National Aeronautics and Space Administration


Team training


Earned value
Mission Operations Directorate's contractors earn Certificates of Validation. Photos on Page 4.

## Space News Roundup

## Galileo finds changes on Jupiter's moon

A new image of Jupiter's volcanically active moon lo, returned by NASA's Galileo spacecraft, shows that significant changes have occurred on the moon since lo was observed 17 years ago by the exploratory NASA spacecraft Voyagers 1 and 2 .
"The changes we are seeing on lo are dramatic," said Galileo camera team leader Michael Belton of the National Optical Astronomical Observatories in Tucson, Ariz. lo's landscape undergoes constant change due to numerous sulfur volcanoes that continually erupt across its mottled orange and white face, he said. "The colors of material on the ground and their distribution have changed substantially since the Voyager fly-
bys of 1979."
One of the most striking changes noted in the image are new deposits of sulfur and sulfur dioxide frost deposited from the volcano Masubi in lo's southern hemisphere "The sulfur dioxide gas that drives the volcano makes a big plume, condenses, then paints the surface white," Belton said Masubi was discovered as an active volcano during the Voyager encounters of lo.
Galileo's first color image of lo was taken June 25 at a range of 1.4 million miles during the spacecraft's approach to Jupiter's largest moon, Ganymede. The smallest features that can be discerned in the new image of to are approximately 14 miles in
size, a resolution comparable to the best Voyager images of the same face of lo. Galileo promises to return new views of volcanic activity on to throughout the spacecraft's remaining 17 -month mission orbiting Jupiter. Higher resolution images of lo will be taken in coming months.

Launched in October 1989, Galileo entered orbit around Jupiter on Dec. 7, 1995. The spacecraft's mission is to conduct detailed studies of the giant planet, its largest moons and the Jovian magnetic environment.
More information on the Galileo mission is available on line at URL
http://www.jpl.nasa.gov/galileo


The mottled face of Jupiter's volcanically active moon lo, viewed by the camera onboard NASA's Galileo spacecraft, shows dramatic changes since it was seen 17 years ago by the exploratory NASA spacecraft Voyagers 1 and 2.

## Chamber team shares memories

The four JSC volunteers who spent 30 days sealed in a special, air-tight chamber in Bldg. 7 as part of the Advanced Life Support Early Human Testing Initiative will share memories with employees, family and friends Wednesday in Teague Auditorium.
Test Team Lead Doug Ming, Lead Engineer John Lewis, Lead Electrician Pat O'Rear and Thermal Syscian Pat Rear and Thermal sys-
tems Expert Katy Hurlbert will distems Expert Katy Hurbert will discuss
20 -foot diameter chamber recycling 20 -foot diameter chamber recycling
air and water during their stay. Two air and water during their stay. Two
additional tests are planned for additional tests are planned for
1997, a 60 -day and 90 -day test, with 1997, a 60 -day and 90 -day test, with
the latter using both plants and the latter using both plants and
physiochemical means for recycling air and water
In addition to the briefing by the crew, JSC Director George Abbey and Engineering Director Leonard Nicholson will recognize key individuals and groups who contributed to the success of the Regenerative Life Support Program and discuss future plans for extended duration testing.
The invitation is being broadened to include not only JSC employees, but their friends and family members and off-site contractors and their guests. Visitors are encouraged to use JSC Gate 2 (in front of Bldg. 1 off of NASA Road 1).


From left, STS-79 Mission Specialists Carl Walz and Jay Apt check out the layout of the double Spacehab module with Chris Jaskola of McDonnel Douglas. The double module configuration will be flown for the first time on STS-79, allowing for more room for experiments and supplies for the Russian Mir Space Station. This is one of the many training requirements the astronauts perform before a mission. For more details see page 3 .


## Fa

## Atlantis awaits new solid rocket boosters in VAB

## The change out of Atlantis' solid and external tank

 rocket boosters continues to go smoothly as engineers prepare to mate the orbiter in the next few weeks.Atlantis remains in the Vehicle Assembly Bldg. at Kennedy Space Center and engineers completed leak checks and joint close-out work on the new left booster mid-week. Work began Wednesday to stack the right booster segments. Booster stacking operations are expected to be completed Monday and engineers will then begin work to mate the boosters to the external tank Tuesday. On Wednesday, technicians will demate Atlantis' boosters to prepare the orbiter for its new set of pare the

Atlantis is scheduled to roll from he VAB to the Orbiter Processing Facility Aug. 13 to await the completion of the mating of the boosters to then roll back mated with the new set of boosters


ATLANTIS

Roll out to KSC's Launch Pad 39A scheduled for Aug. 20 and a fina dress rehearsal of the launch countdown with Commander Bill Readdy Pilot Terry Wilcutt, Mission Specialists Tom Akers, Jay Apt, Carl Walz and John Blaha is scheduled for Aug. 27 and 28.
Aug. 27 and 28 . The tentative launch the fourth docking to the Russian Mir Space Station. The nine-day mission will retrieve Astronaut Shannon Lucid from Mir and drop off Blaha who will begin a four-month stay on the Russian outpost. Blaha will join the Mir 22 crewder Gennady Manakov light Engineer Pavel Vinogradov Claudie Andre-Deschays
During the mission, Atlantis' astronauts and the Mir cosmonauts will focus on a variety of microgravity and life science experiments in the Spacehab double module-the first

Please see DISCOVERY, Page 4

## Lucid writes home about space walking protocol

(Editors note: Mir 21 Cosmonaut Researcher Shannon Lucid recently sent a letter home from the Russian Mir Space Station as the crew begins to wrap up its science work in anticipation of the journey home to Earth. The following is the text of her letter.)

