

Daily Planet

SPRING 2006

The Department of
Atmospheric,
Oceanic and Space
Sciences Newsletter

Space Weather Forecasting Technologies:

A lark could turn into big business

What began as a “lark” for three AOSS doctoral students has kept them up late at night since September and could turn into something big. When Alex Glocer innocently suggested to Jared Bell and Dan Welling that they enter the Michigan Business Challenge sponsored by the Samuel Zell & Robert H. Lurie Institute for Entrepreneurial Studies he had no idea how long they would have to keep going.

The “Space Weather Forecasting Technologies” (SWFT) team was one of 40 teams who submitted an executive summary of their business plan to market and sell “accurate and efficient predictions that will allow [its] customers to adequately and cost effectively protect their otherwise vulnerable assets [from space weather].”

They made the first cut down to 16 teams, submitting a financial and market overview in January. Knowing that they were scientists as opposed to entrepreneurs, U-M MBA candidate Josh Botkin joined the team. SWFT was also selected to represent the University of



Left to Right: Tamas Gombosi (AOSS chair), Alex Glocer, Josh Botkin (Ross School of Business), Jared Bell, and Dan Welling

Michigan in the Rice University Business Pitch Competition. In 2005, the Rice competition attracted entries from 21 foreign and 69 American universities and colleges, making it the largest intercollegiate business plan competition in the US.

And they kept going...

In January, SWFT made the cut to the final eight, the only team outside the Schools of Public Policy and Business to do so. The final

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SWFT



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AOSS Accolades

Faculty

John Barker has received the 2006 *AOSS Award for Outstanding Accomplishment*. John is being honored for his diligent work on establishing the revamped AOSS undergraduate curriculum structure and for his guidance in establishing the graduate student-led Michigan Geophysical Union. The MGU was established three years ago, making it possible for students to hone their presentation skills. The *Thomas M. Donabue Memorial Student Award* is given to the best student presentation at the annual MGU meeting each Spring.

Mary Anne Carroll has received the 2006 *CoE Education Excellence Award*. Each summer, Mary Anne mentors doctoral students at the U-M Biological Station who have received a fellowship in the Biosphere-Atmosphere Research and Training (BART) Program. Her two Rottweillers, who are also certified therapy dogs, accompany her each summer. Throughout her career, Mary Anne has demonstrated excellence in her commitment to quality education.

Michael Combi is now a minor planet. On July 21, 2005, minor planet 17060 (asteroid) was renamed *Mikecombi*. The Lowell Observatory Near-Earth Object Search at the Anderson Mesa Station discovered the planet *Mikecombi* on April 9, 1999.

Tamas Gombosi served on the University's Henry Russel Lectureship selection committee. Considered one of the University's highest honors for a senior member of its active faculty, the Henry Russel Lectureship is awarded annually in recognition of a scholar's exceptional achievements in research, scholarship, and/or creative endeavors, and an outstanding record of teaching, mentoring, and service.

Christiane Jablonowski, AOSS' newest faculty member, was featured in a *ScienceCareers* article about NCAR and its post doc program. Christiane is finishing her post doc at NCAR before joining AOSS this coming Fall. The article is available on the web at: http://sciencecareers.sciencemag.org/career_development/issue/articles/2005_11_25/soaring_into_atmospheric_science

Thomas Zurbuchen has kept busy with Einstein since September. Since the last issue of the *Daily Planet*, he has been presenting *1905 Einstein and Bern: A Year to Remember* in a number of different venues including San Francisco, Boston (twice) and the Ann Arbor District Library. The "lecture tour" will continue with venues in and around Atlanta and the Ann Arbor Jewish Community Center.

On the Web

To produce sky maps and to locate asteroids and comets, visit the web at:

<http://www.fourmilab.ch/yoursky>

Students

Graduate student **Jared Bell** (Waite/Bougher) recently received the College of Engineering *Graduate Distinguished Achievement Award*.

MEng graduate student **Ryan Falor** recently won the *Master of Engineering Distinguished Achievement Award*.

Undergraduate student **Ann-Drea Hensley** recently won the College of Engineering *Roger M. Jones Poetry Contest*.

Congratulations to AOSS graduate students **Yingdong Jia** and **Yingjuan Ma** on welcoming their new son, **Luke**, into the world on November 22, 2005. Proud father Yingdong is a PhD student with Mike Combi while proud mom Yingjuan, a student with Andy Nagy, successfully defended her dissertation in October. Talk about carrying a double load!



