

Daily Planet

SPRING 2008

The Department of
Atmospheric, Oceanic and
Space Sciences Newsletter

\$17 million grant for research on supernova shocks, predictive science

by Nicole Casal Moore, U-M News Services

Supernovae are the most dramatic explosions in the universe. The shock waves that ripple from the demise of massive stars are so hot and fast that they emit radiation. Such “radiative shocks,” in turn, change the structure and behavior of the exploding material, making the system difficult to simulate accurately with computers. That’s why radiative shocks provide a great test case for research to improve predictive science.

A new Center for Radiative Shock Hydrodynamics led by AOSS Professor **R. Paul Drake** aims to advance predictive science through studying and simulating these cosmic shock waves. The Center is funded primarily by a \$17-million, 5-year grant from the U.S. Department of Energy’s National Nuclear Security Administration (NNSA). The grant, one of only five new Predictive Science Academic Alliance Program centers, will also fund a doctoral program for predictive science and engineering at U-M.

Researchers at the Center will create radiative shocks in experiments at large laser facilities. They will study the shock waves, simulate them with computers and then close the gap between prediction and reality.



“When significant decisions are based upon simulations, one needs reliable, defensible assessments of simulation accuracy. This assessment of predictive capability involves quantifying the expected differences between the simulation and the actual event,” said Drake.

The Center will work to quantify uncertainty in simulation results, understand the sources of those uncertainties and use that information to make better predictions. Predictive science aims to answer questions that involve the behavior of complex systems, especially systems where full-scale experiments or prototypes are impossible: How could Earth’s climate change during the next 50 years? How would a new manufacturing process perform on

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AOSS Accolades

Faculty

AOSS Research Scientist **Natasha Andronova** has been elected AGU Section Secretary, (AS) Physics, Dynamics and Climate. Her term will run 2008-2010.

Kenneth (K.C.) Hansen received the 2007-08 College of Engineering Outstanding Research Scientist Award.

Frank Marsik received the 2007-08 College of Engineering Thomas M. Sawyer, Jr. Teaching Award.

The recent article by **Nilton Renno** and doctoral student **Jasper Kok** in *Physical Review Letters* on dust particle charges inspired a News & Views article in the February 14, 2008 issue of *Nature*: "Static in motion: Wind-blown desert sands can charge up spontaneously. But although sand flow and the forces on charged bodies are well studied separately, surprisingly little is known of what happens when the two combine." The same research by Renno and Kok was the subject of an article in the January 10, 2008 online publication, *LiveScience*.

Former AOSS faculty member and SPRL director **Tim Killeen** has been named the next National Science Foundation Assistant Director for Geosciences. Most recently he was the National Center for Atmospheric Research (NCAR) Director and is President of the AGU.

Staff

John Eder, has been appointed to the 2007-08 College of Engineering Dean's Excellence in Staff Service Award Selection Committee.



Congratulations to the "Rosetta Orbiter Sensor for Ion Neutral Analysis Double Focusing Mass Spectrometer

Team" for receiving the NASA Public Service Group Achievement Award for successful development and launch of the electronics package for the mass spectrometer.

Team Members:

Ken Arnett	Tamas Gombosi
Bruce Block	Mark Huetteman
Dave Boprie	Frank Lee
George Carignan	Chuck Navarre
John Eder	Ron Rizor
Lennard Fisk	Steve Rogacki

The Rosetta orbiter is part of the International Rosetta Mission at the European Space Agency. The goal of the mission is to rendezvous with Comet 67P/Churyumov-Gerasimenko in order to study the origin of comets, the relationship between cometary and interstellar material and the implications with regard to the origin of the Solar System. Rosetta was launched in 2004 on its 10-year journey to the comet.

On the Web

The Nature article on charged dust particles can be found at:

<http://www.nature.com/nature/journal/v451/n7180/full/451773a.html>

JASON DAIDA RECOGNIZED FOR HIS COMMITMENT TO COE STUDENTS

Those of us in AOSS have known for years how invaluable Jason Daida's teaching skills are to reaching and teaching CoE students in Engineering 100 and 101. At times it seemed as though his conscientious diligence to bringing hands-on, real-world projects and assignments to his classes went unnoticed. That is no longer the case.

