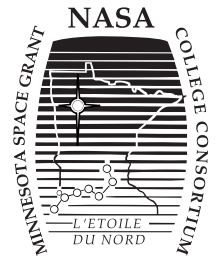


The North Star



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U of M Astronaut Honors His Alma Mater

Duane "Digger" Carey, who graduated from Highland Park High School in 1975 and received a master's degree in aerospace engineering from the University of Minnesota in 1982, is a NASA astronaut. He was chosen by NASA to be an astronaut candidate in 1996 and his first flight in space aboard the space shuttle Columbia, as the pilot, was scheduled for February 28, 2002. Carey underwent two years of intensive training for space flight preparation before going to work at the Johnson Space Center in Houston, Texas. During his 21 years in the Air Force he has logged more than 3700 hours in more than 35 types of aircraft. He worked as an F-16 test pilot at Edwards Air Force Base in California, and has been stationed in Korea, Spain and Turkey. While serving in the Gulf War he flew more than 30 missions.

All astronauts are allowed to bring a few personal items with them into space and Carey wanted to bring something from the University of Minnesota to "begin to pay them back in some small way for what they gave me." Carey contacted Minnesota Space Grant Consortium Director, Dr. William Garrard, asking for suggestions. The U responded by creating a banner especially for his flight.

"It's a 2-by-3 foot banner with four items on it," Garrard said. "It has a logo of the U of M with Goldy Gopher, a symbol from the Institute of Technology, an emblem of the Aerospace Engineering Department and the logo of the NASA Space Grant Consortium."

Article excerpted from Nancy Atkinson's February 20, 2002 'Highland Villager' article, "Beyond the wild blue."

Where Should NASA Go?

NASA appears to have a problem: it lacks a mission. If the agency doesn't go somewhere soon it risks the chance of becoming an artifact of the past. After much deliberation 'Popular Science' has decided that NASA needs to go to Mars. Here are their seven recommendations for change:

- Send Astronauts to Mars
- Complete the International Space Station at a Reasonable Price
- Let Private Companies Reign Between Earth and the Moon
- Build a Next-Gen Space Shuttle
- Celebrate Human Achievement
- Don't Focus Too Narrowly
- Promote National Security

They aren't suggesting that NASA resort to gimmicks, but NASA shouldn't be ashamed of capitalizing on the PR appeal of its employees. The agency also should stop pretending to be motivated solely by science. Americans loved seeing astronauts step onto the moon, plant a flag there, and even swing a golf club. Did these things have scientific value? Not much. But they inspired a generation to study science, math, and engineering. "I wouldn't be a scientist working at NASA today if it weren't for NASA inspiring me as a kid" says Weiler, NASA's chief space scientist. NASA needs to continue that inspiration!

Article excerpted from Dawn Stover's April 2002 'Popular Science' article, "Go Somewhere!" Reprinted with permission from Popular Science magazine, copyright 2002, Time4Media, Inc.

Mars Madness!

The 5th Annual Space Science Across the Curriculum Conference was a success! The conference, Mars Madness! A Conference for K - 12 Educators, was held at the Science Museum of Minnesota on Saturday, March 9, 2002. The Mars Pathfinder, Mars Global Surveyor, and Mars Odyssey probes mark the first wave of the Planet Earth's coming invasion of the red planet, changing our views of the past and future of the planet and the possibilities of life.

This year, the conference keynote speaker was Geoffrey Landis, a physicist in the Power and On-Board Propulsion Technology Division from NASA John Glenn Research Center. His presentation, "Invading the Red Planet: Pathfinder and Future Missions to Mars," contained present experiences on the Pathfinder mission, the challenges of using solar power on the surface of Mars, and a discussion of present and future missions which will explore Mars over the next decade.

Participants chose from a variety of concurrent sessions that linked aerospace and space science across their curriculum to physics, the arts, math, geography, and technology. Heather Enos, the Operations and Outreach Manager for Project 2001 Mars Odyssey Gamma Ray Spectrometer, revisited the Mars Odyssey Project at the conclusion of the day. She provided an inside look at the overall objectives of the 2001 Mars Odyssey mission and how the Gamma Ray Spectrometer built by the University of Arizona will contribute to the accomplishment of these goals.

Article excerpted from the Science Museum of Minnesota's 'Mars Madness! A Conference for K - 12 Educators.'

The NASA Aeronautics Blueprint - A Technology Vision for Aviation

This new NASA blueprint primarily addresses the challenges that confronted aviation in the United States before the terrorist attacks of September 11, 2001. Safety and security have taken on a whole new perspective since that event and technology solutions are presented in the Aeronautics Blueprint. It is recognized that the issues that were facing air travel prior to September 11 will return and require innovative technology solutions. The Blueprint addresses how new technologies can be brought to bear on these issues.

