

NASA bids farewell to Deep Space 1

Glenn's ion engine earns its wings

BY DOREEN B. ZUDELL

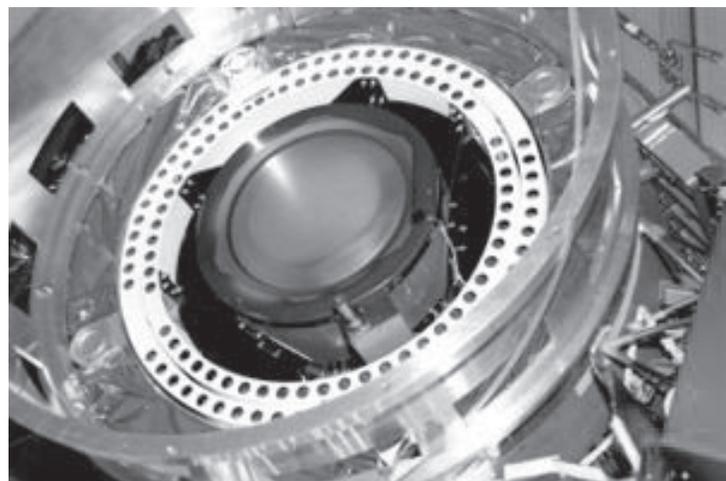
WHEN NASA ended its Deep Space 1 (DS1) mission on December 18, 2001, it proved what engineers and technicians at Glenn knew all along—ion propulsion is an efficient and effective way of moving about the solar system.

Launched October 25, 1998, DS1 was designed and built in just three years. The Jet Propulsion Laboratory (JPL), Pasadena, CA, developed the flight hardware under the NASA Solar Electric Propulsion Technology Applications Readiness (NSTAR) project. Glenn researchers played a key role by developing the ion engine that propelled DS1 into the solar system. This is the shortest development time for any interplanetary spacecraft NASA has flown in the Modern Age. It was the first mission in NASA's New Millennium program. Within 9 months after launch, DS1 successfully tested all 12 technologies.

The engine, which measures approximately 12 inches in diameter, generates thrust by accelerating electrically charged xenon atoms. Enabling spacecraft to travel faster and farther than ever before, DS1's ion engine accumulated over 670 days of operating time, a total of over 16,200 hours.

"With the exception of a minor hiccup in startup of the engine, it performed exceptionally well. In fact, it proved better than long-duration ground tests at Glenn and at JPL," explained Michael Patterson, On-Board Propulsion Branch, who was involved in the ion engine development for DS1.

Ion engine technology has been in existence since 1958 when Glenn



This bottom view of the Deep Space 1 spacecraft (prior to launch) shows a 30 cm xenon thruster mounted within two concentric gimbal rings.

engineer Dr. Harold Kaufman (now retired) built and tested the first ion engine. Several flight tests of the technology followed, most notably NASA's SERT II mission in 1970. Over the years, Glenn researchers

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Employees receive U.S. Olympic honor

BY BARBARA KAKIRIS

DEMONSTRATING the strength and inspiration for which they received the honor, Dr. Julian Earls, deputy director for operations, and Jack Lekan, project manager in the Microgravity Science



Division, were among approximately 140 torchbearers in Northeast Ohio to carry the U.S. Olympic Flame through the region. The Flame was passed through Cleveland during the Olympic Torch Relay on New Year's Day and used to light a cauldron at

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Forty years ago John Glenn became the first human to orbit the Earth

SERVERY REOPENS **12**
Main Cafeteria features numerous enhancements



Message from NASA Administrator Sean O'Keefe

AS we begin a new year, I am honored to be here, working with you as NASA's new Administrator.

As we enter 2002, we are sensitive to the events of the past year. The senseless tragedy of September 11 illustrates the fact that there's no true way of telling what a new year will bring.

However, we now have the chance to pause and take stock, and to think about the possibilities of the year to come. As we work today to live with new resolve, let us commit ourselves

to ignore the trivial anxieties of life and focus on those things most important—our families and our friends. If the year 2001 taught us anything, it's that every day we are blessed with life, health and love is a good day.

In the wake of the terrorist attacks, we are all amazed at the extraordinary sense of national resolve that emerged from the destruction in New York, Washington and Pennsylvania. President Bush has inspired a renewed sense of patriotic purpose. And with that sense of purpose, he has instilled in all Americans a

resolve to take care of one another. We also learned that with challenge comes opportunity.



Administrator O'Keefe

It is up to each and every one of us to exploit the opportunities of 2002.

The strength of this nation's space program comes from your determination. No matter the obstacle, the people of NASA have a legacy of overcoming adversity. It is that deep determination and commitment to excellence that will see us through the challenges of the coming year.

As I move into this new role as NASA Administrator, we face a substantial "to do list." It's going to require a lot of hard work and some difficult decisions. But with you, I know we will reinvigorate the Agency's mission of discovery and conquer new challenges.

