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**ASSTG**

**Spring Presentations**

Members of CASPER's Theory Group outdid themselves this spring, presenting a total of seven papers at two international conferences. Troy Henderson, Truell Hyde, Bruce Lindsay, Ray Nazzario, Ke Qiao, Galen Swint and John Vasut attended the XXXI Lunar & Planetary Science Conference held in March at the Johnson Space Center in Houston. Truell, Bruce, Ray, Galen and John all presented papers while at the conference and held up well under the interest generated by their research! In April, Laura Barge, Carliss Hyde, Truell Hyde, Jerry Reay, John Simcik, and John Vasut attended the 8<sup>th</sup> International Dusty Plasmas Conference held at the Los Alamos National Laboratory. Laura, Truell, Galen and John presented papers, which were again well received. Four of the papers mentioned have already been published with two more in the works to meet a July deadline for publication in a special issue of IEEE Transactions on Plasma Science. In addition to the above, seven more papers have been accepted by members of the group for presentation at COSPAR which will be held in July in Warsaw, Poland. All in all, a very profitable spring!

**New CASPER Logo**

As you've probably noticed, CASPER now has an official logo. Lonnie Bradley (who also designed the Physics Circus 2000 logo) designed CASPER's new look. Watch for a new and improved CASPER web page in the near future.

**HIDPL/SSL**

**HIDPL Construction**

Construction on the HIDPL is underway at long last! The final funding details were worked out in early May and construction began on May 8<sup>th</sup>. Projections have us in the building some time in August.

**SSL**

The SSL is going to be at the center of research this summer. Several labs will be brought on line during June and July along with a GearUp production facility designed to support CASPER's Physics Circus outreach. Look for details in upcoming editions of the CASPER News.

**Los Alamos & Sandia Labs**

While at the Dusty Plasmas conference, Carliss Hyde, Jerry Reay and John Simcik renewed old acquaintances at both the Los Alamos and Sandia National Labs. Along the way, they examined several GEC RF Reference Cells and 'experienced' Z-Pinch. Hopefully, these contacts will blossom into CASPER partnerships in the future.

**ISS Teleconference**

On February 24th, CASPER (along with TSTC and the City of Waco) hosted the ISS: Ventures in Space Teleconference, which explored strategies for the economic development of space. A diverse panel of top NASA, university and commercial researchers along with other experts took questions and comments while on the air. The conference garnered a good response and the Waco Chamber provided lunch! Look for this to become a CASPER tradition.

**Personnel**

**CASPER Undergraduate Research**

*Honors Thesis*

Galen Swint finished his Honors Thesis within CASPER by defending it in early May before his committee. Galen's work on Chondrule Melting via Transient Heating Events has resulted in several publications in reviewed international journals with three of them coming this semester. Galen will be attending Georgia Tech starting in the fall and working on a Ph.D. in computer science. Congratulations, Galen. We'll miss you.

*Senior Research Projects*

Ted Cook and Jason Saunders completed their senior research projects during the spring, presenting their results before physics faculty and members of the Senior Research course they were enrolled in. If you're interested in what they accomplished stop by the office and take a look at their final reports. Congratulations guys.

**CASPER Graduate Research**

*Dissertation Proposal Defense*

Several of CASPER's Ph.D. students will be defending their dissertation proposals this summer. Ray Nazzario is scheduled to defend his in early June while Bruce Lindsay, Simeon Trendafilov and John Vasut are shooting for early August. Ray is also planning on defending his finished dissertation before the end of August. This should be a very busy summer. Good luck.

**Need More Information?**

If you would like additional information on any of the above, contact Truell Hyde at [Truell\\_Hyde@baylor.edu](mailto:Truell_Hyde@baylor.edu)

