creative individuals for a Research Engineer position (Administrative/Professional staff member) in the area of advanced materials research. The advanced materials research will be focused on discovery, development and characterization of novel alloy and composites for client specific applications. As such, the research efforts will highly depend on synthesis, fabrication and testing of new alloys/composites and making test samples.

Research Scientist – Computational Mechanics

The Spokane-based Applied Sciences Laboratory (ASL) of the Institute for Shock Physics (ISP) at Washington State University is seeking a Research Scientist to undertake and lead computational modeling and simulation activities related to the mechanical response

of materials. We are looking for a creative, self-motivated, entrepreneurial individual who has the ability and interest to address challenging, interdisciplinary problems in a fast paced applied research environment. Preference will be given to individuals who can strengthen and enhance ongoing computational research activities related to mesoscale modeling.

Manager, Research Development and Operations

We are seeking to hire a take charge individual with a high level of creativity, entrepreneurship and ambition to serve as the Manager for Research Development and Operations in the Spokane-based Applied Sciences Laboratory (ASL), the applied research component of the Institute for Shock Physics (ISP). The successful candidate will be a key member of the ASL management team responsible for development and implementation of strategic initiatives.

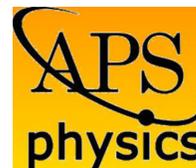
For more information regarding any of the positions at Washington State see:

http://www.shock.wsu.edu/Postdoc_Comp_Mechanics.pdf for more details.

The Expanding Shock Community

Eric and Karen Brown celebrated the birth of their first child, Olivia Maria Brown. She was born Sept 25th, 2007, weighting 7 lbf, 12 oz-f and 21 and ¼ inches tall.

Congratulations to Eric and Karen!!!



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Thanks to all who contributed to this Newsletter. Please send any information for the next newsletter to Gerrit Sutherland at gerrit.sutherland@navy.mil.

John Borg
Edition Editor