Dear Everybody,
Another week, another EVA-or at least that is what it seems like right now here on the space station Mir. Yuri and Yuri have just finished their fourth EVA in less than three weeks and are busy at this very moment getting ready for their fifth. There may even be a sixth. Even by Russian standards, that is a lot. Their fourth EVA was done on their 100th day in space. In answer to your question, no, it is not a routine, business as usual activity; there is a very real sense of anticipation that steadily increases as the EVA time approaches and peaks during the actual event. We have, though, established a certain working pattern preparing for these EVAs.
Several days in advance, Yuri and Yuri check out their spacesuits. Spacesuits are left here on Mir and used over and over; each crew person adjusts the size to fit himself. When a problem develops that can't be repaired by a crew person, the suit is replaced. The suit that Yuri is currently using has been used for more than 13 EVAs. After
the suits are checked out, any changes in wiring or telemetry are made. If Yuri and Yuri are taking a payload out, it is positioned in the airlock. Yuri and Yuri then spend some time looking over procedures and discussing, what they will be doing. Then, they gather together all the tools they'll be using and fasten them onto their tool tray.
Because of our current orbits, we don't have much communication coverage during our day, so all the EVAs have been done in the middle of the night. On the day of an EVA, we get up a little later than usual. After breakfast, Yuri and Yuri check their spacesuits again and the ground looks at telemetry to make certain that everything is in good shape. We have a quick lunch and then a rest period. And yes, we are turned off in a module, it is really you just go to sleep.
After getting up, we wait until time to go out the hatch. Yuri and Yuri put on their white undergarments that have tubes sewn in the body, the head and the upper legs and arms. These tubes are for circulating water to cool the cosmonauts while they are doing the EVA. At this point in time there is very little communication capability with mission control,
so we are pretty much on our own. Just before time to enter the hatch, Yuri takes a big piece of red tape and puts it across the communication controls that I am absolutely not to touch while they are outside. He did this for the first EVA and the tape has now become a "tradition" that signals it is time to leave. I think that if I were the commander leaving a foreigner in my spacecraft all alone, I would wrap the entire place up in red tape.
The Russians have a tradition of everyone sitting quietly and collecting their thoughts before they begin a trip or start a new activity. That is what we do just before they leave for the airlock. We sit quietly together for a few minutes in the base block. Then Yuri says let's go, and both Yuris fly, literally, over my head like two white geese headed south. They exit the base block with a wave and they are off to the airlock. A few minutes later, l hear the airiock clang shut, and there I am, all alone in the space station.
Communication is very good between the rew people here on Mir, so I hear all the preparations that are going on as they are getting the airlock ready for depressurization.放
we are flying over, what time the next communication pass will be, or what I am doing. Finally, I hear them exiting the airlock and leaving the station. I was taken totally by surprise the first time this happened because it seemed that, no sooner were they out of the airlock, than Yuri was yelling at me to look out the window and start taking pictures. I looked out and there was my commander perched on the end of a very long white pole arcing over the blue and white earth below. Because the station is so big, this pole is used to trans port a crew person and payload from one segment to another. It is manually moved by the other crew person. My first thought when I saw this was, "Wow, the future is now. This is real space station work." For a number of years now, I have been seeing artist renditions of what it would be like when the International Space Station is being worked on in a routine manner by astronauts, but this was no artistic fantasy; this was real life. This was the "future" being played out in real time, and I was getting to have a small part in it How could one person be so fortunate?

Unfortunately, Mir is big and the windows are relatively few, so I can only see bits and pieces of the EVA. After one EVA when Yuri and Yuri were looking at the video I had taken, they asked why I only photographed

Please see LUCID Page

## Ticket Window

## JSC

## Dates \& Data

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store
rom 10 a.m. -2 p.m. Monday-Thursday and 9 a.m. -3 p.m. Friday. For more information, call from 10 a.m. -2 p.m.
$\times 35350$ or $\times 30990$.
Houston Astr
ets cost $\$ 16.50$.
Houston As
ts cost $\$ 14.50$.
Lovin Feeling
Lovin Feelings Concert: 7 p.m. Sept. 28 at the Summit. Tickets cost $\$ 37$
Train Trip: Nov 6-12, $\$ 995$ per person, $\$ 200$ deposit
Sam Houston Race Park: $\$ 10$ value pack for $\$ 5.25$, includes Club Level seating, program,
Sal
p sheet, admission, preferred parking and gift
Splashtown: One day pass cost $\$ 14.25$.
Schlitterbahn: One day pass cost $\$ 19.75$ for adults, $\$ 16.95$ for children
Astroworld: One day pass cost $\$ 22.75$, two day pass cost $\$ 34.25$.
Fiesta Texas: One day pass cost $\$ 22.75$, two day pass cost $\$ 34.25$.
Six Flags at Arlington: One day pass cost $\$ 22.75$, two day pass cost $\$ 34.25$
Sea World: Adullt tickets cost $\$ 24.50$, children ( $33-11$ cost $\$ 17.25$.
Space Center Houston: Discount tickets, adult, $\$ 8.75$; children (4-11), $\$ 6.25$, annual mem bership, $\$ 22.95$, family membership, $\$ 59.95$.
Movie discounts: General Cinema, $\$ 4.75$; AMC Theater, $\$ 4.50$; Sony Loew's Theater,
Stamps: Book of $20, \$ 6.40$.
JSC history: Suddenly, Tomorrow Came: A History of the Johnson Space Center. Cost is
Metro tickets: Passes, books and single tickets available.
Aug. 7 good for one day only and cost $\$ 9.95$.

