NEWSLETTER VOL. 7, NO. 1 SUMMER 2005

HVIS

HYPERVELOCITY IMPACT SOCIETY

Message from the President

Dear HVIS Members and Colleagues,

It is my great pleasure and honour to cordially invite you to attend the 2005 Hypervelocity Impact Symposium, taking place October 10–14, 2005 at the Squaw Creek Resort in Lake Tahoe, California.

We are expecting nearly 100 excellent papers (oral and poster) to be presented, offering an interesting and representative state-of-the-art insight into hypervelocity impact science and technology. Up to now seven exhibitors have been attracted by the symposium, covering a wide range of products and services in the field of hypervelocity research.

Thanks to the Conference Co-Chairs (Dennis Orphal and Lalit Chhabildas), the organizing committee, the abstract and paper reviewers, and many others who have helped with preparation tasks, we can look forward to HVIS 2005 as an extraordinary highlight in the history of the Society. A welcome reception on Sunday night will kick off four days of technical presentations, keynote speakers and plenary lectures, evening activities, a Symposium banquet, and a business luncheon.

Last but not least, Squaw Valley and the Lake Tahoe area are one of the most interesting and pleasant sites within the US, offering ideal surroundings in which to experience a scientific meeting.

Thus, we are looking forward to a great event!

Hoping to see you all in Squaw Creek, I remain

Sincerely yours

Eberhard Schneider
(President)

In This Issue

We want to hear from you regarding HVI-related news in your life.

Send news to our Publications Committee Chair, Bill Schonberg, at wschon@umr.edu

HVIS Committee Reports

EDUCATIONAL OUTREACH

As a part of each Hypervelocity Impact Symposium, the Society sponsors the Alex Charters Student Scholar program, which provides travel reimbursement support to selected students, enrolled in an academic institution at the time of the conference and interested in hypervelocity impact phenomena. Students are selected based on an evaluation of nominations submitted by their academic advisors, performed by the Educational Outreach Committee and approved by the Board of Directors. The Hypervelocity Impact Society is pleased to announce the 2005 Alex Charters Student Scholars:

Emily Baldwin, University College London, UK
Noah Bergeron, University of Louisiana Lafayette, US
Alberto Bettella, Universita degli Studi di Padova, Italy
Shinya Fukushige, Kyushu Institute of Technology, Japan
Julian Gomez, Auburn University, US
Takayuki Harano, Kyushu Institute of Technology, Japan
Roque Hernandez, University of Texas at Austin, US
Masumi Higashide, Tokai University, Japan
Andrew Lloyd, Marquette University, US
Daniel Milner, University of Kent, UK
Natalja Naumova, St. Petersburg State Engineering Economics University, Russia
Ilya Nikulin, St. Petersburg State University, Russia
Robert Rabb, University of Texas at Austin, US
Shannon Ryan, Fraunhofer Institut Kurzzeitdynamik, Germany
Masayoshi Tadaoka, Kyushu Institute of Technology, Japan

This group of Alex Charters Student Scholars will be introduced to the society at the opening session of the 2005 symposium. Please join your society colleagues in congratulating these students and welcoming their participation in the technical and social activities at Lake Tahoe.

— Eric Fahrenthold, *Committee Chair*

AWARDS COMMITTEE UPDATE

The Awards Committee has been hard at work seeking nominations from the HVIS membership for the Distinguished Scientist Award, given at each symposium to a scientist who has made a significant contribution to the field of hypervelocity impact.

This year we were disappointed with the lack of nominations since there are some excellent scientists in our community who are worthy of nomination and consideration. Nomination should be recognised as an honour in itself and we would urge the membership to consider this for future symposia.

By demonstrating that HVIS recognises good science and that we have a high calibre of scientists and engineers making significant contributions to it we can convince our national and international funding organisations to support hypervelocity impact research at all levels. This is especially true of fundamental research, which is the seed corn of future progress in a wide range of technologies.

The committee had a hard task selecting a winner from the nominations we did receive; however, you will have to wait until the symposium in Lake Tahoe, however, to find out who it is!

The committee is also assessing papers for the best paper award, also to be made at the symposium. These papers were selected during the paper review in June and cover all the sessions of the symposium. We are currently assessing against a number of criteria, including the contribution made and its novelty amongst others. The papers, as ever, are all to a high standard.