NASA leads a unique expedition that is vital to the future security and vitality of our nation and humanity. ♦

—December 2001

NEWS NOTES

BLACK HISTORY OBSERVANCE: The 2002 Black History Month Observance will feature Thomas N. Todd, an attorney from Chicago, as its keynote speaker on Thurs., Feb. 14 at 9:00 a.m. in the

N.E.W. PLANNED: Glenn's Office of Educational Programs (OEP) will collaborate with the Cleveland Area National Engineers Week Committee in an educational outreach program during National Engineers Week (N.E.W.), February 17–23. This annual event helps raise public awareness and appreciation of engineers and their work, and involves students in relating their academic studies to this career area. Two N.E.W. initiatives highlighted this year are "Introduce a Girl to Engineering," a kit on issues and strategies to attract girls into engineering and technology careers, and "ZOOM Into Engineering," a kit based on a popular daily PBS children's television show, which engages children ages 6-11 in activities to introduce fundamental learning concepts in math and science. OEP will coordinate the visits of NASA scientists, engineers, and local professionals who volunteer to combine their own experiences with material provided for educational presentations at area schools. For more information about N.E.W. activities, please contact Linda Little, (216) 433-9071.

WOMEN'S HISTORY OBSERVANCE: In celebration of Women's History Month, Glenn will again host the Women in History Troupe. The event will take place on March 28 at 9:30 a.m. in the In addition, the annual Glenn Federal Women's Program Awards will be presented during the event. One supervisory and one non-supervisory employee will be selected to receive an award.

BPW SCHOLARSHIPS: The NASA Glenn Business and Professional Women's (BPW) organization will again be providing scholarships to Glenn civil servant or contractor women to continue in career advancement studies. In addition, there are many other BPW state and national scholarships available with deadlines beginning April 1. For more information on these scholarship applications, contact Judy Budd, 433-5580.

LESA MEETING: LESA/IPFTE, Local 28, will hold its monthly membership meeting on Wed., Feb. 6 at noon in

AFGE MEETING: AFGE Local 2182, will hold its monthly membership meeting on Wed., Feb. 13 at the on at 4:30 p.m. All members are encouraged to attend.

AeroSpace Frontiers is an official publication of Glenn Research Center, National Aeronautics and Space Administration. It is published the first Friday of each month by the Community and Media Relations Office in the interest of the Glenn workforce, retirees, government officials, business leaders, and the general public. Its circulation is approximately 6,700.

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DEADLINES: News items and brief announcements for publication in the March issue must be received by noon, Thurs., Feb. 7. The deadline for the April issue is noon, Fri., March 15. Submit contributions to the editor via e-mail doreen.zudell@grc.nasa.gov, fax (216) 433-8143, phone (216) 433-5317 or (216) 433-2888, or Ideas for news stories are welcome but will be published as space allows.



Star Performance

In a survey released Dec. 17, 2001, the American Customer Satisfaction Index (ACSI) showed that the Federal government edged out the private sector in overall customer satisfaction in 2001. The ACSI grades were based on customer expectations and perceived quality and value.

RETIREMENTS



Cohen

Stephen Cohen, Power and Propulsion Office, retired on January 3, 2002, with 38-1/2 years of NASA service.



Manteniks

Maris Manteniaks, Power and On-Board Propulsion Technology Division, retired on January 3, 2002, with 40-1/2 years of NASA service.

IN MEMORY

William Brandt, Jr., 75, who retired in 1977 after 29 years of NASA service, recently died. Brandt had served as a supervisor and section head of Refrigeration and Air Conditioning for NACA/NASA.

Burton Edelson, 75, a leader in satellite communications, recently died. As associate administrator for space science and applications at NASA Headquarters, Edelson played a central role in several programs, including the Hubble Space Telescope and Mars Explorer mission. He had worked closely with Glenn on the Advanced Communications Technology Satellite.

Donald Grant, a dedicated volunteer at the Visitor Center since 1988, recently died. As a docent, Grant assisted in presenting educational programs to school groups and enjoyed interacting with the many students who came through the doors of the Visitor Center over the years.



Director's Corner

with DONALD CAMPBELL

Seize the opportunities

*W*E often speak of courage and taking risks at NASA, but I wonder if most of us realize the courage required to venture outside our comfort zones. Our willingness to keep learning, to seek and seize opportunities, is vital to both individual and Center success. We need to embrace change to create new opportunities.

The question is: How do you as individuals and organizations prepare? One way to achieve a foundation and prepare to change is through training.

Fortunately at Glenn, we have access to a broad spectrum of training and development options both at the Agency and the Center level. These opportunities range from technical to business management to administrative and from interpersonal to professional development. Glenn's Organization Development & Training Office serves as an outstanding resource for building strong technical competence and developing solid leadership capability.

The Center is committed to training and development of its employees as recognized in FY01 through nearly 11,000 training sessions and 283 on- and near-site course offerings. Last year we invested nearly \$5 million to equip employees with the tools needed to meet current and future Center missions. The result is a more highly skilled, competent, and experienced Center workforce.

Whether you're a budget analyst, executive/management support assistant, an aerospace engineer, or a human resource professional, in the early, middle, or advanced stage of your career, the message is the same—you are member of the Glenn team and must individually and collectively continue to strive to acquire and apply new knowledge. I encourage all employees to give serious thought to developing *and* implementing an individual development plan. Seek out your managers or informal mentors to gain their insight and support and watch for opportunities posted on the web, *Today@Glenn*, and the Organization Development & Training Office Homepage.

