

Space News Roundup

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MOD helps promote ways to innovate

By Karen Schmidt

JSC's Mission Operations Directorate is taking steps to help engineers, scientists and managers change the way they conduct business, developing a rapid prototype laboratory and a training program for innovation techniques.

The Rapid Prototyping and Interface Development Lab is in its final stages of completion, and a pilot program in innovation techniques is in the works.

The RAPID lab is a test bed of hardware and software and a team of experts who will be available to provide innovative techniques and expertise to all organizations at JSC interested in development of flight and ground system displays and display software. It is on the third floor of Bldg. 30, scheduled to open in January.

"The center director gave us a challenging project and we are very excited about it," said John Whiteley, deputy division chief for MOD's Reconfiguration Management Division. "We were asked to create a rapid prototype laboratory for developing state-of-the-art on board and ground displays."

The lab will help engineers and scientists by applying a collected knowledge of flight control and onboard displays.

"This lab will be a focal point for JSC, benefiting all organizations interested in display and control prototyping or development. This activity will cover both shuttle and station and all future programs. We are developing a team of highly motivated personnel who are on the leading edge of display and control development technology," Whiteley said.

"It is something we really need at JSC in terms of engineers being innovative and not being afraid of failure and change," said Cliff Farmer, chief of the Display and Control Development Office.

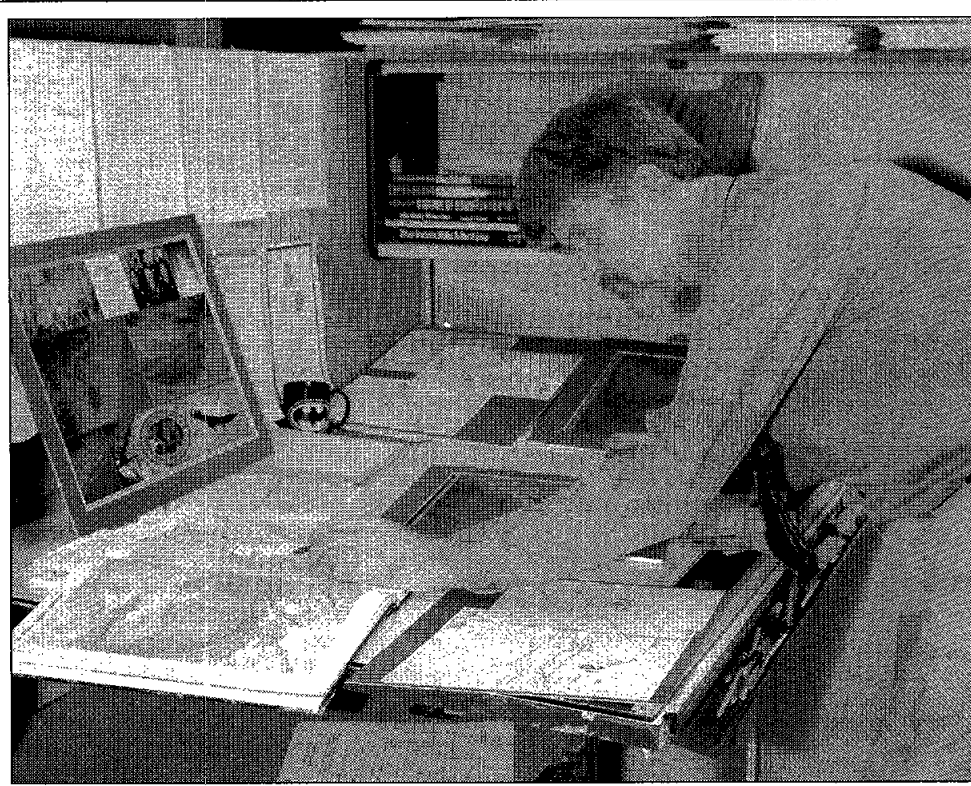
During the development of the lab, Tony Bruins, an engineer for the RAPID lab, saw a need for training employees in innovation techniques.

"This idea was based on the fact that JSC will be either on the leading or bleeding edge of technology," Bruins said. "If we are on the bleeding edge, we will be forced to change because of budget cuts. I saw the need to educate employees on creative and innovative techniques."