Associate Dean James Holloway and Director of Academic Programs Toby Teorey, in a letter to me and copied to the Dean, have recognized Jason's great contributions to the CoE first year academic experience.

In the letter, they state, "Currently the retention rate for our first year engineering students is 95%, and 75% of our students complete an engineering degree at Michigan. The nation's average for degree completion is below 50% ... We pride ourselves in courses such as Engineering 100 and 101 ... Dr. Daida is a key instructor in this effort, and we appreciate his tireless work ... We often use his classes as prime examples of exciting engineering work at Michigan in our presentations to high school juniors and seniors who come to our Campus Day sessions."

I am very proud and pleased that Jason remains a part of our department. As stated in the letter, "Jason helps make our program truly outstanding." How very true.

— Tamas Gombosi



New Grants

Sushil Atreya, Cassini Huygens Gas Chromatograph Mass Spectrometer Science, \$100,000, NASA

Charles Edmonson Jr., Phase B Support to SwRI for the Juno /JADE High Voltage Power Supply Development, \$127,079, SwRI

George Gloeckler, Lennard Fisk, Susan Lepri, WIND-SMS Investigation, \$220,479, NASA

Tamas Gombosi, Darren De Zeeuw, Gabor Toth, Development of an Adaptive Nonideal MHD (Magnetohydrodynamic) Simulation Tool for Multiple Space Science Applications, \$568,830, NASA

Tamas Gombosi, Interdisciplinary Scientist (IDS) for the Cassini Interdisciplinary Magnetospheres and Plasma Investigation: Mission Operations and Data Analysis (MO&DA) Efforts, \$328,450, JPL-NASA

Christopher Ruf, JUNO Pre-Launch Microwave Calibration System, \$407,020, JPL-NASA; Support for Development of the NPOESS Microwave Image Sounder, \$46,000, DOC-NOAA

Janet Kozyra, TIMED Data Analysis Collaboration with Applied Physics Laboratory, \$60,048, Johns Hopkins University; VITMO: A VxO for S3C Data for the Ionosphere-Mesosphere-Thermosphere Community, \$42,584, Johns Hopkins University

Nilton Renno, Weather, Dust Transport, Dust Electrification, and Atmospheric Chemistry: Implications for Mars Habitability, \$34,353, Centro de Astrobiologia

Aaron Ridley, Darren De Zeeuw, Janet Kozyra, Integrating VxOs for Heliophysic Data with Model Repositories, \$1,027,730, NASA

Aaron Ridley, Polar Experiment Network for Geospace Upper-Atmosphere Investigations (PENGUIN), \$295,000, NSF

Wilbert Skinner, Data Services Upgrade: HRDI MLT Temperature, Volume Emission Rate, and Ozone, \$49,935, NASA

Thomas Zurbuchen, Semantic Provenance Capture in Data Ingest Systems (SPCDIS), \$105,000, UCAR; The Virtual Heliospheric Observatory, \$70,000, NASA

ALUMNI OBITUARY

Harold T. Hagan, Jr. (BSEAA '52), November 25, 2007

Walter S. Klappich (BSEAA '42), December 14, 2007

Phillip H. Roberts (BSEAA '40) December 9, 2007

William D. Wenzlau (BSEAA '46), December 18, 2007

CRASH

CONTINUED FROM PAGE 1

the factory floor? How will a spacecraft react as it reenters the atmosphere?

“The research at this Center has the potential to contribute to solving major problems facing humanity,” said David Munson, the Robert J. Vlasic Dean of Engineering. “The work there will improve scientists’ abilities to understand and model the world and the universe around us.”

The computer simulations the Center will conduct are believed to be the largest ever developed at the University of Michigan. By the second year, the researchers expect to be able to run complex simulations utilizing 10,000 processors for as long as two weeks. That’s the equivalent of using one desktop computer for about 380 years.