— Ian Cullis, *Committee Chair*

Nominations Committee Report

In March of this year, the HVIS Nominations Committee solicited the current membership for nominations of candidates to stand for this year's election to the HVIS Board of Directors. Several nominations were received and were included in an initial list of 28 potential candidates.

Through a process of three voting rounds, the six member Nominations Committee pared the initial list down to six outstanding candidates to fill two vacancies that will open this year upon completion of the HVIS 2005 Symposium. The election will be held via email, and you will be able to cast your vote simply by replying to the message you receive. We encourage everyone to participate in selecting the HVIS leadership by sending us your vote!

— Jerry Yatteau, *Committee Chair*

News from our members

EMMA TAYLOR started her new position at the Open University in July 2005 as a Lecturer in Impact Physics. She writes that after a settling in period, she expects to have more free time to devote to HVIS activities as the scope of [her] job is directly aligned with HVI.

Congratulations, Emma! We are all looking forward to many years of working with you!

We want to hear from you regarding HVI-related news in your life.

Send news to our Publications Committee Chair, Bill Schonberg, at: wschon@umr.edu.

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Bill Schonberg . . . . . wschon@umr.edu

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Stephan Bless . . . . . Stephan_bless@iat.utexas.edu
Charlie Anderson . . . . . canderson@swri.edu
Michel Lambert . . . . . michel.lambert@esa.int

HVIS Committee Chairs

AWARDS
Ian Cullis . . . . . igcullis@qinetiq.com

EDUCATIONAL OUTREACH
Eric Fahrenthold . . . . . epfahren@mail.utexas.edu

MEMBERSHIP
Emma Taylor . . . . . e.a.taylor@open.ac.edu

NOMINATIONS
Jerry Yatteau. . . . . jyatteau@ara.com

PUBLICATIONS
Bill Schonberg . . . . . wschon@umr.edu

SITE SELECTION
Lalit Chhabildas. . . . . lcchab@sandia.gov

Burton G. Cour-Palais, 1925 – 2004

D. Kessler, E. Christiansen, J. Crews

Burt Cour-Palais, winner of the 1996 HVIS Distinguished Scientist Award passed away on 20 July 2004. Most people will remember Burt for his internationally recognized contributions to hypervelocity research, but Burt also help set the stage for what eventually grew into today's orbital debris and hazard program

Burt was born a British citizen in India, where he also attended college. After graduating, he worked for several aircraft companies in England and Canada as a structural engineer before going to NASA Langley in 1960. The next year he transferred to what would eventually be known as the Johnson Space Center (JSC) in Houston, Texas where Burt began his meteoroid and hypervelocity research. At JSC Burt played a key role in the assement of the orbital debris hazard and the development of spacecraft shields.

During the early 1960s there were two very different models describing the meteoroid environment. One predicted a large hazard for manned missions; the other, predicted only a moderate hazard. To resolve this uncertainty Burt organized the examination of recovered Mercury spacecraft for hypervelocity impacts, especially the window. These examinations supported the lower hazard. At the same time, Burt's responsibilities increased: in 1964, Burt was appointed Assistant Chief of the Meteoroid Environment Section; in 1965, Manager of Apollo Subsystem Meteoroid Protection; and in 1967, Chief of the Meteoroid Sciences Branch.

As Manager of Apollo Subsystem Meteoroid Protection, Burt established the basis of the meteoroid/debris risk assessment process. That process, coupled with hypervelocity impact models, formulated the protection requirements for the Apollo vehicles (Command Module-Service Module, Lunar Module) and the astronaut space suit. Burt and his colleagues were responsible for defining shielding requirements and designs for essentially all US manned spacecraft during this era.

In 1966, NASA Headquarters asked Burt to write a "monograph" describing the meteoroid environment, which he did with the help of an ad hoc committee. It was published as NASA SP-8013, Meteoroid Environment Model — 1969 (Near Earth to Lunar Surface). This environment became the recommended meteoroid environment model for all spacecraft for the next 25 years.

In 1978, Burt was transferred to the Technical Planning Office and asked to prepare a 10-year program plan for orbital debris research. The next year, the program was approved and orbital debris research found its home under Don Kessler in the JSC Space Sciences Branch.

In 1983, Burt transferred to the Space Science Branch, and began working with Jeanne Crews and Eric Christiansen who were rebuilding the hypervelocity gun facilities at JSC, and beginning to test composite materials. Once again, after 13 years, Burt was able to conduct the hypervelocity research that he loved. Burt, Jeanne, and Eric began researching new ways to design spacecraft shielding, and discovered the innovative shield design using several layers of a ceramic fabric as a bumper material in place of aluminum.

