



# Montana Space Grant Consortium News

January, 2009

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## Front and Center

### MSGC Student Satellites

This September, the student team who designed and built MSGC's **Explorer 1 [Prime]** (E1P) satellite received terrific news: E1P, which commemorates the 50th anniversary of the first U.S. satellite, was selected as 1 of 3 student satellites **recommend to fly on a NASA rocket**. E1P is a 'Cube-Sat' measuring about 10cm/side. That size allows Cube-Sats to ride in an enclosed box ('P-Pod') that can be attached to a rocket. If all goes well, MSGC's E1P satellite will hitch a ride with NASA's larger Glory satellite and **launch in 2009** from Vandenberg Air Force Base in California. For more information see <http://www.montana.edu/cpa/news/nwview.php?article=6274> and [http://ssel.montana.edu/explorer-1\\_prime/](http://ssel.montana.edu/explorer-1_prime/)

Also, MSGC is now supporting MSU's Space Science and Engineering Laboratory **Spacebuoy (II)** Air Force University Nanosat project.



Patrick Lokken solders components to the radio that will ride in E1P. (MSU photo)

## Updates

### New Awards for Research in Engineering and Science (ARES)

This fall, two ARES grants were awarded. At UM-Western, Amanda Kortum (also a MSGC scholarship recipient) received an award for her research on the *Canidida albicans* pathology. At Rocky Mountain College, David Souther received an award for his project, *CAMP: Clustered Autonomous Migration Protocol*. Congratulations to these outstanding students!

### New MSGC Affiliate Representatives

We would like to welcome new MSGC Affiliate Representatives Effat Rady at Flathead Valley Community College and Kevin Pena at Dawson Community College. Welcome to Space Grant! We currently have an Affiliate Representative position vacant at Blackfeet Community College.

### 20 Year Review

In Early November, the MSGC 20 Year Program Performance and Results (PPR) report was submitted to NASA headquarters. Thank you to everyone who helped with creating the PPR! Along with the 52 other Space Grant Consortia, MSGC was evaluated by other Directors and NASA personnel. We will get our reviews in March. Based on the feedback we receive, we will be examining our Strategic Goals and program objectives – stayed tuned!

### 2008-9 Research Initiation and Educational Enhancement Call for Proposals

In October, 2008, nineteen proposals were submitted for the 2008 Montana Space Grant and Montana NASA EPSCoR Research Initiation and Educational Enhancement grants. Award decisions will be announced soon.

## Scholarship and Fellowship Awards

MSGC has awarded \$134,000 in scholarships and fellowships to Montana students for the 2008-2009 school year. MSGC Scholarships and Fellowships are awarded annually by the Consortium to students pursuing studies in science and engineering at the nineteen colleges and universities across the state that are members of the Consortium.

### Scholarships:

Twenty-three scholarships of \$1,500 each were awarded to undergraduate students attending, or planning to attend, a Consortium campus. The students who received Space Grant Scholarships are (home town listed in the first column):

Box Elder	<b>Ron Chandler</b> , junior, natural resources/forestry, Stone Child College
Billings	<b>Katherine A. Kitchen</b> , junior, psychology, Rocky Mountain College <b>Jon Laurent</b> , senior, molecular biology, MSU - Billings
Bozeman	<b>Alaina Garcia</b> , senior, mechanical engineering, Montana State University
Bremerton, WA	<b>Bethany Higgins</b> , freshman, electrical engineering, MSU – Bozeman
Browning	<b>Martin Lorenzo</b> , sophomore, civil engineering Technology, Blackfeet Community College
Butte	<b>Josh Wold</b> , senior, electrical engineering, Montana Tech
Clancy	<b>Ben Dunham</b> , senior, computer science/math, Carroll College
Columbia Falls	<b>Thomas Klein</b> , freshman, computer sciences, Flathead Valley Community College
Cut Bank	<b>James Durka</b> , freshman, computer science, Blackfeet Community College
Ekalaka	<b>Amanda Kortum</b> , sophomore, biology, UM - Western
Fresno, CA	<b>Timothy Brox</b> , junior, geology, Montana State University
Glendive	<b>Dan Gavinsky</b> , sophomore, mechanical engineering, Dawson Community College
Great Falls	<b>Jessica Ostrom</b> , junior, forensic science, University of Great Falls <b>Eugene Garcia</b> , freshman, computer information systems, Ft. Belknap College
Havre	<b>Jayson Nissen</b> , sophomore, physics and mathematics, Montana State University
Lodge Grass	<b>LaDawn PlainFeather</b> , junior, pre-med/biochemistry, University of Montana
Malta	<b>Matthew Bolland</b> , senior, computer information systems, University of Montana - Northern
Polson	<b>Sean Shriner</b> , junior, computer engineering, Salish Kootenai College
Redstone	<b>Jamie Gatz</b> , senior, agriculture operations technology, MSU – Northern
Rock Springs, WY	<b>Nathan Martin</b> , senior, physics, Montana State University
Ronan	<b>James Greene</b> , junior, computer science/Information technology, Salish Kootenai College
West Yellowstone	<b>Jeremy Hostetter</b> , junior, physics and astronomy, The University of Montana