## Gilruth Center News

Sign up policy: All classes and athletic activities are first come, first served. Sign up in person the Gilruth Center and show a NASA badge or yellow EAA dependent badge. Classes tend to fill of registration. No registration will be taken by telephone. For more information, call x 30304 . EAA badges: Dependents and spouses may apply for photo identification badges from 7:30 m. 9 p.m. Monday-Friday; and 8 a.m. 4 p.m. Saturdays. Dependents must be between 16 and years old.
Fitress C
Fitness Challenge: 1996 Fitness Challenge runs to Aug. 31 . Em
$\$ 10$ gitt certificates. For more information call Larry Wier at $\times 30301$.

## Defensive driving: One day course is offered once a month. Cost

ould call the Gilruth.
Stamp club: Meets at 7 p.m. every 2nd and 4th Monday in Rm. 216 ednesdays. Cost is $\$ 25$ a month.
Weight safert is $\$ 25$ a month. 9:30 p.m. Aug. 12. Pre-registration is required. Cost is $\$ 5$.
Exercise: Low-impact class meets from $5: 15-6: 15$ p.m. Mondays and Wednesdays
Aikido: Martial arts class meets from 6:15-7:15 p.m. Tuesday and Wednesday. Cost is $\$ 25$ per month. New classes begin first of each month.
Aerobics: Class meets from $5: 15-6: 15 \mathrm{p} . \mathrm{m}$. Monday, Tuesday and Thursday.
Ballroom dancing: $\mathbf{C o s t}$ is $\$ 60$.
Ballroom dancing: Cost is $\$ 60$ per couple. For additional information call the Gilruth Center at
Country and Western dancing: Beginner class meets 7-8:30 p.m. Monday. Advance class
Fitness program. Monday. Cost is $\$ 20$ per couple.
Fitness program: Health Related Fitness Program includes a medical examination screening
and a 12 -week individually prescribed exercise program. For more information, call Larry Wier at
$\times 30301$.

## Today

Cafeteria menu: Special: baked meatloar. Total Health: baked potato. Entrees: chicken fajitas, ham steak, pork and beef eggrolls, steamed fish gumbo Vegetables: stewed toma toes, seasoned spinach, cut corn macaroni and cheese.

## Monday

Radio club meets: The JSC Amateur Radio Club will meet at noon Aug. 29 in Bldg. 16 Rm. 253. For more information call Larry Dietrich at $\times 39198$.
Cafeteria menu: Special: Italian cutlet. Total Health: roast beef au jus. Entrees: chicken a la king, nchiladas with chili, vegetable asagna, steamed pollock, French dip sandwich. Soup: split pea and ham. Vegetables: Brussels sprouts, oriental vegetables, buttered carrots, lima beans.

## Tuesday

Cafeteria menu: Special: stuffed cabbage rolls. Total Health: roasted turkey. Entrees: turkey and dressing, country style steak and hash browns, beef ravioli, baked chicken, fried cod
fish. Soup: tomato Florentine. Vegefish. Soup: tomato Florentine. Vege-
tables: Italian blend, okra and tomatables: Italian blend, okra and tom
toes, corn cobbette, navy beans.

## Wednesday

Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. July 31 at the House of Prayer Lutheran Church. For more information call Jeannette Kirinich $\times 45752$.
Astronomy seminar: The JSC Astronomy Seminar will meet at noon July 31 in Bldg. 31, Rm. 129. An open discussion meetion is Al Jackson at x35037.

Cabaret show: The Employee Activities Association presents "Cabaret" at 8 p.m. Aug. 17 at the

1894 Grand Opera House, Galves ton. Tickets cost $\$ 23$ and are on
sale at the Bldg. 11 Exchange store sale at the Bld
Cafeteria menu: Special: peppe teak. Total Health: stir fry pork with rice. Entrees: liver and onions, stir fry pork with rice, steamed fish western special, Reuben sandwich. Vegetables: steamed broccoli, yelow squash, macaroni and cheese vegetable sticks.

## Thursday

Warning system test: The sitewide Employee Warning System will under go its monthly audio test at noon Aug. 1. For more information call Bob Gaffney at x34249.
Cafeteria menu: Special: chick en fried steak. Total Health: baked potato. Entrees: beef tacos, steamed pollock, baked chicken, catfish special. Soup: navy bean. Vegetables: spinach, cut corn breaded okra, pinto beans.

## Friday

Cafeteria menu: Special: tuna noodle casserole. Total Health: baked potato. Entrees: steamed salmon steak, baked chicken, fried cod fish, ham steak. Soup: seafood gumbo. Vegetables: French cut green beans, green peas, blackeyed peas, cauliflower with cheese.
Aug. 6
ABWA meets: The American Business Women's Association, Clear Lake Area Chapter will meet at 5:30 p.m. Aug. 6 at Bay Oaks Country Club. For more information call Nancy Hutchins at x34006.

## Aug. 8

Airplane club meets: The Radio Control Airplane Club will meet at 7:30 p.m. Aug. 8 at the Clear Lake Park Community Bldg. For more information call Bill Langdoc at

## $\times 35970$.

Aug. 9
Astronomers meet: The JSC Astronomical Society will meet a 7:30 p.m. Aug. 9 at the Lunar \& Planetary Institute 3600 Bay Area Blvd. For more information cal Chuck Shaw at x35416.
Aug. 13
BAAC meets: The Bay Area Aero Club will meet at 7 p.m. Aug. 13 at the Houston Gulf Airport in League City. For more information call Jerry Adair at x38058.

## Aug. 14

MAES meets: The Society of Mexican American Engineers and Scientists will meet at 11:30 a.m. Aug. 14 in the Bldg. 3 Cafeteria executive dining room. For more information call Michael Ruiz at $\times 38169$.