Centennial of Flight - 2003

On December 17, 1903, after many years of research that included dialog with other aeronautical enthusiasts, experimentation in a wind tunnel of their own making, and test flights of full and subscale models, Wilbur and Orville Wright made the first powered controlled flights in an airplane.

On December 17, 2003 NASA will celebrate the 100th anniversary of the Wright Brothers' Flight (100 years of powered flight). As the second century of powered flight begins, NASA Langley researchers strive to increase the safety, reduce the noise level, reduce the environmental impact and increase the efficiency of aircraft.

Rocketry Design Challenge

The National Association of Rocketry (NAR) and the Aerospace Industries Association (AIA) are sponsoring a rocketry design challenge for US high school student teams as part of the Centennial of Flight celebration in 2003. For more information please see their website at http://www.aia.aerospace.org/aianews/features/team_american/team_american.cfm.

National Space Grant College and Fellowship Program

“National Space Grant Student Satellite Initiative”

Bringing Together University, Industry, Military, and Government Resources to Train America’s Future Scientists and Engineers

Across America, National Space Grant College and Fellowship (Space Grant) students are learning from the ground up - literally - by designing, building, flying, and operating a broad range of spacecraft. Students come to Space Grant with an interest in Space, but with different levels of skill, knowledge and experience. Missions of growing complexity provide opportunities to acquire baseline skills and then to build on them. They range from the simple - building soda-can “satellites” or small payloads for launch for launch from small rockets or balloons - to building sophisticated satellites. We call this strategy “crawl,” “walk,” “run,” and “fly!” Our goal is to make aerospace history by sending the first student-built satellites beyond Low Earth Orbit and to use this strategy to educate the next generation of NASA and aerospace industry scientists and engineers.

What is the National Space Grant Student Satellite Initiative?

The National Space Grant Student Satellite Initiative (SG-SSI) will be a major thrust of the Space Grant program in FY 2003. Space Grant is a national network of colleges and universities working to expand opportunities for Americans to understand and participate in NASA’s aeronautics and space programs by supporting and enhancing science and engineering education, research and outreach programs. The SG-SSI brings together university, industry, military, and government resources to train America’s future scientists and engineers.

What is unique about the SG-SSI?

The SG-SSI is a student-driven enterprise. Students manage and operate the program with faculty advisors and experience the entire “design-build-fly-operate-analyze” cycle of a space mission. The experience complements regular classroom learning by offering direct hands-on immersion with the full mission cycle. Few NASA or aerospace industry scientists and engineers ever take a project through the full mission cycle.

How is the SG-SSI a national-level component of Space Grant?

At the present time, student-built satellite programs have been developed in only a few states. These have proven to be highly successful. Our goal is to have every state Space Grant consortium involved at all levels. Our initial effort is to share the existing programs - for students in all Consortia. We are already moving ahead with our present limited resources, offering a workshop on how to set up a “crawl” program from June 20 - June 22, 2002 (see the next page for more information). Consortia will learn what they need to know to start their own programs. In many cases, consortia will partner and work together.

How will funds obtained for Space Grant be used to support SG-SSI?

Most funds will be used for student stipends and to purchase materials for the student satellite experiments. Funds also will be used to coordinate and spread the program nationwide.

Can a consortium with limited resources realistically get into this activity?

YES! First, thanks to Space Grant’s national network (550+ colleges and universities), we have widespread expertise and experience that we are eager to share and spread to our partner institutions. Second, costs are not large:

- A high altitude ballooning project can be set up for approximately \$4000 in one-time infrastructure costs. After this, a flight to 100,000 feet (above 99% of the Earth’s atmosphere) costs about \$200 in expendables (e.g. helium plus balloon costs).

- A small earth satellite program (Cube Sat) can be begun with approximately \$10,000. A large number of launch opportunities for student developed satellites are being explored, with costs ranging from free to nominal.

- Loral Space Systems has their employees building Cube Sats as part of their continuing education program. If the aerospace industry is willing to pay for their employees to do this, then surely they are enthusiastic about having Space Grant universities provide this experience to their students before they move into the workforce.

How does the SG-SSI aid in aerospace/NASA workforce development?

Aerospace industries are strongly supportive of these programs. Their engineers and scientists act as volunteer mentors to our students. Test facilities and materials and even direct funding are made available for the student-built payloads. The companies are eager to move the students into employment as soon as they graduate.

For example:

- Within 24 hours of one state’s first Space Grant Consortium student payload balloon flight, GSSL Inc, a NASA contractor, contacted the Consortium and offered to hire any student who had worked on the program.

- Since the national Cube Sat university email listserv was established, three aerospace companies have sought to hire students who have worked on Cube Sat programs.

