

TRAVELS NOW AND THEN

© Christopher Earls Brennen

SPACE SHUTTLE STS123 2008

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
Houston, Texas
77058

[Signature]

September 27, 2007

Reply to Attn of: CB

Dear Family and Friends:

The crew of Space Shuttle Mission STS-123 invites you and your immediate family to the launch of the Space Shuttle *Endeavour* at the Kennedy Space Center (KSC) in Florida. This exciting 16-day assembly mission will rendezvous and dock with the International Space Station (ISS) to transport an ISS Expedition crewmember, and deliver and install both the Japanese Experimental Logistics Module – Pressurized Section and the Canadian Special Purpose Dexterous Manipulator. The crew will perform four complex spacewalks and numerous robotic arm operations. The exact launch date will be set approximately two weeks prior and is currently targeted for February 14, 2008.

Due to heightened security, only a limited number of guests will be able to view the launch from within KSC. If you can attend the launch, we will do our best to accommodate you and your family. All guests will pass through security checks before boarding bus transportation to the viewing sites, which are not accessible by private vehicle.

Please respond, **no later than October 25**, by registering on our web site, <http://guestlist.jsc.nasa.gov>. Your user ID and password for the website are printed on the back of this letter. Instructions for logging onto the website are also enclosed. The KSC launch status website: www.pao.ksc.nasa.gov/kscpao/schedule provides the most up-to-date information. When registering, the website will limit the number of family members you can enter. If you do not have access to the Internet or you require additional space for family members, contact our secretary, Alisa Halla, at 281-244-0167.

Launch dates are subject to change (sometimes at the last minute) so flexibility in travel arrangements is strongly encouraged. Some hotels and condominiums will allow reservation dates to move with the launch date, but you should verify their policy when making arrangements. If you plan to travel by air, consider purchasing tickets that can be changed. The on-line newsletter has information on travel planning and launch updates. A formal invitation and launch instructions will be mailed out approximately one month prior to the launch.

We are happy to extend this invitation to be a part of one of America's most spectacular and productive achievements – our Space Program. We, the crew of STS-123, sincerely hope the launch of *Endeavour* fits into your winter plans.

Sincerely,

Dominic Gorie
CAPT Dominic Gorie, USN (Ret)
Shuttle Commander

Garrett Reisman
Garrett Reisman, PhD
Expedition 16/17

Greg Johnson
Col Gregory H. Johnson, USAF
Shuttle Pilot

Robert Behnken
Maj Robert Behnken, USAF, PhD
Mission Specialist 1

Michael Foreman
CAPT Michael Foreman, USN
Mission Specialist 2

Richard Linnehan
Richard Linnehan, DVM
Mission Specialist 4

Takao Doi
Takao Doi, PhD, JAXA
Mission Specialist 3

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas
77058



February 8, 2008

Reply to Attn of: CB

Dear VIP Guest,

Your party of ___ will be viewing the STS-123 launch from the VIP area at Banana Creek. Unfortunately, we can not accommodate any additional guests at this time. This is a premier location for space shuttle launch viewing and access is tightly controlled. **If your plans have changed and you (or any of your party) cannot attend the launch, please notify our crew secretary, Alisa Halla, at (281)244-0167, immediately.** We do not want any of these seats to go unused!

The launch date for STS-123 is currently set for March 11, 2008, at approximately 2:23am EST. We suggest you make flexible travel arrangements allowing for launch slips prior to this date. We strongly recommend that you periodically call the Johnson Space Center launch and landing hotline at (281) 483-3899, or the Kennedy Space Center (KSC) newsroom at (321) 867-4636, for the most current launch schedule. You may also visit our crew website at <http://guestlist.jsc.nasa.gov> for the latest information.

The day before the launch, we invite you to attend one VIP mission briefing at the KSC Visitor Complex at either 10:00 am or 1:00 pm EDT, your choice. Airport-type security screening procedures, **which includes providing a picture ID**, are in effect for the mission briefing. In order to save time on launch day, you may also pick up your launch bus pass at the same time. Please remember that only those guests designated as VIP may attend this briefing.