Fredrick Juarez, AOSS SGUS student in space engineering, was recognized for academic excellence at the fifth annual ScholarPOWER banquet, coordinated by the CoE Minority Engineering Program Office. To be recognized for the ScholarPOWER *Masters Student Achievement Award*, a minimum 6.6 cumulative GPA must be maintained.

SGUS student **Elizabeth Oswald** recently received the College of Engineering *Undergraduate Distinguished Achievement Award*.

Jichun Zhang (Liemohn) was awarded an *Outstanding Student Paper Award* at the 2005 Fall AGU Meeting. The award was for his oral presentation, Understanding Storm-time Ring Current Sources Through Data-Model Comparisons of a Moderate Storm and an Intense Storm.

AOSS

AOSS students, faculty, and events were prominently featured in some University and College publications that are widely distributed to the U-M community.

In the *2005-06 Profile*, which is sent to all interested recruits – faculty and student, the AOSS *Storm the Stadium* event [see the Winter '05 *Daily Planet*] was featured, complete with a picture, as one of three “Unusual Research Projects at the College of Engineering.” And the one member of the National Academy of Sciences Members listed under “faculty distinctions” is **Len Fisk**, the AOSS Thomas M. Donahue Collegiate Professor of Planetary Science.

The Spring 2006 *Michigan Today*, which is distributed to all University alumni, faculty, and staff, contained a section focused on climate change. Cited in the articles were AOSS professors **Joyce Penner**, **Richard Rood**, and **Perry Samson**. And while a description of the research at the U-M Biological Station was included, the *Michigan Today* missed a great opportunity to interview **Mary Anne Carroll** about her work at the station.

The Fall '05 issue of the *Michigan Engineer*, sent to all engineering alums, was chock full of AOSS people and activities.

- **George Carignan's** appointment as interim associate dean for research was highlighted.
- The winning U-M student team, with faculty advisor **Brian Gilchrist**, in the first annual CanSat Competition was profiled.
- **Janet Kozyra** and **Joyce Penner** were profiled for their appointments as the George Carignan Collegiate Research Professorship and the Aksel Wiin-Nielsen Collegiate Professor of Atmospheric Sciences, respectively.
- **Richard Rood** was profiled as a new AOSS faculty member.
- The “Magic Bus” research project, which has been an AOSS 499 student project since 2004 under the direction of **Chris Ruf**, was one of the featured research projects. The project, to develop a GPS Tracking System for U-M transportation Services, is nearing completion.
- **Perry Samson** was interviewed for the article about the effect of digitalization (podcasting) on student life and education.
- The stadium event was again featured: *Researchers and Students Test Winds in Michigan Stadium*.
- **Thomas Zurbuchen** was cited for his address to the U.S. House and Senate about the importance of space-science research.

Daida takes ENG 100 to Shanghai Jiao Tong University

On May 8, AOSS Associate Research Scientist and ENG 100 Instructor Extraordinaire Jason Daida will become the first University of Michigan faculty member to teach ENG 100 at the Shanghai Jiao Tong University. Offering the course has been a goal of SJTU for the past several years and, as most of Jason's students will tell you, he was the perfect selection. The inaugural ENG 100 course has 90 students enrolled and will run through June 8.

In 1999, the College of Engineering and SJTU began a five-year pilot project that enrolled more than 500 undergraduate students and 200 graduate students from SJTU. In 2001, the Chinese Ministry of Education approved an agreement by the College and SJTU that made U-M the first non-Chinese academic institution approved to offer graduate engineering degrees to students in China. Last summer, a new agreement was signed to expand and institutionalize the exchange of engineering education between the two universities.