Our new administrator has asked us for our commitment to excellence. I believe building and maintaining a competent and effective workforce is critical to the future of this Center and the Agency. We have an exceptional mission at NASA, which requires the highest of intellectual standards. Within each of us resides the ability and resolve to meet this challenge.

Donald also helped at the many special events that took place at the Visitor Center.

Alan Wolfe, 64, who retired from Glenn in 1995 with 35 years of Federal service, recently died. He worked as a research support manager, but is best remembered for the many retirement plaque engravings and other items he

crafted for fellow employees. Wolfe is also remembered for his great sense of humor. His wife, Lois, was a secretary in the Space Directorate prior to her retirement.



Wolfe

in the headlines

a sampling of holiday cheer



Photo by Patricia Webb

santa's helper

For the past 9 years, the Publishing Services team in the Logistics and Technical Information Division in _____ has enjoyed a pleasant phenomena. Overnight, their hallway is transformed—as if done by elves—into a holiday wonderland featuring the creative handy-work of Athina "Tina" Crawford (IDI). She develops a theme and makes three-dimensional characters (as many as 50) from such items as paper, cloth, or foil. Each one is personalized for her coworkers. Pictured is Crawford holding this year's abstract Santa, based on a "Ho, Ho, Ho" theme. In the background are items crafted in previous years.



Photo by Marvin Smith

patriotic tree

The beauty of Chris Titran's (9400) trimmings on a tree in _____ (pictured above) served as a thought-provoking centerpiece for several holiday events.



Photo by Marvin Smith

new tradition

The Research & Technology Directorate Office (Rm. 212) took first place in the door-decorating contest

The event revealed creativity and holiday spirit, providing an atmosphere of warmth and cheer for residents and visitors. Bldg. 3 residents agree that this is the start of a new holiday tradition.



Photo by S. Jenise Veris

holiday wishes remembered

Greetings from past Center Directors graced the hallway leading to Glenn's History Office in _____. Historian Bonnie Smith (IDI) decorated a bulletin board using Lab newsletters she had pulled from the archives. Inset photo: This 1946 *Wing Tips* newsletter, an early predecessor of *AeroSpace Frontiers*, featured a message from Director Edward Sharp.

in the headlines

service with a smile

The Director's Leadership Team (DLT) hosted a holiday reception for Center employees in the recently renovated Members of DLT served punch while the guests helped themselves to appetizers and dessert. Pictured below is Chief Counsel William Sikora (0120) graciously serving punch to Tammy Blaser (7750).



Photo by Doreen Zudell



Photo by Lori Manthey

good and gracious

Holiday cheer and food were plentiful at Holiday Party. Most found it hard to turn down Bob Draper's (2300) fresh omelettes prepared to order. Pictured is Draper as he cooks one of many omelets while (left to right) Carolyn Ternovan (2400) and Desa Rakic (2300) patiently await one of his delicious creations.

Attention retirees: may we pick your brains?

DID you know that there is much about our research center that is generally unknown?

Maybe the following trivia from yesterday will help spur some personal memories:

Did you know one of the criteria for selecting Cleveland as a NACA site, which occurred a few months before the United States entered WWII, was the fact that it was on neither coast, and therefore not as vulnerable to enemy attack as Langley or Ames?

Did you know that the original tract of land was acquired for the price of the title certificate and land transfer, about \$500? The Sam W. Emerson Company was contracted to build the Engine Research Building and several of the other original buildings on the Lab. The buildings were designed to

give the laboratory a college campus atmosphere.

Did you know that Edward Raymond Sharp worked at both Langley and Ames before being assigned to the new Aircraft Engine Research Lab in Cleveland? Sharp's law degree from the College of William and Mary came in handy for his first assignment in Cleveland, negotiating a 47-page building contract.

Now, how about testing your knowledge: *What* is the name and manufacturer of the first engine tested at the laboratory? *What* kind of special equipment had to be built for the test, and who built it?

In 2003, Glenn will be taking part in the Inventing Flight celebrations in Dayton, OH, commemorating the 100th anniversary of the Wright

Brothers' achievements. In conjunction with the event, the History Office in the Logistics and Technical Information Division is undertaking a major project. They are creating a comprehensive timeline of employee contributions to flight while working at the Cleveland research center.

We invite you to dig out your memorabilia and get ready for yet another work assignment...and you thought retirement meant that you were finished with NASA.

A web site displaying the information accumulated and a toll-free telephone number to contact the History Office will be published in a future issue of *AeroSpace Frontiers*. ♦

Glenn Historian Bonnie Smith can be contacted at 216-433-5765, Bonita.S.Smith@grc.nasa.gov

Retiree Spotlight

Stone keeps vigil through T-shirts

BY DOREEN B. ZUDELL

RETIREE Phil Stone believes that although it is unlikely that people will forget about the tragic events of September 11, 2001, it is vital that Americans remain vigilant in their efforts against terrorism. To support this belief, Stone collaborated with others to design a T-shirt that will serve not only as a remembrance of the disaster but also as a pledge to never let it happen again.