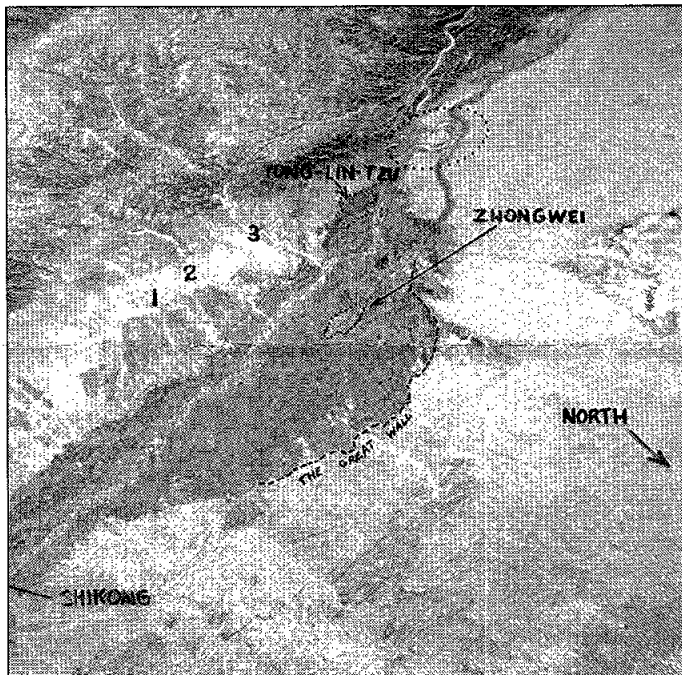
Bruins approached his division chief, who in cooperation with the Space Flight Training Division, supports the idea for training.

"We are really interested in sparking the JSC creative spirit," said

Please see **INNOVATION**, Page 4



Above: Dave Russell of the Information Services Directorate's Center Publications and Graphics team works on an overlay for an Earth observations photograph destined for 12-year-old brain cancer patient Gregory De Lorenzo. Right: The photograph, taken during STS-68 and enhanced with the help of a hand-drawn overlay, shows exactly where the Great Wall of China can be seen.



JSC Photos by Benny Benavides

Images for imagination

Gift slakes cancer patient's thirst for knowledge

A 12-year-old brain cancer patient from Dix Hills, N.Y., received a special holiday gift this year from friends at JSC who have put together a package of shuttle images of the Great Wall of China.

Gregory De Lorenzo, who has been going through a series of radiation treatments this fall, voiced an intense interest in America's space program to his aunt and uncle, Mario and Marie Suriano. They are friends with Alan S. "Bud" MacKenzie, a program manager at ISC, one of the Information Services Directorate's prime contractors.

MacKenzie wrote a letter to ISD Deputy Director Ron Berry telling him about De Lorenzo and his interest in images of the Great Wall of China taken from space and asking for help in raising the boy's spirits.

"Gregory's strong interest in gaining knowledge about the world around him through space exploration really struck a responsive chord with a lot of us here at JSC—especially given the very difficult situation in which he finds himself," Berry said. "It underscores on a very personal level what we're all about here."

ISD's Sheri Dunnette coordinated the project, which involved the production of an STS-68 photographic montage, a set of navigation charts and Earth observations photographs that detailed exactly where the Great Wall is, and a short video that included a downlink discussion by astronauts viewing the wall from orbit.

"Overall, the package we put together for

Please see **ISD**, Page 4

Kraft names review team participants

Former JSC Director Chris Kraft has named the members of the independent review team that will develop a proposal that includes innovative concepts and tools for managing the shuttle program.

The team, made up of aerospace executives, business leaders and current and former NASA officials, was chartered by NASA Administrator Daniel Goldin. The team is expected to present its results by March 15.

The five-member team includes: Frank Borman, former Eastern Airlines chief executive officer and retired astronaut; George Jeffs, former president of Rockwell International's North American Aerospace Operations; Robert Lindstrom, former senior vice president and general manager for space operations at Thiokol Corp. and retired manager of the Space Shuttle Projects Office at Marshall Space Flight Center; Thomas Maultsby, General Research Corp. vice president and former senior Department of Defense representative to NASA Headquarters; and Isom Rigell, former vice president, Florida operations for United Space Boosters Inc., and retired director, shuttle payloads and former director, launch vehicle operations at the Kennedy Space Center.

Technical advisers to the team will include: Jay Honeycutt, director for shuttle management and operations at KSC; Dave Leestma, director of Flight Crew Operations at JSC; William Mackey, Houston businessman and former chairman of the board of Lifemark Corp.; John O'Neill, director of Mission Operations at JSC; George Page, former KSC deputy director; Cary Rutland, Solid Rocket Booster Project manager at MSFC; and Bob Sieck, launch director at KSC.

The team met Monday with NASA managers and contractors at KSC. They will meet next week at JSC with NASA and contractor personnel involved with shuttle management and operations from both JSC and MSFC.

Discovery crew checks payloads for mission

By James Hartsfield

With payloads now aboard, work to ready *Discovery* for launch in early February 1995 remains on track in Kennedy Space Center's Bay 2 shuttle processing hangar.

