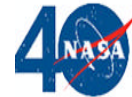




# Wy Space Grant

## rendezvous



Funded through NASA's National Space Grant College and Fellowship Program

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## Libby Huskey: WSGC's 2000 NASA Academy Student

*Lori Duffek*

Libby Huskey, a Mechanical Engineering senior at the University of Wyoming, will be heading to Greenbelt, MD, in June, to represent Wyoming Space Grant Consortium at the 2000 Goddard Space Flight Center NASA Academy Program. Libby is the second Wyoming student to be accepted into a NASA Academy program and the first to be accepted to Goddard's Academy. She is one of only 21 students accepted this year for this distinctive opportunity.



Libby will spend ten weeks working with NASA scientist Scott Schwinger on the project Vertically Integrated MEMS (VIMS). Micro ElectroMechanical Systems (MEMS) enable designers to greatly reduce the size, weight, and costs of future spacecraft systems and instruments. Current MEMS research and development efforts have targeted many aspects of aerospace engineering; including guidance, propulsion, environmental sensing, and thermal control. As NASA continues to pursue cost-saving initiatives without sacrificing mission performance, scientific instruments have continued to become smaller and more efficient. MEMS devices for space applications offer significant volume and weight savings over conventional spacecraft design and manufacture.

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Libby earned her position in this year's Academy through her outstanding scholastic achievement and advanced research skills. There are many sides to Libby, however. She plays viola in the UW Symphony Orchestra; is active in the UW Ski Club; enjoys hiking, camping, & horseback riding; and has traveled extensively in Europe.

Libby plans to use her Academy experience as a stepping stone to becoming an astronaut in the NASA space program. WSGC expects to report in the future that Libby Huskey is the first astronaut from Wyoming!!

*Visit our Web site at:*

[http://physics.uwyo.edu/pa\\_wyoming\\_space\\_grant.html](http://physics.uwyo.edu/pa_wyoming_space_grant.html)

# What is NASA Academy?

excerpt from Goddard NASA Academy Web site  
<http://academy.gsfc.nasa.gov/>

The NASA Summer Academy is a summer institute of higher learning whose goal is to guide future leaders of the Space Program by giving them a unique perspective on the entire NASA system. It includes a 10 week residency program on the campus of a NASA research center. During this residency, students work closely with NASA researchers on ongoing projects, work with other residents on team projects, and attend discussions with experts from both inside and outside NASA.

## NASA Academy History

The first NASA Academy was held in the summer of 1993, at the Goddard Space Flight Center. Since that time, Academies have also been held at Marshall Space Flight Center, Ames Research Center, and Dryden Flight Research Center. In the summer of 2000, there will be academies at Goddard, Ames, and Dryden.

The original academy class at Goddard consisted of 19 select students from around the country. These students were placed on projects with and in laboratories of some of the most innovative scientists and engineers working for NASA. Technical work for each student is arranged in advance, including a specific problem identified by the student and the researcher.

Participants in the NASA Summer Academy are called Research Associates. This title emphasizes that they are not merely summer interns. The intent of the NASA Academy is to give these students a working knowledge of NASA. This is accomplished by showing the participants how NASA field centers operate, identifying links to the private sector, giving Research Associates the opportunity to work in world-class laboratories, and fostering a group mentality which encourages them to work together in order to accomplish common goals.

## Research Projects

The goal of the Academy is to provide insight into all the elements that make NASA's mission possible. This is accomplished through the Research Associates' interaction with NASA experts and their work with top researchers who allow them to contribute towards a space mission.

## Interaction with Experts

Three days each week of the ten week program the Academy, as a group, are introduced to a highly specialized expert or leader who is active in the space program. These experts openly discuss their work, including challenges of the job and possible solutions. In addition to technical experts, these leaders come from the administrative, fiscal and management elements of the Space Program, as well as industry and congress.