The Center’s co-principal investigators are: Kenneth Powell, an Arthur F. Thurnau Professor of Aerospace Engineering and the director of the Center for Advanced Computing; James P. Holloway, an Arthur F. Thurnau Professor of Nuclear Engineering and Radiological Sciences and associate dean for undergraduate education at the College of Engineering; and Quentin Stout, professor of Computer Science and Engineering, professor of AOSS, and co-director of the Center for Space Environment Modeling. The research team also includes professors from Texas A&M University.

UNIVERSITY OF MICHIGAN CRASH TEAM

R. Paul Drake

Professor, Atmospheric, Oceanic and Space Sciences
Professor, Applied Physics

James P. Holloway

Arthur F. Thurnau Professor
Professor, Nuclear Engineering and Radiological Sciences
Associate Dean, Undergraduate Education, CoE

Kenneth G. Powell

Arthur F. Thurnau Professor, Aerospace Engineering

Quentin F. Stout

Professor, Computer Science and Engineering
Professor, Atmospheric, Oceanic and Space Sciences

Tamas I. Gombosi

Rollin M. Gerstacker Professor of Engineering
Chair & Professor, Atmospheric, Oceanic and Space Sciences
Professor, Aerospace Engineering

Smadar Karni

Professor, Mathematics

Edward Larsen

Professor, Nuclear Engineering and Radiological Sciences

William R. Martin

Chair & Professor, Nuclear Engineering and Radiological Sciences

Philip L. Roe

Professor, Aerospace Engineering

Igor Sokolov

Research Scientist, Atmospheric, Oceanic and Space Sciences
Center for Space Environment Modeling

Katsuyo Thornton

Assistant Professor, Materials Science and Engineering
Assistant Professor, Applied Physics

Gabor Toth

Research Scientist, Atmospheric, Oceanic and Space Sciences
Center for Space Environment Modeling

Bram van Leer

Arthur B. Modine Professor of Engineering
Professor, Aerospace Engineering

Colene Haffke, first recipient of the Claudia Alexander Scholarship

Colene Haffke was awarded the first Claudia Alexander Scholarship, which was established in 2007. The scholarship was endowed by Jiles Williams, Claudia's uncle, and matched through the University's Presidential Donor Challenge Fund.

Colene, who is from Bellevue, NB, came to the University of Michigan because of its status as a research university that has many options for undergraduate degrees. However, once she found out about AOSS, as someone who has "always been interested in weather and climate, the program seemed like an obvious choice for me." To date, AOSS 462, Instrumentation for Atmospheric and Space Sciences, taught by Dr. Roger DeRoo is her favorite class. AOSS 462 is one of the program's hands-on classes, and Colene says, "I love doing hands-on labs that relate to my major."

"In my spare time," she said with a laugh, "I like to do the usual, hang out with friends and RELAX!! I am also the



president of the Women's Club Volleyball team so I play volleyball in my free time as well." But, she also enjoys being involved in the many different activities that the University has to offer and "getting to know the students in the AOSS department over the past two years."

Colene, who will graduate in 2009 and plans to pursue a graduate degree, said she's not too enthusiastic about the snow in Michigan – especially in March, but it's better than the wind in Nebraska!

Claudia Alexander, Ph.D. in plasma physics (AOSS, '93), is the project manager of the U.S. Rosetta Project, which is part of the international mission led by the European Space Agency. Rosetta is a robotic spacecraft that will rendezvous with "comet C-G" in 2014. It will be the first spacecraft to orbit a comet and place a lander on it in a controlled touchdown. It will then "escort" comet C-G to the inner solar system.

The Alexander Scholarship is the third undergraduate scholarship established recently for AOSS students. In addition to the Paul B. and Ruth A. Hays Scholarship and the Weather Underground Scholarship, AOSS graduate students are eligible to receive funding from the Thomas M. Donahue Memorial Student Fund.

AOSS: From none to two

Four years ago, AOSS could not boast of a student group dedicated to AOSS students. The Society of Undergraduate Earth Systems Scientists and Engineers (SUESSE) was started in 2006 and this year the American Meteorological Society U-M Student Chapter was reinvigorated.

Students put together a number of events last fall, including:

- A visit to the National Weather Service office in White Lake Township
- Outing to the Corn Maze in Saline, MI
- Pumpkin carving in the SRB
- Discussion Group with Tom Fahey, Manager of Meteorology at Northwest Airlines

The AMS Student Chapter and SUESSE together organized and raised the money for 12 AOSS students to attend this year's AMS National Conference. See accompanying articles on pages 8-9.