Integrated tests were performed this week on the connections between the Spacehab module and *Discovery* and between the Orbital Debris and Radar Calibration Spheres experiment and the shuttle. Checks of connections with the Shuttle Pointed Autonomous Research Tool for Astronomy satellite were completed as well.

Other work on *Discovery* included an inspection of the cargo bay and payloads by the crew—Commander Jim Wetherbee, Pilot Eileen Collins, Payload Commander Bernard Harris and Mission Specialists Mike Foale, Janice Voss and Vladimir Titov—during the Crew and Equipment Interface Verification Test.

Elsewhere, work on *Endeavour* in preparation to carry ASTRO-2 aloft on STS-67 included installation of cryogenic lines for the extended duration orbiter pallet connections. Preparations also are under way to install the ASTRO-2 astronomy observatory in the cargo bay.



JSC engineers heading for classrooms again

JSC employees will spread to the four winds to talk to students in area classrooms as part of JSC's observance of National Engineers Week, which runs Feb. 19-25.

Through JSC's Educational Outreach Program, employees will visit classrooms to accomplish several objectives. As many children think an engineer runs a train, the younger ones will be acquainted with what engineers at JSC do. Older children need to know how their studies will apply in real life. Young adults may be unsure of career directions and want information about why people choose to be engineers and exactly what

paths were taken to accomplish the goal of becoming an engineer.

JSC Director Dr. Carolyn Huntoon plans to visit a classroom during National Engineers Week and is encouraging wide participation among JSC management and employees.

The 1995 JSC program goal is to recruit more volunteers to go into classrooms and reach even more students than in past years. JSC already has exceeded last year's number of requests and they are still coming in.

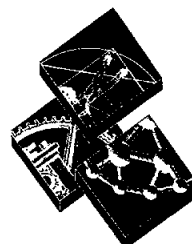
"Whose responsibility is our children's education?" asked Norma Rhoads, JSC Educational Outreach Program manager. "Is it just the

schools; just the teachers? Or, does the responsibility rest on all of us? The responsibility of 'our' children's education rests on each of us. It is a shared responsibility. By taking part, we enhance the school curriculum and maybe even inspire some of the children, but also we enrich our lives by giving back to the community."

Resources such as hands-on activities, exhibits, videos, and hand-out materials will be available to volunteers.

JSC's Educational Outreach Program is part of JSC's commitment to the community and our school chil-

Please see **EMPLOYEES**, Page 4



ENGINEERS
 Turning Ideas
 Into Reality
 National Engineers Week,
 February 19-25, 1995

Hubble rules out leading dark matter explanation

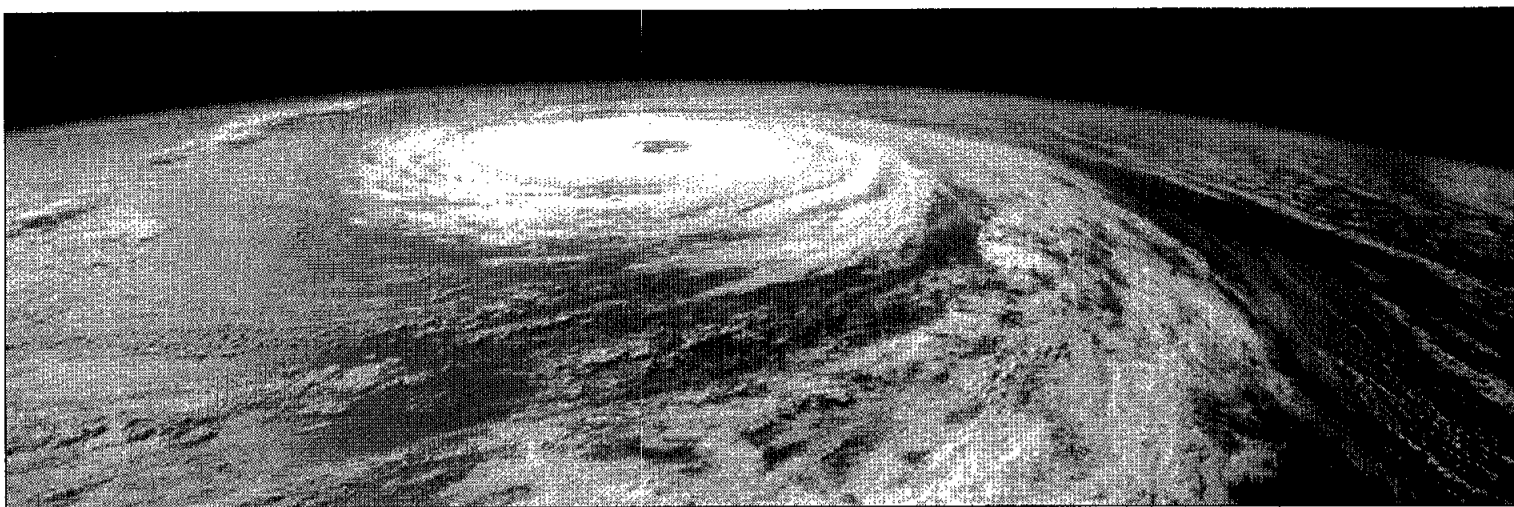
Using images from the Hubble Space Telescope, astronomers have ruled out the possibility that red dwarf stars constitute the invisible matter, called dark matter, believed to account for more than 90 percent of the universe's mass.