## A Few Words from Alumni

Constantly being surrounded by such great intelligence and ingenuity can't help but affect you and raise your expectations and motivation.  
*Grant Bromhal (GSFC '95, West Virginia)*

Personally, NASA Academy has shown me, more than any other experience in my life, the value of initiative.  
*Alberto Gay (GSFC '96, Puerto Rico)*

The NASA Academy experience has had a profound impact on my career and my life.  
*Mike Moreau (GSFC '94, Vermont)*

I owe the Wyoming Space Grant a lot for this opportunity. It's so great!!  
*Heidi Hoffower (ARC '99, Wyoming)*

My enthusiasm about the knowledge to be gained from NASA is absolutely unquenchable!!  
*Libby Huskey (GSFC '00, Wyoming)*

## NASA Academy on the Web

- ➔ *how to apply for a NASA Academy*
- ➔ *past and present Academies*
- ➔ *NASA Academy Alumni Association*
- ➔ *NASA Academy contact information*
- ➔ **<http://www.nasa-academy.nasa.gov/>**

## NASA EPSCoR in Wyoming

Ray Martin

Wyoming NASA EPSCoR has successfully installed a high-speed microwave communication link from Wyoming Infrared Observatory (WIRO), atop Jelm Mountain! We have operated the telescope from the University of Arizona and also from a private research institution in Seattle, Washington.

During the summer months ahead, NASA EPSCoR PI Dr. Paul Johnson and Project Coordinator Ray Martin will travel to various NASA Centers to demonstrate the remote access capabilities of WIRO. These demonstrations will include downloading images, data, and audio/video communications at 10 Mbps. Researchers at Goddard, Ames, and JPL will get to see firsthand that WIRO is now equipped and operational to be practical and beneficial in collaborations between NASA researchers and Wyoming astronomers. Demonstrations of WIRO's new capabilities will also be conducted for the WIRO Council and the UW Board of Trustees.

Wyoming NASA EPSCoR has been awarded follow-on funding to continue the work being done to bring WIRO to the forefront of observing facilities for the 21st Century. One of the possible future developments for WIRO is to be set up as an infrared optical interferometer with the NASA 1K telescope. This would provide us with a 500 km baseline.

In a collaborative effort with the Wyoming Space Grant Consortium, we have been able to refurbish and refit the 40 cm undergraduate telescope in the STAR (Student Teaching and Research) Observatory. This observatory, located atop the Physical Science Building on the UW campus, will provide undergraduates with their introductory experiences to astronomy research.



Ray Martin is the Wyoming NASA EPSCoR Project Coordinator. You may reach Ray at (307)766-6176 or [ramartin@uwyo.edu](mailto:ramartin@uwyo.edu)

## WSGC Resource Highlight

Shannon Benson

*The Universe at Your Fingertips* is an excellent resource for teachers and students of all grades and levels. *The Universe at Your Fingertips* provides: 1) an introduction to assist and familiarize educators with the use of the materials included in the resource; 2) astronomy background material serving you with information and facts for beginners; 3) a teaching and learning section to help you use these units effectively; 4) an astronomy introductory section with sample activities; 5) a section providing you with thirteen units addressing different areas of astronomy; and 6) additional resources and bibliographical information. *The Universe at Your Fingertips* is useful to teachers due to the links from astronomy to mathematics, social studies, history, art, music, writing and other subjects. This resource comes in a loose-leaf binder for easy use in copying and demonstrating activities. To check out this resource, contact Shannon at (307)766-2862 or [shano@uwyo.edu](mailto:shano@uwyo.edu).

## UW Planetarium News

### *Shooting for the stars...lassoing the Moon!!!*

Great strides have been made to bring to completion of the renovation and reopening of what will be the best planetarium in Wyoming. The starball has been shipped back to Spitz for repair and restoration, with delivery back to UW expected to occur this summer. Due to this development, delivery on the projector and computer operation console has been pushed up to summer, also. Spitz and polish will have the walls and floors shining. A space mural will be painted by members of the UW Art Department in the corridor leading to the planetarium.

Thanks to a very generous donation by **Gates Planetarium** and the **Denver Museum of Natural History**, 246 reclining seats, panorama projectors, and other pieces of equipment will be installed.

Several spectacular shows have been ordered, including *The Mars Show*, *The Cowboy Astronomer* (featuring Baxter Black), *Light Years From Andromeda*, and *Larry Cat in Space* (a show specifically for young audiences). In addition to the formal shows that will be offered in the planetarium, plans are underway to develop a system whereby live images of the moon and planets will be exhibited as viewed from the newly refitted 40 cm telescope of the STAR Observatory on the Physical Science Building roof.

Persons desiring to assist with the restoration should contact Ray Martin at (307)766-6176 or [ramartin@uwyo.edu](mailto:ramartin@uwyo.edu). For updates on the progress of the planetarium restoration, go to: <http://faraday.uwyo.edu/planetarium.htm>.

# The Director's Cut



Here is an update on the various programs currently being supported by Wyoming Space Grant Consortium.