On the Web

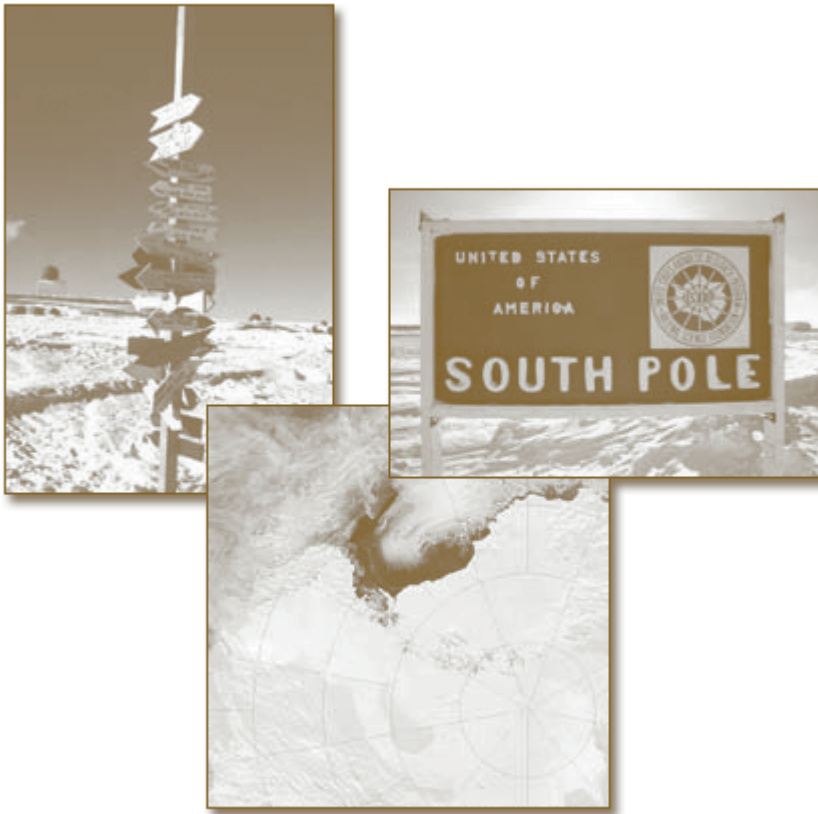
For more information about the CoE program at SJTU, visit the web at:

<http://www.engin.umich.edu/ipe/studyabroad/programs/details/sjtusummer.html>

For more information about the University of Michigan — Shanghai Jiao Tong University Institute, visit the web at:

<http://www.umich.edu/news/?Releases/2005/Jun05/r062405a>

AOSS Lands on the South Pole



AOSS/SPRL Senior Engineer **Ken Arnett** and graduate student **Tom O'Brien** arrived at the South Pole Monday, November 6, to deploy a SPRL-developed autonomous magnetometer system for testing. The two left October 31 and traveled “south” via Christchurch, New Zealand and McMurdo, Antarctica. The instrument is part of a larger project, Polar Experiment Network for Geospace Upper-atmosphere Investigations (PENGUIn) that has been funded by the National Science Foundation. Once deployed, the SPRL instrument will communicate using the IRIDIUM satellite communications links, thereby allowing for real-time data retrieval from remote Antarctic observatories.

According to Ken and Tom in an email sent to AOSS Research Professor Bob Clauer upon their arrival, “A few hiccups but we’ll work through them. The biggest bummer is that we requested a tent but they don’t have one ... Also, they have no indoor space available for us to pre-assemble tower sections. It will be loads of fun working in -50°F air with a wind chill of -80°F bolting sections together.”

New Staff



Denise Moore has joined AOSS as the new Unit Administrator. Denise comes to the department from Wayne State University where most recently she had been the Supervisor of Research Administration, University Medicine Specialists in the Department of Internal Medicine. In this position, she was responsible for approximately 150 faculty and more than 400 funds in the largest department within the WSU School of Medicine. Denise had been at WSU since 1999.

“I am so very grateful that everyone has welcomed me to U-M with open arms,” said Denise. “I truly appreciate the AOSS-SPRL community and their many contributions, more and more each day. I am also looking forward to assisting the chair in various upcoming AOSS initiatives.”

Denise holds an MBA and two BAs, one in Business Administration (cum laude) and one in Psychology. She is the recipient of the WSU President’s Exceptional Service Award (bronze), the Chair of the WSU President’s Commission on the Status of Women, and the President of the WSU Association of Black Business Students, School of Business Administration. In addition, Denise was a facilitator of Banner Instruction (comparable to M-Pathways) and a founding member of the university-wide Banner steering committee.

