Starscan

Johnson Space Center Astronomical Society

Volume 23, Number 8 August 2007

FORTY YEARS
AND
COUNTING!

TABLE OF CONTENTS

Message from the el Presidente

Greetings,

It's saddens me to think of the tens of thousands of dollars the members of this organization have invested in their astronomy equipment sitting idly by while the rain ceases to end. I think I almost saw a star last night, but it was a plane. Hopefully, as fall approaches, we'll get some clearing of this weather and be able to enjoy the sky again. For those not present at our last meeting, I briefly mentioned the Astronomy Day planning that took place in June. Our club members have always been a viable component of this event and we do our part to make this a success. For those who wish to volunteer this year, please drop me a note offline and I'll start a roster. We will also be passing the hat at the next couple of meetings to raise our usual $150.00 for the event. Any excess donations are used to provide door prizes for the All Clubs meeting the night before Astronomy Day. This year's speaker will be Steven O'Meara. For those who know Steven, he always presents an interesting topic. So, as the days start to get a bit shorter, lets hope for some better weather and clearer skies!

Letter from the Editor

By Connie Haviland

This month we have a shuttle launch. The Endeavour is scheduled to launch on August 7th. This is STS—118 (the 119th Shuttle flight). I have included an article taken from the NASA site regarding the launch and the bios of all the astronauts/crew. I am excited about it because I will be in Orlando around that time. I am being a little selfish here, I want it to be postponed until August 10th so I will be there to see it take off, but if it doesn't happen, I still wish the crew a safe flight and hope that they are able to take care of all that they plan on doing while up there. I hope you enjoy all the different articles, puzzles, and even a cut-out for the children of our members, that I have included in this month's Starscan. God speed Endeavour.

Next month's newsletter's theme is going to be about Steven O'Meara. If anyone has any "history" or association with Steven, spent some time with him, read any of his books, please send me an article, short or large, or a critique of his books, whatever, so I can put it in next month's newsletter.

Star Party Dates—2007

By Lisa Lester

Summer—too hot and too many mosquitoes (nothing planned)

August 11, 2007 Moody Gardens

September 8, 2007 Haak Winery

September 15, 2007 Moody Gardens

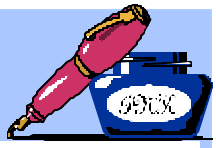
October 11 – 14, 2007 Fort McKavett

October 19, 2007 All Clubs Meeting

October 20, 2007 Astronomy Day at the George Observatory

November 10, 2007 Haak Winery

Letters to the Editor



Connie,
GREAT job on the STARSCAN, Thanks!!!!!!!!!! (via email on the list-serv)

Ditto Kudos! The many photos are greatly appreciated and the layout was fantastic, Layout is really hard and we are blessed as a club to have you doing this. (via email on the list-serv)

Dear Editor:

The 40th dinner celebration of JSCAS's roots was a wonderful event. Our beloved El Presidente' deserves more than just a round of thanks for orchestrating the event. The one point that I would like to bring up from that wonderful evening was when Bob Taylor unveiled the poster presenting past officers from the club. Many of us had the same thought which precipitated this poster. The officers past and present are the reason our great club is where it is today and these people need recognition. The ensuing discussion of the past officers was wonderful because it got a number of people talking about who was where and at what time where the history of the club was starting to become flushed out. Unfortunately, all this discussion was left in the dinning hall of the Gilruth center and not put into print. I feel that we need to continue filling out the list of officers as accurately as we can. We owe to ourselves, and we owe it to JSCAS's legacy. I claim minimal accuracy for what is stated below from memory. I have no recollection earlier than the presidency of Hernan Contreras as it was under his administration when I joined the club. So just to get it re-started…

Pres: Bob Taylor; VP: David Haviland
Pres: Ed Malewitz; VP: Bob Taylor (2004), Ken Lester (2003)
Pres: John Erickson; VP: Ed Malewitz (2002), Lisa Judd (2001)
Pres: Hernan Contreras; VP: John Erickson
.
.Need help with the rest…

At the discussion that night, I remember Jim Cate, John Erickson, Paul Hanagraf, Ed Malewitz, Bob Taylor, Triple Nickel, among others including some early email input from Becky Ramotowski in trying to fill in the blanks. Although the Starscan is a historical record of sorts, not all the Starscans of past have the officers of the club in print. I've looked. I would like to ask these people and anyone else to help fill out the past of JSCAS's as far back as we can go. Please submit any additions to myself, the JSCAS list-serv, or the Editor when possible.

I feel that with a little effort, bit by bit, we will be able to fill out the history of the club, and with the administration changes, the list can be republished annually.

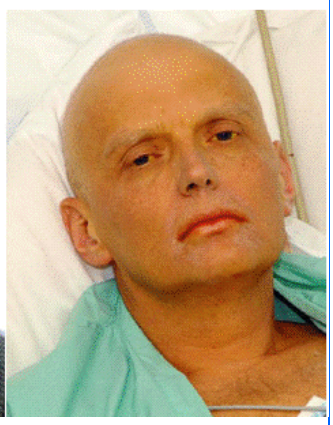
Sincerely,

David Haviland
Veep
(I humbly apologize for any butchering of peoples names!)

From the Editor: *Thanks everyone for the wonderful comments and words of encouragement. As far as our "Veep" and his letter, I will see what I can do regarding this and hope that our readers will respond to it so we can document this information. It would be nice to recognize all those who have stepped up to the plate and taken on this responsibility. So I personally ask the club to let me know the names, so we can recognize these "brave" souls.*

CHARLIE'S CHALLENGE

A few months ago an ex-KGB agent named Alexander Litvinenko was poisoned in England by the radioactive element polonium. Polonium is a synthetic element, so only a few people would have access to it. It was stated in the press that polonium has industrial applications, and that one could not definitely conclude that some government was responsible.



I Googled the element to find out what these industrial applications might be. Wikipedia said that polonium is used in combination with beryllium as a neutron source. The only uses I know of for a neutron source are: 1. To initiate a nuclear explosion. 2. Perhaps for neutron diffraction experiments. The former application is exclusively the province of governments. The second application is mostly for academic research, and is used infrequently even there.

Charlie's Challenge: ***What practical uses does polonium have? I do not know the answer to this question myself.***

Charlie's response to the answer to last month's *Challenge:*

Perhaps your response contains the answer to my question about tantalum capacitors. The fact that a tantalum capacitor can be used in AC applications may mean that is used as the capacitive component of an LC filter, which is something that a cell phone would have to have. I had thought that a polarized capacitor like the tantalum kind wouldn't work in AC applications and that a simple air capacitor like one sees in radios would dissipate less power than any dielectric capacitor, even if the dielectric capacitor would work. If the tantalum capacitor in cell phones is for the LC filter, then the explanation I need (I hadn't asked for that.) is why my thinking about polarized capacitors and dielectric capacitors is wrong.

From Connie Haviland: I don't know Charlie, since I am not very educated in circuits and electronics, but here is a small portion of what I learned when I looked it up.

(cont'd)

RESPONSE TO LAST MONTH'S CHALLENGE

Provided by Connie Haviland

Ok, first let me point out, I am not an electronic guru/geek. I do feel that I can do research and find an answer. I may not be able to explain it correctly, in detail, but I can get the main "gest" of the subject matter. I found this article and I feel that it explains what a capacitor is doing in a cell phone. My answer to why they are using the Tantalum capacitors over the others consist of many reasons. First I had to understand what the capacitor was doing in the cell phone, so I went online and read this article; *Managing Noise in Cell-Phone Handsets* (http://www.maxim-ic.com/appnotes.cfm/appnote_number/668). From what I read about tantalum capacitors, everything pretty much matched what Charlie said. After reading about capacitors, I concluded the purpose of the capacitor was to block out the noise that was being created by the LDO regulator. An LDO regulator (a closed-loop system consisting of a voltage reference, an error amplifier, and a series pass transistor) can be a broadband noise source because of it's function, so you need something to block all the noise. This is the purpose of the capacitor. I have a diagram of a capacitor in the pathway of a circuit at the bottom of the page taken from that article.

So Charlie's Challenge is: ***What function do tantalum capacitors have in cell phones?***

Tantalum capacitors have many advantages over other capacitors.

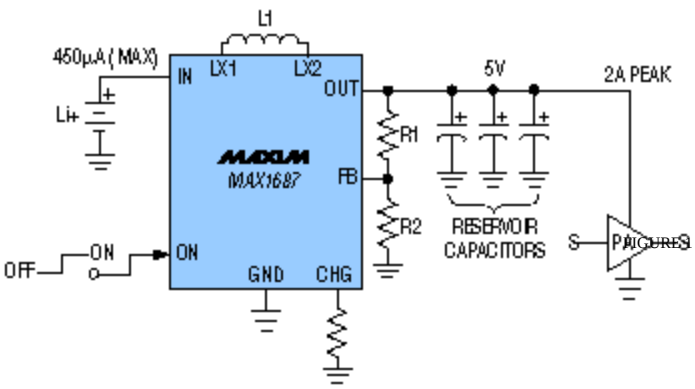
1. They have a higher volumetric efficiency (CV/cc). This means they allow engineers to put more components in a smaller area, replacing those larger capacitors. How does this help with cell phones? People are wanting smaller, thinner cell phones that can do a lot of functions. This allows engineers to design cell phones to match the demand for them.

2. They have superior frequency characteristics than other types of capacitors, including the aluminum ones. It has 10 times the ESR (Equivalent Series Resistance is the sum of in-phase AC resistance) than a comparable aluminum electrolytic capacitor. I learned that an ESR acts like a resistor in series with a capacitor (thus the name).

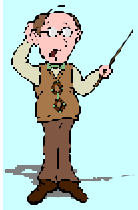
3. They are far more reliable. They don't degrade over time. This is very important due to the volume of cell phones that are manufactured and sold. They need to be able to stand the test of "time".

4. They don't wear out, another reason they are very important; because of the high use of a cell phone. I read that "even if there is an imperfection in the dielectric layer of a tantalum, the resistance of the manganese dioxide layer will typically convert to a form that is even more resistive." (taken from Engineers Edge, online)

5. They have a very wide temperature-operating range, from -55 degrees Centigrade to +125 degrees Centigrade, with very little amount of degradation in the electrical properties. Have you ever been on your cell phone for a very long conversation? I have, and it gets very warm, no, hot to be exact.



It is said that because they can develop higher charged powders, which in turn allows for designing smaller tantalum capacitors, this has allowed them to use them in small things such as cell phones, pagers, and other electronic devices. I bet they are used in laptop computers and these small Blackberries and handheld computers. Look around you, there are very small and thin cell phones. They fit inside your pocket and barely take up any room. Could be why I lose mine so easily.



HERNAN'S ODDITY OF THE MONTH

By Hernan Contreras

End of Mayan Cycle: December 21, 2012

Mark 13.0.0.0.0 on your Mayan calendars. The Mayan date that marks end/start of the "Long Count," a period of 5125 years, is not far off. If you don't have a Mayan calendar, mark December 21, 2012 on your Gregorian calendar—it might be significant.

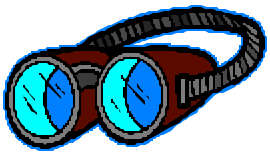
The Mayan calendar is actually a system of three distinct almanacs, the Tzolkin, the Haab and something so unpronounceable it's call simply as the "Long Count." The three systems interlock in complex ways giving numerous cycles of which some are quite mysterious. Of these the Tzolkin is the most ancient and probably the most important system. It is a combination of 13 day and 20 day "weeks" that marks a 260-day cycle--about the length of the human gestation period—and was likely used by midwives.

The "Haab" (seen to the left) is the solar calendar divided into 18 "months" of 20 days each plus a 5-day period without a "month" to complete the 365-day year. People born during the 5 day, no month period were considered unlucky and destined for a life of misery. The Tzolkin combined with the Haab form a cycle lasting 52 years—roughly the life expectancy of a human at that time.

The "Long Count" was used to track longer periods of time and is basically the elapsed number of days from August 11, 3114 BCE. No one is sure of the significance of this starting point, but the end point is very special. At dawn on the winter solstice of A.D. 2012, the galactic and solar planes are perfectly aligned. When the Milky Way rises on that date, it rims the horizon at all points around. That the Maya astronomers could have figured this event so far in the future is amazing. Once the Maya determined the end date they back tracked 5125 years to set the mythical starting point. Why 5125 years? The simple answer is that is the number of years needed to reset the mixed 18 based and 20 based positional Mayan calendar notation to keep track of the number of days from the start date. (The Long Count is the Mayan equivalent of our Julian Date concept.) Of course they could have added another position to the calendar notation and get a really big number, but they didn't. Perhaps the 5125 had a special significance or perhaps an explanation is that they simply ran out of stone.

Image source: http://webexhibits.org/calendars/calendar-mayan.html

Chichen Itza has four staircases with 91 steps each plus a platform to mark the 365 days of the solar year. The Mayan calendar calculates the solar year more accurately than the Gregorian calendar.



FORT (Forward Observing Recon Team)

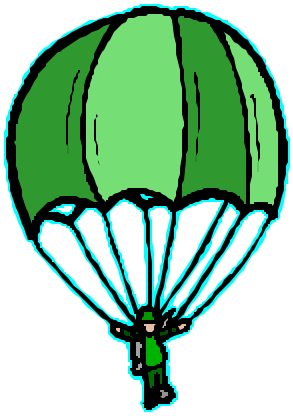
By Ken and Lisa Lester (special operations team)

Preparing for observing trips requires careful planning. It is important to make a detailed checklist in order to make sure important things like eyepieces, batteries, gloves and food are not forgotten. Ken and I have made a recon to a new restaurant in Fort McKavett in order to help you with planning a trip to the Fort. This information will help with the planning of which meals to bring and where and when to eat out.