**HIGHER EDUCATION:** Development of Web-based space-related courses is extremely important in Wyoming. The availability of on-line courses has allowed higher education to be far more accessible to our population than ever before. Our support of development ensures high quality space-related curricula will be included in the on-line offerings.

**PRECOLLEGE EDUCATION:** The UW Lab School Field Study provides students with the opportunity to conduct meaningful research using an in-depth inquiry approach. Students identify the area of research, plan the data collection and analysis, perform the collection and analysis, and refine/refocus the research for the next year of the project. Currently, a fourth through ninth grade group of students is conducting a long-term ecological monitoring project on disturbed and non-disturbed sites.

**GENERAL PUBLIC EDUCATION:** Our support of the public radio program Stardate consistently outshines other efforts to reach Wyoming's general public. In addition to the meritorious content of the program, we use our underwriter airtime as a channel to disperse information on events in the state, funding opportunities, and general information about our overall program.

**UNIQUE RESOURCE:** The University of Wyoming is the home of WIRO (Wyoming Infrared Observatory), a 2.3 m infrared telescope that is now Internet-operable. Remote accessibility of this world class IR telescope, coupled with Wyoming's dark skies (a resource of itself), leads us to expect a high subscription rate for WIRO.

**NATIONALLY ADAPTABLE PROGRAM:** We have implemented a program, called Space Grant in the Classroom, which provides one-on-one contact in order to assist Wyoming educators with: 1) locating NASA materials designed for classroom use; 2) adapting the materials, if necessary, to meet their individual classroom needs; and 3) using the materials effectively in their classrooms. The most important facet of this program is the actual teaching visits to the classroom by our project coordinator. This allows each teacher to freely observe the class during lesson participation and note the positive effect on the students' interest and level of participation during a NASA created space science lesson.

## Wyoming Space Grant Consortium

### **Lead Institution:**

University of Wyoming

### **Academic Affiliates:**

Sheridan College  
Laramie Co. Community College  
Albany County LCCC  
Embry-Riddle Aeronautical University

### **Industrial Affiliates:**

US West

**POSITIVE IMPACT OF SPACE GRANT FUNDS:** Every Space Grant dollar spent in Wyoming has some measure of positive impact. Each person in Wyoming reached by Space Grant has confirmed the positive effect in one way or another. A first grader gleefully exclaims, "The Space Lady is here!" A graduate student proudly submits a publication based on Space Grant supported research. A teacher is wide-eyed with excitement at the abundance of supplementary materials available through NASA. An undergraduate student claps her hands with joy at the opportunity to apply to NASA Academy. A rancher's wife calls to thank Space Grant for helping support her favorite public radio program. Perhaps the best testimony for the positive impact of Space Grant in Wyoming comes from one of this year's NASA Academy applicants, who said, "Everywhere I go, I tell people what a great program Space Grant is and how much it has to offer the people of Wyoming!"

Paul E. Johnson



*Dr. Paul Johnson wears many hats at the University of Wyoming. In addition to serving as Chair of the Physics and Astronomy Department and Director of the NASA Wyoming Space Grant Consortium, he has recently become the Director of the Wyoming NASA EPSCoR Program.*

# WSGC Launches Survey of Wyoming Teachers

Are Wyoming teachers aware of the NASA educational resources available for classroom use? Are teachers using these resources? Do teachers have the equipment necessary to access NASA web-sites, run programs, and retrieve information? WSGC is interested in answering these and other questions related to Wyoming K-12 teachers and their use of NASA materials and information. A University of Wyoming graduate student, Angie Varca, has received a fellowship for the Spring 2000 semester to create and conduct a survey to determine the answers.

WSGC and NASA are watching this research project closely, which is being held up as an example of a proactive step in determining how well NASA educational materials meet the needs of teachers. The pilot study of 50 Wyoming teachers was mailed in April. In the fall, 500 Wyoming teachers will receive the survey. The questionnaire can be completed in about 15 minutes. Questions on the survey range from determining the level of teacher awareness and use of NASA educational materials to gathering information about scheduled planning time for teachers and Internet access in the classroom. To raise response rate, WSGC is offering incentives of free educational software, videos, and lithograph sets to teachers who complete and return the survey.

WSGC plans to use the information gathered in the survey project to help determine the level of success of NASA's educational program in Wyoming and decide what changes may need to be made to better meet the needs of teachers and students in the state. The survey data should be compiled and analyzed by November of this year and Ms. Varca hopes to present the results at the WSGC Research Symposium in the fall of 2000.