Until now, the dim, small stars were considered ideal candidates for dark matter. The dark matter's gravitational pull determines whether the universe will expand forever or someday collapse.

"Our results increase the mystery of the missing mass. They rule out a popular but conservative interpretation of dark matter," said Dr. John Bahcall of the Institute of Advanced Study, Princeton, N.J.

A team, led by Bahcall and Andrew Gould of Ohio State University, showed that faint red dwarf stars, which

Please see **ASTRONOMERS**, Page 4



ATLAS-3 mission measures atmosphere

STS-66 crew works around the clock for Mission to Planet Earth

Atlantis and its six-member crew worked around the clock on the third Atmospheric Laboratory for Applications and Science mission.

Commander Donald McMonagle, Pilot Curt Brown, Payload Commander Ellen Ochoa, and Mission Specialists Scott Parazynski, Joe Tanner and Jean-François Clervoy collected invaluable data from several experiments on board during the 11 day flight.

Top to bottom, left to right:

1) Hurricane Florence in the Atlantic Ocean, about 400 miles from Bermuda, was one of a number of storm systems the astronauts captured detail on around the globe.

2) McMonagle works with the Heat Pipe Performance experiment. HPP-2 was flown to investigate thermal

performance and fluid dynamics of heat pipes, which are being examined to help design systems for removing excess heat from future spacecraft and space stations.

3) Using the shuttle's robot arm, the crew deploys the Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere and its Shuttle Pallet Satellite. The crew deployed CHRISTA-SPAS Nov. 4 and retrieved it Nov. 12.

4) The crew poses for the traditional in-flight crew portrait on Atlantis' flight deck. Counterclockwise from upper left are Ochoa, Tanner, McMonagle, Parazynski, Brown and Clervoy.