How does the SG-SSI build a community of learners?

Student efforts evolve from relatively simple experiments to more sophisticated levels through the “crawl, walk, run, and fly” strategy. This builds a community of learners across the states as well as educational levels. For example, Master’s level students may be working on a space science instrument at the “fly” level while freshmen engineering students are designing, building and flying balloon payloads at the edge of Space at the “crawl” level.

Many introductory freshman curricula in engineering and the sciences are often tedious but necessary to provide knowledge based on science discovered centuries ago. Offering incoming students the chance to design, build, and fly a space mission of their own design and fabrication captures the imagination and enthusiasm of students, brings science and engineering alive, and provides skills that make participating students highly employable. Space flight projects engage students in exciting science, engineering, and technical learning.

Together we can push the boundaries of student accomplishments, propel our students into America’s high-tech workforce and earn a place in aerospace history.

Eye to the Future Career Conference for Young Women in Math and Science

The Eye to the Future Career Conference is for 4 - 8th grade young women who are interested in careers in mathematics and science. This year’s conference will be held on **Saturday, May 4, 2002**, from 8:00 a.m. - 12:45 p.m. at Augsburg College, Minneapolis, MN. Participants “try on” career opportunities through hands on activities and discussions with professional women in mathematics, science, engineering and technology fields. Conference registration for young women and adults is \$8.00. This fee includes workshops, workshop packet, conference t-shirt, registration for various prizes, and a small snack. Call 612.330.1253 and leave your name, a phone number, mailing address and the number of brochures. This program is sponsored by Augsburg College, the Minnesota Space Grant Program at Augsburg College and the American Association of University Women.

Learning To Crawl - A How To Workshop

Learning To Crawl is a "how to" workshop in Boulder, Colorado from June 20 - June 22, 2002. The workshop will be held on the University of Colorado campus. Participants in this workshop will go home with the tools and knowledge to start their own successful crawl program. This workshop will provide participants with detailed information and instructions on how to duplicate current crawl programs. They will gain hands-on experience while building their own versions of crawl experiments, including building and launching their own BalloonSat to 100,000 feet (weather permitting). Participants will leave this workshop with the confidence to provide these opportunities to their students. Registration includes workshop book, equipment for hands-on activities, breakfast, lunch, snacks, and demonstration materials. Register by June 10, 2002 on-line at <http://spacegrant.colorado.edu/crawl/>.

FIRST: For Inspiration and Recognition of Science and Technology

FIRST is a national non-profit organization which inspires youth to pursue further study, experience and careers in engineering and technical fields. By doing so, FIRST helps ignite the curiosity and demand for learning, with the schools and universities then supplying that desired education. The premise of FIRST is to partner youth with practicing engineers so that the students can "play with professionals" to solve challenging engineering problems. To achieve this goal, FIRST has established the FIRST Robotics Competition for high school youth and a Junior Robotics program for 9 - 14 year old students with a network of tournaments called the FIRST Lego League. Modeled after MIT Professor Woodie Flowers' introduction to design course, the FIRST Robotics Competition provides teams with a limited amount of materials and a challenging game to solve. For more information on FIRST refer to their website at www.usfirst.org

Hey Girls! STEP On Up!

Science Technology and Engineering Preview Summer camp for girls (STEPS) is a one-week introduction to the exciting world of technology and engineering. Campers will participate in a variety of activities that will give them hands-on experience with high-tech equipment and processes. Program activities during the week for 7th Grade STEPS include designing, manufacturing and flying a radio controlled airplane. Activities during the week for Advanced STEPS (10th and 11th Grade) include designing, manufacturing, and launching a rocket payload.

Seventh grade STEPS applicants must be residents of the state of Minnesota. Advanced STEPS (10th & 11th Grade) applicants must be residents of Minnesota or Wisconsin. Wisconsin residents must have completed the 7th grade STEPS program. Participants must have completed the 7th Grade STEPS program.

For more information please see the website: www.manufacturingiscool.com.

2002 Summer Engineering Institute - Itasca Community College

Itasca Community College of Grand Rapids, MN is hosting a 2002 Summer Engineering Institute. This 5-day event is intended for high school juniors and seniors interested in learning more about a career in engineering. Students who attend the institute can expect to leave with a solid understanding of the engineering profession as well as what it takes to become an engineer. Students will: learn about careers in engineering, tour companies where engineers work, compete in team design competitions, meet and talk with real engineers, develop ideas for new products, tour the new ICC engineering center, eat a lot of pizza and meet cool people. This institute will take place from July 9 - July 13, 2002 and will cost participants \$125. Fall 2002 high school juniors and seniors are eligible to attend. For more information please contact Brad Steinbrecher - Director of Engineering at 1-800-9966-ICC or via email at bsteinbrecher@it.cc.mn.us.