“Shortly after the terrorist attacks, Dan Mimis, a Romanian immigrant and friend of mine, contacted me with an idea for a logo design and phrase that spoke out against terrorism,” Stone explained. “Unfortunately, the design centered on the message of revenge, which I felt wasn’t a constructive way of moving past the tragedy. So, Mimis, my wife, Barbara, and I began brainstorming on a design that would evoke the principals of patriotism, remembrance, and perseverance.”

Their efforts resulted in a red, white, and blue graphic design that depicts the Pentagon and Twin Towers of the World Trade Center within the words “We Will Overcome.” Stone explained that these three words came from his involvement in the 1960’s Civil Rights Movement and President George W. Bush’s continuing usage of “We Will Prevail” in his speeches and various proclamations.

Another unique characteristic about the T-shirt that separates it from the numerous other patriotic items depicting 9-11 is its packaging. The 100 percent, preshrunk, heavy cotton shirt is hydraulically compressed and shrink-wrapped into roughly the size of a CD jewel case. Stone said that some people who have purchased the shirts have chosen not to open them, desiring to keep them as preserved mementos.

“The first place I thought of when it came time to share this with the public was Glenn, my ‘homeland’ of 30 years,” Stone said. “The T-shirts are available at the _____ at a price reduced from that of the other locations. Part of the

proceeds from all sales will go toward the various 9-11 disaster relief funds.”

Stone said that the T-shirts might be just the beginning of a broader treatment of this inspirational motto. He hopes to develop other items such as caps, mugs, and sweatshirts. This new venture is quite a departure from Stone’s NASA career that included space electric power, automotive pollution control, solar cell advancement, and major exhibit design and management.

“If I could wish for one thing it would be that this motto ‘We Will Overcome’ could reach beyond the events of



Photo by Doreen Zudell

T-shirts designed by retiree Phil Stone are available in the Exchange Store,

September 11,” Stone said. “There are many occurrences in our lives that challenge us daily. I believe that if we embrace this philosophy, we can move ahead in the face of adversity and come out a lot stronger for it.” ♦



Graphic by Terry Condrich

Tunnel quietly coming up to speed

GLENN engineers and technicians will be able to fully explore the capabilities of a recent upgrade to the 9-by-15 foot Low-Speed Wind Tunnel when they begin the second phase of a fan test starting in April ‘02, aimed at identifying engine noise sources in support of NASA’s Quiet Aircraft Technology Program.

Model fans can now be tested without stator vanes, providing researchers with valuable acoustic diagnostic information. Tests are typically long since they provide one-stop shopping for data; the models look like miniature turbofan engines that provide aerodynamic, acoustic, and structural assessments for the inlet, fan, nozzle,

portions of the core, and sometimes engine pylon and strut simulations.

“The ability to obtain both fundamental data and component integration assessments is a capability not duplicated at facilities outside of our Center,” said Dennis Huff, chief of the Acoustics Branch in the Structures and Acoustics Division. “The 9-by-15-foot Wind Tunnel is a state-of-the-art facility that has enabled NASA to successfully meet engine noise reduction and aerodynamic performance technology goals.”

Plans to further enhance the facility in 2002 include installation of a new Dynamic Actuation System to help solve developmental issues associated with Short Take-Off and Vertical Landing aircraft like the new Joint Strike Fighter.

The 9-by-15, housed in the return loop of the 8-by-6 Supersonic Wind Tunnel that straddles nine buildings, provides the nation with a one of a kind facility for testing large-scale hardware in a continuous subsonic air stream. ♦



Recent upgrades include dynamically controlled nacelle support struts that allow a fan to run without stators (no internal support).

Remembering a leap and legend in our time

ONCE upon a time in 1959, seven skillful pilots* were brought before the masses as this Nation's nominees for the first human voyage into space. They endured numerous trials of mental and physical fitness to determine their worthiness to enter Project Mercury. These astronauts, heroes of the uncharted vastness of space, became the *Mercury 7*.

USMC/Lt. Col. John H. Glenn, Jr. was among those heroes who entrusted their life to the spirit of Mercury and the strength of the Atlas rocket. On February 20, 1962, Glenn launched into space inside the capsule christened *Friendship 7* to become the first American to orbit Earth.

The accelerated efforts of this country to outpace the Soviet Union in rocket development, as well as upper-atmospheric and space medical research conducted by the Air Force, enabled the astronauts to take on their quest confidently. More than 2,000,000 people

from many major governmental agencies and much of the aerospace industry united their skills, initiative, and experience to support this national effort.

Project Mercury's objectives were simply to orbit a manned spacecraft around Earth, investigate man's ability to function in space, and recover both man and spacecraft safely. Glenn's flight was one of six human flights successfully completed over the nearly 5 years of the project. He, along with Alan Shephard, Virgil "Gus" Grissom, Scott Carpenter, Walter Schirra, and Gordon Cooper proved that a person could function ably as a pilot-engineer-experimenter without deterioration of body functions or negative side-effects for periods up to 34 hours of weightless flight.

After an impeccable military record as a fighter pilot in WWII and Korea, service as a pilot instructor, then a record-setting first transcontinental flight to average



Photo courtesy of NASA Archives

This historic photo captures John Glenn entering the Friendship 7 capsule preparing for the mission.

supersonic speeds, travel to space was naturally the next frontier for Glenn to conquer. He learned everything he could about space and seized the opportunity to volunteer for one of NASA's early feasibility studies of manned space flight, which proved to be key in his selection as a member the original 7 of the Mercury Project.