Burt retired from NASA in 1989, but he didn't retire from hypervelocity work. For the next five years, he worked for McDonnell Douglas supporting the design of the shields for the ISS. After that, he continued to consult with NASA on hypervelocity issues through the Southwest Research Institute (SwRI).

HVIS 2005 UPDATE!

The Hypervelocity Impact 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. The 2005 Hypervelocity Impact Symposium (HVIS 2005) has been organized to provide maximum opportunity to meet, exchange results and ideas, and otherwise interact with technical experts and leaders from around the world who are interested in the technologies and applications associated with hypervelocity impact.

Over 120 papers were submitted from 11 different countries. Disciplines represented include material response, planetary impact, launchers and diagnostics, shock physics, terminal ballistics, fracture and fragmentation, analytic and numerical modeling, penetration mechanics, and spacecraft shielding. The papers that are presented will be published in the Symposium's proceedings, a dedicated volume of the *International Journal of Impact Engineering*.

Breathtaking Lake Tahoe and the surrounding areas have much to offer visitors. Autumn in Squaw Valley is the perfect time for scenic hikes, fishing excursions, and mountain biking.

The host hotel for this Symposium, the award-winning Resort at Squaw Creek, is located at the base of Squaw Valley USA, site of the 1960 Winter Olympics and only minutes from the north shore of Lake Tahoe. The Resort features luxurious accommodations, a premier golf course, three heated swimming pools, a 120-foot water slide, and state-of-the-art meeting facilities. To make a reservation at the Resort at Squaw Creek, please call the hotel at (800) 327-3353. Be sure to mention reservation code "HVIS"! To receive the conference group rate, reservations must be made by September 8, 2005. The conference group rate will be available from October 9–13, 2005. The Resort at Squaw Creek is located 42 miles from the Reno/Tahoe International Airport. Squaw Creek Transportation provides shuttles to and from the Reno/Tahoe International Airport. For reservations and shuttle fees call toll-free (866) 909-RIDE. The temperature in the conference room will be around 68°F. During October, the temperature in the Lake Tahoe area can range from 40°F in the evening to 65°F during the day. Visit www.squawcreek.com for up-to-date weather information.

HVIS 2005 promises to be both intellectually stimulating and socially enjoyable. For information about the Companion Program, please contact Ms. Michelle Ramsey by calling (512) 232-4451 (ramsey@iat.utexas.edu), or visit our website at www.hvis.org/HVIS_05.

We have also invited distinguished plenary speakers to discuss hypervelocity impact technology and applications in their area of expertise.

We are pleased to report that the following individuals have accepted our invitation to present a plenary talk at HVIS 2005:

- **PETER EARLY**—Professor of Geological Sciences at Brown University
- **DENNIS GRADY**—Associate and Principal Scientist with the South West Division of Applied Research ASsociates
- **MARCUS KNUDSON**—Staff member in the Shock Physics Applications group at Sandia National Laboratories

Early registration (before 1 September) can be achieved through the web site at www.hvis.org. Additional information on the Symposium hotel, The Resort at Squaw Creek and a registration form can also be obtained at www.hvis.org. We welcome your participation in this exciting event and are looking forward to seeing you there!

Lalit Chhabildas and **Denny Orphal**
Symposium Chairmen

Make Plans for HVIS 2007 — Williamsburg, Virginia, U.S.A.

The next Hypervelocity Impact Symposium, HVIS 2007, will occur during the week of 23 September 2007 in Williamsburg, Virginia, USA.

Williamsburg is located centrally between Richmond (the capital of Virginia) and Virginia Beach (located on the shores of the Atlantic), Virginia. It is part of Virginia's Historic Triangle which also includes Jamestown and Yorktown.

The conference location will be the Williamsburg Lodge. During 2006, the Lodge's conference center, guest rooms, and suites will be new or newly renovated with furnishings inspired by the collections of the Abbey Aldrich Rockefeller Folk Art Museum. Guest accomo-dations will include all modern amenities, including high-speed internet connectivity. Recreation at the Lodge includes golf, outdoor pools, tennis croquet and lawn bowling.