Websites of Interest

- Internet Content for the Classroom - <http://marcopolo.worldcom.com>
- Sun-Earth Connection Education Forum - <http://sunearth.gsfc.nasa.gov>
- Urban and Rural Community Enrichment Program (URCEP) - <http://aesp.nasa.okstate.edu/URCEP/>
- Yuri's night - <http://www.yurisnight.net>

B-WISER Institute

The Buckeye Women in Science, Engineering, and Research (B-WISER) Institute is an educational partnership of the Ohio Space Grant Consortium (OSGC) at OAI and The College of Wooster. B-WISER will take place June 16 - 21, 2002 at The College of Wooster.

The purpose of B-WISER is to enhance the interest of seventh grade girls in physics, chemistry, geological sciences, computer science, mathematics, and engineering. The program consists of two events on the Wooster college campus: The B-WISER Summer Science Camp for girls who have completed the seventh grade and a fall 2002 Career Workshop for students and parents. The B-WISER Institute "made me realize that I could be a woman, a female, and still be in science, too."

For more information please see their website at: www.wooster.edu/BWISER.

Camp Kate 2002 - The Best Part of Summer

Camp Kate "Leadership skills to last a lifetime" is a leadership day camp for girls ages 10-12 at the College of St. Catherine in St. Paul. Camp Kate is five exciting, fun-filled days designed to help girls ages 10-12 develop leadership skills to last a lifetime - all in a supportive, girls-only setting. The two five-day options are June 24 - June 28, 2002 -or- July 8 - July 12, 2002. For more information please see their website at: www.stkate.edu/ce.

Camp Kate - Our Northern Star "Aim for the stars this summer" is a weeklong residential leadership camp for girls ages 12-15 at Camp Warren near Eveleth, Minnesota. Camp Kate - Our Northern Star is a weeklong residential camp designed for girls 13-15 to experience firsthand the excitement of astronomy, aeronautics and aerospace. The weeklong camp will take place July 14 - July 19, 2002. For more information please see their website at: www.CampWarren.org

2002 Workshops for Science Educators

The 2002 Workshops for Science Educators is an outreach program of the Pennsylvania Space Grant Consortium, the Eberly College of Science, the College of Earth and Mineral Sciences, the Life Sciences Consortium, and Outreach and Cooperative Extension. The workshops will help science educators bring fun, inspiration, and thought-provoking learning into the classroom. The workshops are welcome middle school or high school teachers from all states in all science disciplines.

The 2002 workshops include: *Astrobiology: The Origin and Early Evolution of Life*, *Penn State Weather Camp for Teachers*, *Biotechnology: From Laboratory to Classroom*, *The Mechanics of Materials Series: Chemistry of Materials*, *Space Astronomy for Science Teachers*, and *Galaxies and Cosmology for Science Teachers*. For up-to-date conference information and a downloadable application form please see: www.outreach.psu.edu/C&I/Science4Teachers/.

Climate and Global Change Geoscience Education Workshop

The National Center for Atmospheric Research (NCAR) is offering teachers an opportunity to learn about state-of-the-art research in these important collaborative research efforts that are of interest to governments and citizens around the world. NCAR is sponsoring the first annual Climate and Global Change Geoscience Education Workshop that will take place in Boulder, Colorado from July 22 - August 2, 2002.

This 12-day workshop will explore all aspects of the geosciences related to climate and global change. Participants will experience presentations by leaders in scientific research, training in hands-on and computer-based activities, field trips, project work, and discussions about pedagogy, educational standards, dissemination, and follow-up.

For more information and a downloadable application form please see: http://www.ucar.edu/educ_outreach/gew/brochure.html.

Announcements

- 2002 Summer S'COOL (Students' Cloud Observations On-Line) Workshop from July 17 - July 24, 2002. Teachers in grades 3 - 6 may apply. <http://scool.larc.nasa.gov>
- NASA Student Involvement Program (NSIP) is a national program of investigations and design challenges. NSIP is a wonderful opportunity for students to learn science by doing science. Please see their website for more information at <http://www.nsip.net/competitions>.

Consortium Affiliates

Ken Erickson, Physics
Jeanine Gregoire, Science Education
Augsburg College

Jason Dahl, Geology
Deb Davis, Administration
Bemidji State University

Tom Greenlee, Physics
Richard Peterson, Physics
Bethel College

Cincy Blaha, Physics
Carleton College

Terry Flower, Physics
College of St. Catherine

Heidi Manning, Physics
Concordia College

Glenn Langhorst, Physics
Fond du Lac Tribal & Community College

Michael Price, Science Education
Leech Lake Tribal College

Karl Wirth, Geology
Macalester College

Mark Hollabaugh, Physics
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