## Aug. 15

Directors meet: The Space Family Education board of Directors will meet at 11:30 a.m. Aug. 15 in Bldg. 45 Rm .712 D . For more information on this open meeting call Gretchen Thomas at x37664

## Aug. 21

Scuba club meets: The Lunarfins will meet at 7:30 p.m. Aug. 21 at Redfish Restaurant under the Kemah/Seabrook Bridge, Seabrook Side. For more information call Fred Toole at x33201.

## Aug. 22

NASA open forum: NASA will conduct an open forum meeting to solicit responses concerning NASA's procurement policies and practices from 2-4 p.m. Aug. 22 at
the Teague Auditorium. For more the Teague Auditorium. For more Assistance Office at $\times 34511$.

## Swap Shop

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#### Abstract

88 Dodge Aries K, 4 dr, new hoses/batt/radiator, 1.5 k obo. Greg, $\mathbf{x} 34391$ or $335-8098$ $\$ 1.5 \mathrm{k}$ obo. Greg, x34391 or $335-8098$.  Ma Eagle Talon Tsi turbo load ' 0 Eagle Talon Tsi turbo, loaded, CD/cass, alarm, ex cond, $\$ 8 \mathrm{k}$. Ryan, $\mathbf{x} 34474$ or $286-7971$ '84 Corvette, auto, removable top, silver, good cond, $\$ 7.5 \mathrm{k}$. $333-19113$, cond, \$7.55. 333-9113. '88 Pontiac LeMans, 4 dr, 5 spd, new brakes/tires/ battfrans, $\$ 3 \mathrm{k}$. 282-4418 or $286-4681 \mathrm{l}$  mi , $\$ 144.5 \mathrm{k} . \times 32264$ or $488-2184$. : 84 BMW 318 i , 5 spd, sunroot AC, $\$ 3,850$ obo. X35590 or $991-0821$. $\quad 82$ Pontiac J2000, good cond, good work or teen car, $\$ 750$ obo. x47326 or 486 -9673 car, 7850 obo. x 47326 or $486-967$ good, $\$ 1.6 \mathrm{k}$. $\times 38785$. '89 Pontiac Lemans, silver, 5 spd, AM/FM/cass, AC $\$ 2 \mathrm{k}$. Joe , 38851 or $488-1750$, A/C, \$2 C Joe, $\times 38851$ or $488-1750$. ' 82 Chewy $\$ 10$ pickup, needs engine \& AC work, new carb, starter, good tires, hatt trans, adio, new carb, starter, good tires, batt, trans, radio, body $\$ 500$ obo. 244-0249 or 488-5166 mi, std, \$1.2k obo. Sherman, 337-2590. mi, 89 , jeep Cherokee 4.0 , red/grey, auto, A/C, alloy wheels, $\$ 7.2 \mathrm{k} . \times 44714$ or $326-3375$. nodge Ram van, depend, full sz , custom inter, no AC, \$1.4k. Ken, x31496, 286-7583. cond, 90 kmi , garaged, $\$ 8,950$. $\times 32515$ con  38 k mi, $\$ 6.3 \mathrm{k}$. Richard, 282 -4404 or $474-5842$. ' 9 T Trans AM , red, 6 spd, loaded, 14 k . obo. Bob, x32386 or 480-9370. '8 Nissan $300 z X, 5 \mathrm{spd}$, T -tops, dk gray, new tires $/ \mathrm{A} / \mathrm{C}$, fuel $\mathrm{inject}$,115 k mi , $\$ 2,950$ obo. Nelson, $\times 48591$ or $334-1008$. '91 Alfa Romeo 164 L , grn/tan leather, 85 k mi , records incl, price nego. Rhonda, $750-1312$.


## Boats \& Planes

18' Gulf Coast sail boat, extra sails, trailer, good shape, cabin sleeps 2,6 person deck, $\$ 1.5 \mathrm{k}$. $282-$
4404 or $474-5842$.

## Cycles

'84 Kawasaki 550 LTD, $5.4 \mathrm{k} \mathrm{mi}, 6 \mathrm{spd}$, shaft drive,
garaged $\$ 125 \mathrm{k}$
.
Kastan Pro XL
frame, Technique cranks, Odyssey, chedals we-molly cages, Kevlar racing seat, helmet, leathers, jersey gloves, $\$ 500$ nego. Keith, $\times 38739$ or $534-3279$. Fugi Saratoga, 18 spd touring bike w/computer
profile aerobars, Kryptonite locks, profilie aerobars, Kryptonite locks, access, $\$ 400$
Trakstand Performance trainer, $\$ 100.482-0888$.

## Audio Visual \& Computers

## Sega Genesis w/3 controllers $\$ 90 ; 15$ Sega gam <br> 54-4946

Macintosh Performa 405, w/SW pkg. 14' color
monitor, kybd, mouse, modem, $\$ 550$ obo; 14.4 faxmodem for Mac, \$70 obo. 326-5184.
Yamaha stereo sys w/dbl dr oak cabinet, $\$ 375$ obo.
996 -0152 $996-0152$.
Satellite
\& controller, \$250. 337-4182. Mac IIx 8/80, $15^{\circ}$ Radius Pivot color mon, ext kybd.
mouse, $\$ 450$ obo. Carl, x 32563 or $527-8947$.
Mac Performa 450, $25 \mathrm{MHz}, 4 \mathrm{M}$ $\mathrm{HD}, 14^{*}$ color monitor, kybd, 1.4 Mb FD, ex cond, $\$ 600.244-1791$ or 488 -1326.
Mac $\$ 200$ A Apsic, intern 40Mb HD, 4Mb RAM wext Iybd, $\$ 2000$; Apple Imagewriter, $\$ 25$; Apple Stylewriter II, $\$ 50$; case, $\$ 25$, all ex cond; Bubble Shatt driver, 80 -
reg flex, $\$ 150$ Ken reg flex, \$150. Ken, 473-2602.
Packard Bell 386 SX16, 4MD RAM, 105 Mb HD, $14^{*}$
VGA monitor, Panasonic KXP VGA manitor, Panasonic KXP 1124 , 24 -dot pin matrix