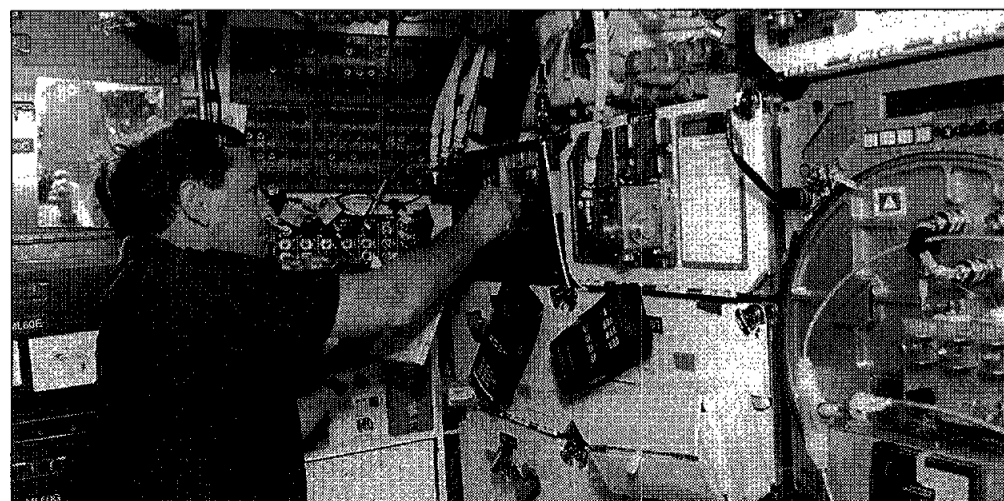
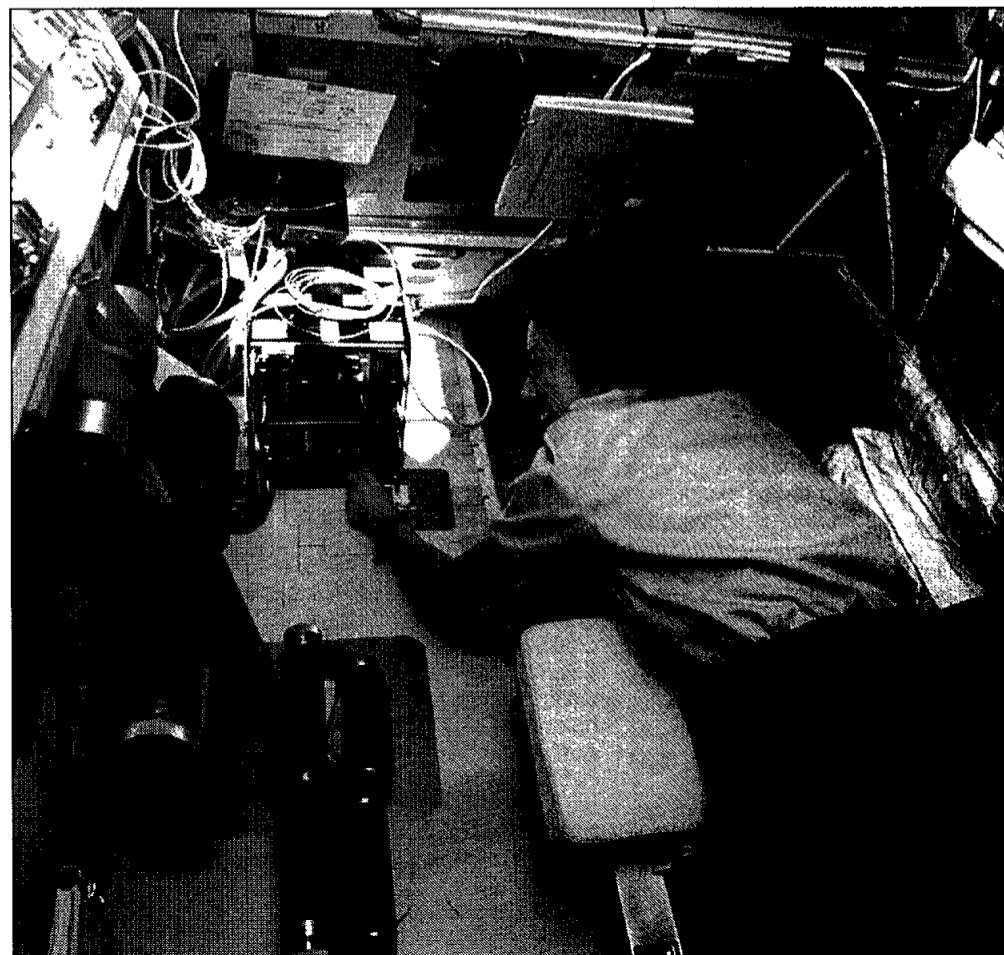
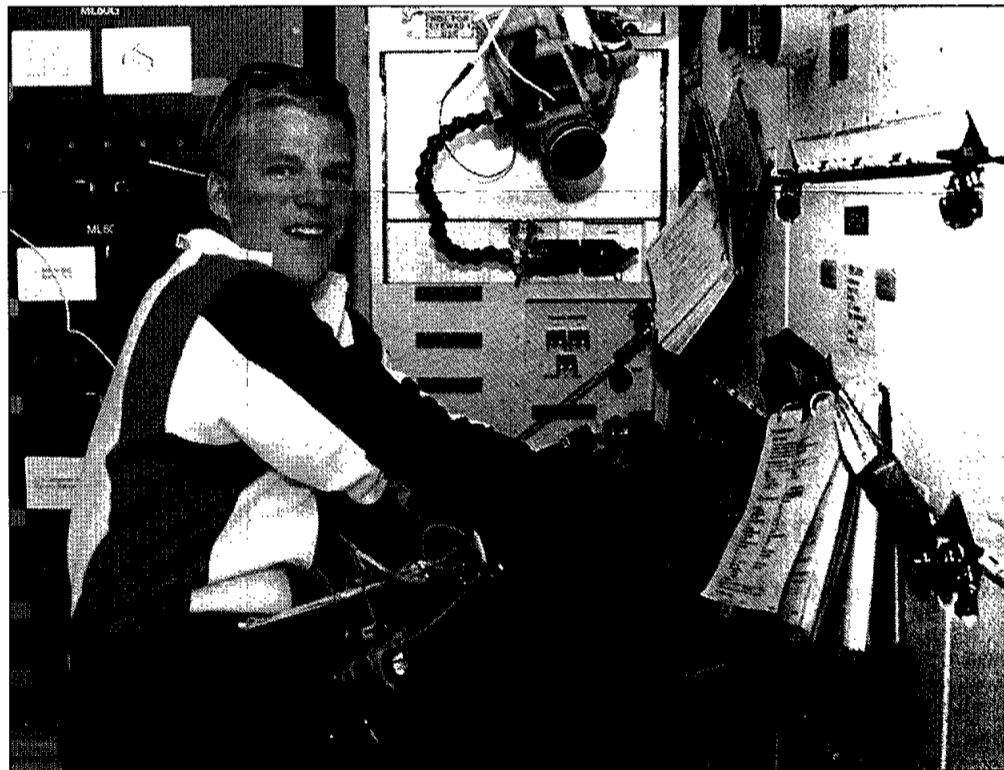
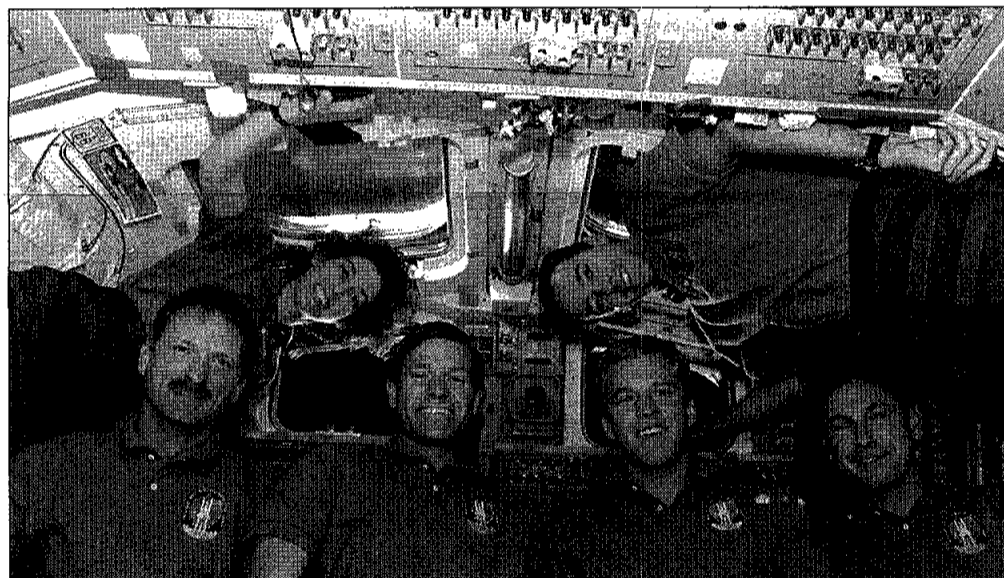
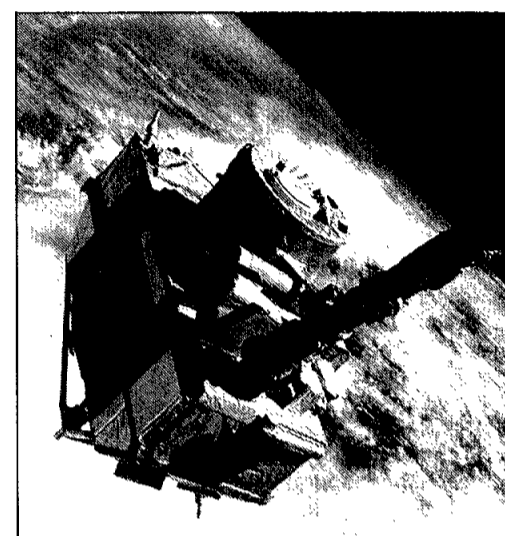
5) Parazynski works at the Vapor Diffusion Apparatus which supported the Protein Crystal Growth experiment. Crystal growth experiments are helping scientists study the structures of proteins