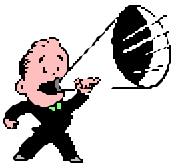
Those of you who have been to Fort McKavett before are probably familiar with the Outback Restaurant. If you were here in March you know that it closed down again and was being sold. The sale of the restaurant went through and after two months of remodeling Cowboys opened up the second week of June. The building looks almost the same on the outside except for the sign. (Okay, say Duh!! Lisa) However, once you walk through the door your eyes will scan the room trying to take in all the changes. There is a beautiful wooden bar with very comfortable bar stools across from the entrance. Yes, the bar stools have been Lester tested! The tables are all well made wooden tables that can easily be pushed together in order to accommodate a large group of people. The restaurant is decorated with the Cowboy motif complete with a big flat screen TV in one corner!

The menu is a little more extensive than the previous one and there is more variety. Some of the items include: 5 appetizers (including fried dill pickles), 6 different burgers, 6 sandwich choices, 5 salads, sirloin & rib eye steaks, chicken fried steak, stuffed grilled steak, grilled chicken and onions, a steak finger basket and a chicken strip basket. There is also a kid's and Sr. citizen's menu. Beverages include tea, coffee, milk, soda, wine and a variety of beers.

Ken and I have been to Cowboys several times. We have tried several different items on their menu and have enjoyed it all. The new owners are very friendly and enthusiastic and the wait staff is friendly and efficient. We hope that you will put Cowboys on your list of places to eat while visiting Fort McKavett.



Need volunteers



What's Happening at the George!!!

Cynthia Gustava

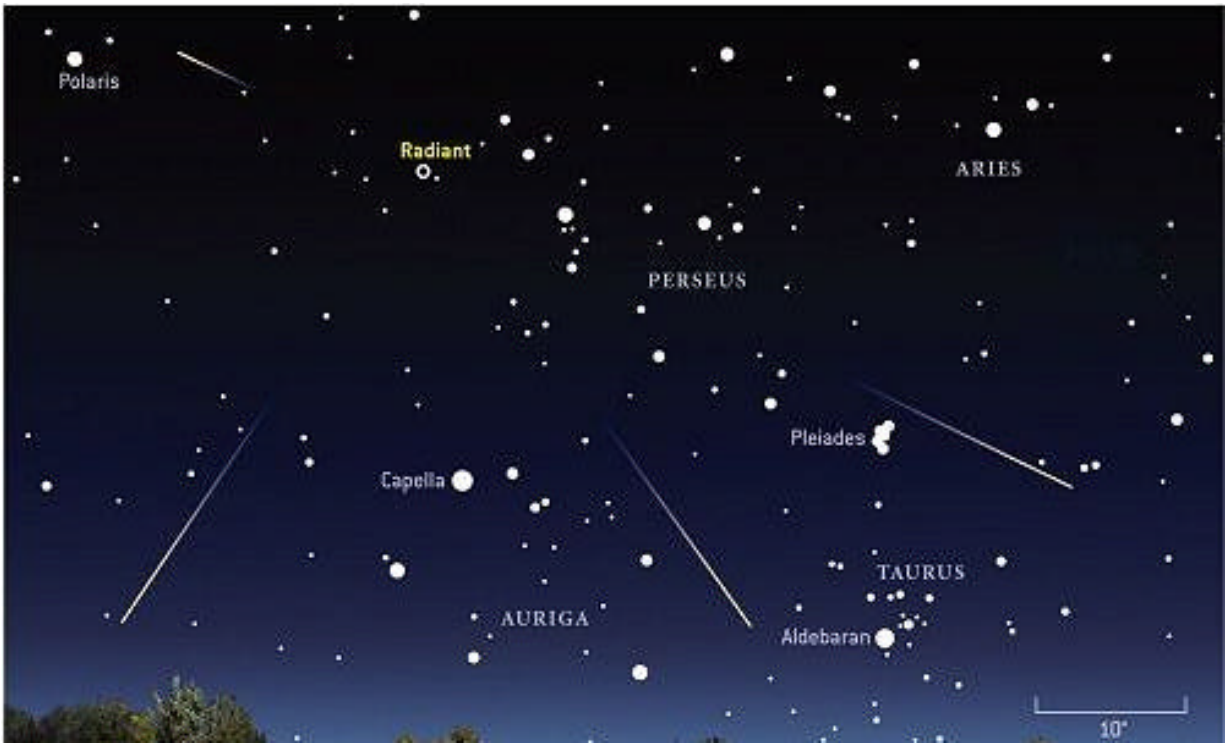
August 12-13...Perseid Meteor Shower

The George Observatory in Brazos Bend State Park will host viewing the peak of the annual Perseid meteor shower the night of Sunday August 12 and lasting until dawn Monday, August 13. This annual shower is caused by the Earth passing through the dust trail left behind by Comet Swift-Tuttle. The bright streaks of light will be seen crossing the sky around 11:00 pm to near dawn.

Predictions are that we can expect to see a few Perseid meteors as early as 10:00 p.m. on Sunday evening, but many more will be expected after midnight when the constellation of Perseus has climbed high into the northeastern sky. Watchers can expect to see a meteor a minute during the peak hours just before dawn on August 13.

For more information on these activities or to volunteer, please contact either Barbara Wilson at bwilson@hmns.org or Cynthia Gustava at cynm31@comcast.net Please note the change in the email address for Cynthia.

*A*nother HMNS Members' Night will be held at the George Observatory on Friday August 24, from 7:30-10:00 p.m. These usually book out completely, so come join the fun and show the night skies to the members of the Houston Museum of Natural Science!



Updated -- July 11, 2007 - 1 p.m.

Legend: +Targeted For | *No Earlier Than (Tentative) | **To Be Determined

Date/2007	Mission	Vehicle	Launch Site
Aug. 3	Phoenix The Mars Phoenix lander is the first of NASA's scout missions. Phoenix is designed to analyze the ice and soil samples retrieved by the robotic arm from the Martian arctic's ice-rich soil. Launch Time: 5:35:18 a.m. EDT		
Aug. 7 +	STS-118 STS-118 will deliver the S5 Truss and will be the twenty-second mission to the International Space Station. Launch Time: 7:02 p.m. EDT		
Sept.	Dawn The Dawn Mission will be the first time a spacecraft will orbit two planetary bodies on a single voyage as it studies Ceres and Vesta.		
Oct. 20 +	STS-120 STS-120 will be the twenty-third mission to the International Space Station and deliver the U.S. Node 2.		
Nov. 8*	Missile Defense Agency Block 2010 Spacecraft Risk Reduction To be launched by NASA for the Missile Defense Agency (MDA), STSS Block 2010 Risk Reduction serves as a pathfinder for future launch and mission technology for MDA.		
Dec. 6 +	STS-122 STS-122 will deliver the Columbus European Laboratory Module and will be the twenty-fourth mission to the International Space Station.		

Launch Vehicles


Atlas V


Delta II


Delta IV


Minotaur


Pegasus XL


Space Shuttle

Launch Sites


Kennedy Space Center or Cape Canaveral Air Force Station


Vandenberg Air Force Base


Wallops Flight Facility/ Goddard Space Flight Center

ATLAS V

DELTA II

DELTA IV—Medium Payload

DELTA IV—Heavy Payload

MINOTAUR

PEGASUS XL

THE SHUTTLE

AUGUST 2007 OBSERVING

★ **SSO**: (Solar System Objects) Summary for the 15 Aug 07

Object	Const	Mag	% Ill	Rise Time	Transit	Set Time
Sun	Leo	-26.7	100	06:48	13:24	20:00
Moon	Vir	----	10	09:15	15:25	21:33
Mercury	Leo	-1.9	100	06:52	13:30	20:11
Venus	Sex	-4.0	1	07:14	13:28	19:46
Mars	Tau	0.4	86	01:12	08:02	14:52
Jupiter	Oph	-2.3	99	15:07	20:22	01:32
Saturn	Leo	0.9	100	07:14	13:47	20:23
Uranus	Aqr	5.7	100	21:14	03:02	08:51
Neptune	Cap	7.8	100	19:52	01:19	06:46
Pluto	Sgr	13.9	99	16:06	21:33	02:56
Comet Linear C/2006 VZ1	Vir	11.1	81	10:49	16:36	22:27

Highlighted times denote daylight events.

Lunar phases for August 07

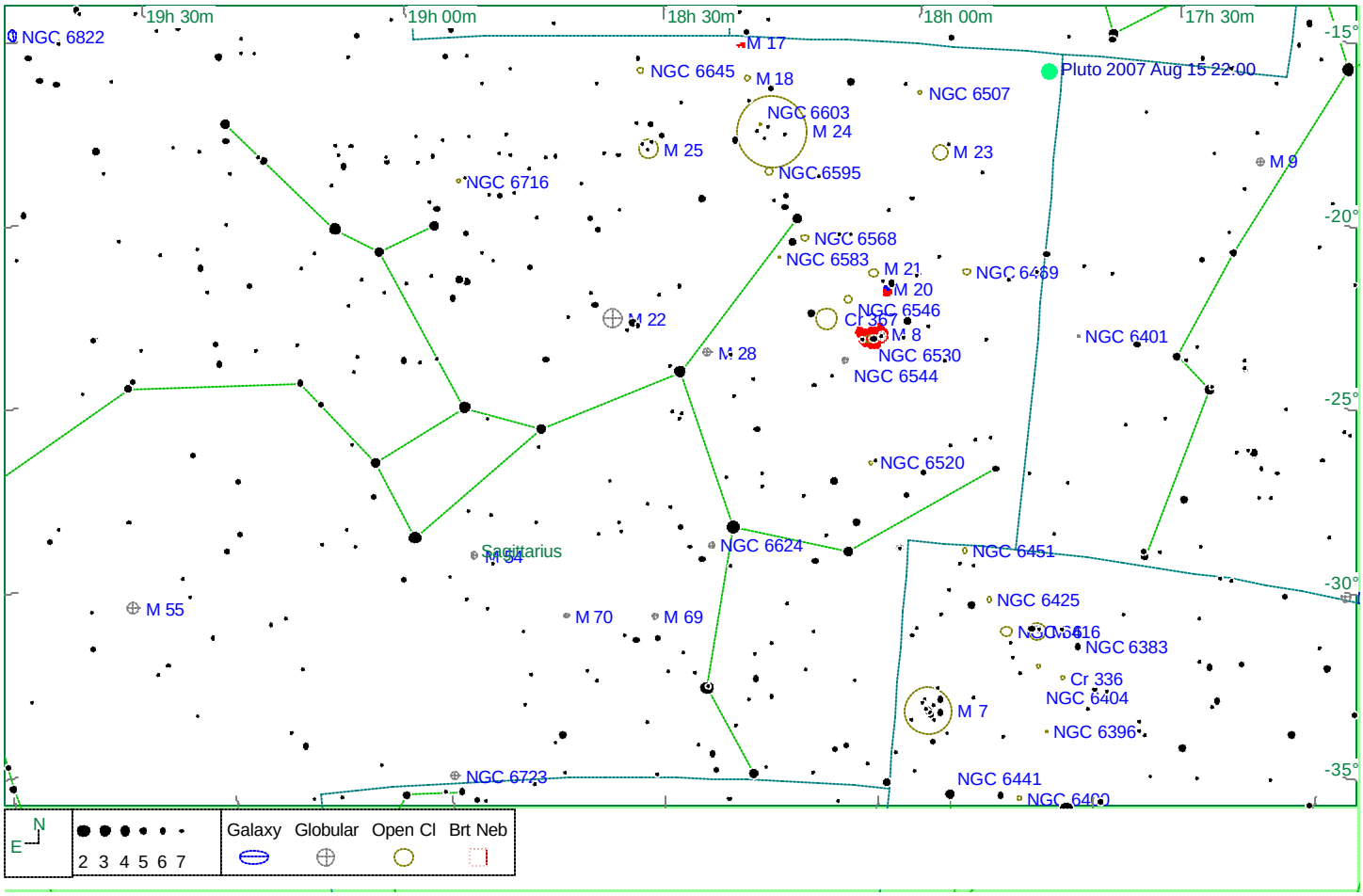
Third	New	First	Full
05th 16:20	12th 18:02	20th 18:54	28th 05:35