## Macintosh Power PCC's, several to choose form, details/prices. Bobby, $244-2444$ or 488 -4382

 details/prices. Bobby, 244-2444 or 488-4382.Sony car Discman Sony car Discman w/remote \& ESP, \$100/ Thanh,
$\qquad$ HUSH I.S.P, single-ended noise reduction sys, uses compression \& dynamic enhance automatic \& manual Two stereo speakers, shelf $s z$, KLH, ex cond, $\$ 25$
both. Mike 333 -2335 both. Mike, 333-2335.
Epson action Laser II printer, $\$ 360$ obo. x $\mathbf{x} 3590$ or Technics
Technics 5 Disc CD player, \$75. 538-3431.

## Sega game sys w/case, adapt, magnifier \& games, \$150; Jungle Strike game for SNES, \$35. Ron $\times 48200$

Nintendo game system, \$25 obo. 280-9740.
$\$ 100$ obo- Panasonic 24 pin color camp processor,
printer, \$25. Jon or Elizabeth, 286-5002.
Stylewriter printer, Mac, 360 dpi, ex cond, $\$ 95$.
$326-5150$.

## 326-5150

## Musical Instruments

'78 Gibson Las Paul $\$ 600.326$-1775

## Bill, $326-5373$.

Sigma 6 sting cuita wicasa stand boot 5500. Wendell, $\times 39421$ or 286-9892.

Photography
位tor Telescope w/finder scope \& $\$ 700.585-4268$.
or 286-2850

## Pets \& Livestock

Siberian Husky pups, mif, AKC champion sire, shots, ready now, $\$ 275-\$ 300$; Great Pyrenees, male, neutered
current shots, $\$ 100$. Lisa, 440113 or $992-730$. current shots, $\$ 100$ Lisa, $\times 40113$ or $992-7302$.
Golden Hair Trarantula, huge w/aqua $\$ 20 \times 38785$
Cocker Spaniels, female, red/white, sm, show qualit,
$\$ 100$. Bob, $\times 33057$ or $538-3431$.
Household
place settings of Pfattzgraf "Aura" w/service pcs. $\$ 60$
Wht contemp on hdbd, 2 nite stands, drssr $\$ 250$ wht wicker rocker \& table, $\$ 20$ ea; sleeperer sofa, SW colors, \$150; 2 armless chrs, $\$ 2$
5 pc dining room set, table 1 ineat, chairs roll, swivel \& rock, \$275. Kathy, 337-5622

Kg
0250.
Semi
$\$ 200.337-5583$
Sofa \& loveseat, off-wht SW style weave, ex cond,
$\$ 325$; coffee tbl \& 2 end thls $\$ 325 ;$ coffee tbl \& 2 end tbls, wood const w/storage cabinets each pcs $\$ 200 \times 334538$ or $286-7484$.
Whirlpool gas Brian, $\times 32635$ or $480-4351$.
Sofa, beige, ex cond, $\$ 225 . \times 39527$ or 538-3483.
2 lg oak consoles, $31^{44 \times 67 " ; ~ \$ 200 ~ e a ; ~} 2$ hort blind dusty rose, $78 \times \times 80$ ", $\$ 40$ ea. $282-3570$ or $474-3820$. Kg sz waterbed w/matt/frame, ig mirrored hdbd \$150. 283-4284 or 488-4028.


Team Training
STS-79 crew spends hours preparing for link up with Mir

The STS-79 mission, set to lift-off in September, will carry an experienced crew of six that have spent the majority of its time training for the fourth shuttle docking to the Russian Mir Space Station
Commander Bill Readdy, Pilot Terry Wilcutt and Mission Specialists Tom Akers, Jay Apt and Carl Walz, along with Cosmonaut Researcher John Blaha, trained at the JSC Weightless Environmental Training Facility and Kennedy Space Center's Payload Processing Facility o prepare for shuttle emergencies and learn the Spacehab payload systems. In addition to training in the states, Blaha spent a majority of his time in Russia preparing to become a member of Mir 22. He returned home recently to participate n another training exercise, the Terminal Countdown Demonstration Test, set for the end of August.
Training consist of a variety of activities. Crew members must leam how to space walk and repair shuttle systems even if there is no planned space walk. They must learn how to bail out of the shuttle's escape hatch and to survive in the water.

Crew members also must learn the systems they will be working with during the nine day mission. The Spacehab module will carry a variety of experiments, equipment and supplies for the Russian outpost and its occupants. Life science experiments
will study the effects of space on rew members-in particular Cosmonaut Researcher Shannon Lucid, who will return to Earth with he STS-79 crew after a recordbreaking stay on Mir
Throughout the training, the crew took photos to share. From top to bottom left to right:

1) Apt spends time in the WETF preparing for a space walk. Although no space walk is scheduled for this mission, the crew must be prepared to venture into the cold environment of space to repare shuttle systems. 2) From left, Walz, Wilcutt, Readdy, Apt and Akers practice escaping the shuttle in their ascent entry suits.
2) Readdy practices water survival training in the WETF in case the crew must abandon a mission over water
3) At KSC, Walz, left, and Apt examine the interior of the Spacehab module. STS-79 will be the first flight of a double Spacehab and will allow more supplies and equipment to be taken to Mir while still allowing room for scientific while stit alowing room 5) Chris

有 Douglas, right, shows Walz, left, and pt the layout of the Spacehab.
6) Walz prepares to help a team member escape the orbiter during crew escape training in Bldg. 9. 7) Apt, left, and Walz check out some of the equipment aboard the Spacehab module.


