



# NEWSLETTER

## Department of Mechanical and Materials Engineering

<b>WHAT'S INSIDE</b>	
<i>New Educational Centers</i>	<b>2</b>
<i>Student Successes</i>	<b>3</b>
<i>Student Activities</i>	<b>3</b>
<i>Department News</i>	<b>4</b>

### SUCCESSFUL LAUNCH OF NEAR SPACE EXPERIMENT

It's rare that you'll find a college student up at 5:30 on a Sunday morning unless they are still awake from the night before. That's not the case when it comes to our High Altitude Balloon (HAB) Team. After an attempted launch on Sunday, March 16 failed, the team successfully launched the balloon and experiment on Sunday, May 4.



Getting ready to release the balloon

The HAB launch team consists of two mechanical engineering students, two electrical engineering students, and two alumni members. The students are lead by five faculty advisors, Drs. Joseph Slater and Mitch Wolff, both ME faculty, Dr. John Wu and Kumar Yelamarthi from the Electrical Engineering department, and Dr. Ruby Mawasha from the College of Engineering and Computer Science.



Filling the balloon with helium

The group traveled to Portland, Indiana for the launch. The experiment goal was to deploy a shape memory polymer tube in a near space environment. It was launched in a folded state, of approximately 2 feet in length, to approximately 63,000. The system was designed to deploy the shape memory polymer tube using heating elements inside the tube powered by a set of batteries.

The balloon experiment equipment was recovered after the launch near Sidney, Ohio by the Shelby County Sheriff's office. Data analyzed after recovery showed that the tube was heated to just ten degrees Celsius below what was necessary. This was likely caused by the early rupture of the balloon failing to carry the experiment into near-vacuum conditions. Another launch will be conducted this summer to complete the experiment.



Winning team accepting their award from Dr. Slater

### TREBUCHET COMPETITION

February 8th marked the date of the eighth annual Trebuchet Competition held at the Nutter Center. Fifty three teams from schools across the Miami Valley participated in the event, each team consisted of six or more students. The winning team, *The Chronicles of the 300+6*, was from Carroll High School. They beat out many other teams to claim their prize. The event was successful yet again due to the hard work and dedication of Dr. Joseph Slater and the over 75 volunteers. With each passing year this event continues to grow, attracting schools from further and further away.



### CONGRATULATIONS TO OUR EXCEPTIONAL FACULTY

The department is proud to announce the promotion of several of our faculty members. These promotions will become effective starting fall quarter, 2008. It is the hard work and dedication of our faculty that helps to make our program stand out in comparison to other universities. Congratulations to the following faculty members as they continue on their path of success.

- Dr. Ravi Penmetsa, promotion to Associate Professor
- Dr. Junghsen Lieh, promotion to Professor
- Dr. Maher Amer, promotion to Professor
- Dr. James Menart, promotion to Professor
- Dr. Nathan Klingbeil, promotion to Professor
- Dr. Joseph Slater, promotion to Professor

## EXCITING NEW COLLABORATION FOR THE DEPARTMENT



The Department is proud to announce the establishment of the new Center for High Performance Computing (CHPC). CHPC was established on May 1<sup>st</sup>, 2008 and is a joint collaboration between WSU and Cradle, a Japanese Computational Fluid Dynamics (CFD) firm.

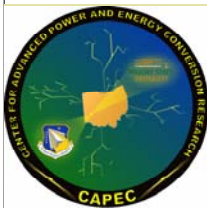
Prior to choosing Wright State as their partner for improving and marketing their software products, Cradle visited several other places in the United States. Ultimately they chose Wright State based upon our impressive faculty research activities in CFD, Optimization, Mechanics, Nano-Materials and PC-Cluster Computing. They were equally impressed with our long history of collaboration with the Air Force Research Laboratory and other research agencies such as NASA in the area of high performance computation.

Cradle has been serving the Japanese aerospace, automotive, electronics, construction, chemical and environmental industries for 25 years. They produce sophisticated CFD software that enables new product performance requirements to be met early in the design cycle and satisfy time-to-market considerations for product development. In contrast, the group at WSU has been working on fundamental aspects of the CFD research, such as algorithm development, physical understanding of high speed flows, plasma, turbulence, and combustion modeling. These two distinct research areas compliment one another allowing for broader CFD research applications in the future.