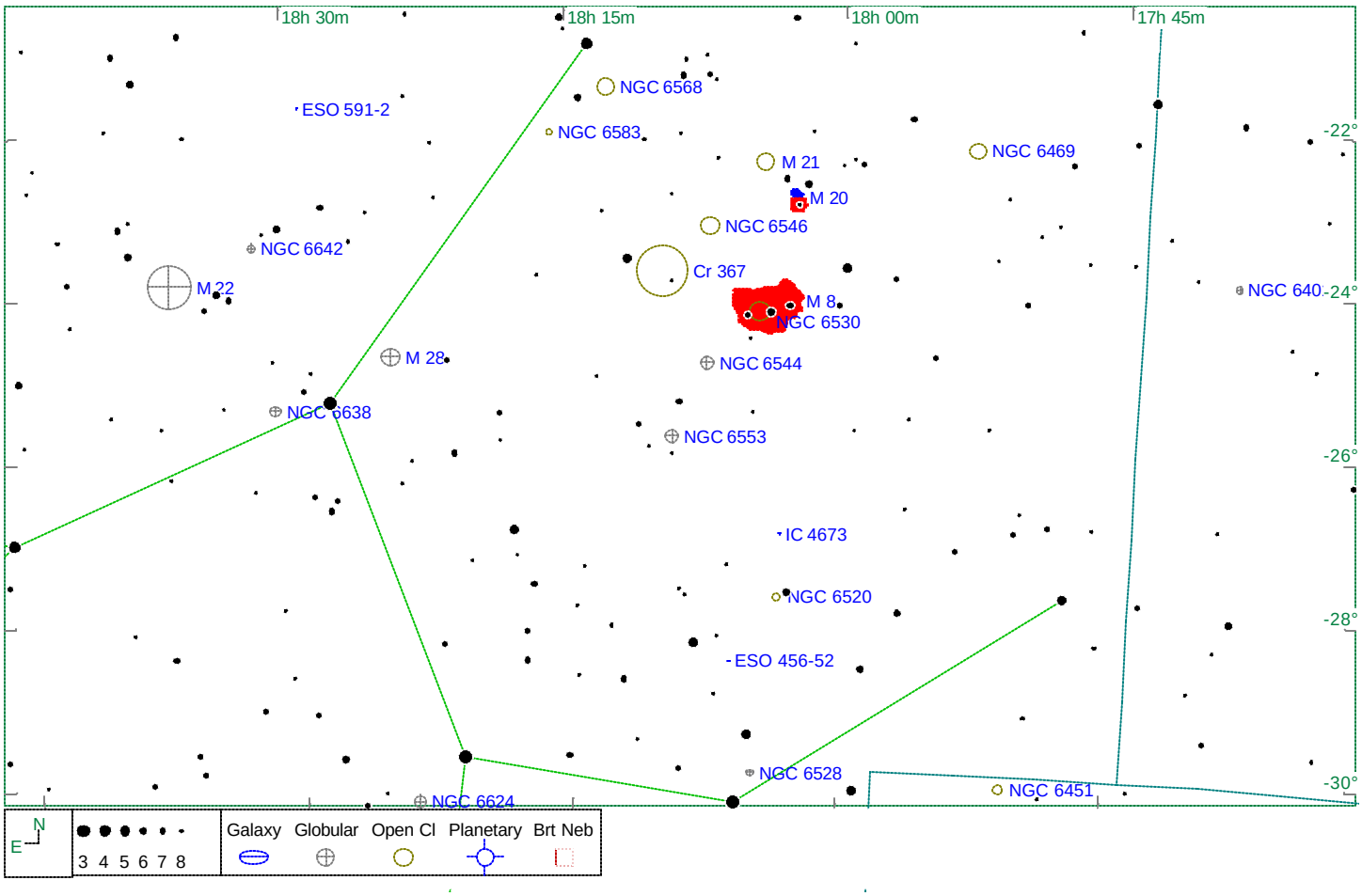
Central Daylight Time

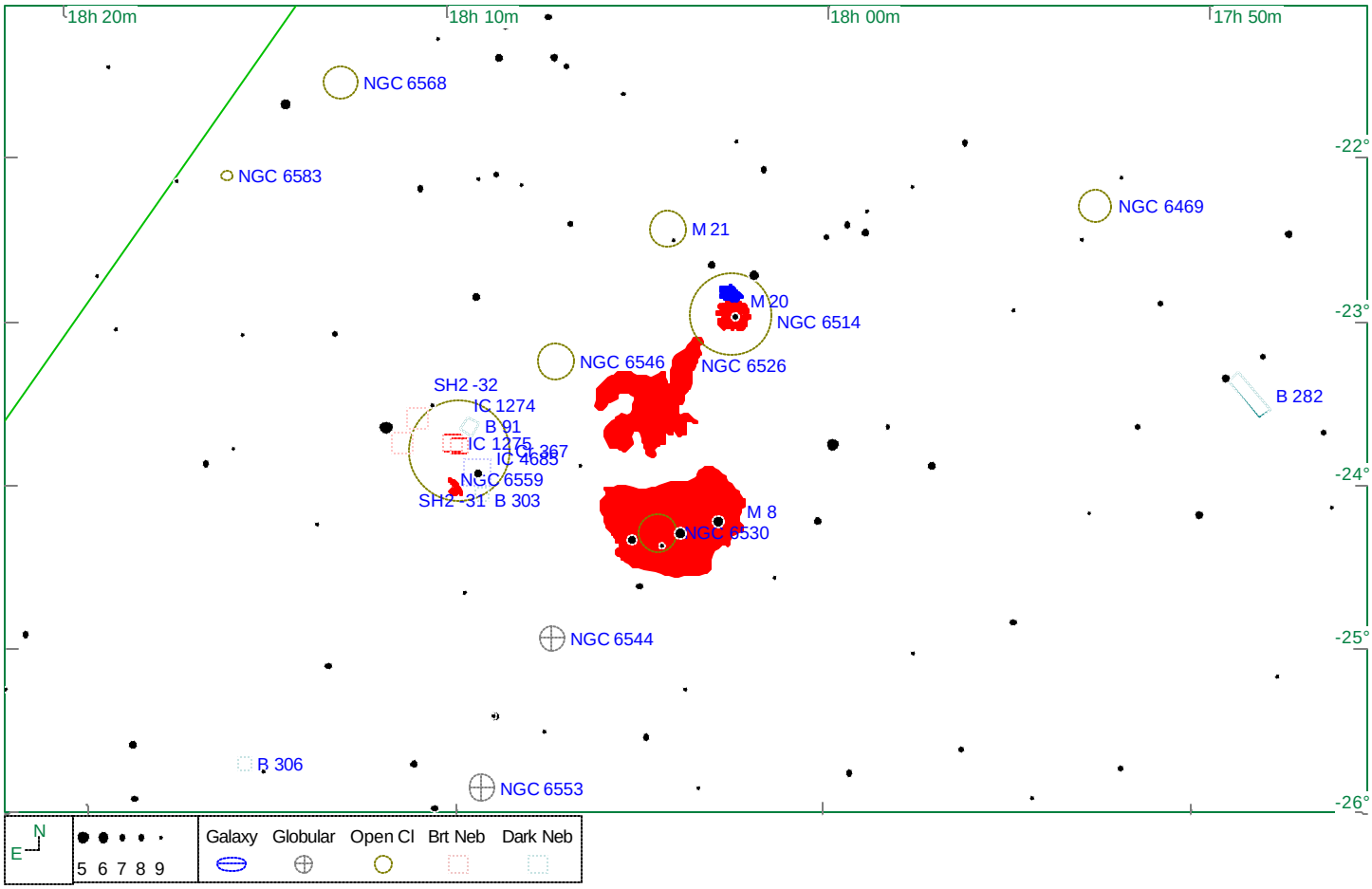
★ **CDMP:** (Chris' Don't Miss Pick)

NOTE:
I decided to try something a little different this month. Most everyone this time of year looks at the show pieces of the Lagoon and the Trifid Nebulae, but there are plenty more objects to observe within 4 degrees of them. Take some time and enjoy the lesser know objects.

NGC 6469 (Cr 353, Mel 182) – Open Cluster, Magnitude 8.2, Size 12', # Stars 50.
NGC 6568 (Cr 369) – Open Cluster, Magnitude 8.6, Size 12.0', # Stars 50.
NGC 6520 (Cr 361, Mel 187) – Open Cluster, Magnitude 7.6, Size 6.0', # Stars 60.
NGC 6531 (M-21, Cr 363) – Open Cluster, Magnitude 5.9, Size 13.0', # Stars 70.
NGC 6583 (Cr 370) – Open Cluster, Magnitude 10.0, Size 4.0', # Stars 35.
NGC 6546 (Cr 365) – Open Cluster, Magnitude 8.0, Size 13.0', # Stars 150.
NGC 6544 – Globular Cluster, Magnitude 7.5, Size 9.2'
NGC 6553 – Globular Cluster, Magnitude 8.3, Size 9.2'.
Cr 367 – Open Cluster, Magnitude 6.4, Size 37.0', # Stars 30.


19h 30m
19h 00m
18h 30m
18h 00m
17h 30m
-15°
-20°
-25°
-30°
NGC 6822
M 17
NGC 6645
M 18
Pluto 2007 Aug 15 22:00
NGC 6507
NGC 6603
M 24
M 25
M 23
M 9
NGC 6595
NGC 6716
NGC 6568
NGC 6583
M 21
NGC 6469
M 20
NGC 6546
M 22
Cr 367
M 8
NGC 6401
M 28
NGC 6530
NGC 6544
NGC 6520
Sagittarius
M 54
NGC 6624
NGC 6451
M 55
NGC 6425
M 70
M 69
NGC 6616
NGC 6383
Cr 336
NGC 6404
M 7
NGC 6396
NGC 6723
NGC 6441
NGC 6400
N
E
2 3 4 5 6 7
Galaxy
Globular
Open Cl
Brt Neb


18h 30m
18h 15m
18h 00m
17h 45m
-22°
-24°
-26°
-28°
-30°
NGC 6568
ESO 591-2
NGC 6583
M 21
NGC 6469
M 20
NGC 6546
NGC 6642
Cr 367
M 22
M 8
NGC 640
NGC 6530
M 28
NGC 6544
NGC 6638
NGC 6553
IC 4673
NGC 6520
ESO 456-52
NGC 6528
NGC 6624
NGC 6451
N
E
3 4 5 6 7 8
Galaxy
Globular
Open Cl
Planetary
Brt Neb



NOTE TO THOSE WHO CONTRIBUTE THEIR TIME TO THE STARSCAN EACH MONTH

I want take this moment to thank those who contribute to our newsletter every month. I know just how much time it takes to come up with articles, challenges, "oddities", the reviews of books and observation of the universe each month. This is not an easy task, yet you give of yourself to the club. I wonder what it would be like if we opened up a Starsan one month and nothing was there. What a shock and certainly a huge disappointment.

So, thank you , Chris, Charlie, Hernan, Bob, Karen, Ken, Lisa and Dave. Without your help, I couldn't do this newsletter.

Connie Haviland
Starscan Editor

STS-118: Build the Station. Build the Future

06.22.07

Like all shuttle missions, STS-118 is about the future: putting the International Space Station a step closer to completion and gathering experience that will help people return to the moon and go on to Mars.

Image at right: The STS-118 insignia represents the continuation of the assembly of the International Space Station and the pursuit of knowledge through space exploration. Credit: NASA

But this mission also will see a two decade-old dream realized and a vision of inspiration completed. Twenty-two years after first being selected as Christa McAuliffe's backup in the Teacher in Space Project, Barbara Morgan will strap into space shuttle Endeavour as a fully-trained astronaut. She is one of five mission specialists in the seven-member crew.

"The mission has lots of angles," Matt Abbott, lead shuttle flight director, said. "There's a little bit of assembly; there's some re-supply; there's some repairs. And there are some high-visibility education and public affairs events. It's a little bit of everything."

The little bit of assembly – as in assembly of the International Space Station – refers to the next segment that will be attached to the right side of the station's backbone, or truss. The new segment, known as the S5, is relatively small and weighs about 5,000 pounds. The piece provides clearance between sets of solar arrays on the truss structure.

That doesn't mean, however, that installing it will be easy. Every crew member will play a part. Pilot Charles Hobaugh and space station Flight Engineer Clay Anderson will operate the station robotic arm that moves the segment into place, while spacewalkers David Williams and Richard Mastracchio provide guidance from the outside and finish the installation. Commander Scott Kelly and mission specialists Tracy Caldwell and Benjamin Alvin Drew will help out inside. Morgan will operate the shuttle robotic arm to provide television views of the operation.

"It's less than two inches from some critical electronic components that we want to make sure we don't come in contact with," Kelly said. "So that's a very tight clearance."

The resupply is not so little, either. This will be the last dedicated shuttle mission providing cargo to the station for 12 to 15 months. Russian Progress vehicles and the European Space Agency's Automated Transfer Vehicle (ATV) will bring cargo to the station in the interim. So Endeavour will carry enough supplies to last the station residents for awhile.

Image at left: STS-118 Mission Specialist Barbara Morgan. Credit: NASA

"I think right now the manifest has us bringing up about 5,000 pounds and then bringing down about 5,000 pounds," Kelly said. "So it's a lot of spare parts, food, clothing, scientific experiments. We'll unload that and then reload it with stuff that needs to come home – garbage, spare parts that are no longer needed on the station."

Then there's the repair work, which Lead Station Flight Director Joel Montalbano expects to be one of the most difficult parts of the mission. One of the station's control moment gyroscopes – a spinning wheel used to control the space station's orientation – experienced problems and was shut down in October. Program managers determined that it needed to be replaced during STS-118. Kelly's crew had less than a year to train for the task.

"The other stuff is a challenge, but we've known it was coming," Montalbano said. "We've developed procedures, we've trained the crew – it's all known. The gyroscope, it's a little bit new to us. We're putting a major task in when we're well into training."

Luckily, it's not new to NASA. The crew of STS-114 replaced a faulty gyroscope in 2005, and Montalbano said

Image at right: STS-118 Mission Specialist David Williams. Credit: NASA

Added all together, it's a lot of stuff to get done in one mission – but thanks to an electrical boost from the space station, the 118 crew could have a little more time than most missions to get it all done. Endeavour will be the first to try out a new system designed to let the shuttle use electrical power from the station.

The extra juice will allow Endeavour to stay in space for an extended period of time while docked to the station. STS-118 currently is an 11-day mission with three spacewalks planned. Mission managers could add three more days and an additional spacewalk after the Station-Shuttle Power Transfer System (SSPTS) is activated and checked out.

Future missions could gain as many as six extra days once all the station's solar arrays are installed and providing power to the SSPTS. This will become more important as the construction of the station continues.

"I'm really excited about going up and doing our jobs and doing them well," Morgan said. "I'm excited about experiencing the whole spaceflight, seeing Earth from space for the very first time and experiencing weightlessness and what that's all about. I am excited about seeing what it's like living and working onboard the International Space Station."

Morgan trained side by side with McAuliffe and witnessed the 1986 Challenger accident in which McAuliffe and her six fellow crew members died. The Teacher in Space Project was suspended then, but Morgan held on to her NASA ties. In the months following that tragedy, she went on the visits McAuliffe would have made, talking to children and teachers all over the country. Then, when she was selected in 1998 to become a full-fledged astronaut, she jumped at the opportunity.

In 2002, Morgan was chosen as the first educator to become a mission specialist astronaut. The Educator Astronaut Project evolved from the Teacher in Space Project. Both aimed to engage and attract students to explore the excitement and wonder of spaceflight and to inspire and support educators. Morgan's primary duty is the same as it is for the entire crew -- accomplish the planned objectives of the station assembly mission. But she also will take part in several education-related activities.

Image at right: STS-118 Mission Specialist David Williams. Credit: NASA

Added all together, it's a lot of stuff to get done in one mission – but thanks to an electrical boost from the space station, the 118 crew could have a little more time than most missions to get it all done. Endeavour will be the first to try out a new system designed to let the shuttle use electrical power from the station.

The extra juice will allow Endeavour to stay in space for an extended period of time while docked to the station. STS-118 currently is an 11-day mission with three spacewalks planned. Mission managers could add three more days and an additional spacewalk after the Station-Shuttle Power Transfer System (SSPTS) is activated and checked out.