KSC Photos JSC Photos by Andrew Patnesky, Robert Markowitz

## Houston science museum seeking JSC volunteers

seeking volunteers and will be at JSC next month to discuss available opportunities.

The Houston Museum of Natural Science is very proud to offer one of the most rewarding and exciting volunteer programs in the Houston area," said Claudia Baltodano, recruiter for the museum's volunteer services. "Our volunteer program provides an excellent opportunity for JSC employees to become more involved in helping children and adults nourish their knowledge in science and encourage them to appreciate and love the world around them."
Baltodano will be at JSC from 2-3 p.m.

Aug. 14 in Bldg. 45 , Rm. 251 to discuss the oes Some pram with interested employanimals, will be included in the meeting. The museum houses the Cockrell Butterly Center, Burke Baker Planetarium, Wortham IMAX Theatre, the world's first Challenger Learning Center and over a Challenger Learning Center and over a
dozen halls of permanent natural science exhibits that the museum hosts each year. exhibits that the museum hosts each year.
Volunteers work in every area of the museum, from interpreting exhibits for museum, from interpreting exhibits for school children and families, to essential
jobs behind the scenes. There are a variety jobs behind the scenes. There are
of volunteer opportunities available.

Volunteers may choose to work win the pubic as interpreters of the museum's permanent and temporary exhibits and assist with educational and outreach programs, or choose to be visitor services volunteers, assisting the information desk patrons. Volunteers also may choose to help with special events and fundraising activities, in all areas of planning, organizing and executing the events. Staff volunteers also are needed to work behind the scenes to maintain files, prepare mailings and help to organize and catalog museum collections Training is provided in all areas
Aside from the inherent personal rewards
wich come from volunteering, employees also will receive museum benefits Baltodano said. Volunteers will receive free parking and two free passes for every 20 hours of volunteer service, a 10 percent discount in the Museum Gift
To learn more about the museum and its volunteer program, employees can visit the museum's web site at URL: http://www hmns.mus.tx.us:80/hmns/home.html
Employees interested in becoming muse Employees interested in becoming museing or call the museum volunteer office at 639-4643.

## Disability act marks sixth anniversary

Today marks the sixth anniversary of the signing of the American with Disabilities Act of 1990 and the Equal Opportunity Programs Office is available to help maximize the potential of disabled workers.
This landmark legislation gives civil rights protection to individuals with disabilities, similar to those provided to individuals on the basis of race, color, sex, national origin, age and religion. Several federal statutes have been passed to enhance the opportunities of persons with disabilities to enjoy the benefits and ities to enjoy
Among these statutes are two laws of interest to the work force at JSC- the Rehabilitation Act of 1973 and the ADA. The intent of the Rehabilitation Act of 1973 was for the federal government to become a model employer of individuals with disabilities. The ADA was patterned after the Rehabilitation Act of 1973. Both laws provide employees and employers with guidelines to maximize job opportunities and employment potential for employees with disabilities.
The laws include requirements for employers to make reasonable accommodations to employ and retain qualified handicapped individuals. Such accommodations could involve restructuring the job, modifying work schedules, adjusting or modifying examinations, providing readers or interpreters and acquiring or modifying equipment or facilities. The employer is not required to provide reasonable accommodation if it will impose an undue hardship on operations. The ADA does not require employers to hire anyone who is not qualified. An employee or job applicant may not succeed in claiming discrimination under the ADA unless he or she meets all the requirements of the job and can perform its essential functions.
For more information employees may contact the Equal Opportunity Programs Office at $\times 30601$.

## Correction

A story in the July 19 edition of the Space News Roundup incorrectly Group team members. Members were Jeff Stone, Paul Lloyd, Randy were Jeff Stone, Paul Lloyd, Randy
Barckholtz, Victor Badillo, Ronnie Rogers and John Shimp.


EARNED VALUE—Above: Mission Operations Director Certificates of Validation to from left, Jay Crutchfield, Ron Gantz and Leroy Hall of Ron Gantz and Leroy Hall of
Lockheed Martin, formerly Loral, following demonstrations that their performance management systems and management teams are com-
pliant with the cost and schedules control system criteria, also known as "earned value."
Right: Hughes-Link also

received validation from MOD. From left are, Charlie Floyd of Hughes-Link, O'Neill and Howard Marshall also of Hughes-Link. Earned Value Management is a proven industry best-practice process that provides for improved contract planning the establishment of a baseline plan for performance, it provides a sound basis for early problem identification, impact analysis and corrective action as may be required By emphasizing adherence to approved processes, earned value manage ment facilitates improved communications within each company and with their JSC customers. As a result of their success, JSC now has improved cost and schedule visibility on two major MOD contracts. JSC Photo by Mark Sowa

## Discovery returns to fleet; '97 mission will service Hubble

(Continued from Page 1)
flight of the large science module. The double module provides more room for experiments and supplies for the Mir-22 crew.
Meanwhile, Columbia is in the Obiter Processing facility at KSC undergoing preparations for STS-80-the third flight of the Wake Shield Facility. Engineers are preparing to test Columbia's fuel cell voltage. The flash evaporator system was flushed this week and technicians will remove and replace an auxiliary power unit today. The impact of the solid rocket booster swap on

Columbia's launch date is continuing to be
Elsewhere, technicians are beginning work on Discovery, just returned recently via ferry filight from a modification period in Palmdale Ca. Discovery's next mission is planned to be STS-82 in early 1997, the second Hubble Space Telescope servicing mission. Also preparations are in work for Endeavour to be ransported to California for its maintenance period. Upon its return from Palmdale, Endeav our's next flight will be the first International Space Station mission in 1997.