and other macromolecules such as viruses.

6) Clervoy, from the European Space Agency, moves a platform for the recumbent seat device. The seat, which reclines, is being tested for use by astronauts who are returning to Earth after long stays aboard Russia's Mir space station.

7) Ochoa checks out a pair of 8mm video tape recorders that support the Atmospheric Trace Molecule Spectroscopy experiment, which measured the chemical and physical composition of the middle atmosphere.

8) Brown works with the Space Acceleration Measurement System. SAMS supports PCG experiments by collecting and recording data to characterize the microgravity environment on the shuttle middeck. □



Astronomers count red dwarf stars like pebbles on beach

Observations with Hubble Space Telescope show Milky Way has relatively few such faint, low-mass stars

(Continued from Page 1)

were thought to be abundant, actually are sparse in the Earth's home galaxy, and in the universe.

Another team, led by Dr. Francesco Paresce of the Space Telescope Science Institute in Baltimore, determined that the faint red stars rarely form and that there is a cutoff point below which nature does not make this type of dim, low-mass star.

The space telescope observations accurately count stars and gauge their brightness. The observations overturn several decades of conjecture, theory and observation about the typical mass and abundance of the smallest stars in the universe.

In our own stellar neighborhood, there are almost as many red dwarfs as there are all other types of stars put together. The general

trend throughout our galaxy is that small stars are more plentiful than larger stars, just as there are more pebbles on the beach than rocks. This led many astronomers to believe that they were only seeing the tip of the iceberg and that many more extremely faint red dwarf stars were at the limits of detection with ground-based instruments.

Over the past two decades, theoreticians have suggested that the lowest mass stars also should be the most prevalent and therefore might provide a solution for dark matter. This seemed to be supported by previous observations with ground-based telescopes that hinted at an unexpected abundance of what appeared to be red stars at the faintest detection levels achievable from the ground.

However, these prior observations were uncertain because the light from these faint objects is blurred slightly by Earth's turbulent atmosphere. This makes the red stars appear indistinguishable from the far more distant, diffuse-looking galaxies.

Hubble's capabilities made it possible for the team of astronomers led by Bahcall and Gould to observe red stars that are 100 times dimmer than those detectable from the ground—a level where stars can be distinguished easily from galaxies. Hubble Space Telescope's extremely high resolution also can separate faint stars from the much more numerous galaxies by resolving the stars as distinct points of light, as opposed to the "fuzzy" extended signature of a remote galaxy.

Bahcall and Gould, with their colleagues used images of random areas in the sky taken with the HST Wide Field Planetary Camera 2 while the telescope was performing scheduled observations with other instruments. By counting the number of faint stars in the areas observed by HST, the scientists demonstrated that the Milky Way has relatively few.

The HST observations show that dim red stars make up no more than 6 percent of the mass in the halo of the galaxy, and no more than 15 percent of the mass of the Milky Way's disk. The halo is a vast spherical region that envelops the Milky Way's spiral disk.

The HST findings are the latest contribution to a series of recent, intriguing astronomical observations that are struggling to pin down the elusive truth behind the universe's "missing mass."



HUBBLE SPACE TELESCOPE

Workers avert water damage

Quick action by Space Station Integrated Training Facility workers averted expensive damage last week when a vent hose bib covering a drain pipe for chilled water burst under pressure in Bldg. 5 South.

The cover burst under the raised computer floor about 4:40 p.m. Dec. 1, when no one was on the third floor.

Isaac Stubbs, of CAE/Link had taken the elevator up to the second floor and noticed water running out from the ceiling. Stubbs immediately notified authorities, who dispatched a response team and contacted Center Operations.

While Johnson Controls workers worked to isolate the leak, SOC maintenance and operations personnel began disaster response procedures to protect the computer equipment on the first floor.

The computer equipment is being used to develop simulation applications for the ISSA Integrated Training Facility. Damage could have resulted in significant delays in ISSA ITF development deliveries. The equipment itself has a replacement cost of several million dollars.

SOC personnel who helped prevent damage to the computer equipment included Allied Signal Technical Services employees E.J. Emery, Jack Wright, Jim Svehla, Carl Edmonson, Curtis Tater, Mark Burns, Ray Gonzales, Vance Jow, Shawn McFerrin, Marjerie Filler, Sam Parker, and Joe Reyna.

Choirs perform for employees

The JSC cafeteria and Public Affairs will host choir programs next week for JSC employees.

The Lockheed Choir and Brass Band will perform sounds of the holiday season at 11:30 a.m. Tuesday in the Bldg. 3 cafeteria. The fourth and fifth grade choir from McWhirter Elementary will sing carols at 12:30 p.m. Thursday in Teague Auditorium.

Space Center Houston will host choirs beginning Saturday. Several choirs will perform at noon Saturday and Sunday. There will be one performance at 1 p.m., Dec. 16, two at noon Dec. 17, and one at 1 p.m. Dec. 22. There is no additional charge.

Employees share experience, dreams

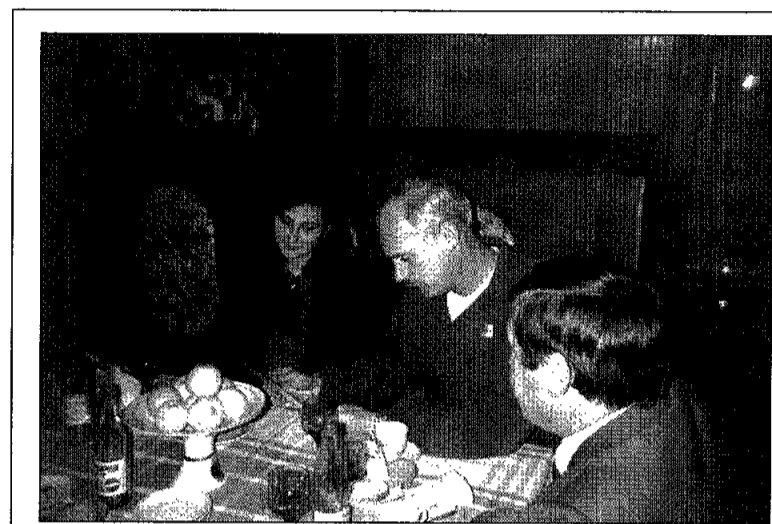
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dren, in particular, Rhoads said. Part of NASA's mission is education, and NASA employees have a unique opportunity to use space exploration to capture the interest of young people.