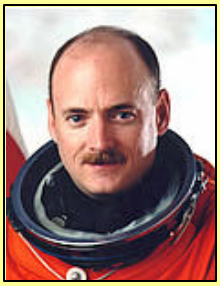
Future missions could gain as many as six extra days once all the station's solar arrays are installed and providing power to the SSPTS. This will become more important as the construction of the station continues.

"I'm really excited about going up and doing our jobs and doing them well," Morgan said. "I'm excited about experiencing the whole spaceflight, seeing Earth from space for the very first time and experiencing weightlessness and what that's all about. I am excited about seeing what it's like living and working onboard the International Space Station."

Morgan trained side by side with McAuliffe and witnessed the 1986 Challenger accident in which McAuliffe and her six fellow crew members died. The Teacher in Space Project was suspended then, but Morgan held on to her NASA ties. In the months following that tragedy, she went on the visits McAuliffe would have made, talking to children and teachers all over the country. Then, when she was selected in 1998 to become a full-fledged astronaut, she jumped at the opportunity.

In 2002, Morgan was chosen as the first educator to become a mission specialist astronaut. The Educator Astronaut Project evolved from the Teacher in Space Project. Both aimed to engage and attract students to explore the excitement and wonder of spaceflight and to inspire and support educators. Morgan's primary duty is the same as it is for the entire crew -- accomplish the planned objectives of the station assembly mission. But she also will take part in several education-related activities.

Find this article at:
http://www.nasa.gov/mission_pages/shuttle/shuttlemissions/sts118/mission_overview.html



Scott J. Kelly (Commander, USN) - NASA Astronaut

PERSONAL DATA: Born February 21, 1964 in Orange, New Jersey. Married to the former Leslie S. Yandell of Atlanta, Georgia. They have two children. His parents, Richard and Patricia Kelly, reside in Flagler Beach, Florida.

EDUCATION: Graduated from Mountain High School, West Orange, New Jersey, in 1982; received a bachelor of science degree in electrical engineering from the State University of New York Maritime College in 1987, and a master of science degree in aviation systems from the University of Tennessee, Knoxville, in 1996.

ORGANIZATIONS: Associate Fellow, Society of Experimental Test Pilots and Member, The Association of Space Explorers.

AWARDS: Defense Superior Service Medal, Navy Commendation Medal, Navy Achievement Medal, 2 Navy Unit Commendations, National Defense Service Medal, Southwest Asia Service Medal, Kuwait Liberation Medal, Sea Service Deployment Ribbon, NASA Space Flight Medal, NASA Exceptional Service Medal, Korolev Diploma from the Federation Aeronautique Internationale, 1999.

EXPERIENCE: Kelly received his commission from the State University of New York Maritime College in May 1987, and was designated a naval aviator in July 1989 at Naval Air Station (NAS) Beeville, Texas. He then reported to Fighter Squadron 101 at NAS Oceana, Virginia Beach, Virginia, for initial F-14 Tomcat training. Upon completion of this training, he was assigned to Fighter Squadron 143 and made overseas deployments to the North Atlantic, Mediterranean Sea, Red Sea and Persian Gulf aboard the USS Dwight D. Eisenhower (CVN-69). Kelly was selected to attend the U.S. Naval Test Pilot School in January 1993 and completed training in June 1994. After graduation, he worked as a test pilot at the Strike Aircraft Test Squadron, Naval Air Warfare Center, Aircraft Division, Patuxent River, Maryland, flying the F-14 Tomcat and F/A-18 Hornet. Kelly was the first pilot to fly an F-14 with an experimental digital flight control system installed and performed subsequent high angle of attack and departure testing.

Kelly has logged over 3,700 flight hours in more than 30 different aircraft and has over 250 carrier landings.

NASA EXPERIENCE: Selected by NASA in April 1996, Kelly reported to the Johnson Space Center in August 1996. Following completion of training, he was assigned technical duties in the Astronaut Office Spacecraft Systems/Operations Branch. He served as pilot on STS-103 in 1999 and has logged over 191 hours in space. Following STS-103, Kelly served as NASA's Director of Operations in Star City, Russia. He served as a back-up crewmember for ISS Expedition-5 and more recently, as the Astronaut Office Space Station Branch Chief. Scott Kelly is currently assigned and training as the commander of STS-118, an assembly mission to the International Space Station scheduled to launch on August 7, 2007.

SPACE FLIGHT EXPERIENCE: STS-103 (December 19-27, 1999) was an 8-day mission during which the crew successfully installed new instruments and upgraded systems on the Hubble Space Telescope (HST). Enhancing HST scientific capabilities required three space walks. The STS-103 mission was accomplished in 120 Earth orbits, traveling 3.2 million miles in 191 hours and 11 minutes. JULY 2007

Charles Owen Hobaugh (Lieutenant Colonel, USMC) - NASA Astronaut

PERSONAL DATA: Born November 5, 1961 in Bar Harbor, Maine. Married to the former Corinna Lynn Leaman of East Petersburg, Pennsylvania. They have four children. He enjoys weight lifting, volleyball, boating, water skiing, snow skiing, soccer, bicycling, running, rowing, triathlons. His parents, Jimmie and Virginia Hobaugh, reside in Sault Ste. Marie, Michigan. Her parents, Jerry and Dottie Leaman, reside in East Petersburg, Pennsylvania.

EDUCATION: Graduated from North Ridgeville High School, North Ridgeville Ohio, in 1980; received a Bachelor of Science degree Aerospace Engineering from the U.S. Naval Academy in 1984.

ORGANIZATIONS: U.S. Naval Academy Alumni Association.

SPECIAL HONORS: Distinguished Graduate U.S. Naval Academy, Joe Foss Award for Advanced Jet Training, Graduated with Distinction U.S. Naval Test Pilot School. Awarded the Strike/Flight Air Medal, Navy and Marine Corps Achievement Medal, Combat Action Ribbon, Navy Unit Commendation, and various other service awards.

EXPERIENCE: Hobaugh received his commission as a Second Lieutenant in the United States Marine Corps from the United States Naval Academy in May 1984. He graduated from the Marine Corps Basic School in December 1984. After a six month temporary assignment at the Naval Air Systems Command, he reported to Naval Aviation Training Command and was designated a Naval Aviator in February 1987. He then reported to Marine V/STOL Attack Squadron VMAT-203 for initial AV-8B Harrier Training. Upon completion of this training, he was assigned to Marine Attack Squadron VMA-331 and made overseas deployments to the Western Pacific at MCAS Iwakuni Japan and flew combat missions in the Persian Gulf during Desert Shield/Desert Storm embarked aboard the USS Nassau. While assigned to VMA-331, he attended Marine Aviation Warfare and Tactics Instructor Course and was subsequently assigned as the Squadron Weapons and Tactics Instructor. Hobaugh was selected for U.S. Naval Test Pilot School and began the course in June 1991. After graduation in June 1992, he was assigned to the Strike Aircraft Test Directorate as an AV-8 Project Officer and as the ASTOVL/JAST/JSF Program Officer. While there, he flew the AV-8B, YAV-8B (VSRA) and A-7E. In July 1994, he went back to the Naval Test Pilot School as an Instructor in the Systems Department, where he flew the F-18, T-2, U-6A and gliders. Hobaugh was assigned to the U.S. Naval Test Pilot School when he was selected for the astronaut program.
He has logged over 3,000 flight hours in more than 40 different aircraft and has over 200 V/STOL shipboard landings.

NASA EXPERIENCE: Selected by NASA in April 1996, Hobaugh reported to the Johnson Space Center in August 1996. He completed two years of training and evaluation, and was qualified for flight assignment as a pilot. Hobaugh was initially assigned technical duties in the Astronaut Office Spacecraft Systems/Operations Branch. Projects included Landing and Rollout, evaluator in the Shuttle Avionics Integration Laboratory, Advanced Projects, Multifunction Electronics Display Enhancements, Advanced Cockpit and Cockpit Upgrade, Rendezvous and Close Proximity Operations and Visiting Vehicles prior to his first flight assignment. Most recently, he served as Capsule Communicator, working in the Mission Control Center as the voice to the crew. Currently, he is assigned as pilot on STS-118, scheduled for launch in 2007.

SPACE FLIGHT EXPERIENCE: Hobaugh was assigned to, and flew as Pilot on STS-104 (July 12-24, 2001). This mission was the 10th mission to the International Space Station (ISS). During the 13-day flight the crew conducted joint operations with the Expedition-2 crew and performed three spacewalks to install the joint airlock "Quest" and to outfit it with four high-pressure gas tanks. The mission was accomplished in 200 Earth orbits, traveling 5.3 million miles in 306 hours and 35 minutes. MAY 2006

Dafydd (Dave) Rhys Williams (M.D.) - ASTRONAUT, Canadian Space Agency

PERSONAL DATA: Born May 16, 1954, in Saskatoon, Saskatchewan, Dave Williams is married and has two children. He enjoys flying, scuba diving, hiking, sailing, kayaking, canoeing, downhill and cross-country skiing.

EDUCATION: Education: Attended high school in Beaconsfield, Quebec. Graduated from McGill University, Montréal, Quebec, with a Bachelor of Science, Major in Biology (1976). Obtained a Master of Science from the Physiology Department, a Doctorate of Medicine and a Master of Surgery from the Faculty of Medicine, McGill University, (1983).
Completed a residency in family practice in the Faculty of Medicine, University of Ottawa, (1985). Obtained a fellowship in emergency medicine from the Royal College of Physicians and Surgeons of Canada, following completion of a residency in emergency medicine at the University of Toronto (1988). He is a Fellow of the Royal College of Physicians and Surgeons and the College of Family Physicians of Canada.

AFFILIATIONS: Member of the College of Physicians of Ontario, the Ontario Medical Association, the Canadian Association of Emergency Physicians, the Undersea and Hyperbaric Medicine Society and the Aerospace Medical Association. Past affiliations include the Society for Neuroscience, the New York Academy of Science and the Montreal Physiological Society.

SPECIAL HONORS: Awarded the Commonwealth Certificate of Thanks (1973) and the Commonwealth Recognition Award (1975) for his contribution to the Royal Life Saving Society of Canada. Academic awards include the A.S. Hill Bursary, McGill University (1980); Walter Hoare Bursary, McGill University (1981); J.W. McConnell Award, McGill University (1981 to 1983). Faculty Scholar (1982) and University Scholar (1983), Faculty of Medicine, McGill University. Psychiatry Prize, Wood Gold Medal, and Dean's Honor List, Physiology Department, McGill University, for postgraduate research (1983). Second prize (1986, 1987, 1988) for participation in the University of Toronto Emergency Medicine Research Papers Program. NASA Space Flight Medal (1998); Melbourne W. Boynton Award, American Astronautical Society (1999); Ramon y Cajal Institute of Neurobiology, Spanish Council for Scientific Research (CSIC) Bronze Medal for contribution to neuroscience during Mission STS-90 (1999); Rotary National Award for Space Achievement (2000); NASA Outstanding Leadership Medal (2002); Patron of the International Life Saving Federation (2002); Spokesperson for the Life Saving Society Canada and Honorary Ambassador of the Smart-Risk Foundation; NASA JSC Space and Life Sciences Directorate Special Professional Achievement Award (2003) for the implementation of the Automatic External Defibrillator Program that has saved several lives at the NASA Johnson Space Center; Honorary Doctor of Laws, University of Saskatchewan (2004).

EXPERIENCE: Dave Williams pursued postgraduate studies in advanced invertebrate physiology at the Friday Harbour Laboratories at the University of Washington, Seattle, but his interests shifted to vertebrate neurophysiology when, for his master's thesis, he became involved in basic science research on how adrenal steroid hormones modify the regulation of sleep-wake cycles. While working in the Neuro-physiological Laboratories at the Allan Memorial Institute for Psychiatry, Williams assisted in clinical studies of slow wave potentials within the central nervous system.
His clinical research in emergency medicine has included studies evaluating the initial training and skill retention of cardiopulmonary resuscitation (CPR) skills, patient survival from out-of-hospital cardiac arrest, the early identification of trauma patients at high risk, and the efficacy of tetanus immunization in the elderly

In 1988, Williams became an emergency physician with the Department of Emergency Services at Sunnybrook Health Science Centre, while also lecturing with the Department of Surgery at the University of Toronto. He served as a member of the Air Ambulance Utilization Committee with the Ministry of Health in Ontario, both as an academic emergency physician and later as a representative of community emergency physicians. In addition, he has trained basic ambulance attendants, paramedics, nurses, residents, and practicing physicians in cardiac and trauma resuscitation with both the Canadian Heart and Stroke Foundation and the American College of Surgeons

From 1989 to 1990 Williams served as an emergency physician with the Emergency Associates of Kitchener, Waterloo and as the medical director of the Westmount Urgent Care Clinic. In 1990, he returned to Sunnybrook as medical director of the Advanced Cardiac Life Support Program and also as the coordinator of postgraduate training in emergency medicine. Subsequently, Williams became the director of the Department of Emergency Services at Sunnybrook Health Science Centre and assistant professor of Surgery at the University of Toronto. He is currently an adjunct professor of Surgery at the University of Toronto and McGill University.
In June 1992 the Canadian Space Agency selected Williams as one of four successful candidates from a field of 5330 applicants to begin astronaut training. He completed basic training, and in May 1993, was appointed manager of the Missions and Space Medicine Group within the Canadian Astronaut Program. His assignments included supervising the implementation of operational space medicine activities for the Canadian Astronaut Program Space Unit Life Simulation (CAPSULS) Project. During this seven-day simulated space mission, which was conducted at the Defence R&D Canada, Toronto (Formerly DCIEM), Williams was the principal investigator of a study to evaluate the initial training and retention of resuscitation skills by non-medical astronauts. He was also one of the crew members and the crew medical officer.

In January 1995 Williams was selected to join the international class of NASA mission specialist astronaut candidates. He reported to the Johnson Space Center (JSC) in March 1995 for a year of training and evaluation. Following his successful completion of this training in May 1996, he was assigned to the Payloads and Habitability Branch of the NASA Astronaut Office. As a representative of the Office, he participated in the JSC Institutional Review Board and Science Merit Review Committee, the Independent Advisory Team for the International Space Station Crew Health Care System (CHeCs), the JSC Radiation Constraints Panel and was involved in the development of the Human Research Facility.