## JSC team receives honorable mention

JSC's Electronic Documentation Project Software
Development Team took home honorable mention in Development Team took home honorable mention in tion.
The 12 member team developed software that will provide an electronic capability to distribute, display and control changes for crew/ground controller procedures and documentation. The EDP System will dures and documentation. The EDP System wil include the functionality provided by the current paper
based system, but in an electronic format. This sysbased system, but in an electronic format. This sys-
tem will be available in the office, control center and tem will be avaliable in the office, control center and
in training instructor facilities. In addition, the EDP in training instructor facilities. In addition, the EDP
System will build on the paper process with hypertext System will build on the paper process with hypertext
extensions. The electronic system will reduce the extensions. The electronic system will reduce the
cost of maintaining the current paper-based method cost of maintaining the current paper-based method
of operations. The system also will improve the efficiency and provide enhanced flexibility in document usage, supplement and ultimately replace the paper documents and provide NASA-wide access to Mission Operations documents.
The Software of the Year Award winners were Linked Windows Interactive Data System, or LinkWinds, developed by the Jet Propulsion Laboratory and the Tetrahedral Unstructured Software System, or TetrUSS, developed by NASA's Langley Research Center. LinkWinds software will help scientists better examine geophysical and climatological data. TetrUSS provides solutions to aerodynamic data. TetruSS provides solutions
NASA will present the awards at the Technology 2006 Conference to be held in Anaheim, Calif., in October. Recipients will receive a plaque and a subOctober. Recipients will
stantial monetary award.

## Symposium calls for technical papers

The 31st Aerospace Mechanisms Symposium, planned for May 14-16 at Marshall Space Flight Center, will focus on the problems of design, fabrication, test and operational use of aerospace mechanisms.
The program will emphasize hardware developments. Informative and thought-provoking papers pertaining to mechanisms technology are now being solicited for the symposium.
Papers should describe fully-developed, tested and/or flown space or aircraft mechanisms and should contain essential design details and also unique requirements and other factors of interest to engineers developing flight hardware. Authors are encouraged to discuss anomalies that have occurred and thus help others avoid similar problems in the future.
Papers for presentation are selected on the basis of summaries of approximately 1000 words and must include the principal results of the investigation, along with the scope and status of the work
Summaries must be submitted by Sept. 6 to Edward Boesiger at Lockheed Martin Missiles and Space, P.O. Box 3504, Orgn. 73-15, Bldg. 150, 1111 Lockheed Way, Sunnyvale, Calif. 94088-3504. Employees also may call 408-743-2377, or email at boesiger ed@mm. may call 408-743-2377,
ssd.lmsc.lockheed.com

## Lucid writes home about Mir space walking activities <br> (Continued from Page 1) <br> end of this cosmic "fishing pole." Yuri <br> mistakenly gotten the wrong tube.

their backs. I told them that you can only take pictures of what you can see. We named that video "Cosmonaut Spines." Although I cannot see everything, I can hear the entire EVA. Several times during a night pass I have been watching them work in a small flat pancake of light out on the end of some module and have heard them muttering about Russians use these terms instead of "male" and "female" for electrical connectors-as they work on connecting a payload to station
all feels warm and homey
After five hours of intensive work, it is time to think about coming back inside and Yuri rotates the handle the other Yuri through space on the
and Yuri then enter the airlock and begin the process of repressurization. After what seems like a long time, and after many requests for me to read them the station pressure, the airlock opens and they suddenly appear in the base block looking like two excited young boys that have just completed a great adventure. They immediately watch the video I have taken and excitedly discuss each event while drinking the hot tea or the tube of juice I have waiting. Unfortunately, even the best plans sometimes go wrong. After the last EVA, I had what I thought was Yuri's favorite juice. He eageriy grabbed it with a smile of thanks, which immediately turned into a horrible grimace into his mouth. Yes, I had

They all look pretty much alike. My language skills are not quite at the level that I could convince him that I should at least get points for trying. Before the first EVA that occurred while I was on Mir, Yuri and Yuri oked about what I would be doing while they were outside, saying that would be the "commander" of Mircommander by virtue of being the only person inside the station. They jokingly agreed with each other that I would have a large American flag hanging in the base block to greet their return. Well, no, I did not hang up the American flag. I wasn't sure how far to stretch their sense of mand decision. For several command decision. For several weeks we had been eating what was left in
any new ones. As you might guess, the selection we had was not any of our favorites; that is why it was left. Being in command, and feeling very much like Captain Kirk, I knew that the first prerogative of a good commander is the welfare of her troops, so I decided to open a new container and have their favorite meat and potato dish warmed up and ready for them upon their return. Eating it with gusto after the EVA, neither one asked where it had been found. All they said was, "Thank you so much." After our meal, it is off to bed. We wake up refreshed and begin talking about the next EVA later in the week. And I begin fantasizing that maybe this time the guys will invite me to go out with them. Yes, the me to go out with them. Yes, the
stars are always brighter on the other side of the hatch.