UMHS Volunteer Spotlight: Ryan Miller

Reprinted with permission of UMHS

Name: Ryan Miller

Position: Senior Engineer, U-M Space Physics Research Laboratory

Volunteer Organization: Motor Meals



What exactly do you do (when you volunteer)?

I pick up meals for 10 to 14 people at the Motor Meals office on Plymouth Road at around 11:30. I then drive to an apartment complex and deliver the meals to shut-ins and others that need assistance. I have a fixed route, but occasionally get cancellations or additions. I usually chat with some of the people and I offer to do simple tasks for them (such as opening their meal or helping them with a hearing aid battery. I even turned a lady's mattress for her once!).

How much time do you normally spend volunteering?

2 to 3 hours per week. I volunteer 1 day per week essentially taking an extended lunch hour. The time depends mostly on how talkative people are.

Why do you volunteer?

I like to help people. I volunteer a little through my church, but I wanted to do something extra with my time. Once I found out Motor Meals was located on North Campus, close to my office, it seemed natural to use some of my free time on my lunch hour to help others.

What has been your most rewarding experience?

I helped one woman get her laptop working and connected to the internet. She's in a wheelchair and has limited income for a professional computer repair person. Now we exchange emails occasionally and she's bought some quilting supplies over the internet for herself. She's in more regular contact with friends and relatives via email, too.

How did you get started volunteering?

Back in college here at the U, I volunteered for Motor Meals as a service project for one of the engineering societies. I volunteered for most of a semester and I really enjoyed it. Since then, I've been involved in my church on and off, but I was looking for something that I could do during my lunch hour while here at work. I remembered Motor Meals and I've been delivering meals for over a year now.

How would you encourage someone who has never volunteered before to become involved?

It helped that I had experience with Motor Meals before, so I can imagine that someone who hasn't done this type of volunteer work might be intimidated. Motor Meals makes getting started easy by allowing you to go with someone more experienced your first few times until you get more comfortable. They also provide excellent driving to delivery destinations. They'll work with you to give you a delivery route that fits into your available time. And once you've been at it a while, you meet some very nice people and make some new friends who REALLY appreciate your help.

Volunteers play an integral role in augmenting the work of University of Michigan Health System staff, providing caring and compassionate support to patients and their families. Volunteer opportunities are not limited to the main hospital campus, which includes University Hospital, CS Mott Children's Hospital, Women's Hospital, the Comprehensive Cancer Center and soon to be open Cardiovascular Center. The medical campus has expanded to include the East Ann Arbor Health Center, the Surgical Center and the Rachel Upjohn Building, as well clinics at Domino Farms. Volunteers are needed at many community outreach programs such as Housing Bureau for Seniors, Motor Meals, and the Turner Senior Resource Center.

On the Web

*For more information on volunteering at UMHS, visit:
<http://www.med.umich.edu/volunteer/>*

How does AOSS compare?

by **D.K. Eddy**

Not bad. Out of 11 CoE departments, AOSS is fourth, with 12% of the faculty having Endowed, Collegiate, Distinguished, and Thurnau professorships as of Fall 2007. AOSS is the only department that can boast of having three Distinguished University Professors. The six distinguished AOSS faculty are:

Michael Combi,

Distinguished University Research Professor

Lennard A. Fisk

Thomas M. Donahue Distinguished University Professor of Space Science

Tamas I. Gombosi

Rollin M. Gerstacker Professor of Engineering (Endowed)

Janet U. Kozyra

George Carignan Collegiate Research Professor

Joyce E. Penner

Ralph J. Cicerone Distinguished University Professor of Atmospheric Science

Perry J. Samson

Arthur F. Thurnau Professor

Dept	Collegiate	Endowed	Thurnau	Distinguished University	Grand Total	T&TT/Total Faculty
AERO	1	1	2		4	23/29
AOSS	1	1	1	3	6	19/49
BME		2			2	12/18
CEE	2	1	1		4	25/34
ChemE	2	4	3	1	10	20/30
EECS	1	14	4	2	21	93/110
IOE		3			3	23/27
ME	1	4	4		9	55/84
MSE	1		1		2	19/34
NAME	1		1		2	11/23
NERS		1			1	17/27
Grand Total	10	31	17	6	64	