Since NASA considered pilot input essential to development of the Mercury project, Glenn also had a hand in the design of the Mercury capsule. He specialized in the instrument panel

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Internships help launch successful career

BY S. JENISE VERIS

IF you are looking for an example of how NASA can make a difference in the lives of young people, get to know Dr. C. Fred Higgs, III.

Although Higgs was awarded a NASA scholarship out of high school, he was introduced to internship opportunities at NASA as a Tennessee State University (TSU) freshman when alumnus Dr. Rickey Shyne, chief of Glenn's Nozzle Branch, came to campus to make a presentation. Shyne told Higgs about the success of fellow TSU alumni at Glenn and encouraged him to intern.

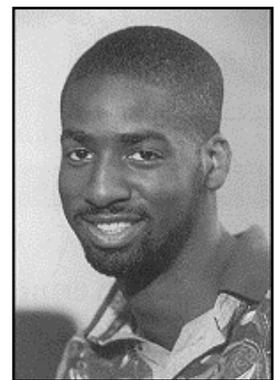
"I was fortunate to work the next six summers as a NASA Undergraduate and GEM (National Consortium for Graduate Degrees for Minorities in Engineering) Scholar with some

extraordinary mentors," Higgs said. "The scholarships allowed me to stay focused on my academic goals and strengthened my ability to solve technical problems. This enabled me to excel in the classroom and on the job."

Higgs first internship was in 1992 working with Larry Liou, deputy chief, Test Installations Division. While there, he helped Liou design a lab-size high power laser enclosure, which Liou said Higgs did with a high level of professionalism. For the next three summers, he linked up with Tom Benson, Engine Systems Technology Branch, who Higgs considers his most influential NASA mentor.

"Fred is truly one in a million! In 1994, the first summer he interned for me, he already owned a business and had a research project underway," Benson

reflected. "By the end of the summer, he helped me develop a new interactive computer program to assist undergraduate students in economic analysis; gained the tools to develop his own algorithm to predict failure and improve reliability of machine elements; and inspired me to anticipate his return for the next summer. I remember telling my office mate, 'someday we'll be working for Fred'."



Higgs

CONTINUED ON NEXT PAGE

Speakers Bureau members earn recognition

BY DOREEN B. ZUDELL

WHILE public access to the Visitor Center was limited for a short time after the September 11 disaster, members of Glenn's Speakers Bureau kept the Center's outreach efforts going strong. During a recent recognition ceremony, current and retired employees who make up the Speakers Bureau team were acknowledged for the crucial role they play as "NASA's goodwill ambassadors."

"The Speakers Bureau is a great group of dedicated people who take pride in Glenn and enjoy sharing with the public the Agency's mission as well as their own individual contributions," said Patricia Hannan, BTAS/Visitor Center, coordinator of Glenn's Speakers Bureau.

With approximately 700 presentations—to the educational community; professional, technical, civic, and social organizations; libraries; and museums—the 140-member Speakers Bureau reached a record 46,000 people in 2001.

Bill Crell, who retired from the Computer Services Division in 1995, made a significant contribution to that number by providing 55 presentations this year, bringing his total to 350 since 1983. On behalf of Glenn and the Agency, Crell received a NASA flight jacket in appreciation of his efforts.

"I truly believe in the importance of promoting NASA," Crell explained. "I try to incorporate the philosophy 'benefit to all humankind' in my presentations by citing spinoffs and tailoring the information for the appropriate audience—whether it be elementary school students or senior citizens."

Frank DeAngelo, Glenn Safety Office, also received a benchmark award in 2001. DeAngelo has conducted 260 presentations for which he accepted a color print of his choice complete with matt and frame and personalized with a plaque.

Other top presenters included David

Herb, Facilities and Test Engineering Division, with 204 presentations; Dave McKissock, Power and Propulsion Office, with 213 presentations; Ron Kiessling, retiree and volunteer at the VC, with 226 presentations; and Bryan Palaszewski, Turbomachinery and Propulsion System Division, with 232 presentations. Each speaker received a set of brass space shuttle bookends.

In addition to Glenn's awards, NASA's Outreach Program Officer Nora Normandy showed the Agency's support by providing all of the Speakers Bureau members with a NASA decal pin. ♦



Speakers Bureau member Erline Trsek, Computer Services Division, shared her knowledge with students at Kenneth Clement Elementary School, Cleveland, during their recent Career Day.

Higgs advances to new heights

CONTINUED FROM PAGE 7

Mentors Nancy Rabel-Hall, Microgravity Science Division, '97; and Dr. Wilfredo Morales, Tribology and Surface Science Branch, '98, included similar glowing remarks on Higgs' evaluation/referral sheets.

Such remarks were well deserved for the student/entrepreneur who between the summer of 1992 and 1998 designed three different graphical user interface software packages to aid undergraduate engineering students. He also authored five papers and co-authored four papers, and advanced his education to the doctoral level.