### Fellowships:

Three full-year fellowships (\$15,000 each plus in-state tuition and fees) and three half-year fellowships (\$7,500 each plus in-state tuition and fees) were awarded to graduate students attending, or planning to attend, a Consortium campus. The students who received Space Grant Fellowships are:

#### Full-year:

Grand Junction, CO	<b>Charles Richardson</b> , Ph.D., Geosciences, The University of Montana
Silver Springs, MD	<b>Steven Price</b> , Ph.D., Physics, MSU – Bozeman
Sturbridge, MA	<b>Kerry Neal</b> , M.S., Electrical Engineering, MSU – Bozeman

#### Half-year:

Anchor Point, AK	<b>Ingrid Abrahamson</b> , M.S., Geology, MSU – Bozeman
Cheyenne, WY	<b>Christina Carr</b> , M.S., Earth Science, MSU – Bozeman
Ithaca, NY	<b>Scott R. Wiessinger</b> , M.S. Fine Arts, MSU – Bozeman

## NASA Global Climate Change Education Proposal

In October, several MSGC leaders, including Director Bill Hiscock, Deputy Director Angela Des Jardins and Affiliate Representative and President of Anasphere John Bognar worked together to submit a proposal to NASA's Global Climate Change Education program. The proposed effort, called Balloon Radiosondes for EngAging Teachers in Hands-on Earth (BREATHE) Climate Change Education, uses small Anasonde instruments to teach students about climate change through hands-on, inquiry-based learning. We should know if our proposal was selected this spring.



Student holding the Anasonde she built.

## Space Public Outreach Team (SPOT) Update

### **LISTENING TO THE UNIVERSE**



MSGC's SPOT program's new show, *Listening to the Universe*, has been very successful so far this year. The show's subject matter, gravitational waves, might sound daunting, but the exciting presentation uses audio demonstrations to make the science concepts fun and easy to understand. If you are interested in scheduling a presentation, contact the SPOT manager, Adam Kobelski ([akobelski@physics.montana.edu](mailto:akobelski@physics.montana.edu) or 406-994-1677). More information about SPOT is available at <http://solar.physics.montana.edu/spot/>

## **Opportunities**

### MSGC and NASA 2009 Summer Internship Opportunities

Check out <http://www.spacegrant.montana.edu/Text/internships.html> for details about the many opportunities that are available this year. Also, see stories from last years' interns below.

### MSGC on Facebook

facebook

MSGC is now using Facebook as a tool for tracking students and communicating NASA aerospace opportunities. We encourage you to participate in this connection tool. To join the MSGC Facebook group, simply search for Montana Space Grant Consortium using the Facebook search. If you do not have a Facebook page, it's easy to set one up (just be sure to set the privacy settings to your comfort level): <http://www.facebook.com>

## **Accomplishments**

### International Year of Astronomy Student Ambassador

Congratulations to Joey Key, MSU physics graduate student, on winning a NASA award as part of the International Year of Astronomy (IYA). Joey was selected by MSGC to be Montana's IYA Student Ambassador. She will work through the Space Public Outreach Team (SPOT) to bring presentations about current NASA missions to schools on Montana's seven Indian reservations over the course of 2009. For more information see <http://www.spacegrant.org/niya/>.



2008 Summer Internship Experiences

During the summer of 2008, 20 students participated in MSGC internships. Some highlights:

**George Anderson**, MSU, Jet Propulsion Laboratory (CA): This summer I studied the role of chamber-structure coupling in causing certain discrepancies between two different methods of acoustic testing [for space flight hardware]. The two methods are called “reverberant chamber testing”, which takes place in a large, sealed room with rigid walls; and “direct field testing”, in which the test article is surrounded by loudspeakers and “blasted” from all sides. I would heartily recommend any future student to take this opportunity. If the opposite of disappointing is appointing, then this internship was incredibly appointing.