Data provided by CoE Resource Planning and Management

MORE AOSS FACULTY DISTINCTIONS

Sushil Atreya, Fellow, American Association for the Advancement of Science; Elected Member, International Academy of Astronautics

R. Paul Drake, Fellow, American Physical Society

Lennard A. Fisk, Chair, NAS Space Studies Board; Member, National Academy of Sciences; National Associate, National Research Council; Fellow, American Geophysical Union; Elected Member, International Academy of Astronautics

Tamas I. Gombosi, Fellow, American Geophysical Union; Elected Member, International Academy of Astronautics

Janet Kozyra, Fellow, American Geophysical Union

Andrew Nagy, Fellow, American Geophysical Union; Elected Member, International Academy of Astronautics

Joyce Penner, Fellow, American Geophysical Union; Contributor, UN Intergovernmental Panel on Climate Change, co-winner, '07 Nobel Peace Prize

Richard Rood, Fellow, American Meteorological Society; Recipient, World Meteorological Organization Norbert Gerbier-Mumm International Award

Christopher Ruf, Fellow, Institute of Electrical and Electronics Engineers; Recipient, IEEE Resnick Field Award

Thomas Zurbuchen, Recipient, Presidential Early Career for Scientists & Engineers Award

American Meteorological

New Orleans, LA 20-24 January 2008

by D.K. Eddy

EDITOR'S NOTE:

The AOSS students who attended this year's AMS Conference were so enthusiastic about their trip that it warranted two articles in the *Daily Planet*.

This January two graduate and ten undergraduate students got an opportunity to attend the 88th American Meteorological Society Conference in New Orleans, Louisiana, thanks to funding provided by the Department of Atmospheric, Oceanic and Space Science and the College of



Brad Charboneau shaking hands with one of the "cool toys". Photo by Brandon Wills.

Engineering. When Virginia Silvis, the chair of the Student Chapter of the AMS, was asked what the conference was like, she immediately responded, "Amazing!" She said it was an invaluable experience. She and the students who went with her had the chance to see what was available in meteorological programs at a wide assortment of universities.

Our students also had excellent chances for networking. They got to talk to university graduate school representatives and to meteorologists in the private sector, and they got a chance to interact with



Joe Merchant shaking hands with one of the "cool toys". Photo by Brandon Wills.

some of the "cool toys" that are being developed. They learned what exciting opportunities await our graduate and undergraduate students, and found out what the grad schools are looking for in incoming students.

The only frustration was in getting there. This was the first time that a significant number of U-M students had been able to scrounge up the funding to go to the conference. Were it not for

Herculean efforts by Virginia and two other officers from the Student Chapter, putting forth their case to the Department,

the College, and anyone they could think of, the University of Michigan would not have had such a strong presence as they managed to put together. But, "it was all worth it," Virginia declared. She herself applied for and won some support from the AMS, which got her a position as a student helper providing tech support to the presenters, and thereby building her own invaluable network of connections, which will no doubt aid her future in the field she finds so exciting.

Next year the AMS Annual Meeting will be in Phoenix, Arizona. For only a \$15 membership fee, students can join the AMS, add their voices to getting out the message of how invaluable such an experience is and strongly encourage the Department and the College of Engineering to provide the funding to send an even stronger contingency of students, grad and undergrad, to Phoenix in January 2009.

The American Meteorological Society

The American Meteorological Society promotes the development and dissemination of information and education on the atmospheric and related oceanic and hydrologic sciences and the advancement of their professional applications. Founded in 1919, AMS has a membership of more than 11,000 professionals, professors, students, and weather enthusiasts. AMS publishes nine atmospheric and related oceanic and hydrologic journals — in print and online — sponsors more than 12 conferences annually, and offers numerous programs and services.