New Grants

(Only AOSS Principal Investigators are listed)

Sushil Atreya, *Comparative Giant Planet Atmospheres and Titan*, \$95,294, NASA; *Cassini-Huygens Aerosol Collector Pyrolyzer (ACP)*, \$20,000/\$77,000, JPL/NASA; *SAM Suite Investigation on the Mars Science Laboratory Science Support*, \$200,000, NASA; *To the Depths of Venus: A Comprehensive Exploration of Atmospheric Dynamics and Chemistry on Our Sister World*, \$60,000, NASA

Stephen Bougher, *Developing a Titan Thermospheric General Circulation Model: A Study in Comparative Aeronomy*, \$24,000, NASA

John Boyd, *Solitons and Wavepackets in the Ocean and Atmosphere and High Order Numerical Algorithms*, \$748,555, NSF

Mary Anne Carroll, *Supplement Request to IGERT National Recruitment Project*, \$298,889, NSF

Robert Clauer, *Interhemispheric High Latitude Ionospheric Electrodynamics Using a Coordinated Analysis of AMISR, Sondrestrom, SuperDARN, and Other Data Sets*, \$392,553, NSF

Roger De Roo, *Dielectric Database for Microwave Remote Sensing of the Circumpolar Arctic*, \$6,000, United States Civilian Research and Development Foundation

Charles Edmonson, Jr., *Development of a Universal, High-Speed Buoy System for Coastal Observation CA4/VI-8*, \$127,497, NOAA; *Sample Acquisition at Mars (SAM) Digital Electronics Subsystem*, \$24,974, NASA; *Sample Acquisition at Mars (SAM), Phase B/C/D/E Support Contract*, \$934,772, NASA

Tamas Gombosi & Aaron Ridley, *Global MHD Simulations in Support of the SMART Mission*, \$15,000, NASA

Susan Lepri, *Modeling Elevated Charge States In Hot ICMEs and SEP Events to Study Their Inner Coronal Sources*, \$160,000, NSF

Ward Manchester IV, *Tomographic Determination of Lower Boundary Conditions in the Corona*, \$45,838, University of Illinois; *Participation of Evolution of Coronal Mass Ejections (CME) Shocks in a Realistic Lower Corona*, \$74,000, George Mason University Foundation; *3D MHD Numerical Simulations of Magnetic Flux*, \$292,000, NASA

Frank Marsik, *Cardiopulmonary Toxicity Induced By Ambient Particulate Matter: Inhalation Toxicology Studies Using A Mobile Particle Concentrator In Regions Dominated By Power Plant And Mobile Source Emissions*, \$646,090, Electric Power Institute

Andrew Nagy, *Cassini Mission Team Member: Radio Science Team MO & AMP; DA*, \$275,600, JPL/NASA

Rick Niciejewski, *Space Weather: An Examination of Short-Term Forecasting of Equatorial Spread-F Using a Longitudinal Chain of Wind-Measuring Fabry-Perot Interferometers*, \$371,163, NSF

Joyce Penner, *Global-Scale Photochemistry of Oxidants, Peroxides and Organic Nitrates: A model-based investigation*, \$613,085, NSF; *Development of a Coupled Aerosol-Chemistry Model for GMI*, \$375,000, NASA

Nilton Renno, *Weather, Dust Transport,*

Dust Electrification, and Atmospheric Chemistry: Implications for Mars Habitability, \$37,843, Centro de Astrobiologia; *Concept Development for Campaign Methodologies Concept Element Toolkit*, \$8,500, JPL/NASA

Aaron Ridley, *Interhemispheric High Latitude Ionospheric Electrodynamics Using a Coordinated Analysis of AMISR, Sondrestrom, SuperDARN and Other Data Sets*, \$392,553, NSF; *Global Magnetohydrodynamic (MHD) Simulations in Support of the SMART Mission*, \$15,000, NASA

Christopher Ruf, *Development of a Geosynchronous Temperature and Humidity Sounder/Imager*, \$24,000, NASA; *GeoSTAR Sensor Performance Characterization: GeoSTAR Augmentation #2*, \$200,000, NASA

Perry Samson, *Quantitative Transport Bias Analysis (QTBA) Hybrid Receptor Model Development*, \$225,476, EPA; *Evaluating Use of Wireless PocketPCs in GeoScience Survey Course*, \$99,965, NSF

Wilbert Skinner, *Correction of UARS Attitude for the Purpose of Recovering HRDI Winds*, \$25,000, Praxis, Inc./DOD; *Geostationary Imaging Fabry-Perot Spectrometer*, \$36,835, Johns Hopkins University

Igor Sokolov, *Towards a Global 3D Solar Wind Model with Realistic Energy Flux: Tracing the Turbulent Energy Flow from the Corona*, \$88,967, JPL/NASA

SUCCESSFUL DISSERTATION DEFENSE: DECEMBER 2005 — MARCH 2006

Xiaohua Fang, Atmospheric Geoeffectiveness of Energetic Proton Precipitation with Beam Spreading, December 2005. Janet Kozyra and Michael Liemohn, co-chairs.