**Sean Bannon**, UM, Space Science and Engineering Laboratory: I was assigned to design and implement the Attitude Control System of Explorer-1 [Prime]. My experience at SSEL was so enjoyable that I jumped at the chance to continue working here as a student employee this fall. Seeing first-hand what it actually means to be an engineer has assured me that mechanical engineering is in fact the right career path for me.

**Ashley Brendal**, MSU, Anasphere, Inc. (Industry Affiliate, Bozeman): At Anasphere, I worked on building light sensor circuits and a gamma photon radiation circuit. This summer was full of opportunities to expand my horizons and learn so many new things. I am better well-rounded and have a knowledge of so many new things because of my experience. I wouldn't trade it for anything.



**Scott Kratochvil**, MSU, Langley Aerospace Research Summer Scholars Program (VA): My experience at NASA has really taught me a lot about the professional engineering environment. I feel I was really fortunate with my internship because I got to work with so many people all over the Langley center. My experience here has really shown me that working at NASA is something I really want to do. To me the best part of working at NASA is contributing to something that will literally be making history; I will never forget the work I did for the Mars Science Laboratory.



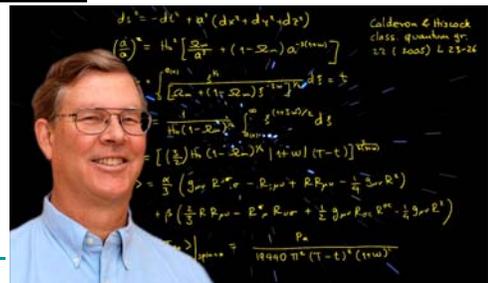
**Conrad Martin**, MSU, BOREALIS High Altitude Ballooning: Two of the projects I primarily worked on were a weather station for the command capsule and a cut down system to release the parachute and payloads from the balloon. I had a great experience this summer as a BOREALIS intern. I think that it provided a good opportunity to experience an actual research setting



Director Bill Hiscock in the movies!

Bill and his PhD student Hector Calderon make an appearance in the movie, “The Day the Earth Stood Still” – at least their equations and names do! Check out the MSU news article for more info:

<http://www.montana.edu/cpa/news/nwview.php?article=6641>



Bill with some of the equations he and Hector sent to a consultant for the movie. (MSU photo)

## High Altitude Student Platform

NASA's High Altitude Student Platform (HASP) balloon successfully launched from Fort Sumner, NM on September 15<sup>th</sup>. One of the four large experiments onboard was Montana Space Grant Consortium's BOREALIS cosmic dust capture experiment. The HASP balloon is approximately 11 million cubic feet and can carry a 2,800 lb. payload. Congratulations to the BOREALIS HASP team, which is lead by undergraduate students Jayson Nissen and Jenny Sue Hane with guidance from BOREALIS Flight Director Berk Knighton. For more information about BOREALIS, see <http://spacegrant.montana.edu/borealis/>



HASP balloon and payload.

## Montana NASA EPSCoR Grantee wins PECASE Award

Dr. Charles Kankelborg, Associate Professor of Physics at MSU, has been selected to receive the Presidential Early Career Award for Scientists and Engineers (PECASE), the highest honor bestowed by the U.S. Government on scientists and engineers beginning their independent careers. Charles received a Montana NASA EPSCoR Research Initiation grant from the Montana NASA EPSCoR program in 2003. Charles has been very successful in obtaining regular NASA funding. He has won two sounding rocket awards; the first flew out of White Sands in February 2006, carrying Charles' new solar spectrograph, MOSES: <http://www.montana.edu/cpa/news/nwview.php?article=3363> . His Montana NASA EPSCoR award, "Payload Integration and Test Laboratory" ([http://www.spacegrant.montana.edu/Text/EPSCoR\\_PayloadIntegration.html](http://www.spacegrant.montana.edu/Text/EPSCoR_PayloadIntegration.html)) was crucial to providing the *infrastructure* needed for him to be able to start his sounding rocket program at an institution that had no previous history in spaceflight instrumentation.



Charles Kankelborg

## **BOREALIS Flights, MSU**

Since the Spring MSGC newsletter was distributed, the MSU BOREALIS team has had four flights, two in June, one in July and one in November. On these flights were a number of science and engineering experiments including the Little-g experiment, the Amateur TV (ATV) system and the Cutdown system.