On the Web

Learn more about the American Meteorological Society at
<http://www.ametsoc.org>
or contact Virginia Silvis at vigrsi@umich.edu

al Society Conference

AOSS students travel to the 88th annual AMS conference

by **Ilissa Ocko, SUESSE Co-President**

It was a weather wonderland in New Orleans, LA, where thousands of meteorologists gathered for the 88th Annual American Meteorological Society (AMS) Conference. In addition to numerous scientists, students from various universities have gravitated towards the conference for many years. This year, the undergraduates in the AOSS department decided that it was their turn.

At the beginning of Fall semester, the executive officers of the Society of Undergraduate Earth System Scientists and Engineers (SUESSE) and the U-M AMS Chapter, dreamed of the possibility of attending the AMS Conference. Although it was difficult to organize and secure funding, within months the ten officers were fully funded by the department and the university, with the privileged opportunity to attend the event in January 2008.

Upon arrival at the conference, the students found themselves immersed in an agenda that was way beyond their expectations. Complete with a student conference that included a career fair, the conference also had multiple seminars and workshops available to educate listeners on current research topics and projects. The students in AOSS found this experience to be one of the most memorable and valuable experiences they had attained during their undergraduate careers. Catalina Oaida, Co-President of SUESSE,

remarks, “The benefits of participating are numerous. Not only do you get to meet and connect with fellow students and share your knowledge over similar interests, but you can meet so many amazing researchers and faculty that love to share their experiences and knowledge with the students.”

The conference not only educated the AOSS students about current research advances and job opportunities in the field, but it also served as a bonding environment for the officers. Evan Oswald, an AMS officer, enjoyed “getting to know my fellow AOSS students better.” And in terms of taking what they had learned at the conference and bringing it back to



AOSS, AMS President Virginia Silvis commented

that she “gained several good ideas for future directions for the U-M AMS chapter from talking to officers in other chapters.”

Attending the AMS Conference was an unbelievable experience for these students, and has inspired them to continue with their education and research within the

field. Through participating in numerous activities, the students networked with faculty and research scientists, learned about the implications of weather and climate, explored future job opportunities, and simultaneously developed their professional skills.

AOSS Students Attending 88th AMS Conference

<i>Ghassan Alaka Jr</i>	<i>Evan Oswald</i>
<i>Kim Billmaier</i>	<i>Stephanie Praus</i>
<i>Bradley Charboneau</i>	<i>David Reed</i>
<i>Joe Merchant</i>	<i>Virginia Silvis</i>
<i>Catalina Oaida</i>	<i>Brandon Wills</i>
<i>Ilissa Ocko</i>	<i>Jennifer Wurtzel</i>

AOSS student wins 2006 Hollings Scholarship

by D.K. Eddy



Competing with students from across the nation, Ilissa Ocko sought and won one of only 100 coveted 2006 Ernest F. Hollings Undergraduate Scholarships.

To do so, Ilissa had to fulfill the eligibility requirements, complete an application, gather letters of recommendation and college transcripts, and write a personal statement.

The scholarship consisted of a generous award of \$16,000

in financial aid for Ilissa's junior and sophomore years, and, even more important, a 10-week paid summer internship at any NOAA facility in the United States. After considering all this opportunity could mean to her studies and all the people she could have a chance to work with, Ilissa chose to work for Taneil Uttal at the Earth Systems Research Laboratory in Boulder, Colorado where she had a unique chance to study the Arctic climate.

"The experience was absolutely amazing," Ilissa says. "I learned more about myself as a researcher, and about the work field that I would soon venture into upon my graduation. Having the opportunity to work for

NOAA opened up many doors for me, and not only helped with networking, but also strengthened my application to graduate schools." Ilissa got the opportunity to present her work to the people at NOAA and learned how best to get her message across both to a room full of people and one-on-one. She also gained experience in conveying her results in writing.

Not only did Ilissa get a chance to grow in her verbal and written skills, but also in her self esteem and self-reliance. "My mentor

treated me like a Ph.D. student, and I was independent, yet communicative at the same time."

Due to this experience, Ilissa has been asked to collaborate on research papers and was even offered a doctorate position at the Norwegian Institute for Air Research. "The opportunities that I have received as a result of working for NOAA are plentiful and extraordinary," Ilissa says, "and I am so thankful for the Hollings Scholarship program."