SPRL-Built Instruments Deliver Data from Saturn's Moons

Findings Reported in *Nature* and *Science*

When launched in 1997, the Cassini-Huygens spacecraft carried two instruments built at the Space Physics Research Laboratory and the hard work of numerous AOSS/SPRL faculty, students, engineers, and staff. Since reaching Saturn in July 2004, the Gas Chromatograph Mass Spectrometer (GCMS), built jointly with the Goddard Space Flight Center, and the Ion and Neutral Mass Spectrometer (INMS), built with the Jet Propulsion Laboratory, have been allowing us to glance deep into the past of the solar system, and generated exciting data and science that is continuing to be analyzed and reported by many members of AOSS.



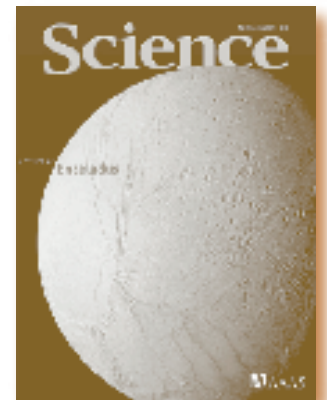
In the December 1, 2005 online issue of *Nature*, findings from the first direct measurements of Titan's atmosphere and surface were outlined in the paper, *The Abundances of Constituents of Titan's Atmosphere from the GCMS Instrument on the Huygens Probe*. AOSS Professor **Sushil Atreya** and AOSS Research Scientist Emeritus **George**

Carignan helped design the spectrometer and interpret the readings.

"The findings show that Titan and Earth have a lot of similarities from the very beginning," Atreya said. "The most important aspect of Titan is that it has an Earth-like atmosphere. No other body in the solar system outside Earth has a massive nitrogen atmosphere. It's like a window into the past of the Earth. It tells us the conditions the way they were when Earth began to form, the way the atmosphere came about."

Findings from data collected by the INMS at Saturn's moon Enceladus were reported in the March 10, 2006 issue of *Science*. AOSS faculty **J. Hunter Waite** and **Michael Combi**, with senior engineering research associate **David Gell**, lead mission operations engineer **Greg Fletcher**, and research computer specialist **Brian Magee**, reported in *Cassini Ion and Neutral Mass Spectrometer: Enceladus Plume Composition and Structure* that INMS data indicate an atmospheric plume and coma are "dominated by water with significant amounts of carbon dioxide..."

According to the authors, "The special role of Enceladus in supplying water vapor ... to the magnetosphere of Saturn has been recognized since the observations by the Hubble Space Telescope..." However, the source rate from Enceladus has been unclear. "The discovery by Cassini [INMS] of an unexpected venting of water vapor from the south pole of Enceladus may provide a solution to this mystery."



On the Web

To read the full articles, visit *Nature* at:

<http://www.nature.com/nature/journal/v438/n7068/index.html>

and *Science* at:

<http://www.sciencemag.org/content/vol311/issue5766/index.dtl>

On the Web

More about the Cassini-Huygens Mission to Saturn is available at:

<http://saturn.jpl.nasa.gov/home/index.cfm>

AOSS Gets into the Holiday Spirit





Research Administrator Bobbi Walunus entered a "rendition" of Mars, Martians, and the Mars Rover in the first annual CoE gingerbread house competition. Together with her sister "Anony Mouse" (alias Brett Weston), Bobbi created a gingerbread Mars-scape and came away with three ribbons. Next year ... Venus?



AOSS Staff Reach University Milestones

In 2005, three AOSS employees reached University-recognized milestones for their length of service to U-M. Sue Griffin, 40 years, Bobbi Walunas, 30 years, and Rick Baker, 20 years, were honored for their "decadal" anniversaries of 20+ years at a banquet last semester.

On December 13, 1965, Sue's start date at the University, *The Lucy Show* was in its fourth season and the episode that night was "Lucy the Choirmaster;" "Turn, Turn, Turn" by the Byrds was the number one song (at least in Canada); the aircraft carrier USS Independence returned to her home port, Norfolk, VA; and San Diego Chargers receiver Lance Alworth was on the cover of *Sports Illustrated*. It seems that no one of significance was born or died on December 13, 1965.