In April 1998 Dave Williams participated in STS-90 as Mission Specialist 3 aboard Space Shuttle Columbia. During the 16-day flight, called Neurolab, the seven-person crew served as both experiment subjects and operators for 26 individual life science experiments. These experiments, dedicated to the advancement of neuroscience research, focused on the effects of microgravity on the brain and the nervous system. Williams also functioned as the crew medical officer, the flight engineer during the ascent phase, and was trained to perform contingency spacewalks. Columbia orbited the Earth 256 times, covered over 10 million kilometers and spent over 381 hours in space.

From July 1998 until September 2002, Dave Williams held the position of Director of the Space and Life Sciences Directorate at the Johnson Space Center in Houston, Texas. With this appointment, he became the first non-American to hold a senior management position within NASA. He concurrently held a six-month position as the first deputy associated administrator for crew health and safety in the Office of Space Flight at NASA Headquarters in 2001.

In addition to these assignments, Dave Williams continued to take part in astronaut training to maintain and further develop his skills. In October 2001, he became an aquanaut through his participation in the joint NASA-NOAA (National Oceanic and Atmospheric Administration) NEEMO 1 mission, a training exercise held in Aquarius, the world's only underwater research laboratory. During this seven-day exercise, Williams became the first Canadian to have lived and worked in space and in the ocean.

In 2006, Dave Williams took the lead of NEEMO 9 as the crew commander of this mission dedicated to assess new ways to deliver medical care to a remote location, as would be done in a long space flight.
Dave Williams is currently training to participate in his second space flight, Mission STS-118/13A.1. During the 11-day mission to add a truss segment and relocate solar arrays on the International Space Station, Dave Williams will perform at least two spacewalks, and if there is a mission extension, a third. JULY 2007

Barbara Radding Morgan , Teacher- NASA Astronaut

PERSONAL DATA: Born November 28, 1951, in Fresno, California. Married to Clay Morgan. They have two sons. Barbara plays flute and enjoys reading, hiking, swimming, skiing, and her family.

EDUCATION: Hoover High School, Fresno, California, 1969; B.A., Human Biology, with distinction, Stanford University, 1973; Teaching Credential, College of Notre Dame, Belmont, California, 1974.

ORGANIZATIONS: National Education Association; Idaho Education Association; National Council of Teachers of Mathematics; National Science Teachers Association; International Reading Association; International Technology Education Association; Challenger Center for Space Science Education.

SPECIAL HONORS: Phi Beta Kappa, NASA Headquarters Special Service Award, NASA Public Service Group Achievement Award. Other awards include Idaho Fellowship Award, University of Idaho President's Medallion Award, International Technology Education Association Lawrence Prakken Professional Cooperation Award, Challenger Center for Space Science Education Challenger 7 Award, National Space Society Space Pioneer Award for Education, Los Angeles Chamber of Commerce Wright Brothers "Kitty Hawk Sands of Time" Education Award, Women in Aerospace Education Award, National PTA Honorary Lifetime Member, and USA Today Citizens of the Year.

EXPERIENCE: Morgan began her teaching career in 1974 on the Flathead Indian Reservation at Arlee Elementary School in Arlee, Montana, where she taught remedial reading and math. From 1975-1978, she taught remedial reading/math and second grade at McCall-Donnelly Elementary School in McCall, Idaho. From 1978-1979, Morgan taught English and science to third graders at Colegio Americano de Quito in Quito, Ecuador. From l979-l998, she taught second, third, and fourth grades at McCall-Donnelly Elementary School.

NASA EXPERIENCE: Morgan was selected as the backup candidate for the NASA Teacher in Space Program on July 19, 1985. From September 1985 to January 1986, Morgan trained with Christa McAuliffe and the Challenger crew at NASA's Johnson Space Center, Houston, Texas. Following the Challenger accident, Morgan assumed the duties of Teacher in Space Designee. From March 1986 to July 1986, she worked with NASA, speaking to educational organizations throughout the country. In the fall of 1986, Morgan returned to Idaho to resume her teaching career. She taught second and third grades at McCall-Donnelly Elementary and continued to work with NASA's Education Division, Office of Human Resources and Education. Her duties as Teacher in Space Designee included public speaking, educational consulting, curriculum design, and serving on the National Science Foundation's Federal Task Force for Women and Minorities in Science and Engineering.
Selected by NASA as a mission specialist in January 1998, Morgan reported to the Johnson Space Center in August 1998. Following the completion of two years of training and evaluation, she was assigned technical duties in the Astronaut Office Space Station Operations Branch. She then served in the Astronaut Office CAPCOM Branch, working in Mission Control as prime communicator with on-orbit crews. More recently, she served in the Robotics Branch of the Astronaut Office. Morgan is assigned to the crew of STS-118, an assembly mission to the International Space Station. The mission will launch in 2007. MAY 2007

Tracy E. Caldwell (Ph.D.) - NASA Astronaut

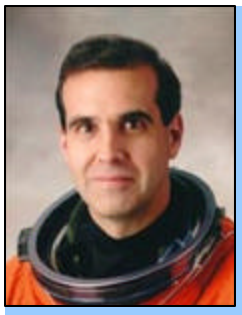
PERSONAL DATA: Born August 14, 1969 in Arcadia, California. Recreational interests include running, weight training, hiking, softball, basketball, and auto repair/maintenance. As an undergraduate, she competed in intercollegiate athletics on CSUF's track team as both a sprinter and long jumper.
EDUCATION: Received a Bachelor of Science degree in Chemistry from the California State University at Fullerton in 1993 and a Doctorate in Physical Chemistry from the University of California at Davis in 1997.

ORGANIZATIONS: Sigma Xi Research Society and the American Chemical Society.

SPECIAL HONORS: NASA Performance Award (2002 & 2001), NASA Go the Extra Mile (GEM) Award (2001), NASA Superior Accomplishment Award (2000), NASA Group Achievement Award - Russian Crusader Team (2000), Camille and Henry Dreyfus Postdoctoral Fellowship in Environmental Science (1997). Outstanding Doctoral Student Award in Chemistry from the University of California Davis (1997). American Vacuum Society - Nellie Yeoh Whetten Award (1996). American Vacuum Society Graduate Research Award (1996). Pro Femina Research Consortium Graduate Research Award (1996). Pro Femina Research Consortium Graduate Award for Scientific Travel (1996). University of California, Davis Graduate Research Award (1996). University of California, Davis Graduate Student Award for Scientific Travel (1994). Patricia Roberts Harris Graduate Fellowship in Chemistry (1993-1997). Lyle Wallace Award for Service to the Department of Chemistry, California State University Fullerton (1993). National Science Foundation Research Experience for Undergraduates Award, (1992). Council of Building & Construction Trades Scholarship (1991 and 1992). Big West Scholar Athlete (1989-1991).

EXPERIENCE: As an undergraduate researcher at the California State University, Fullerton (CSUF), Dr. Caldwell designed, constructed and implemented electronics and hardware associated with a laser-ionization, time-of-flight mass spectrometer for studying atmospherically-relevant gas-phase chemistry. Also at CSUF, she worked for the Research and Instructional Safety Office as a lab assistant performing environmental monitoring of laboratories using hazardous chemicals and radioactive materials, as well as calibrating survey instruments and helping to process chemical and radioactive waste. During that time (and for many years prior) she also worked as an electrician/inside wireman for her father's electrical contracting company doing commercial and light industrial type construction. At the University of California, Davis, Dr. Caldwell taught general chemistry laboratory and began her graduate research. Her dissertation work focused on investigating molecular-level surface reactivity and kinetics of metal surfaces using electron spectroscopy, laser desorption, and Fourier transform mass spectrometry techniques. She also designed and built peripheral components for a variable temperature, ultra-high vacuum scanning tunneling microscopy system. In 1997, Dr. Caldwell received the Camille and Henry Drefus Postdoctoral Fellowship in Environmental Science to study atmospheric chemistry at the University of California, Irvine. There she investigated reactivity and kinetics of atmospherically relevant systems using atmospheric pressure ionization mass spectrometry, Fourier transform infrared and ultraviolet absorption spectroscopies. In addition, she developed methods of chemical ionization for spectral interpretation of trace compounds. Dr. Caldwell has published and presented her work in numerous papers at technical conferences and in scientific journals.
Dr. Caldwell is a private pilot and conversational in American Sign Language (ASL) and Russian.

NASA EXPERIENCE: Selected by NASA in June 1998, Dr. Caldwell reported for training in August 1998. Astronaut Candidate Training included orientation briefings and tours, numerous scientific and technical briefings, intensive instruction in Shuttle and International Space Station (ISS) systems, physiological training, ground school to prepare for T-38 flight training, as well as learning water and wilderness survival techniques. Completion of this training and evaluation qualified her for flight assignment as a mission specialist. In 1999, Dr. Caldwell was first assigned to the Astronaut Office ISS Operations Branch as a Russian Crusader, participating in the testing and integration of Russian hardware and software products developed for ISS. In 2000, she was assigned prime Crew Support Astronaut for the 5th ISS Expedition crew, serving as their representative on technical and operational issues throughout the training and on-orbit phase of their mission. During ISS Increments 4-6, Dr. Caldwell also served as an ISS spacecraft communicator (CAPCOM) inside Mission Control. In 2003, she transitioned to the Astronaut Shuttle Operations Branch and was assigned to flight software verification in the Shuttle Avionics Integration Laboratory (SAIL) and also worked supporting launch and landing operations at Kennedy Space Center, Florida. She served as Lead CAPCOM for Increment 11. Dr. Caldwell is assigned to the crew of STS-118 targeted for launch in 2007. STS-118 will deliver to the station the third starboard truss segment, an external stowage platform, and logistics and supplies in a SPACEHAB single cargo module. MAY 2006



Rick Mastracchio - NASA Astronaut

PERSONAL DATA: Born February 11, 1960 in Waterbury, Connecticut.

EDUCATION: Graduated from Crosby High School, Waterbury, Connecticut, in 1978; received a bachelor of science degree in electrical engineering/computer science from the University of Connecticut in 1982, a master of science of degree in electrical engineering from Rensselaer Polytechnic Institute in 1987, and a master of science degree in physical science from the University of Houston-Clear Lake in 1991.

ORGANIZATIONS: Member, Institute of Electrical and Electronics Engineers.

EXPERIENCE: Rick Mastracchio worked for Hamilton Standard in Connecticut as an engineer in the system design group from 1982 until 1987. During that time, he participated in the development of high performance, strapped-down inertial measurement units and flight control computers.

NASA EXPERIENCE: In 1987, Mastracchio moved to Houston, Texas, to work for the Rockwell Shuttle Operations Company at the Johnson Space Center. In 1990, he joined NASA as an engineer in the Flight Crew Operations Directorate. His duties included the development of space shuttle flight software requirements, the verification of space shuttle flight software in the Shuttle Avionics Integration Laboratory, and the development of ascent and abort crew procedures for the Astronaut Office.
From 1993 until 1996, he worked as an ascent/entry Guidance and Procedures Officer (GPO) in Mission Control. An ascent/entry GPO has both pre-mission and real time Space Shuttle support responsibilities in the areas of onboard guidance, navigation, and targeting. During that time, he supported seventeen missions as a flight controller.
In April 1996, Mastracchio was selected as an Astronaut Candidate and started training in August 1996. Mastracchio has worked technical issues for the Astronaut Office Computer Support Branch, for Space Station Operations, and the EVA Branch. He next served as lead for cockpit avionics upgrades. Mastracchio flew as a mission specialist on STS-106 and has logged over 283 hours in space.
Currently, he is assigned to the STS-118 crew.

SPACE FLIGHT EXPERIENCE: STS-106 *Atlantis* (September 8-20, 2000). During the 12-day mission, the crew successfully prepared the International Space Station for the arrival of the first permanent crew. The five astronauts and two cosmonauts delivered more than 6,600 pounds of supplies and installed batteries, power converters, a toilet and a treadmill on the Space Station. Two crewmembers performed a space walk in order to connect power, data and communications cables to the newly arrived *Zvezda* Service Module and the Space Station. Mastracchio was the ascent/entry flight engineer, the primary robotic arm operator, and responsible for the transfer of items from the Space Shuttle to the Space Station. STS-106 orbited the Earth 185 times, and covered 4.9 million miles in 11 days, 19 hours, and 10 minutes. MAY 2006

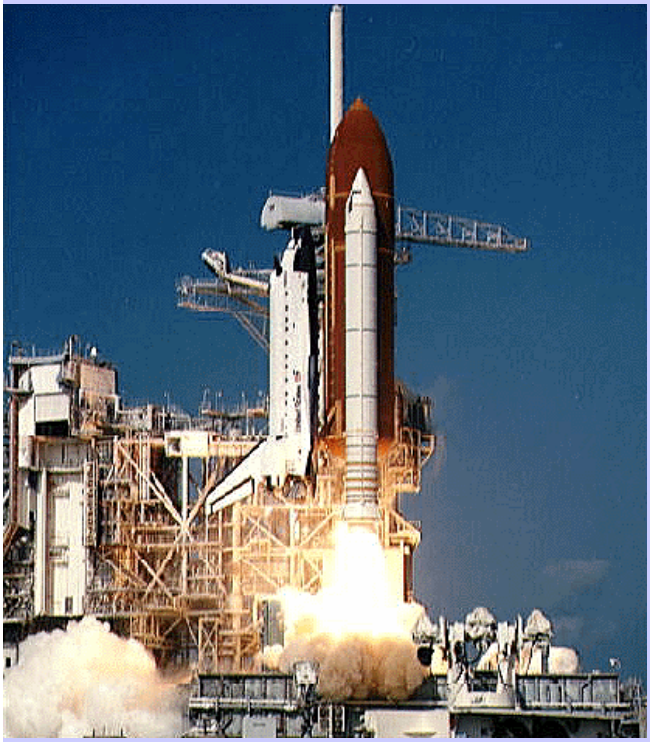
Benjamin Alvin Drew, Jr. (Colonel, USAF) - NASA Astronaut

PERSONAL DATA: Born November 5, 1962 in Washington, DC. Single. His parents, Muriel and Benjamin Drew, Sr., reside in Fort Washington, Maryland.
EDUCATION:
1980 High School Diploma from Gonzaga College High School in Washington, DC.
1984 Bachelor of Science in Astronautical Engineering from the United States Air Force Academy.
1984 Bachelor of Science in Physics from the United States Air Force Academy.
1995 Master of Aerospace Science from Embry Riddle University.
2006 Master of Strategic Studies in Political Science from the United States Air Force Air University.