On the Web

For more information on the Hollings Scholarship, or for 2008 application information, go to:

<http://www.orau.gov/HollingsScholarship>.



AOSS visited by youngsters learning about weather

AOSS Associate Chair Perry Samson teaches all ages of future atmospheric scientists — including elementary students. This winter, Professor Samson introduced a group of Ann Arbor school children to meteorology instruments displayed in the second floor lounge of the Space Research Building.

AOSS students part of winning team

Last year, AERO 483, mentored by AOSS/AERO 582, took on a challenge: as their core project, they entered an Asteroid Tagging Competition defined by The Planetary Society. The team's entry, RA (Rendezvous Apophis) tied for second place in the student division of the competition. RA is a small, conventionally propelled orbiter with camera and laser rangefinder. In addition to Doppler tracking, the RA proposal team explored the possibility of employing Very Long Baseline Interferometry for tracking the position of the spacecraft.

The Planetary Society described the competition as one "to design a mission to rendezvous with and 'tag' a near-Earth asteroid such as Apophis. In this competition, Apophis, currently with a one in a few thousand probability of striking Earth in 2036, was treated as an example to facilitate mission design. The purpose of the competition was to gather a diverse and large suite of entries that could be a creative and useful starting point for a potential space agency project to tag any asteroid that may be coming dangerously close to Earth. The Planetary Society awarded \$40,000 in prize money among three winners of the open competition, and split an additional \$10,000 among four notable student entries."

Competition judges were:

- Mark Adler, Chief Mission Concept Architect, Jet Propulsion Laboratory
- Ian Carnelli, European Space Agency General Studies Programme
- Daniel D. Mazanek, Systems Analysis and Concepts Directorate, NASA Langley Research Center
- Naomi Murdoch, Advanced Concepts Team, European Space Agency
- Stefano Santandrea, System Engineer, European Space Agency, D-TEC In-Orbit Technology Demonstration Projects Office
- S. Pete Worden, Director, NASA Ames Research Center

AOSS student members of the RA Team:

- Eli Busen
- Trisha Donajkowski
- Joan Ervin
- Caitlin Garcia
- Corinne Gatto
- Kartik Ghorakavi
- Matthew Holmes
- Leif Knag
- Michael Lash
- Nathaniel Meredith
- Bogdan Oaida
- Danielle Layher
- Karan Patel
- Rickard Redick
- Jung-Sik Yu



For the third year, students in AOSS 102, Professor Perry Samson's Extreme Weather class, have held a fund raiser to help academic institutions that have been affected by an extreme weather happening. At 7:00 PM on February 5, 2008, a class IV tornado went through Jackson, Tennessee, a town northeast of Memphis and home of Union University. Two dormitory complexes were destroyed by the tornado and the University estimated damages could reach \$40 million. While no one was seriously injured during the storm, classes at the University of approximately 3,300 students were cancelled until February 20.

The 92 students in AOSS 102 held a showing of the movie Day After Tomorrow (with colorful commentary by Professor Samson) and raised nearly \$600. A check for \$1,000 has been sent to Union University to assist in their storm clean-up efforts.

The little sensor that could — and did, and will again

Are We There Yet? Are We There Yet? We're There!

by D.K. Eddy

For the last three and a half years, since 3 August 2004, a little three-pound sensor has been rushing through space. Nestled in its thermal blanket beneath the protective wing of the MESSENGER spacecraft, FIPS has patiently awaited its big day.

Finally, on 14 January 2008, MESSENGER and FIPS

Maryland, now part of U-M/AOSS) and Associate Professor Thomas H. Zurbuchen, in the Space Physics Research Laboratory of the Department of Atmospheric, Oceanic and Space Sciences at the University of Michigan.

FIPS is a novel particle sensor, effectively a fish-eye camera, the kind of camera used by modern security systems to see a wide field of view at one time.

“FIPS is a great idea by George Gloeckler and me,” says U-M project director Zurbuchen, “but it was Bob Lundgren’s [FIPS systems engineer] skills and genius that made this idea a reality.”