If you receive a survey, please fill it out and return it promptly. You will receive a useful educational resource and WSGC will acquire important information about Wyoming teachers, students, and classrooms.

To learn more about this survey, contact Angie Varca at [avarca@uwyo.edu](mailto:avarca@uwyo.edu) or call WSGC at (307) 766-2862.

## GLOBE

The Training Team is getting geared up for the first Wyoming Franchise GLOBE training session!!

### Trainer Roster

Dr. Pat McClurg, Director, Natural Science Program  
Alan Buss, Asst. Professor, Natural Science Program  
Cheryl Jaworowski, UW Research Scientist  
Lori Duffek, WY Space Grant  
Greg Bell, Teacher, Carey Junior High  
Sharon Catchpole, Teacher, Wheatland Elementary

### Session Topics

Atmosphere/Climate	Hydrology
Land Cover/Biology	Soils
Remote Sensing/GPS	GLOBE Data Entry

There are still a few open slots in the session, scheduled to be held July 10 - 14, 2000, on the University of Wyoming campus. Anyone wishing to participate in this session should contact Lori without delay at [lorfek@uwyo.edu](mailto:lorfek@uwyo.edu) or (307)766-2862.

*W* An Astronomy Network  
*y* For Wyoming's  
*o*  
*S* tudents  
*T* eachers  
*A* mateurs  
*R* esearchers

Do you teach astronomy? Are you interested in doing so, or in expanding your resources? Check out the information on the new program WyoSTAR, the Astronomy Network for Wyoming Students, Teachers, Amateurs, and Researchers.

We're in the process of developing resources to connect teachers and their students to active astronomy researchers.

Please join our mailing list by sending an email to [wyostar\\_jmb@yahoo.com](mailto:wyostar_jmb@yahoo.com) or calling Janelle Bailey at (307)682-7247 ext 259.

A web page is in development at:  
<http://wyoskies.uwyo.edu/wyostar/wyostar.html>

Visit the site and send us your comments & questions.

*The only way of finding the limits of the possible is by going beyond them into the impossible.*

—Arthur C. Clarke

## Meet the Graduate: Angie Varca

Lori Duffek

The most recent addition to Wyoming Space Grant's graduate fellowship roster is Angie Varca, who is pursuing a Master's of Science in Teaching through the UW Natural Science Program. Prior to entering grad school, Angie taught General and Environmental Chemistry at Laramie High School. She currently holds certifications in Secondary Chemistry and Secondary Biology. Additionally, Angie is Middle School endorsed.

Angie's love of science and passion for teaching have brought her to Space Grant with a research project involving NASA Educational Materials (see page 5). Through a carefully conducted survey, Angie intends to establish a framework through which Wyoming Space Grant can promote and improve the dissemination and use of NASA materials in Wyoming classrooms. Once this has been successfully accomplished at the state level, results from the research will be shared with NASA and other Space Grant Consortia in order to improve use of NASA resources on a national level.

When Angie is not pouring over data collected from teachers, she keeps busy doing a variety of activities. She is currently studying astronomy and enjoys spending time doing naked-eye observation with her two elementary aged children. Biking, canoeing, hiking, and camping are some of her outdoor interests. Angie has recently added karate to her roster of activities.

Angie's plans for the future include completion of the MST program, continuation of the current research project, and publication based on her research. She wants to eventually return to the classroom and teach science. With the knowledge gained from the coursework in the MST program, as well as the practical experience of her research, Angie believes she will have broadened considerably her already substantial science education expertise.

"I very quickly became vested in this project," Angie recently told the WSGC Project Coordinator. "As a science teacher, I am aware of the difficulty of obtaining appropriate and inexpensive supplemental curricular materials. Before beginning this project, I knew NASA created educational materials. I had a relatively low awareness, however, of not only the tremendous amount of resources available to teachers through NASA but also the range of topics addressed at all grade levels. Simply conducting this survey will serve as an avenue of sharing this information with teachers. The compilation and analysis of the results will help WSGC determine what the next step should be."



### *WSGC Research Symposium*

WSGC will be holding its second Research Symposium November 3, 2000. The goal of the Symposium is to promote the exchange of results, ideas, and interests in the space sciences among researchers, industry, educators, students and the public. The Symposium will be focused primarily, but not exclusively, on research funded by WSGC.

Details on the program and schedule of events will be made available by mid-summer 2000. Visit the WSGC web site for up to the minute information.

