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## ASSTG

### Summer Presentations

Members of CASPER's Theory Group had a productive(!) summer, presenting a total of seven papers at COSPAR and submitting another nine for publication in various journals. Bill Barge, Laura Barge, Carliss Hyde, Truell Hyde, and Galen Swint attended the COSPAR 2000 Conference held July 16-23 in Warsaw, Poland where they presented papers authored by Laura Barge, Truell Hyde, Michael Lennek, Bruce Lindsay, Ray Nazzario, Galen Swint and John Vasut. A large amount of interest was generated by several of their papers with numerous requests for preprints. Also in July, Laura Barge, Truell Hyde, Michael Lennek, and John Vasut submitted papers to the IEEE Special Dusty Plasmas Edition of their Transactions on Plasma Science Journal. These grew out of CASPER presentations at the 8<sup>th</sup> International Dusty Plasmas Conference held at the Los Alamos National Laboratory in April. All in all, a *phenomenal* summer!

### New CASPER Web Pages

As you've probably noticed by now, CASPER has a completely redesigned web page. The new page is much faster and better represents what's currently going on within the Center. Additionally, the Physics Circus web page is slowly coming on line as well. The English front pages are already on-line with the Spanish ones soon to follow. When you have a minute, check them both out and let us know what you think.

## HIDPL/SSL

### HIDPL Construction

Construction on the HIDPL is almost completed! The final wiring was underway in August with the scheduled opening of the building either in late August or early September. If you haven't been by the HIDPL in a while, stop by and see what you think. You're sure to be impressed.

### SSL

The SSL was at the center of CASPER's educational outreach and research this summer. Over fifty students and faculty worked within the labs on a daily basis. 6 REU Fellows, 4 RET Fellows, 13 CASPER Interns and 14 CASPER High School Scholars were all working in SSL labs with their activities primarily funded through the NSF, the Department of Education and HOTCOG monies. Several labs were brought on line during June and July along with a GearUp production facility designed to support CASPER's Physics Circus outreach. Additionally, the Diagnostics Lab now has \$40K of brand new equipment along with an E&M screen room ready for use. Check out the pictures on the web page and see CASPER in action!

### New Contact Information

Several new phone and fax lines were installed within the SSL during the summer. The labs within the SSL now have two phone lines (254.867.3180 and 254.867.3208) as well as a dedicated fax line (254.867.DUST). All of the above plus mailing and shipping addresses can be found on the CASPER web site under Contact Information.

## Personnel

### Dr. Lorin Matthews

In August, Dr. Lorin Matthews accepted a position as a Senior Research Fellow within CASPER. She will be moving into her offices at Baylor and the SSL during the week of August 21st, 2000. Dr. Matthews holds the Ph.D. from Baylor University where she was a National Science Foundation Fellow, a TexSpace Fellow and a P.E.O. Scholar. Dr. Matthews has been working for the past two years at Raytheon Aircraft Integration Systems as the Lead Engineer for vibroacoustic analysis on the NASA SOFIA project. She will also be teaching two classes at Baylor and no doubt recruiting along the way. If you haven't met her yet, make sure to stop by the SSL and do so.

### Ph.D. Proposal Defense

In May, Ray Nazzario defended his Ph.D. proposal before his committee. Ray is completing his dissertation and looking to graduate in the fall. Congratulations!

### CASPER TexSpace Fellows

In May, three of CASPER's own were notified they had been selected as Texas Space Grant Consortium Fellows. Bernard Smith was selected as a TexSpace Graduate Research Fellow (for the third year in a row) and Troy Henderson and Ethan Swint were both appointed TexSpace Undergraduate Research Fellows. Congratulations!