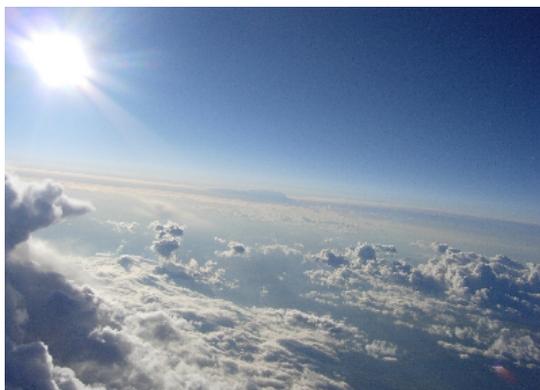
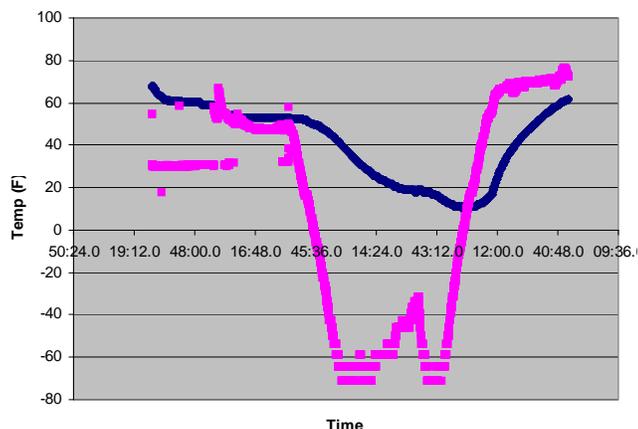


Image from the flight camera, June 18<sup>th</sup>



Temperature vs. time: inside (blue) and outside (pink) the payload box on the July 17<sup>th</sup> flight.

## MSGC BOREALIS Flights, UM

This summer, the UM BOREALIS team had three high altitude flights (one in June and two in July) and several tethered and Anasonde flights. One of the experiments flown was to measure the environmental lapse rate and compare it to the theoretical lapse rate. From the undergraduate student's report on this research project: "In the lowest ten kilometers of earth's atmosphere (the troposphere), temperature usually drops with increasing altitude, so temperature changes with altitude at a negative rate. The positive of this rate  $-dT/dz$  is defined as the lapse rate, and has an average measured value of six to seven Kelvin (or Celsius degrees) per kilometer."



Launch from Augusta in June

## MSGC Meetings and Travel



MSGC representatives

In September, the MSGC Affiliate Representatives met in Bozeman for the annual **MSGC Affiliates' Meeting**. At the meeting, we heard from student speakers, updated everyone about current MSGC opportunities, and learned about what is happening with Space Grant on a national level.



Angela, Glenda and Jayson

In September, Angela Des Jardins, MSGC Deputy Director, Glenda Winslow, MSGC Program Coordinator, and Jayson Nissen, student leader of the BOREALIS HASP project (see above), traveled to Jackson Lake Lodge, WY for the **Western Regional NASA Space Grant Meeting**. At the meeting, Jayson gave a very successful presentation on his group's cosmic dust experiment.

In October Angela and Glenda traveled to Atlanta for the **Fall meeting of the National Council of Space Grant Directors**. At the meeting, they heard from Dr. Joyce Winterton, NASA Assistant Administrator for Education. Although the Administrator of NASA is a political position, and therefore has the potential to turnover soon, Dr. Winterton is not a political employee and thus will not be leaving her position in January. While Glenda and Angela were at the meeting, they had dinner with the Space Grant group at the Georgia Aquarium – in the Beluga whale room!



Beluga whale at the Georgia Aquarium (photo by M.A. Stark)



Dinner (and dessert!) with UM-Missoula hosts

Over the course of the fall, Angela (and occasionally Glenda) traveled across the state visiting **MSGC Affiliate campuses**. In early October, Angela visited Stone Child College in Box Elder (with a stop at the new ExplorationWorks museum in Helena on the way), had dinner in Great Falls with the University of Great Falls scholarship recipient, and visited UM-Missoula. In the second-half of October, Angela and Glenda visited MSU-Northern in Havre, Ft. Belknap College in Harlem, Chief Dull Knife College in Lame Deer and Little Big Horn College in Crow Agency. At the end of October, Angela visited Rocky Mountain College and MSU-Billings. In early December, Angela and Glenda visited UM-Western in Dillon. All told, Angela traveled ~2,300 miles and visited half of MSGC's 19 affiliates. **If you would like Angela to visit your campus, she would be happy to schedule that anytime after March 11<sup>th</sup>.**



Congratulating Ft. Belknap scholarship recipient Eugene Garcia