ORGANIZATIONS: Society of Experimental Test Pilots, American Helicopter Society.

EXPERIENCE: Drew received his commission as a Second Lieutenant from the United States Air Force Academy in May 1984. He completed Undergraduate Pilot Training - Helicopter at Fort Rucker, Alabama and earned his wings in March 1985. His initial assignment was to the HH-3E flying combat rescue. He transitioned to the MH-60G and was assigned to the Air Force Special Operations Command. There, he flew combat missions in operations JUST CAUSE, DESERT SHIELD/ DESERT STORM and PROVIDE COMFORT. He completed USAF Fixed-Wing Qualification in April 1993, and the United States Naval Test Pilot School in June 1994. He has commanded two flight test units and served on Air Combat Command Staff. He is a Command Pilot with 3000 hours flying time in over 30 types of aircraft.

NASA EXPERIENCE: Selected as a mission specialist by NASA in July 2000, Drew reported for training in August 2000. Following the completion of two years of training and evaluation, he was initially assigned technical duties in the Astronaut Office Station Operations Branch. He is currently assigned to the crew of STS-118. Launch is targeted for August 7, 2007. JULY 2007



Launch Target:
Aug. 7, 2007

Orbiter:
Endeavour

Mission Number:
STS-118
(119th space shuttle flight)

Launch Window:
10 minutes

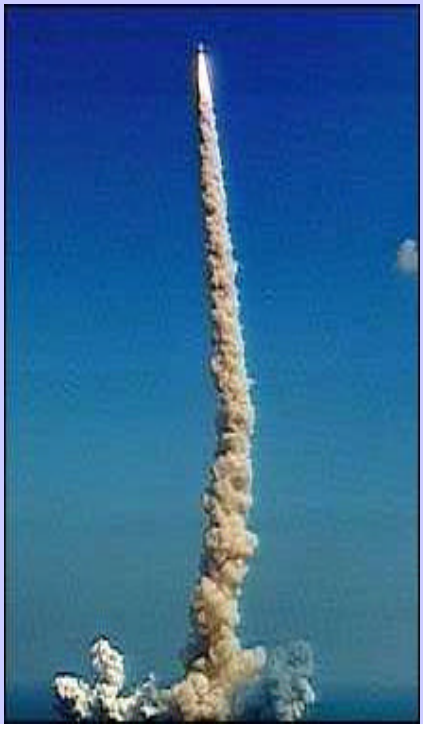
Launch Pad:
39A

Mission Duration:
11 days

Landing Site:
KSC

Inclination/Altitude:
51.6 degrees/122 nautical miles

Primary Payload:
22nd station flight (13A.1), S5 Truss



JSCAS LIBRARY

JSCAS Library's New Home

A message from your new librarian:

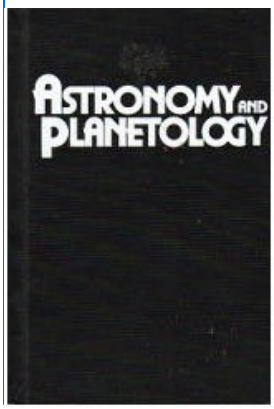
After many years of the JSCAS Library being in the care of Lisa Lester, it now resides in the Taylor home. It is my pleasure to be the clubs new Librarian and hope that everyone will take advantage of the free use of these books/videos/software/etc.

The list of what the library has to offer is posted on the JSCAS website (http://www.ghg.net/cbr/jscas/ or http://www.riverofstars.net/JSCAS/Library/Library.htm). Should you decide to borrow from the library please drop me a line, I'm on the list-server, or give me a call at 409-925-4350. I'll bring the item to the next club meeting or we can arrange a special meeting should you want your selection sooner.

Our new editor has graciously allotted the library this new section in the Starscan. We will use it to highlight a different book each month and also to post reviews of books that any members may have read and feel are worth sharing comments on. You can send these reviews directly to Connie and she will see that they make it into the Starscan.

Karen Taylor, JSCAS Librarian

HIGHLIGHT OF THE MONTH:



Gives instructions for building or making theodolites, sundials, telescopes, spectroscopes, planetariums and models of stars. In addition, describes methods and times for observing the sun, moon, planets, stars, comets and meteors.

NEWS AROUND THE GLOBE—Provided by David Haviland

Queen star finishes PhD thesis after 30 years—Wed Jul 11, 7:08 PM ET

LONDON (AFP) - After more than 30 years which he spent as a member of one of the world's most successful bands, Queen guitarist Brian May has finally finished his PhD thesis which he began as a student in the 1970s, The Times reported on Thursday. May, 59, earned a degree in physics at Imperial College London but after years of studying interplanetary dust, he abandoned work towards his doctorate when Queen took off.

His interest in the subject was reignited when he co-authored "Bang! The Complete History of the Universe", which tells the story of the universe from the big bang through its subsequent evolution, and was released last year.

"For the last nine months, I've done nothing except slave over my PhD, which is now written up, thank God," May reportedly told students at a ceremony at Exeter University in southwest Britain when he received an honorary doctorate.

"But there are times when you really want to give up. There are times when you go, 'Why on earth did I take this on?'" May worked on the PhD between 1971 and 1974, and kept all his hand-written notes on the subject through the years, finally discovering them in his loft recently.

"People are aware he is here and there is a feeling it is pretty cool that he has come back to finish his PhD, even if he has not been hugely visible," Abigail Smith, a spokeswoman for Imperial College, was quoted as saying by The Times. The rocker will receive his PhD next May, assuming his thesis is approved by supervisors.

SOLAR ECLIPSE EXPEDITION TO IWO JIMA

Paul Maley

The total eclipse of the sun that is going to happen July 22, 2009 will pass over the island of Iwo Jima. This may prove to be a unique opportunity to go to a place that is off tourism limits, is safe, and the sun is 85 degrees above the horizon during totality. I am in the process of attempting to secure permission for a JSCAS team to land on the island in order to observe the eclipse process. Because of the sacred nature of this island to the Japanese psyche, permission is required for any foreigner to travel there, and many are denied. We do not expect to hear a result for 6 months to a year. However, I am attempting to determine if there is enough interest in the Houston area to travel there. We will give first priority to JSCAS members. A maximum of about 5 minutes 11 seconds of totality can be seen from the island. If you are interested, please contact me at pdmaley@yahoo.com in order to be added to the interest list. The initial plan will be to charter an aircraft and fly in from Guam.

Note that we will also be conducting another expedition to the same eclipse in eastern China and details are available right now. About 5 minutes 50 seconds of totality will be visible from our planned site near Shanghai. You can find out what is happening by checking out this link--http://www.eclipsetours.com.

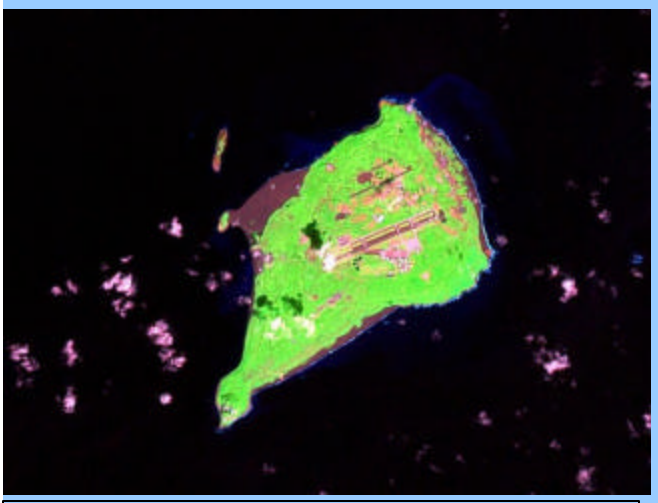


Figure 1. An overhead view of the island showing the landing strip. The famous Mount Suribachi is located at the lower left tip of the island. The eclipse lasts longest in the upper right part.

Figure 2. A closeup of the invasion beach used by US marines during World War II

The Japan Maritime Self-Defense Force (JMSDF) operates a naval air base on the island. The airstrip is 2,650 meters (8,700 ft) long and 60 meters (200 ft) wide. The JMSDF is in charge of support, air-traffic control, fueling, and rescue. The Japan Air Self-Defense Force also utilizes the base. The Japan Ground Self-Defense Force is in charge of explosive-ordnance disposal. Some 400 Japanese troops live on the island. The United States Navy also utilizes the base for operations such as nighttime carrier landing practice.

Telescope Solutions - Clayton Jeter
PO Box 375 Mont Belvieu, TX 77580-0375
Call: 713-569-7529 Email: stonebloke@gmail.com

Because the weather can be so fickle during the summer, as you have experienced these past few weeks, I decided that I would find a recipe you can use when you want the "party" but don't have the stars. Sangria...Sangría is a wine punch typical from Spain that can be also found in Portugal. The word sangría comes from the Spanish sangre meaning blood. It typically consists of red wine, chopped or sliced fruit, a sweetener such as honey or orange juice, a small amount of added brandy, triple sec, or other spirits and gaseosa, which is similar to lemonade but less sweet. Because of the variation in recipes, sangría's alchoholic content can vary greatly.

This sangria take 5 to 10 minutes to assemble in a large pitcher. Take the time to prepare it in the morning so the sangria has several hours to develop its fruity flavor. Pull it out when dinner is ready to serve that evening.

Sunset Sangria

3 tablespoons sugar
3 tablespoons (3 splashes) spiced dark rum
3 tablespoons orange liqueur
1 navel orange, sliced
1 lemon, sliced
2 ripe peaches, cut into wedges
3 ripe plums, cut into wedges
2 cinnamon sticks
1 bottle Rioja
Sparkling soda water, for topping off glasses of sangria at table

Combine sugar, rum, orange liqueur, fruits, and cinnamon sticks in a large pitcher. Cover with 1 bottle of wine and chill sangria several hours.

To serve, spoon fruits into glasses or goblets and pour over spiced wine. Top glasses of sangria off with a splash of soda water

Recipe courtesy Rachael Ray

Houston Area Astronomy Clubs

Brazosport Astronomy Club
Meets the Third Tuesday of the month, 7:45p.m.
At the Planetarium
400 College Drive
Clute, Texas (For more information, contact Judi James at the Planetarium 979-265-3376)

Fort Bend Astronomy Club http://www.fbac.org
Meets the third Friday of the month, 7:00 p.m.
First Colony Conference Center
3232 Austin Pkwy
Sugarland, Texas

Houston Astronomical Society http://spacibm.rice/edu/~has
Meets the first Friday of the month, 8:00 p.m.
University of Houston, University Park
Science and Research Building, Room 117

North Houston Astronomy Club http://www.astronomyclub.org
Meets the fourth Friday of the month, 7:30 p.m.
In the Teaching Theatre at Kingwood College

Members' Gallery
August 2007

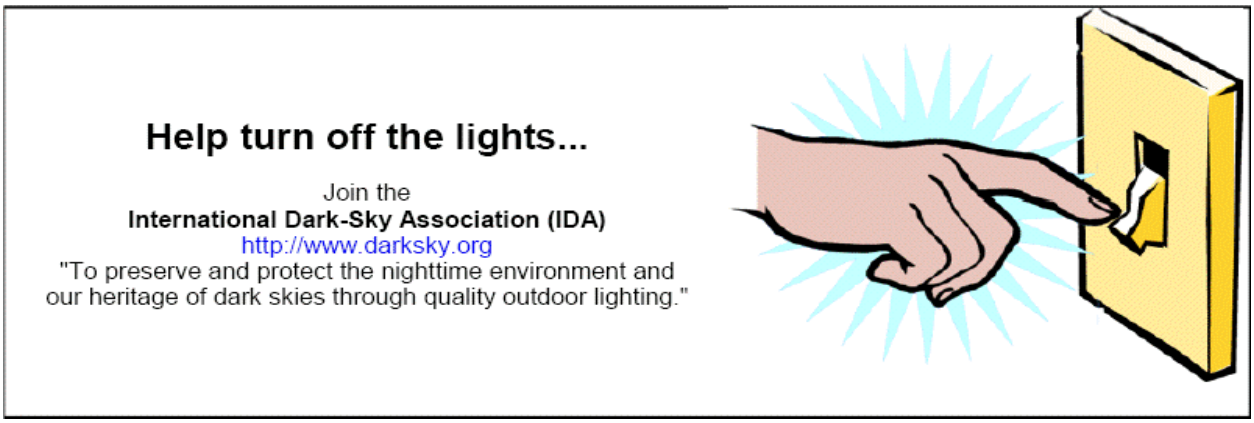
A VIEW FROM STS-117 EVA 2

From: Chris Wells

I thought since I was including information about our next Shuttle launch and that they were going to be "visiting" the ISS, I would include this breathtaking photo of Steve Swanson, sent to one of our members, Chris Wells, who graciously provided for us.

Photo was taken by fellow EVA crewman Pat Forrester during STS-117 EVA 2. The camera is a slightly modified, off the shelf, Kodak DCS 760, 6MB CCD, SLR, with a thermal blanket. (information provided by Randy Moore)

This has to take your breath away….Thanks Randy and Chris.