Higgs successfully defended his dissertation "Particulate Flow Lubrication: Continuum Modeling of Shear Behavior," to earn a Ph.D. in mechanical engineering from Rensselaer Polytechnic Institute, August 2001. He is currently a post-doctoral fellow in mechanical engineering at Georgia Technical Institute of Technology, Atlanta, GA. He also maintains his company, Carpe Diem Motivational and Educational

Consultants (CDMEC), with the help of his partner, Jason L. Ward, and ten associates across America. Some of his clients include NASA Glenn, NASA Langley, Cuyahoga Community College, Lucent Technologies, and Tennessee State University.

"We are proud of Fred and his success and the way he has been able to give back through CDMEC, which is active in the national community and is sincere in its efforts to serve as a catalysts for improvement in the academic and professional arena," said Jo Ann Charleston, chief, Glenn's Office of Educational Programs.

Higgs current activities keep his schedule full, but he still finds time to respond to dozens of emails that come in during the academic year from undergraduate and graduate students who attended his company's professional development workshops. Some ask to have their senior project presentations edited; others request the services of CDMEC. During his last NASA internship, he arranged a meeting with former astronaut Guion Bluford, president of Logicon. Why you ask? He is looking into the possibility of becoming an astronaut. ♦

Earls and Lekan selected for inspiration to others

CONTINUED FROM PAGE 1

the Rock and Roll Hall of Fame during an evening celebration.

Roger Curtis, president and CEO of SITCUR, an e-business consulting service in Los Angeles, CA, nominated Earls, an avid runner who completed his 25th marathon this year. Curtis was inspired by a keynote speech Earls gave during the annual NASA/JPL High Tech Small Business Conference at the Jet Propulsion Laboratory, Pasadena, CA. Earls had traveled to Los Angeles three times over the past several years to speak to the group.

"As I told the Olympic Organizing Committee, I could think of no one else more deserving than Dr. Earls. During all three addresses, he spoke about educating kids, being a good member of the community, running the marathon, and his passion for life...all in addition to speaking about business. He truly goes the extra mile," Curtis said. "Each time he had the audience on their feet and inspired with the same flame the Olympic Torch represents. I know I have been inspired by his words and his passion."

Humbled and honored at being selected, Earls said it was especially complimentary to be nominated by someone he did not know. "The act of allowing those who are not known widely, or celebrities, to carry the Olympic Flame across America speaks to the strength of a Nation that appreciates all citizens...big and small," Earls said.



To add to the honor, Earls was more involved in Cleveland's Olympic events than being a torchbearer. In November, he met an Olympic Relay advance manager while in Atlanta, GA, for a speaking engagement, and their conversation led to his various roles in our city's festivities. Earls was instrumental in arranging for the Rock and Roll Hall of Fame as the ceremony location and the Shaw High School Band as the entertainment. As a result, Terry Stewart, Rock Hall CEO, became so impressed with the students that he made a generous financial contribution to the East Cleveland School System for the band's use. Earls' actions truly signified the community involvement and inspiration heralded by the Olympic committee.

Lekan, who is also an avid runner, had the distinction of being the first torchbearer in the downtown Cleveland relay. As the starting leg of the relay, Lekan was the first to take the torch, which was lit from the cauldron in Euclid, when it arrived from Erie, PA. "My most vivid memory was all the media and cameras when I began the relay, as well as many people waving American flags and cheering," he explained.

Lekan said he was not aware of how many people had nominated him for the honor and didn't learn about the selection until November when he found his name on the official Olympic web site. He later discovered that he had received several nominations, including some from Glenn employees. Lekan called the experience "awesome," and humbly added that he considered himself "an average person who is blessed with extraordinary coworkers and friends."

In the nominating statement sent to him by Coca-Cola Company, an Olympic sponsor, Lekan was touted for his positive attitude, strength of conviction, and high morals.



Photo by Marvin Smith

Glenn's own Julian Earls (left) and Jack Lekan donned official Olympic gear with torches to take a jog on Lab.

Comments included the following: "Jack makes people his priority," and "Jack is an everyday person living an everyday life but in such a way as to be an example and encouragement to those around him." A coworker shared, "He [Jack] has shown me (through our work relationship) how to always have integrity and work hard to care for people."

Torchbearers were determined by community judging panels across the U.S. who read tens of thousands of stories submitted by people from all walks of life wanting to honor individuals that serve as sources of personal inspiration. The panels' task was to choose a few special people to represent the light of inspiration in our nation. The Olympic Relay is designed to celebrate the inspirational fire found within every U.S. community and the actual torches are inscribed with the phrase "light the fire within."

The Olympic Flame, which is kept in a lantern, arrived December 4, 2001, in Atlanta, GA, from Athens, Greece, to begin its 250-city, 46-state trek. It will arrive in Salt Lake City, UT, on February 8 where the Winter Olympics will begin on February 10. ♦

Kakiris (IDI) is a public affairs specialist in the Community & Media Relations Office.