Bobbi began work at the University, for the second time, on September 2, 1975. On that day in history, the Canadian-British boxer Lennox Lewis was born; the Yankees beat the Red Sox 4-2 in Fenway Park; former senator Allan Simpson celebrated his 44th birthday; and a Cornell University student smashed the "coin snatching" record by catching 45 coins flipped from his elbow.

When Rick started on February 4, 1985, *Time* magazine carried an article about the 38-16 San Francisco win over Miami in the Super Bowl; President Reagan transmitted the 1986 budget to Congress; in the 33rd annual Beanpot Hockey Tournament, it was Boston U. 5, Harvard 3, and Northeastern 4, Boston College 2; and the 50th episode of *Cagney & Lacey*, titled "Stress," aired on CBS.

Since this is the first time length-of-service anniversaries have been covered in the resurrected *Daily Planet*, the box contains all AOSS staff who have been with the University for at least 10 years.

Congratulations to Sue, Bobbi, and Rick and to all of the AOSS staff on their length of service with the University!

Sue Griffin	41
Marti Moon	40
Bobbi Walunas	31
John Eder	30
Bruce Block	29
Kathy Norris	28
Sandee Hicks	23
Dave Gell	23
Chuck Navarre	22
Frank Lee	22
Rick Baker	21
Margaret Reid	20
David Boprie	19
Mike Drumm	17
Cheri Champoux	15
Debbie Eddy	15
Charles Edmonson	15
Stephen Musko	15
Ken Arnett	15
Curt Cooper	15
Ryan Miller	14
Jan Beltran	12
Christine Gloeckler	12
Sandra Pytlinski	11
Ron Rizor	10

FAREWELL TO STAFF

This April AOSS said farewell to Lana Tyrrell who moved on to the Solid-State Electronics Laboratory as Senior Research Manager. Lana, who joined the University in 1998, came to AOSS in 2002 as a research administrator. Congratulations and good luck.

AOSS Undergraduates Found SUESSE

On November 13, 2005 a group of AOSS undergraduate students held their first meeting of the Society of Undergraduate Earth Systems Scientists and Engineers, and they've been running ever since. What began as an undertaking during the 2004-05 school year by undergraduates Jessica Parker and Shaneen Braswell now has 26 members, holds regular meetings and



**SOCIETY OF UNDERGRADUATE EARTH
SYSTEMS SCIENTISTS AND ENGINEERS**

study nights, has hosted invited speakers, and even held a Euchre Tournament this semester.

In addition to the support from AOSS Chair Tamas Gombosi, three AOSS faculty members were instrumental in assisting the students get the SUESSE up and running. They are Perry Samson, Advisory Committee Chief Chair and Head Sponsor, Sushil Atreya, and John Barker.

If you are interested in working with the SUESSE, there are many ways you can assist the students. Some of them include:

1. Providing internship, research, and employment opportunities
2. Providing advice via email or in-person as a guest speaker
3. Assisting in establishing networks with alumni and others within the industry
4. Becoming an outside sponsor of SUESSE

For more information, contact the SUESSE Executive Board at: SUESSE_EBOARD@umich.edu.

"The goals of the Society of Undergraduate Earth Systems Scientists and Engineers are to help ensure successful completion of the undergraduate programs of the AOSS, GEO and EE departments on an academic and personal level and provide research, internship, and employment opportunities in each of these undergraduate programs. With this said, it is our overall goal to promote a sense of community to ensure the success of our members in all areas of Earth Systems Science and Engineering."

— SUESSE CONSTITUTION

AOSS Faculty meet with Vice President Gore

On October 25, 2006, AOSS faculty members Joyce Penner and Ricky Rood had the opportunity to meet in a small group with former Vice President Al Gore to discuss climate change. Gore met with the group of nine faculty prior to giving the annual Peter M. Wege Lecture, which was sponsored in part by the School of Natural Resources.



On the Web

To learn more about Professors Penner and Rood, visit the web at:

*<http://aoss.engin.umich.edu/penner>
and
<http://aoss.engin.umich.edu/rood>*

Update

AOSS Professor Sushil Atreya and Research Professor Stephen Bougher are both involved with the European Space Agency Venus Express, which successfully entered orbit around Venus on April 11, 2006. Prof. Atreya, one of ten U.S. scientists jointly selected by NASA and ESA to participate in the mission, is Co-Chair of the Venus Exploration and Analysis Group (VEXAG) and is the Co-Investigator on the Planetary Fourier Spectrometer instrument. Dr. Bougher will be analyzing Spectroscopy for Investigation of Characteristics of the Atmosphere of Venus (SPICAV) data derived from the SPICAM (Ultraviolet and Infrared Atmospheric Spectrometer). Both types of instruments are also part of the Mars Express Mission that has been gathering exciting data about the atmospheres of Mars and Titan.