At this time, WSGC extends an open invitation for abstracts for presentations. Anyone interested in preparing an exhibit, poster session, or oral pre-

sentation should submit a 1-2 page abstract to the Research Symposium Chair.

**Hard copy may be sent to:**

Dr. Rex Gantenbein  
University of Wyoming  
Computer Science Department  
PO Box 3682  
Laramie, WY 82071

**Electronic submissions should be sent to:**

rex@uwyo.edu

For more information, call (307)766-4226 or (307)766-2862.

# Educator Resource Center News

*Laurn Wilhelm*

There's plenty of excitement in the air! That's what you get when you combine teachers, children, and NASA educational materials. It happens whether they are viewing the video entitled "Toys in Space" or picking up an item from the table of acquired NASA literature. All of this takes place in the Learning Resources Center on the University of Wyoming campus. The Center is designated by NASA and the State of Wyoming to be the dissemination location for NASA K-12 educational materials. As such, it is part of the network of Educator Resource Centers located in each state of the Union.

The use of space and earth science related materials have increased significantly during the past few months. A record number of videos have been copied and supplied to educators out in the state. Brochures, educational fact sheets, pictures, posters and resource materials have left the Center destined for placement in the teaching toolboxes of educators and the minds of Wyoming students.

The Center staff was also busy in preparing packets of materials that were sent to each elementary, middle, junior and senior high school in the state.

Educators and interested individuals are invited to visit or contact the ERC. It is located in Room 222 of the Education Building on the University of Wyoming campus.

Summer hours: Monday - Friday, 7 AM - 4 PM  
Winter hours: Monday-Thursday, 8 AM - 7 PM  
Friday, 8 AM - 5 PM

Email may be sent to [wilhelml@uwyo.edu](mailto:wilhelml@uwyo.edu). Voice contact can be made by calling (307) 766-2527.

## Undergraduate Update:

### Chris Rodgers, Casper Community College



Among this year's undergraduate students funded by WSGC is Chris Rodgers. Chris is a 1998 graduate of Kelly Walsh High School in Casper, Wyoming. He received his Associate Degree in Physics from Casper Community College in May, 2000. In the Fall of 2000, the University of Wyoming will welcome Chris into the Physics and Astronomy Department, where he will pursue a Bachelor's Degree in Astronomy and Astrophysics.

During the '99 - '00 academic year, Chris worked under advisor Paul Marquard on a project to align the capabilities of several planetarium software programs with labs being developed for inclusion in astronomy distance learning courses. Part of Chris' responsibility to the project was to match lab activities with as many freeware and shareware planetarium programs as possible. This will allow students to use several different programs without placing undue financial stress upon them. Chris presented his work in a colloquium at the University of Wyoming in April.

Wyoming Space Grant is not the alone in recognizing Chris' talents and potential. In addition to the funding received through Space Grant, Chris has been the recipient of a Richardson's Scholarship and Memorial Funds for Physical Science Majors for the past two years. He has also been employed during this time at the Math Learning Center at Casper Community College.

Don't let his stringent work schedule be misleading, though! Chris enjoys quite a variety of "downtime" activities, including roll-playing games and stargazing. Where better to gaze at the stars than under the dark skies of Wyoming?

### Notes and Dates

**July 10 - 14, 2000**

**GLOBE Workshop**

Space is limited for the first Wyoming Franchise workshop. Register right away!!

**November 3, 2000**

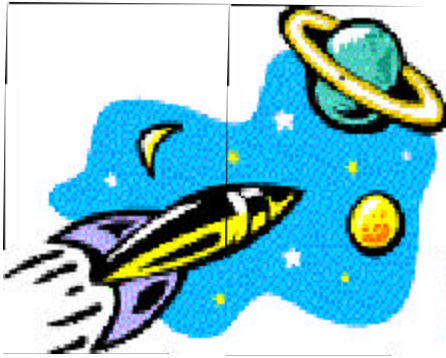
**WSGC Research Symposium**

See Page 6

WSGC and the ERC continue to add to our teacher resources available for checkout. Contact us with requests or specific needs.

**For more information, or to submit notes and dates to be included in this newsletter, contact:**

(307)766-2862 or [lorfek@uwyo.edu](mailto:lorfek@uwyo.edu)



on

# STARDATE

Visit StarDate Online!!  
at  
<http://stardate.utexas.edu/>

## Wyoming Public Radio

Monday - Friday	6:33 AM & 12:35 PM
Saturday	9:00 AM & 8:00 PM
Sunday	10:00 AM & 6:00 PM

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