Glenn shares in DS1 success

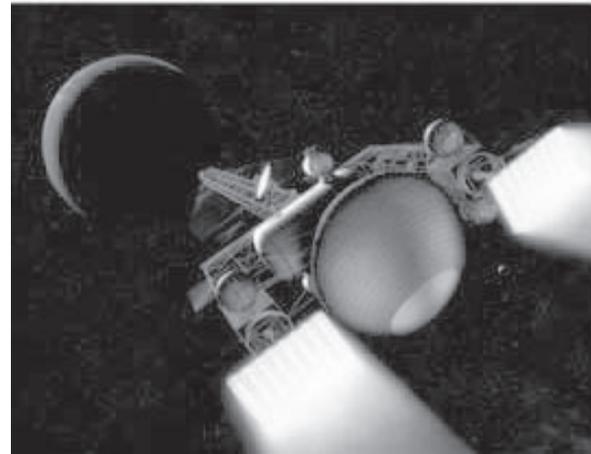
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have worked to refine elements of ion propulsion. They have developed state-of-the-art power and control technologies for integration with kilowatt-class ion engines and performed ground tests of the systems.

DS1's validation of the ion engine has spurred its use in Dawn, a Discovery

Program mission slated for launch in 2006. On its 9-year journey, Dawn will orbit the two largest asteroids—Vesta and Ceres—in the solar system with the objective of understanding how planets formed.

"DS1 was primarily a technology validation mission; however, Dawn will seek scientific information," Patterson explained. "In addition,



This futuristic nuclear-electric spacecraft departing for Mars shows two arrays of ion thrusters and a central aero-brake shield.

DS1 validates solar arrays

WHILE most spacecraft tap into chemical propellants for propulsion power, Deep Space 1 (DS1) got its power from the Sun. Glenn researchers, in collaboration with private industry and the Ballistic Missile Defense Organization that provided major funding, developed the open advanced solar arrays that worked in conjunction with Glenn's ion engine system on the successful DS1 mission.

Jutting from the sides of the spacecraft-like wings, the two 15-foot SCARLET (Solar Concentrator Array with Reflective Linear Element Technology) solar arrays captured the Sun's energy using a unique refractive lens system that concentrates sunlight onto power generating photovoltaic cells. This breakthrough—the first successful photovoltaic concentrator ever flown as a primary power source—provided approximately 2.4 kilowatts of electrical power for DS1's ion engine.

"Glenn played a substantial role in the solar array technology for DS1," explained Michael Piszczor, Photovoltaic and Space Environments Branch. "This mission—with

the use of Glenn's solar array technology—validated the use of concentrators in space."

Glenn began development of refractive concentrator technology with Entech, Inc. in 1986 under the Small Business Innovation Research program. Ten years later, the Jet Propulsion Laboratory expressed interest in this technology for use on DS1. In preparation for the mission, Glenn researchers conducted a variety of component-level tests, some of which were performed in the Tank 6 space environment chamber in

Researchers made significant suggestions on modifications that secured the successful debut of the technology. Proper operation of the solar arrays was critical due to the power requirements and tolerances of the ion engine.

NASA acknowledged the significance of this technology in May 2001 when Glenn and JPL received a prestigious Turning Goals Into Reality Award from the Agency. The Ion Engine and SCARLET team received recognition in the category of "Advanced Space Transportation."

"The solar arrays performed flawlessly," Piszczor explained, "and were essential to the success of this mission." ♦

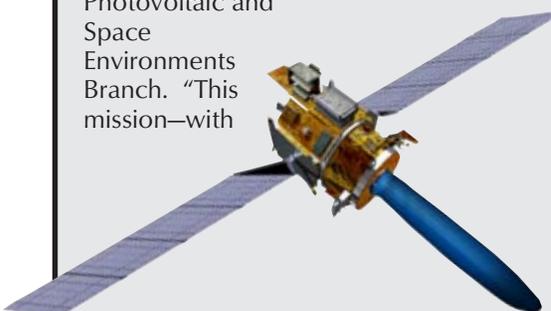
Glenn-developed solar arrays captured the Sun's energy and provided power to Deep Space 1's ion engine system.

while the ion engine technology used for Dawn replicates that of the DS1, the Dawn spacecraft will utilize three—as opposed to one in DS1—ion engines."

While Glenn will support the Dawn mission, the On-Board Propulsion Branch (with support from the Test Installations Division as well as other organizations throughout the Lab) is committed to advancing ion engine technology for the next generation of spacecraft. This means new and more capable engines with higher power generation and propellant throughput required to meet the demands of future planetary missions.

Recognizing the importance of this technology, NASA recently showed its support through a significant investment of \$25 million toward this development, under the Next-Generation Ion NASA Research Announcement. Last year, NASA Marshall Space Flight Center provided funding to Glenn for the development of the next-generation ion engine. Within a 9-month time span, a large engine was conceived, designed, manufactured, and performance characterized over a 1.1–7.3 kW power range. Detailed designs for the engine were developed and engineering model hardware fabrication was initiated.

Patterson, who now serves as technical lead for ion propulsion at Glenn, affirmed, "We're proud that the roots of ion engine technology are here at Glenn and we will aggressively continue our efforts to develop this amazing technology." ♦



Behind the Badge...

a closer look at our colleagues

Loretta Shaw



Job Assignment: Compressor Branch chief, Turbomachinery Propulsion Systems Division.

Time at Glenn: This year I will have 28 years of service at NASA.

Hometown: My hometown is Wheeling, WV. I've been a resident of _____ for the past 21 years.

Describe your family: My husband, Joe, works as the UEET Program manager at Glenn. We have a lovely daughter who is in graduate school at the University of Colorado studying atmospheric science. She is engaged to a young man currently in pilot training at Vance Air Force Base in Oklahoma.