On the Web

More information about the ESA Venus Express Mission is available at:

http://www.esa.int/SPECIALS/Venus_Express

SWFT continued from Page 1

round required submission of a full business plan with full financials and a 15-minute presentation to be made in February. They consulted with experts in the field of Space Weather, both in and outside AOSS, where interest in SWFT was high and the advice invaluable when it came to fine-tuning their submission.

In the final round, SWFT came away with the Williamson Award for Outstanding Business and Engineering Team and the Outstanding Presentation Award. Also, in what was described as



a very close decision, they were named Runner-up for grand prize, the Pryor-Hale Award for Best Business.

and going ...

Then, Alex, Dan, Jared, and Josh headed for the Rice University Competition, March 30 - April 1 in Houston. At Rice, SWFT placed second in their division and eleventh overall. This was after being selected as one of 36 semi-finalists from the original pool of 112 entries. SWFT incorporated an Advisory Committee into its business plan comprised of: Tamas Gombosi, AOSS Chair, Principal Investigator, NASA/DOD-sponsored Space Weather Modeling Framework (SWMF) project; Aaron Ridley, AOSS Research Associate Professor, Co-Investigator, NASA/

DOD-sponsored SWMF project, expert on high-power computing systems; James D. Price, MBA, accomplished technology entrepreneur, Board of Directors, Soar Technology, Inc.

and going ...

As a testament to their hard work, excellent business plan, research, and product, SWFT was invited to the University of Texas at Austin "Moot Corp" Competition to be held May 3 - 6. This year 40 teams qualified for the global competition that is the largest new venture competition in the collegiate ranks. The Moot Corp was the first competition of its kind and is still considered the most prestigious in the world.

and going ...

Before the SWFT Team heads to Austin, however, the team has been invited to speak at the annual Space Weather Week Conference on Wednesday, April 26 in Boulder. The annual conference, held at the NOAA Space Environment Center, brings industry, academia and government agencies together in a dialog about space weather. Space Weather Week is the Nation's leading conference on all issues relating to space weather.

Congratulations Alex, Dan, Jared, and Josh. Don't forget, the first million goes to AOSS!



WHAT THE ROSS SCHOOL OF BUSINESS SAID ABOUT SWFT

The Runner-up for Pryor Hale was Space Weather Forecasting Technologies (SWFT), which provides customized forecasts that help users mitigate the destructive, costly effects of space weather. By using cutting-edge modeling technology and a powerful, dedicated supercomputer to generate predictions of unparalleled accuracy, SWFT dramatically reduces the satellite industry's annual \$200 million outlay due to space weather. Jared Bell, Ph.D. Space Science & Physics 2007; Joshua Botkin, MBA 2006; Alex Glocer, Ph.D. Space Science & Physics 2007; Daniel Welling, Ph.D. Space Science 2008. SWFT also received \$2,500 for Outstanding Presentation and the \$5,000 Williamson Award for Outstanding Business & Engineering Team for the most successful student team in the competition that has at least one Ross School of Business student and one College of Engineering student.



Your tax-deductible gift to AOSS will provide opportunities for students and keep our programs strong. AOSS strives to offer U-M students the best possible educational and research opportunities. Your gift to the Department will enable us to make awards to AOSS students who have financial need, are outstanding students or have exemplified exceptional leadership and character. The Department has been working hard to make the recently established Thomas M. Donahue Memorial Student Fund an endowment that will benefit AOSS students for years to come. We encourage you to be a part of a long-lasting endeavor to assist others in their academic endeavors.

Please use the form below to make a Michigan Difference today.

Thomas M. Donahue Memorial Student Fund

Enclosed is my gift of \$_____ for the Thomas M. Donahue Memorial Student Fund.

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Address _____

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Daytime Phone () _____ Email _____

Please do not send acknowledgment note to the Thomas M. Donahue Family.
(The amount of your gift will remain confidential.)

Send to:
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2455 Hayward Street
Ann Arbor, MI 48109-2143

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