## Research Presentations

### *Lunar & Planetary Conference*

*Dust Grain Orbital Behavior Around Neptune*

**R. Nazzario & T.W. Hyde**

*Plasma Condensation and the One Component Plasma Model*

**J.A. Vasut & T.W. Hyde**

*Simulation of Chondrule Formation Using A Resizing Box Tree Code*

**G.S. Swint & T.W. Hyde**

*The Effects of Chaos on Planetesimal Interactions within Protoplanetary Disks*

**B. Lindsay & T.W. Hyde**

### *8<sup>th</sup> Dusty Plasmas Conference*

*Calculating Grain Charge in a Dusty Plasma with a Size Dependent Potential*

**L.A. Barge & T.W. Hyde**

*Computer Simulations of Coulomb Crystallization in a Dusty Plasma*

**J.A. Vasut & T.W. Hyde**

*Dust Grain Coagulation Using a Resizing Box Tree Code*

**G.S. Swint & T.W. Hyde**

### *Invited Seminar*

*Colloidal Plasmas*

**T.W. Hyde,**

**Invited Seminar, UT Dallas**

### *Honors Thesis Presentation*

*A Simulation of Chondrule Melting and Transient Heating Events*

**G.S. Swint**

### *Senior Research Presentations*

*Development of a Laser Curtain Diagnostic System*

**Ted Cook**

*The Design, Construction and Testing of A Light Gas Gun Range*

**Jason Saunders**

### *Graduate Physics Seminars*

*Current Research in Hypervelocity Impact Studies*

**John Perkins**

*Wave Structure in Dusty Plasmas*

**Ke Qiao**

*Recent Developments in*

*Experimental Dusty Plasmas*

**Bernard Smith**

## Funded Grants/New Proposals

### **Viking Science & Technology, Inc.**

CASPER was invited in April by Viking Science & Technology to submit a proposal for the development of a 'Smart Skin' on-orbit sensor system. NASA is interested in employing such a system on both the Orbiter and the International Space Station. The 'Smart Skin' system would enable detection of micron and larger impacts thus allowing for enhanced safety capabilities on both the shuttle and the ISS. In addition, it would provide CASPER the opportunity to flight test next generation sensor designs and collect data which would produce a reliable database on near-Earth particle and debris densities. If funded, the contract would run until the end of September and be eligible for multiyear renewal.

### **Gear Up Waco – Physics Circus**

CASPER's first Physics Circus was a huge success. In fact, it was such a success that the Circus now has its own newsletter! Hopefully, the publicity being generated will provide CASPER, LET and the Department of Physics with a powerful recruiting tool for attracting new majors. Congratulations to Dr. Barge and everyone involved.

### **CASPER 2000 National Science Foundation REU/RET Program**

CASPER was notified in December by the National Science Foundation that its 2000 NSF REU program had been funded for the third year of a three-year funding cycle. The NSF also notified CASPER in late April that a second NSF RET grant had been awarded as well. This brings the current grant award from the NSF to \$148,396. CASPER's 2000 NSF REU/RET program will have at least twenty-five undergraduates and high school students along with four high school teachers working with physics research faculty, graduate students and TSTC faculty on various research projects. As usual, we have NSF Fellows coming from all over the United States to be a part of CASPER 2000. In spite of the stiff competition, three of our own (Troy Henderson, Ethan Swint and Brennan Thomas) were selected to work in the labs as CASPER 2000 REU Fellows. It promises to be an exciting and busy summer.

### **School to Work Program**

The Heart of Texas Council of Governments notified CASPER in April of funding for a School-to-Work program within the labs for the summer of 2000. This program will allow AP science and math students to participate in a course on National Instrument's Labview software while being involved in ongoing research within the labs on flight instrument design. The students will also be involved in weekly NSF and CASPER seminars. Another outstanding recruitment opportunity!

## Spring Donations

CASPER received several significant donations this past spring as well as a few promised donations for the coming summer and fall. Rice University donated three EM shield rooms for use in the HIDPL while Baylor University donated a 133 MHz Pentium box for use as the basis of a Labview Diagnostics system. On the theory group side, Dr. Adams in Baylor's Physics Department donated a large number of research texts from his personal library. (These are already in use by CASPER graduate students!) Research groups at both Sandia and Los Alamos National Labs promised several donations in the late summer and early fall as well. We'll let you know as things develop. Thanks to everyone involved in helping CASPER obtain the resources necessary for quality research.

## GEC RF Reference Cell

The plasma reactor chamber, pumpout manifold and weldment along with the lower electrode assembly are now awaiting installation in the HIDPL. The rest of the GEC RF Reference Cell will be ordered this summer with 'first light' hopefully coming some time in the fall. Anyone up for a "first light" party?