Favorite food: I enjoy all types of food, but I especially like the foods of my Polish ethnic heritage such as pierogies and cabbage rolls.

Favorite music: I enjoy all kinds of music. Recently I'm enjoying the New Age music of *Secret Garden*. I find piano solos very relaxing.

Favorite book or magazine: I enjoy the fiction of Ann Tyler and the self-help books of Richard Carlson.

Favorite movie or play: My favorite play is *Les Miserables*, although I've enjoyed most of the plays that have come to Playhouse Square in the Broadway Series.

Activities when away from Glenn: My husband and I recently put a pond in our backyard. I enjoy gardening, reading, and relaxing near the pond.

Robert "Joe" Shaw



Job Assignment: Chief of the Ultra-Efficient Engine Technology (UEET) Office, which has management responsibility for both the UEET Program and the Turbine Based Combined Cycle efforts including the Revolutionary Turbine Accelerator effort, which is part of NASA's Advanced Space Transportation Program.

Time at Glenn: I have 31 years of service at Lewis/Glenn.

Hometown: My hometown is Lisbon, OH.

Describe your family: My wife, Loretta, is a Glenn employee and currently the Compressor Technology Branch chief in the 5000 Directorate. Our daughter, Cynthia, is currently a graduate student at the University of Colorado, majoring in atmospheric science. We are a total NASA family in that our daughter has worked at the Center for four summers. These very positive experiences greatly helped in shaping her career decisions.

Career alternative: In my next career, I would like to be either a university professor or the manager of the New York Yankees.

Favorite music: Jazz and doo-wop.

Favorite book or magazine: I am currently reading the series of books written by the Nobel prize physicist, the late Richard Feynman. I am finding them very fascinating.

Favorite movie or play: Like my wife, I enjoy attending the Broadway Series at Playhouse Square. I think the play I've enjoyed the most was *The Civil War*.

Person most admired: I very much admire people who are willing to make the hard decisions and accept accountability for those decisions, regardless of outcome.

Activities when away from Glenn: Besides the backyard pond my wife describes, I enjoy (when time permits) reading, baseball, and digital photography.

What do you see as an area of expertise to be proud of at Glenn: After 31 years, I still am very impressed by the skills and capabilities possessed by the Glenn workforce (civil servant and contractor). It is a pleasure and privilege to work with them each and every day.

Graphic by Kelly Shankland

Anniversary N A S A of the **Mercury 7**

CONTINUED FROM PAGE 7

layout, cockpit design and control functioning, including some of the early designs for Project Apollo.

After his flight on the *Friendship 7*, Glenn returned to the U.S. to a tremendous hero's welcome—one repeated when he flew aboard STS-95 in October 1998, and he continues to receive everywhere he goes because of extended service to his country.

*(Donald "Deke" Slayton, was the only original member of the Mercury 7 that was grounded because of a previously undiscovered heart condition, but later flew as a crewmember of the Apollo Soyuz Test Project.) ♦

Main Cafeteria offers larger selection, longer hours

DOREEN B. ZUDELL

LOOKING for an eatery that offers fresh food, affordable prices, friendly service, and convenient hours in an appealing environment? The staff at Glenn's Main Cafeteria, which reopened its new and improved serving area on December 19, 2001, is determined to meet these requirements.

"By serving our customers on a daily basis we've gotten to know their likes and dislikes," explained Exchange Business Manager Mark Betlejewski. "This reinforced our desire to make enhancements to the servery and guided our choices for improvements in the food selection."

Betlejewski knows that happy customers are return customers and is excited about the upgrades. Patrons can now select from an average of 16 items—broccoli to cheeses to olives—on the salad bar. Salads are sold by the ounce and weighed at the registers.

In addition to traditional hot meal favorites such as roast pork and baked chicken, the grill area has expanded its

menu to accommodate customers who are looking for "fast-food" choices. Hamburgers, French fries, personal pan pizzas, and breakfast sandwiches are among the many items that are hot and ready-to-go.

Betlejewski said cold sandwiches have gained popularity over the years. An deli counter now features Sara Lee luncheon meats in a variety of sandwich choices comparable to most sub or deli shops but at lower prices. For added convenience, patrons can purchase luncheon meats by the pound to take home or for office gatherings.

Fresh ground coffee, complemented by flavored creamers and java jackets, as well as soft-serve ice cream are also noteworthy enhancements.

For added variety and flexibility, a portable, self-contained island located in the center of the serving area will support special promotions such as

"build your own taco bar." The island is part of the new decor, which features an open, airy environment with easy accessibility to menu choices.

In addition to an expanded menu, many patrons have asked for longer hours of service. To meet this request, the Main Cafeteria now serves hot service items and salad bar hours until 2 p.m. The deli will remain open until 5:30 p.m. and will feature take-home entrees for customer convenience.

Betlejewski said, "We look forward to serving our valued customers with expanded selections, service, and hours." ♦



Photo by Marvin Smith

Center Director Donald J. Campbell, flanked by an excited crowd, cut the ribbon on the reopening of the Main Cafeteria servery.

National Aeronautics and
Space Administration

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VOLUME 4 ISSUE 2 FEBRUARY 2002



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