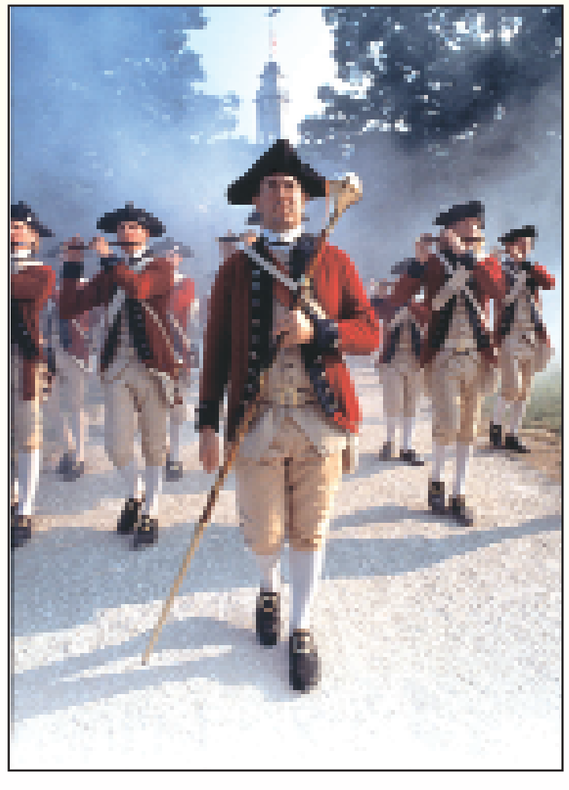
Included in the conference package will be admission tickets to Colonial Williamsburg. By taking a short walk from the Lodge, you will step back in time to a thriving 18th-century community, the capital of England's largest and most important colony in the new world. America's largest living history museum offers an unparalleled view of daily Colonial life when it was a powerful center of politics, commerce and culture. Over 500 original and carefully reconstructed public buildings, private homes, taverns and shops, and 90 acres of gardens and public greens make up the Historic Area. It is brought to life with tradesmen and historical interpreters in full period costume. A shuttle-bus service around the perimeter is available.

Colonial Williamsburg's Visitor Center is also the official gateway to America's 400th anniversary, marking the establishment of the first permanent English settlement in the New World at Jamestown in 1607. America's evolution from colonial status to nationhood is chronicled through a unique blend of timeline, film, thematic exhibits and outdoor living history at the Yorktown Victory Center. Special events throughout 2007 at both locations celebrate this momentous event and explore its role in the evolution of government, cultural and social institutions that characterize today's United States.

The Williamsburg area offers a variety of other activities, including Busch Gardens Williamsburg an action-packed, European-themed adventure park with 17th-century charm and 21st-century technology and shopping at the area's outlet malls. By taking short drives one can explore America's Civil War history, maritime museums at Norfolk and Newport News, and the shores of the Chesapeake Bay or Atlantic Ocean.

Major airports are located within 45 minutes of Williamsburg. The average temperature range should range from a low of 57°F to a high of 78°F.

Photos courtesy of
The Colonial Williamsburg Foundation, Williamsburg, VA.



Fred Lawrence Whipple, 1906–2004

STAR BRIGHT "Now that's a snowball," said Smithsonian astronomer Fred Lawrence Whipple when he first saw the icy chunk at the Smithsonian Astrophysical Observatory in Cambridge, Massachusetts, in February 1986. It was part of a stunt arranged by photographer Jonathan Blair, who was making a portrait of Whipple, perhaps best known for his 1949 theory that comets were "dirty snowballs," not clumps of sand or rock. Whipple, who served nearly 50 years at the observatory, including 22 years as its director, died August 29 at age 97. He is survived by his wife, Babette, and three adult children. A star of the 20th-century astronomy, Whipple created a worldwide satellite-tracking program after the launch of *Sputnik*, anticipated the U.S. manned spaceflight program in the early 1950s, and pioneered the use of the innovative Multiple-Mirror Telescope in 1979. In 1986, close-up photographs of Halley's comet confirmed his snowball theory. His legacy is enshrined at the Fred Lawrence Whipple Observatory on Mount Hopkins in Arizona and also in a 1946 invention, the Whipple shield, which protects spacecraft from cosmic debris.

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Hypervelocity Impact Society
Bill Schonberg, Publications Committee Chair
UMR CArE Engineering Department
1870 Miner Circle • Butler-Carlton Hall
Rolla, MO 65409-0030

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