Space News Roundup

The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, byas, and is published every Friday space center employees.
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Editor .....................Kelly Humphries Managing Editor Karen Schmidt Associate Editor Natasha Calder


[^0]:    Property
    Sale: Townhome/duplex, 2-2.5-1G +CP, FPL, deck,
    new water heater/disposai new water heater/disposal,,$~ D$
    assum $F H A$, , $\$ 63 \mathrm{k} .488-2716$.
    Lease: Meadowgreen, $3-2-2$, new carpet, 1800 sq ft , avail $8 / 1, \$ 950 \mathrm{mo}$. $244-0124$ or $480-9436$.
    Sale: Nassau Bay, $4-2.5-2$, FPL, new paint and Sale: Nassau Bay, 4-2.5-2, FPL, new paint and
    kitchen, spaddeck, landscaped, \$126.9k. $335-1378$. Sale: Pearland, $4-3.5-2,2760 \mathrm{sq}$ tt, $\$ 117,850$. 489 -
    3845. 3845.
    Sale: Sale: El Dorado Trace condo, 2-1- W/D, sec sys,
    cov'd parking, pool, storage room. 286-7014. cov'd parking, pool, storage room. 286-7014.
    Sale: Egret Bay condo. $1-1$, WD, FPL, new carpet, Sale: Egret Bay condo, 1-1,
    cov'd parking, \$29.9. $339-2306$.
    Coval parking, $\$ 29.9 k .339-2306$.
    Sale: LC. $3-2-2$ avail 771 , new roof, Ig yard, near
    NASA, cul-de-sac, $\$ 55 \mathrm{k}$. James $386-1934$. NASA, cul-de-saca, \$55k. James, 386-19344.
    Lease: Univ Trace condo $1+$ tudy, Lease: Univ Trace condo, $1+$ study. $11 / 3$ baths,
    WDD, $\$ 520$ mo. $\times 39541$ or $480-2417$. W/D, $\$ 520$ mo. x 39541 or $480-2417$.
    Lease: Univ Trace condo $2-2$. Lease: Univ Trace condo, $2-2$, retrig, non-sm
    no pets, WIO Conn, FLL, $\$ 550$ mo. $80 .-1340$.
    Lease: CLC, Oakbrook, fen, $4-2.5-2$, formals Lease: CLC, Oakprook, fen, $4-2.5-2$, formals,
    smokers/pets, $\$ 1,250$ mo. Jack Cohen, 488-3171. Smokers/pett, $\$ 1,250$ mo. Jack Cohen, 488-3171.
    Lease: CLC, University Trace, townhouse,
    ACC FPL refrio WID AC, FPL, refrig, W/D conn, x34698 or $286-7541$.
    Rent: West Galveston Bay house, $3-2$, sleeps 8 , Rent: West Galveston Bay house, $3-2$, sleeps
    conven, wend/wkly rates, no pets. $488-4412$.
    Sale: Heritege Pake conven, wkend/wkly rates, no pets. $488-4412$.
    Sale: Heritage Park, $-2-2-2$ brick 2 -story
    ownere, below appraisal Owner, below appraisal, $\$ 77.5 \mathrm{Kk} .482-8845$. Sale: Lake Conroe resort, all faciiltites- yr round activi-
    ties, charter membership, $\$ 1,975.326-5150$. ties, charter membership, \$1,975. 326 -5150. Sale: Woodville, IX, lakefront home, $3-2.5-2+$ guest
    quarters, $C$ A/H, FPL,
    $\$ 124.5 \mathrm{k} .484-8030$, perk, pier/bulkhead, 5 ac lot, \$124.5k. 484-8030.
    Lease: LC, Meadow Bend, $3-2-2$, W/D, refrig, fence,
    avail $8 / 1, \$ 925 \mathrm{mo}+$ dep. $538-1724$ or $409-948-0247$ avail 8/1, $\$ 925$ mo + dep. $538-1724$ or $409-948$-0247. furn, $\$ 115$ dly, $\$ 600$ wkly. 335-1378.
    Cars \& Trucks
    86 Honda Prelude Si, red/black, sunroof, auto, AC inted, alarm, AMFM/cass, new tires/paint, good cond,
    $\$ 3.3 \mathrm{k}$ obo. Lisa, $\mathbf{~ L 4 0 2 1 3}$ or $992-7302$, '89 Ford Probe GT Turbo, 5 spd, loaded, alarm great cond, $\$ 4.5 \mathrm{k}$. Tititiny $\times 31888$ or $643-2210$
    93 Ford ' 93 Ford Aerostar XLL van, Eddie Bauer inter, ex
    cond, $\$ 10 \mathrm{k}$. Donna, 302021 or 334 -5082 '77 Pontiac Grand Prix, T-top, blue, needs
    AMFM, work car $\$ 650 \times 48838$ or $935-4862$ AMFFM, work car, $\$ 650$. $\times 48838$ or $935-4862$.
    ' 5251 BMW, blk w/tan feather inter, sunroo alarm, $\$ 11.5 \mathrm{k}$ obo. Ginger, $326-2535$ or 834 -2804. '93, Chey Custom van, blk, loaded, ext warr, $\$ 13.5 \mathrm{k}$
    obo. $333-3988$. ob. 93 Jeep Wran
    ' 13 .
    93 Jeep Wrangler, Sahara edition, $47 \mathrm{k} \mathrm{mi}$,alarm
    $\$ 13.5 \mathrm{k}$ Josh, $488-4182$.
    8.872400 L Volvo wagon, great cond, AMFM, CD.
    489-3845.

    | 489-3845. |
    | :--- |
    | 79 |
    | E. Ca |

    337-5583.
    85 Pontiac Grand Prix, 305 V8, auto, loaded, $A C$,
    pwr, 2 tone grey, 1 owner. Mary Helen, $333-2859$ or
    333 -6478.
    ${ }^{\prime} 91$ Honda CRX SI, white w/blk inter, pwr, new
    Clutch/batt, 5 spd, sunnoof, AM/FM/cass, ACC, runs
    ${ }^{7}$ reat, $78 \mathrm{k} \mathrm{mi} \$$,6.4 k . 31
    $P$,, PL, AM/FM, CB racio, radar detector, new tires
    $\$ 2.5 \mathrm{k}$. 282-3570 or 474-3820.