NASA Administrator Daniel Goldin also challenged each NASA employee to do his or her part:

"Our nation is facing many social problems and each of us has a responsibility to get involved. NASA, as a member of the federal community, must do its part to foster the spirit of community service."

Our responsibility is to capture our young people's interest, help them develop self-confidence and self-esteem, challenge the limits of their knowledge, and assist them in turning their dreams into reality.



Natasha Doroshenko, left, receives a Silver Snoopy Award from Bill Readdy, NASA's manager of operations activities at Star City, Russia. She is the first Russian to earn the coveted award.

Snoopy salutes Russian effort

Silver Snoopy Awards have been around the world many times, as each one is flown aboard the shuttle before it is presented, but Snoopy's recent landing in Russia was a first.

The astronaut corps' personal recognition of excellence in support of the space program recently was presented to Natasha Doroshenko, an administrative assistant and secretary for NASA's Operations Office in Star City, Russia.

"Natasha has rapidly established herself as a vital part of our NASA team in Star City," said Bill Readdy, NASA's manager of operational activities. "We're awfully lucky to have someone with her talents and 'can do' attitude."

Doroshenko is an employee of Tech Trans International, the company providing translation and support services to JSC and other NASA employees at the Star City training facility in Russia. In addition to supporting technical needs at Star City and translating technical documents, Doroshenko helps JSC employees and their families feel at home.

"Natasha has selflessly dedicated evenings and weekends to ensure that crew members, technical specialists and family members are properly taken care of," Readdy said. "Without her dedication and team spirit, we would not be able to accomplish our mission in Star City."

ISD employees put together package for cancer patient

(Continued from Page 1)

this was outstanding," Dunnette said. "The people involved were obviously very touched by Gregory and really put a lot of effort into this project."

Barry Schroder, an image analyst with RMS Photographic Services in the Imagery Services Branch gathered film from several shuttle missions in which photographs of the Great Wall could be found. Two were selected and compared to maps of the area.

Dave Russell, a graphic artist with Hernandez Engineering in the Publications and Administrative Support Branch, took a deep interest in De Lorenzo and his illness, working beyond the call of duty to put together the montage that the STS-68 crew signed, Dunnette said.

The montage included two pictures of the Great Wall, as well as photos of the crew, launch, landing, and De Lorenzo's hometown on Long Island. In addition, Russell mounted color copies of the charts

with detailed annotations showing exactly where the Great Wall was in the photographs. He also used large prints of the two pictures from the montage to create an interactive photograph with an acetate overlay illustrating the location of the Great Wall.

Dunnette also worked with scene lists in the Imagery Services Branch to select footage taken during STS-68 that included the voices of two crew members talking excitedly about the Great Wall.

The package was shipped to De Lorenzo on Dec. 1, just in time for the start of the holidays.

"On behalf of Gregory and his parents, I would like to thank all of the NASA/JSC people who have reached out uniquely to touch Gregory and his family, and who have succeeded in giving them much hope for the future," MacKenzie said. "You should all be commended for your tremendous outpouring of good will and support to our new friend, Gregory De Lorenzo."

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Editor Kelly Humphries
Associate Editor Karen Schmidt

Innovation classes available to help employees help themselves improve

(Continued from Page 1)

Frank Hughes, chief of the Space Flight Training Division. "We want to make sure all of the innovation that is possible is being turned loose on our projects here at the center. This training will provoke that kind of response."

In cooperation with Human Resources and Dr. Jack Matson of Penn State University, a pilot workshop is being developed to promote innovation. The pilot program will feature two different classes, one aimed at engineers and scientists and one designed especially for managers.

Data was collected by Bruins and Matson from several MOD division chiefs and Human Resources

to develop the program. With this information, and aid from the Space Flight Training Division, specific exercises for the engineers and managers were developed.

"I am very excited to see the classes brought to JSC because principles behind them are just what we need with the huge challenges all of us at JSC face today," said Bob Holkan, chief of the Simulator Operations and Technology Division. Holkan helped prepare the exercises for the training classes.

For more information on the RAPID lab contact Cliff Farmer at x39529. Training class questions should be directed to Beth Hall at x33078.