Johnson Space Center Astronomical Society

Club Officers

President – Bob Taylor
Vice President – David Haviland
Secretary – David Haviland
Starscan Editor – Connie Haviland
Star Party Chairperson – John Erickson
Librarian – Bob and Karen Taylor
Historian – Susan De Chellis
Scientific Expeditions – Paul Maley
Web Master - Chris Randall

SIGS

Observing Awards – Triple Nickel
Astronomy 101 — Triple Nickel
CCD Imaging – Al Kelly
Binocular Observing – Leslie Eaton
Telescope Making – Bob Taylor
Deep Sky Observing – Chris Randall

Starscan Submission Procedures

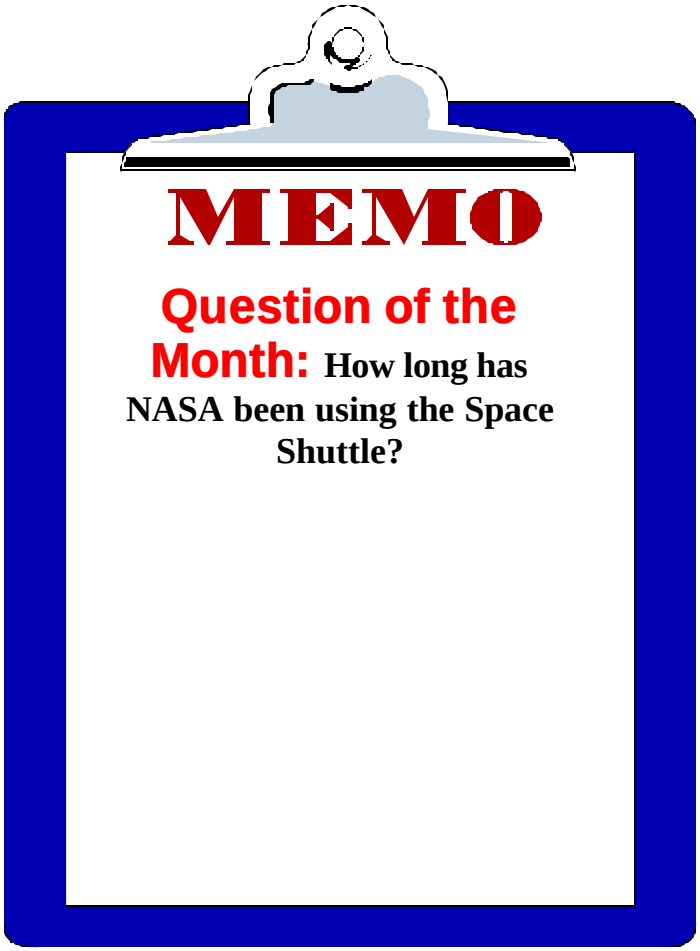
Original articles of some relation to astronomy will be accepted up to 6 p. m. (1800 hrs) on the 25th of each month. THE most convenient way to submit articles or a Calendar of Events is by email is preferred but hard copies (CD, disk) are also accepted. All articles must include author's name and phone number. Also include any picture credits. Word, WordPerfect, and text files will be accepted.

Please send all submissions to:
txconstance@houston.rr.com
This hasn't changed yet, but will be changing soon, to Comcast.net..not yet, though.

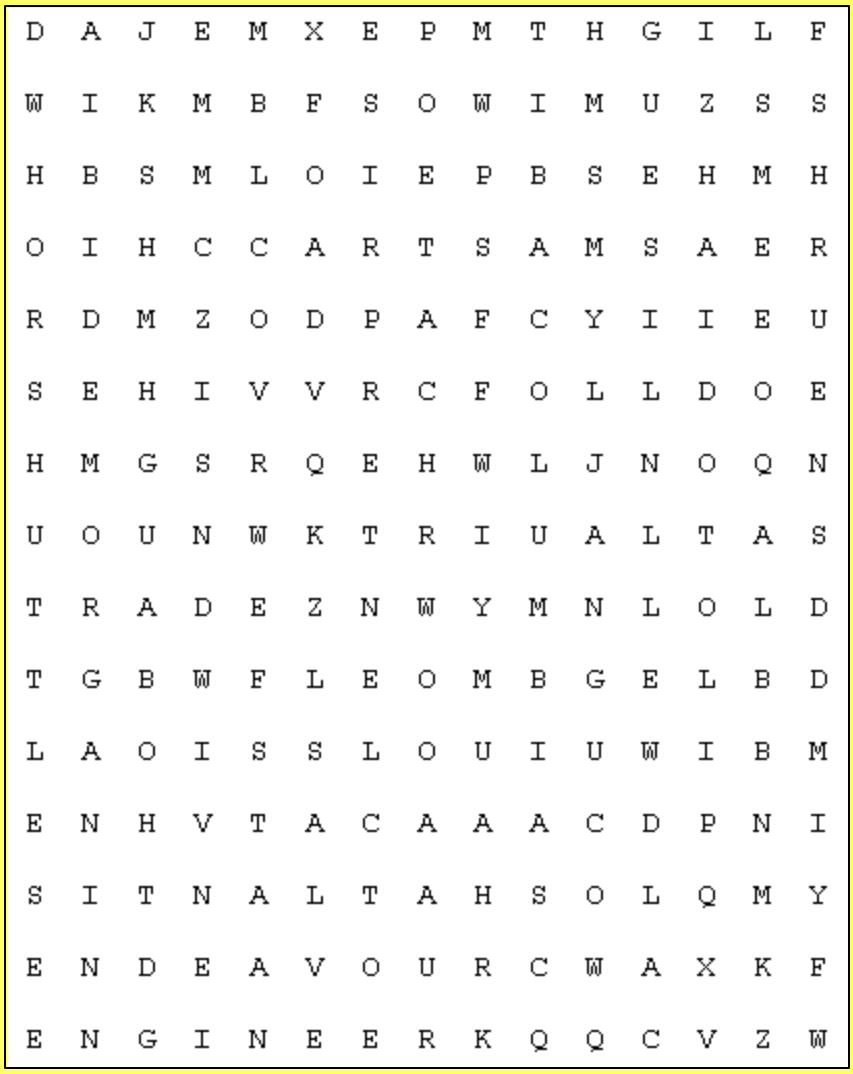
The author of individual articles bears all responsibility for publishing any e-mail addresses in the article on the World Wide Web

Astronomy and Kids

This is the section strictly for kids (or kids at heart). We will be including information, stories, ideas, puzzles or anything that has to do with astronomy. The only difference here is, it will be directed for children. We don't discourage parents or any other adult to get involved. In fact, we encourage it strongly. So we hope you enjoy this section and if it touches a child's interest in astronomy, our goal has been achieved. Enjoy!!



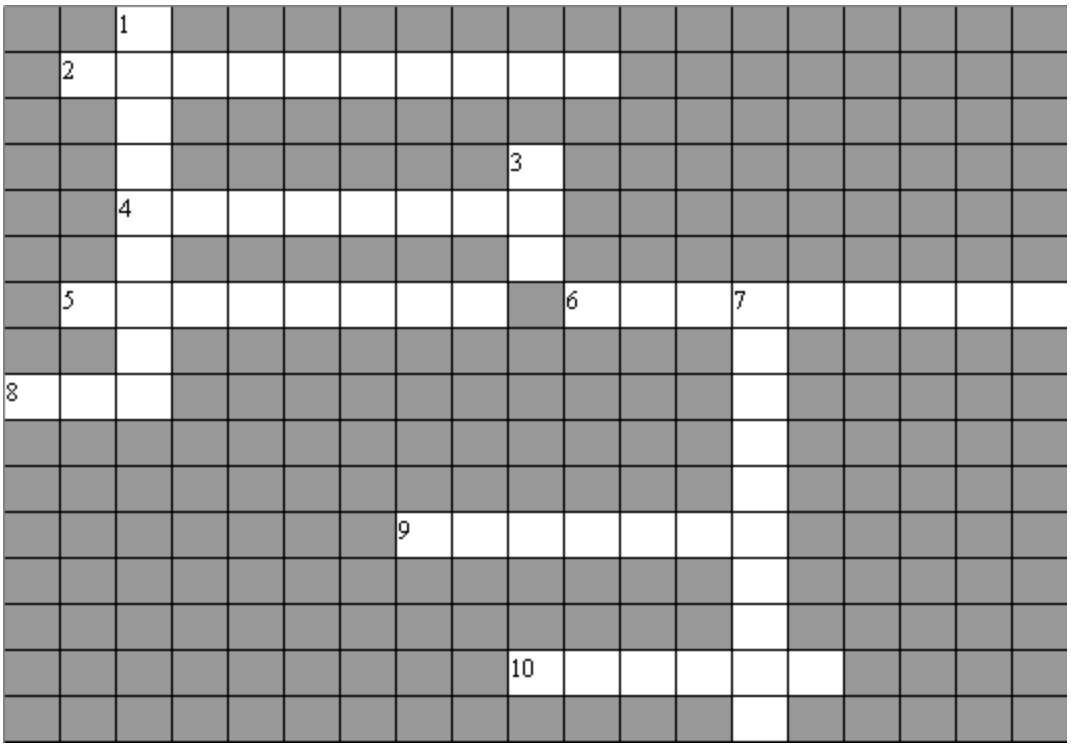
PUZZLES AND SOLUTIONS



D A J E M X E P M T H G I L F
W I K M B F S O W I M U Z S S
H B S M L O I E P B S E H M H
O I H C C A R T S A M S A E R
R D M Z O D P A F C Y I I E U
S E H I V V R C F O L L D O E
H M G S R Q E H W L J N O Q N
U O U N W K T R I U A L T A S
T R A D E Z N W Y M N L O L D
T G B W F L E O M B G E L B D
L A O I S S L O U I U W I B M
E N H V T A C A A A C D P N I
S I T N A L T A H S O L Q M Y
E N D E A V O U R C W A X K F
E N G I N E E R K Q Q C V Z W

ATLANTIS
CALDWELL
CHALLENGER
COLUMBIA
COMMANDER
DISCOVERY
DREW
ENDEAVOUR
ENGINEER
ENTERPRISE
FLIGHT
HOBAUGH
ISS
MASTRACCHIO
MIR
MISSION
MORGAN
PAYLOAD
PILOT
SHUTTLE
WILLIAMS

AUGUST'S CROSSWORD PUZZLE



ACROSS

2. other name for (OV-101)
4. Shuttle named after the first U.S. ship used for ocean research
5. Shuttle named after the first American ship to sail around the world
6. Shuttle named for two famous ships
8. Russian space station
9. reusable rocket that could fly many missions
10. the last name of Triple's partner who who helps train space shuttle commanders and pilots(hint: answer is in last month's Starscan)

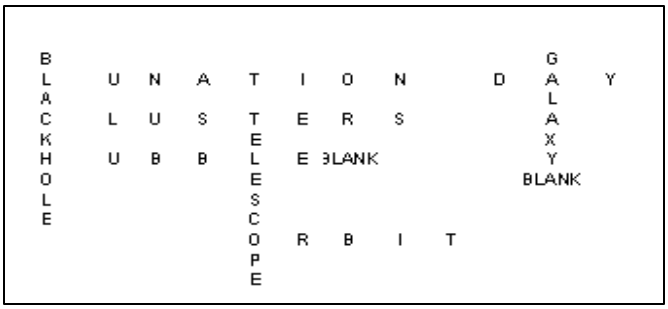
DOWN

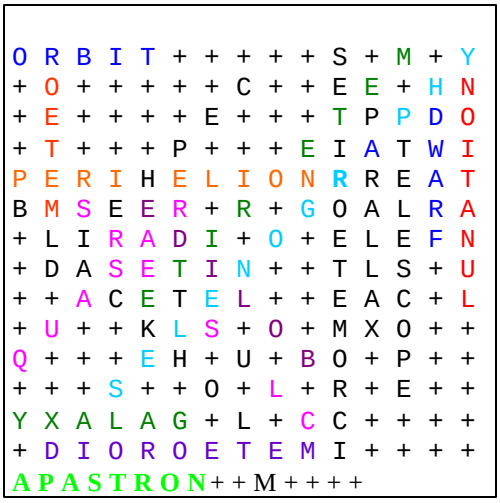
1. named after the first ship commanded by James Cook, the 18th century British explorer
3. a spacecraft where astronauts could live and work
7. Shuttle named after a British Naval research ship

Puzzle of the month—JULY

Astronomy Solution #4

LAST MONTH'S CROSSWORD PUZZLE



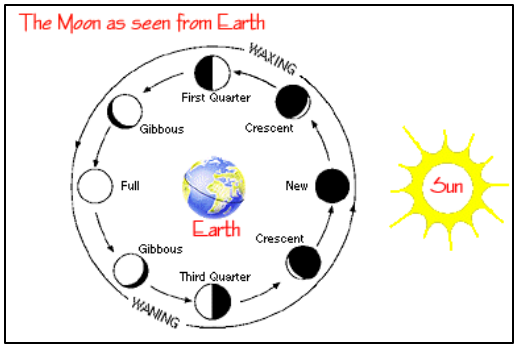


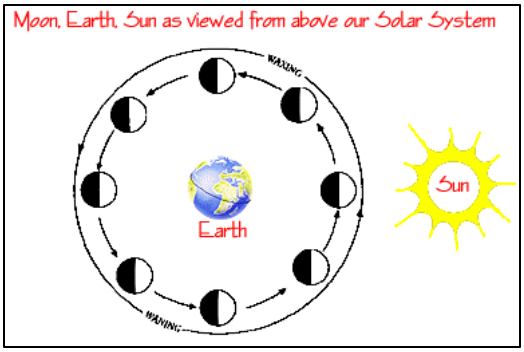
ANSWER TO THE QUESTION OF THE MONTH

Question: *What are the phases of the moon?*

Answer:

The Moon orbits Earth at an average distance of 382,400 kilometers. The lunar month is the 29.53 days it takes to go from one new moon to the next. During the lunar month, the Moon goes through all its phases. You can see the phases drawn in the image below. Just like the Earth, half of the Moon is lit by the Sun while the other half is in darkness. The phases we see result from the angle the Moon makes with the Sun as viewed from Earth. The diagram below on the right is one you typically see in books. Don't let it confuse you. The images of the Moon show what you see the Moon look like from Earth when it is at given points in its orbit. It does not show which side of the Moon is lit by the Sun. The side lit by the Sun is always the side that is pointed toward the Sun, as seen in the diagram below on the left.