### 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

### *COSPAR (Warsaw, Poland)*

*A Charging Model For a Dust Cloud with a Size Distribution and A Nonuniform Potential*

L. Bringol-Barge & T.W. Hyde

*The Calculation of Grain Charge in a Dense Dusty Plasma With A Nonuniform Surface Potential*

L. Bringol-Barge & T.W. Hyde

*Charging In A Dusty Plasma With A Size Distribution: A Comparison of Three Models*

L. Bringol-Barge & T.W. Hyde

*Mutual Gravitational Perturbations Between Planetesimals Within Protoplanetary Disks*

B. Lindsay & T.W. Hyde

*Dust Grain Orbital Behavior Around Neptune*

R. Nazzario & T.W. Hyde

*Plasma Condensation and the One Component Plasma Model*

J.A. Vasut, M.D. Lennek & T.W. Hyde

*Modeling Chondrule Melting Using a Resizing Box\_Tree Code*

G.S. Swint & T.W. Hyde

### *Ph.D. Proposal Defense*

*Dust Grain Orbital Behavior*

Ray Nazzario

### *CASPER REU Presentations*

*Hypervelocity Impact Studies and Electrodynamic Balancing*

Troy Henderson

*Mach Cones in Dusty Plasmas*

Mike Lennek

*Hypervelocity Impact Detection and Dusty Plasma Experimental Research*

Patricia Quarles

*Dusty Plasmas Diagnostics*

Ethan Swint & Dean Darnell

*Short Laser Pulses and Impact Simulations Using Lasers*

Brennan Thomas

## Funded Grants/New Proposals

### **Gear Up Waco – Physics Circus/Women in Physics Seminar**

CASPER's Physics Circus now has its own web page and newsletter. (Copies are available at the usual places.) This summer was a productive one with lots of new 'hands-on' equipment designed and built by GearUp Interns and ready for use at all future Circus presentations. This year's schedule has the Circus becoming a weeklong event with presentations in both December and May. (There's even going to be a version of the Circus presented in India this fall!) During May, Dr. Barge also presented the first of CASPER's Women in Physics Seminars at Tennyson Middle School. Congratulations to Dr. Barge and everyone involved for a GREAT job.

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

This year's NSF REU and RET programs took place between the first of June and the 21st of August. The 2000 NSF program culminated with the students presenting their research results as PowerPoint presentations. They were also required to produce a research quality paper, which will be considered for possible publication during the coming year. Several of the summer research fellows are planning on continuing their CASPER research next year either at Baylor or at their home institutions via the Internet. RET Fellows spent the summer developing stand alone curriculum modules (designed to integrate with the Physics Circus) which will be used to introduce basic physics principles into the middle school classroom. These are being beta tested this fall at Tennyson Middle School. Along the way, everyone had a great time at a Ranger game and ate all sorts of goodies provided by Dr. Barge. All in all, a *great* summer!

### **NSF Science & Technology Center Preproposal**

A preproposal to expand CASPER into a Science & Technology Center was submitted to the National Science Foundation in August. The proposal would fund two additional GEC RF Reference Cells (along with diagnostics) and allow the hiring of up to twenty researchers. Funding is set for a minimum of \$13 million over five years with the possibility of a five-year extension. Needless to say, this would go a long way toward establishing CASPER as a world class research facility. Unfortunately, CASPER is competing with JPL, Goddard, Marshall and a host of other 'big-name' players for a very few funding slots. We'll keep you posted as events unfold.

### **Los Alamos Proposal**

CASPER was notified in July that they had been awarded a complete excimer laser system through the Los Alamos Laboratory Education Equipment Gift Program. This system (valued by Los Alamos at over \$60,000) was picked up by CASPER technicians during August and will soon be installed in the labs.

## Spring Donations

CASPER received several significant donations during the summer. A ruby laser (1997 model) was donated to CASPER via a private source in August. This laser system (worth over \$65,000) will be used in the laser labs in the SSL. In addition, Intel donated several million dollars worth of equipment to CASPER in June. Jerry Reay and Mike Cook picked the equipment up personally (which is a LONG story) and it has now been unpacked, inventoried and stored in the SSL. Look for much of it to be used as part of various diagnostic packages on the reference cell. Thanks to everyone involved in helping CASPER obtain the resources necessary for quality research.

## CASPER in the NEWS

CASPER made the local papers three times during the past summer. Stories on CASPER programs ran in the Waco Tribune Herald in the May 13th, July 6<sup>th</sup> and August 3<sup>rd</sup> editions. In all of these, CASPER was the lead story in the local section. The word is getting out!