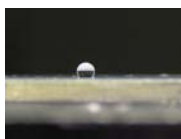
*Cradle President, Ichiro Komada and WSU provost Steve Angle signing collaboration agreement*

Cradle's investment will provide the CHPS with student support, new staff positions and additional computer hardware. This will not only strengthen the existing fundamental research capability of the Department but also connect CHPC to industry-based applied research applications. Under the current arrangement, Cradle will provide unlimited licenses to WSU for teaching and research purposes. A number of companies in the Dayton area have seen this as a great opportunity for teaming up with WSU in computational research. The first assignment of CHPC is to establish a knowledge-based workbench for modeling and validation in multi-disciplinary turbulence research, as turbulence is still considered a weak link to the success of CFD prediction.

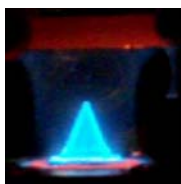


## CENTER FOR ADVANCED POWER AND ENERGY CONVERSION

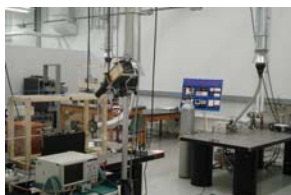
The Center for Advanced Power and Energy Conversion (CAPEC) is a joint collaboration between Wright State and Wright Patterson's Air Force Research Laboratory (AFRL). CAPEC celebrated it's opening on May 30, with an open house and reception for research partners and members from the local business community.



Dr. Biswa Ganguly of AFRL has been leading a research effort in the area of fundamental plasma-related research for many years; his research has great potential for non-military applications which may in turn benefit the regional economy. Unfortunately, because his work is mainly conducted at the Wright-Patterson Air Force Base, working with outside individuals can be challenging. With Wright State University as the host of the research activities, CAPEC has the capability to resolve these difficult issues and also allows students to work with internationally recognized researchers at Wright State University.



Drs. Joseph Shang, James Menart and George Huang conduct plasma research in the Department. Their work however is largely computational, and their research can supplement the experimental work at AFRL. Not only can their research provide other research scientists with a better understanding of the physical phenomena, but it can potentially provide a tool to scale the experimental setup in a lab environment to a large scale industrial setup. Another important role WSU will play is to provide the manpower needed to conduct the research. In addition to graduate students and post-doctoral researchers, a number of undergraduate students within the College of Engineering and Computer Science will also be conducting research activities in the CAPEC lab.



CAPEC Lab

The Lab's initial research focus will be on non-equilibrium reactive flow. Non-equilibrium plasma reactive flow research has potential for material surface treatments and biomedical sterilization applications. A few local companies, such as UES, Inc. and Mound Laser & Photonics Center, Inc. have already shown interest in collaborating with CAPEC.

## STUDENT SUCCESS STORIES

- Congratulations to students Ben Florkey, Tim Cormier, and Pritish Khale for their recent success in the Leaf Vacuum Competition initiated by South Coast Air Quality Management District. Under their advisor, Dr. Junghsen Lieh, Wright State's team was selected as one of the top five that will move on to the next phase of the competition, building a prototype. They traveled to California to display their prototype.
- Congratulations to our Human Powered Vehicle Team. Five undergraduate ME students, under the advisement of Dr. Junghsen Lieh, competed in the East Coast ASME Human Powered Vehicle Competition. The competition was held at the University of Wisconsin-Madison on April 25-27. The team brought home several trophies. They won **1st Place** in Utility Vehicle Endurance, a 10KM race, **2nd Place** in Multi-rider Vehicle Endurance, a 60KM race, **2nd Place** in the Multi-rider Vehicle Overall, and **3rd Place** in the Utility Vehicle Overall.
- Our Aero Design Teams traveled to Georgia for the SAE Aero Design Competition. Both the micro class team, consisting of eight ME students, and the regular class team consisting of seven ME students, were lead by advisor Dr. Scott Thomas. The micro class team won **1st Place** for Best Design. The Regular class team placed 10th. Congratulations to both teams.
- Congratulations to three of our graduate students whose presentations were selected as best presentations at the 2008 DCASS convention. The students selected were Charles Webb for his CFD applications presentation, William Bennett for his presentation on Space and Access to Space, and Thomas Spradlin for his Materials presentation.
- Mike Jonell was chosen as Top Scholar for the College of Engineering and Computer Science. He was chosen by the WSU Parents Association and the Friends of the Libraries. As part of the award, the library will purchase a book pertaining to his major in his honor.
- Scott Stanfield, Ph.D. student, received the Best Student Paper Award for 2007 from the AIAA Plasmadynamics and Lasers Technical Committee. His paper was entitled "Rotational and Vibrational Temperatures of a Dielectric Barrier Discharge."
- Joy Davis won best overall presentation and best technical presentation at the ASME Old Guard Technical Presentation Contest. Joy will be traveling to Boston in October to compete at the international level.
- Heaters designed by Ph.D. student Mike Maddux were recently used by NASA on the March 11-26 Endeavor mission, STS-123.