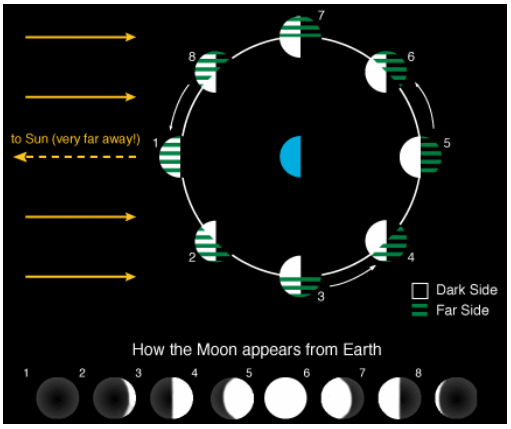
We only see the Moon because sunlight reflects back to us from its surface. During the course of a month, the Moon circles once around the Earth. If we could magically look down on our solar system, we would see that the half of the Moon facing the Sun is always lit. But the lit side does not always face the Earth! As the Moon circles the Earth, the amount of the lit side we see changes. These changes are known as the phases of the Moon and it repeats in a certain way over and over.

At new moon, the Moon is lined up between the Earth and the Sun. We see the side of the Moon that is not being lit by the Sun (in other words, we see no Moon at all, because the brightness of the Sun outshines the dim Moon!) When the Moon is exactly lined up with the Sun (as viewed from Earth), we experience an eclipse.

As the Moon moves eastward away from the Sun in the sky, we see a bit more of the sunlit side of the Moon each night. A few days after new moon, we see a thin crescent in the western evening sky. The crescent Moon waxes, or appears to grow fatter, each night. When half of the Moon's disc is illuminated, we call it the first quarter moon. This name comes from the fact that the Moon is now one-quarter of the way through the lunar month. From Earth, we are now looking at the sunlit side of the Moon from off to the side.

The Moon continues to wax. Once more than half of the disc is illuminated, it has a shape we call gibbous. The gibbous moon appears to grow fatter each night until we see the full sunlit face of the Moon. We call this phase the full moon. It rises almost exactly as the Sun sets and sets just as the Sun rises the next day. The Moon has now completed one half of the lunar month.

During the second half of the lunar month, the Moon grows thinner each night. We call this waning. Its shape is still gibbous at this point, but grows a little thinner each night. As it reaches the three-quarter point in its month, the Moon once again shows us one side of its disc illuminated and the other side in darkness. However, the side that we saw dark at the first quarter phase is now the lit side. As it completes its journey and approaches new moon again, the Moon is a waning crescent.

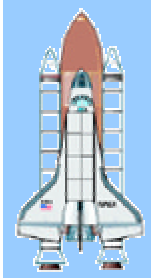


Want another description of why the Moon has phases?

You can demonstrate the phases of the Moon for yourself by using a lamp and a baseball. Place the lamp with its shade removed in one end of a darkened room. Sit in the other end of the room and hold the baseball up in front of you so that it is between your face and the lamp. Now move the ball around your head at arm's length. Do this slowly and move your arm from right to left. As the baseball orbits your head, you will see it go through the same phases as the Moon.

Want to know what phase the Moon is in right now? Go to: http://aa.usno.navy.mil/data/docs/RS_OneDay.html

(http://library.thinkquest.org/J0112188/space_shuttles.htm)



The space shuttle is a spacecraft designed for transporting people and cargo to and from orbit around Earth. NASA built the shuttle in the 1970's to serve as a reusable rocket that could fly many missions. Past spacecrafts could only be used one time.
After 10 years of preparing Columbia, the first space shuttle was launched on April 12, 1981. Now four space shuttles are in use—Columbia (1981), Discovery (1983), Atlantis (1985), and Endeavour (1991), which replaced Challenger.

Important Missions

Two of the most important missions for a space shuttle are to carry satellites and other equipment into space and repair them there if necessary and to allow astronauts to conduct space experiments for studying weightlessness called "microgravity."

Main Parts

The space shuttle has three main parts—the orbiter, rocket systems (two solid rocket boosters and three main engines), and an external fuel tank. The orbiter has the crew cabin (which can carry up to seven crew members) the cargo bay, and the three main engines. Located on each side of the shuttle, the solid booster rockets holds solid fuel. When the fuel is gone, the boosters fall back down to Earth. The external fuel tank holds the shuttle's liquid fuel.

Levels

The space shuttle has three levels—the flight deck, the mid-deck, and the utility floor. The flight deck is where the mission commander and the pilot control the shuttle. The astronauts sleep, eat, and go to the bathroom on mid-deck. The utility floor storage area is where they keep the water and air tanks. The cargo bay is large enough to fit a tour bus. The laboratory is located in the cargo bay on the utility floor. That is where the satellites are stored and experiments are conducted. The cargo bay is where they complete all the missions. For example if one of their missions was to repair a satellite, the astronaut would fix it in the cargo bay.

Heat Shield Tiles

The space shuttle is covered with special tiles to protect it from the intense heat when it reenters the Earth's atmosphere. The tiles are so safe that if exposed to temperatures of up to 2,300? F, a human could hold them in their bare hand without injury! The tiles can last for up to 100 missions. Without these tiles, the space shuttle would burn to a crisp, killing all the astronauts inside.

Robotic Arm

Located on the left side of the space shuttle is a Canadian built robotic arm. It is used to pick up satellites and astronauts. The arm has three moving joints similar to the human wrist, elbow, and shoulder. The arm stretches fifty feet in length. It has two video cameras used to record the activities of the crew. The robotic arm has been a very important tool because it was used to build and repair the Russian space station, Mir, and the International Space Station.

Space Suit

Astronauts wear space suits and maneuvering units. These units strap on to an astronaut's back over the space suit, allowing them to move around in space without being connected to the shuttle. This equipment allows astronauts to take space walks outside the shuttle to work on satellites and other equipment.

Launch

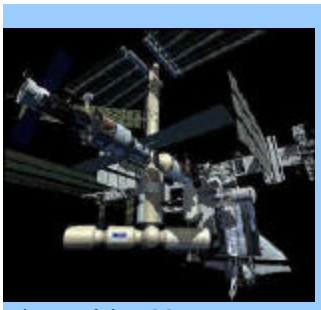
Space shuttles are designed to leave Earth vertically using rockets and to land horizontally a lot like an aircraft. The booster rockets take the shuttle 28 (45 km) miles high before they fall away. These engines are designed to be used for 55 space missions, the world's first reusable rocket engines. The speed of the rockets reaches 3,049 mph (4,973 km/h) before they burn out and fall into the ocean. After the booster rockets fall away, the three main shuttle engines kick in.

Crew

The mission commander and the pilot, who are responsible for flying the shuttle, lead the flight crew. The rest of the crew is responsible for making sure the mission completes all of its assignments. Payload specialists conduct experiments or launch and repair satellites or other equipment.

Landing

The space shuttle usually lands back at Kennedy Space Center in Cape Canaveral, Florida. If there is bad weather or other problems, the shuttle can land at Edwards Air Force Base in California. Shuttles that land at Edwards have to be carried back to Cape Canaveral by a special Boeing 747 at a cost of nearly $1 million.



The ISS and the Shuttle Working Together

The International Space Station (ISS) is a spacecraft where astronauts could live and work. Since the ISS is large, it is less expensive to take it piece by piece into space and assemble it there rather than build the entire station and launch it into space. In the year 2002, after 44 flights into space, the ISS will be finished.
The center of the ISS is the U.S. Destiny Laboratory. This is where new and extraordinary experiments will be done in near-zero gravity.
The first piece of the ISS put into space was the Zarya control module, launched on November 20, 1998. It was put into orbit by a Russian Proton rocket. Zarya will provide power and communication and help dock other parts of the station. Following this mission, the Endeavour carried the Unity connecting module into space. Unity allows the pieces of the ISS to connect together.

X-33

One day the new X-33 will replace the space shuttle. It is only half the size of a space shuttle. NASA is conducting test flights now.

You can look it up here: http://en.wikipedia.org/wiki/Lockheed_Martin_X-33,
http://www.hq.nasa.gov/office/pao/History/x-33/menu1.htm,
http://www.fas.org/spp/guide/usa/launch/x-33.htm

Spacenews.com staff writer Brian Berger reported on March 6, 2001, that testing of the X-33 aerospike engines at NASA's Stennis Space Center has stopped following NASA's decision not to fund X-33 beyond the end of March 2001. The second of nine planned test firings of two linear aerospike engines in tandem was scheduled to take place on March 6. Stennis spokesperson Paul Foreman told Berger that Stennis officials had decided to remove the remaining eight engine tests from the schedule. No order has been given yet to remove the engines from their test stands. (http://www.hq.nasa.gov/office/pao/History/x-33/2001.htm) Maybe someday, they will go back to testing this and find a different need for this.

Space Shuttle Names

Each space shuttle was named after a famous ship.

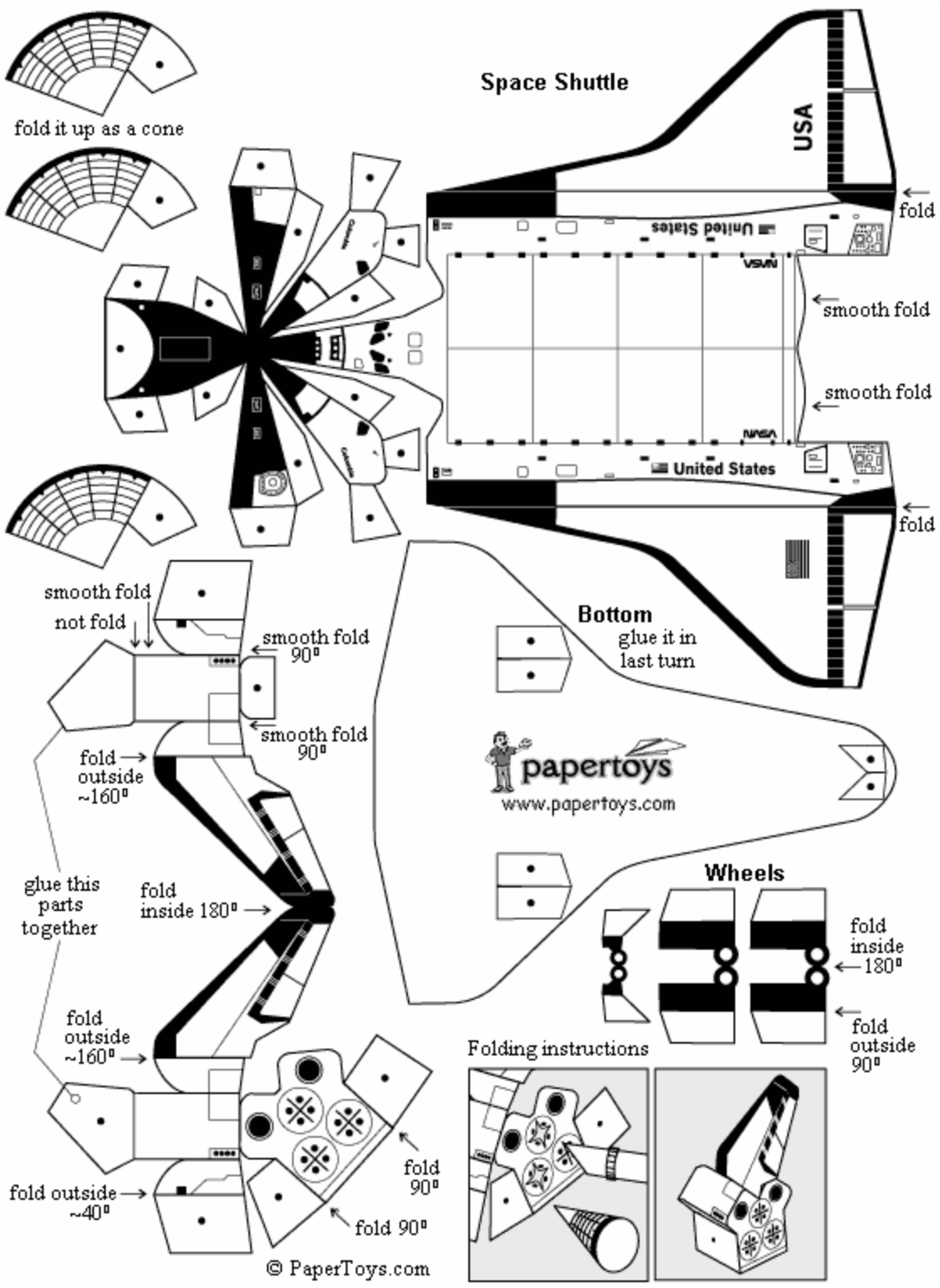
Want to know how the astronauts prepare for space?

Suiting Up for Space - Before the spacesuits get packed for flight, they must be carefully prepared on Earth. Go to: http://anon.nasa-global.edgesuite.net/anon.nasa-global/ccvideos/sts-116/windows/ksc_030107_emu.asx

Rehearsing for Rescue: http://www.nasa.gov/mission_pages/shuttle/behindscenes/Mode8photoessay.html

Part office, Part Sanctuary, All Crew Quarters: http://www.nasa.gov/astronauts/crewquarters.html

- Enterprise, the first Space Shuttle Orbiter, was originally to be named Constitution (in honor of the U.S. Constitution's Bicentennial).
- Columbia was named after a sailing vessel the explored the Columbia River in 1792 and was the first American ship to sail around the world
- Discovery was named for two famous ships—Henry Hudson's ship that searched for a route from the Atlantic Ocean to the Pacific Ocean in the 1610's and Captain James Cook's ship that sailed the Pacific Ocean where he found the Hawaiian Islands in the 1770's
- Atlantis was named after the first U.S. ship used for ocean research.
- Endeavour was named after the first ship commanded by Captain James Cook. In 1788 the ship sailed to the South Pacific and around Tahiti, discovered New Zealand, mapped Australia, and sailed around the Great Barrier Reef. His ship often took scientists on explorations.
- Challenger was named after a British Naval research ship, The HMS Challenger, that sailed into the Atlantic and Pacific Ocean in the 1870's.



INSTRUCTIONS: Print only 1 single page on your printer. You can make larger by using a photocopier to enlarge. Have fun!