Designed to measure plasmas in the solar wind and pickup ions, FIPS can also make high-quality observations in planetary environments. By measuring plasmas in Mercury’s magnetosphere, scientists can explore how the planet reacts to the solar wind—the stream of charged particles thrown out by the



FIPS and, to compare its size, a Coke. Image courtesy of SPRL

arrived at their destination, FIPS peaked out of its cozy wrap, and gazed down at the planet Mercury.

FIPS, the Fast Imaging Plasma Spectrometer, was developed and built by an extremely dedicated team of researchers, engineers, and students lead by George Gloeckler (at that time a Professor at the University of



MESSENGER at Mercury. Image courtesy of NASA/Johns Hopkins University Applied Physics Laboratory/Carnegie Institute of Washington.

10 spacecraft never worked, leaving this virgin territory to current eager, inquiring minds to explore.

Then, adding frosting to the cake, ions actually coming from the planet Mercury streamed into the instrument, and for the first time ever physical samples from this alien world closest to our Sun were measured and the information sent streaming back to Earth to be analyzed.

Sun, which envelopes all the planets, including Earth.

As MESSENGER flew past Mercury this past January, all that hard work paid off. Everyone involved anxiously awaited the downlink of data, and they weren’t disappointed. They quickly racked up two firsts. FIPS took the first ever measurements of ions in the space around Mercury. A similar instrument that went to Mercury on the Mariner

On the Web

For more information on MESSENGER, go to:

<http://www.nasa.gov/messenger>

If you’d like to learn more about FIPS, or to check out its latest discoveries, visit: <http://solar-heliospheric.engin.umich.edu>

Actually, FIPS has been “gazing” at space for much of its journey. To get to Mercury at a proper speed and attitude to be captured by Mercury’s gravity, MESSENGER has flown by Earth (August 2005), twice past Venus (October 2006 and June 2007), and it will fly past Mercury twice more before settling into orbit around the innermost planet in March 2011.

Analysis of the data gathered in those earlier encounters and in the depths of space “may really add to our understanding of the subtleties in the direction of the solar wind,” according to Jim Raines, FIPS lead operations engineer, and it has the potential to reveal many of the mysteries of the ion background in our solar system. Such knowledge could have a “real impact in our understanding of the Sun and solar wind,” Jim says.

FIPS adds another gold star to the stellar record of atmospheric and space instrumentation produced by SPRL.

AOSS Happenings



Dan and Kylie Welling would like to introduce you to their pride and joy, Aurora Lynn (a.k.a. Rory). Rory was born at 10:18 p.m. on January 18, weighing 6 pounds 9 ounces and measuring 19 inches long. Dan tells us “she arrived a month early, but is doing very well.” What a great name for an AOSS baby!



This has been a busy Spring for the Cohen family. Ofer Cohen passed his oral exams followed soon thereafter by the birth of Ethan Albert Cohen. Dganit, and Ofer welcomed little Ethan to the family at 6:54 AM, April 5. Congratulations to the entire Cohen family.



Grandpapa Gallery

Grandpa Steve Bougher announces the arrival of his first grandchild. Granddaughter Hannah Rosemarie Bougher was born on March 9 at 10:41 p.m., 7 pounds 9 ounces to Jessica and Jonathan (Steve’s son).

We hear there are several more new AOSSers expected in the next few months.

- Shun Han and her husband Xianglei Huang are expecting their first in July.
- As are Allison Steiner and her husband Deryl Seale.
- And, not to forget the grandparents, Tamas and Eszter Gombosi are awaiting the arrival of their second grandchild in August.

We wish them all easy deliveries and many, many smiles and baby giggles.



Get ready for a party!

The Space Physics Research Laboratory turns 60 this year, and we're having a party!

When

October 16 - 17, 2008

Where

University of Michigan
North Campus

Theme

SPRL at 60 – Universities and Space Exploration

An open discussion on the role of universities in space exploration and engineering. As interests, funding and project structures change, how should institutions of higher education that are based in hard science research react; how do these changes affect the education of future scientists and engineers – what does the future hold?

Mark your calendars today!

**For more information:
maryln@umich.edu**

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Questions? Contact Mary Nehls-Frumkin at maryln@umich.edu