## STUDENT ACTIVITIES

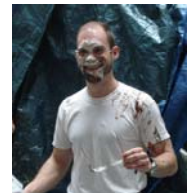
During Engineering Week, engineering honor society Tau Beta Pi hosted several events including a pie eating contest as well as an event called Pi-a-Prof. Pi-a-Prof was an opportunity for students to bid money for the opportunity to put a pie in the face of a professor.



*Pie Eating Contest*

Our department was well represented in the pie eating contest. Our student participants included: Tricia Kingseed, Joy Davis, Katie Thiel, Joel Wish, Randy Tobe, Jeremy Fuhr, and Mike Jonell. Joy Davis won for the girls and Joel Wish came out on top for the guys.

Our brave faculty willing to take a pie in the face included Drs. Raghavan Srinivasan, Scott Thomas, Nathan Klingbeil, and Ravi Penmetsa. Dr. George Huang instigated much of the pie throwing at our faculty members by out bidding many others. The faculty was happy to pay Dr. Huang back by pooling their money together with students. The winning bid for a chance to throw a pie in Dr. Huang's face came in at over \$200, money well spent according to most in the audience.



*Dr. Klingbeil after being pied by Dr. Huang*

## LOSS OF DOLORES H. RUSS




*Dolores Russ*

In January, Wright State lost a good friend, Dolores Russ. The Russ Engineering Center was named after Dolores and her husband, Fritz. She was 86 years old. The improvement of engineering education was of utmost importance to the couple. Along with Wright State, Ohio University's engineering college is also named after them. Fritz and Dolores founded Systems Research Laboratories in 1955. The company is an engineering research firm located in Beavercreek. Throughout her life, Dolores served on many boards and stayed heavily involved as an advisor and benefactor in the engineering world. She will be missed.

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## Department News



For the latest news and events,  
visit our website  
[www.engineering.wright.edu/mme/](http://www.engineering.wright.edu/mme/)

Please e-mail your comments or  
suggestions to [me-dept@wright.edu](mailto:me-dept@wright.edu)

- ◆ February 8 marked the date of the Trebuchet Competition at the Nutter Center.
- ◆ On March 15 the department hosted an event for our direct admit students. This event was successful and will be continued in the future.
- ◆ Dr. Ramana Grandhi and Dr. Arif Malik at Minster Machine taught a short course at Minster Machine in Minster, Ohio. The course dealt with finite element modeling.
- ◆ On April 13, the department hosted a signing event for a new collaboration with Japanese software company Cradle. Cradle will have a space located in the Joshi Research Center.
- ◆ A new graduate course became available to our students during spring quarter. The course is entitled Advanced Energy Storage and Conversion.
- ◆ Dr. Sharmila Mukhopadhyay participated in the Ohio Nanotech Summit on April 9-11 in Mason, Ohio. Forty nine businesses and universities across Ohio were in attendance for this event.
- ◆ EGR 499 Study Abroad trip to Taiwan has been planned for June 26-July 20.
- ◆ Drs. George Huang and Raghavan Srinivasan traveled to India to visit PSG College of Technology and Polytechnic College. They signed a cooperative agreement between the two departments. The agreement promotes education and academic exchanges between the universities.
- ◆ Dr. Amir Farajian was published in the 2008 March issue of Nano Letters. This publication is one of the most prestigious research journals in the field of nanoscience and nanotechnology. He was featured on the cover.

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