On launch day, you will be transported by bus from the KSC Visitor Complex to the Apollo/Saturn V Center at Banana Creek (the VIP site). **You will need the enclosed STS-123 vehicle placard to drive through the checkpoints en-route to the KSC Visitor Complex on the day of launch.** Once at the Visitor Complex, each VIP guest must check in at the NASA Guest Operations Center. Please see the enclosed insert for further information. Expect large crowds as those going to the general viewing location will also be boarding buses at the KSC Visitor Complex. We urge you to arrive early. Food, drinks, restrooms, souvenirs, and space exhibits are available at both the KSC Visitor Complex and the Apollo/Saturn V Center. The launch will be viewed from an outside location, so we recommend that you dress accordingly. If you have any questions, please call our crew secretary, Alisa at (281) 244-0167 (Houston office) or (281) 844-8304 (cell phone in Florida).

Enjoy your trip to Florida for the launch of *Endeavour*!

Sincerely,
The Crew of STS-123

Enclosure

Launch Transportation Tickets

You must call the KSC Visitor Complex from Feb. 12, 2008 to March 3rd at 5:00 p.m. EST to claim your or your launch transportation tickets (LTT) or your reservation will be cancelled. If you arrive in Florida without having requested your tickets by the deadline, you will not be able to request a ticket, and you will need to watch the launch from a public viewing area. Any tickets requested after the deadline will not be crew guest tickets.

You can reach the KSC Visitor Complex directly at (321) 449-4400, or log onto the KSC website <http://www.ksctickets.com/sts123.html>.

- Be sure to indicate that you are the guest of an astronaut
- Children age two and under do not require a ticket for this area only
- The KSC Visitor Complex is NOT authorized to send you more than your reserved number of tickets
- Tickets are NON-TRANSFERABLE, but you may request fewer than your allotment

The LTT will only take guests to the launch viewing site on the causeway. To enhance your visit, you may purchase a launch transportation package that includes a LTT and entitles you admission into the KSC Visitor Complex for \$28.00 + tax/per person for adults and \$18.00 + tax/per child. This ticket provides admission to all KSC Visitor Complex movies, exhibits, shows, and two IMAX films. Also included is the Kennedy Space Center tour, the Apollo/Saturn V Center and the Astronaut Hall of Fame. Keep in mind that not all exhibits or tours may be available on launch day. Please visit the KSC Visitor Complex website above to view the hours of operations.

The tickets must be mailed to you in advance or picked up at the KSC Visitor Complex prior to launch day. You must have your tickets shipped to you if you are unable to pickup your tickets at the KSC Visitor Complex by 4:00 pm EST the day before launch. You will be charged for any shipping/handling fees incurred other than United States Postal Service charges.

On launch day:

- Arrive at KSC by the required time listed on your parking placard that you have received with your tickets. Expect heavy traffic on launch day and plan accordingly.
- Display your vehicle parking placard prominently in your windshield to enter the KSC Visitor Complex.
- Ensure you only bring items allowed on the bus. Ask KSC when you call for your tickets if you are unsure about something.
- Once inside, follow the signs for your ticket color (tickets are two sided).
- Each guest over 17 must provide a picture ID and all guests pass through an airport-type security screening before boarding the bus.
- Depart via bus to the NASA Causeway
- The Causeway area has Port-O-Potties, snacks, and souvenir booths, but no indoor facilities.
- Since seating is limited, guests are allowed to bring the umbrella style collapsible lawn chairs that they can easily hold in their lap while on the bus.

If the launch time moves or delays prior to loading on buses, your tickets are valid for the next launch attempt.

If launch delays after buses begin loading on launch day, you will need to get a new ticket at the crew ticket window of the Visitor's Complex.

Your car placard is still valid for subsequent launch attempts, but be sure to check your new arrival time.

Please be sure to read and understand all the conditions related to your tickets.

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
2101 NASA Road 1
Houston, Texas 77058-3696



Reply to Attn of : CB

August 17, 2007

Christopher Brennen
360 Olive Tree Lane
Sierra Madre, CA 91024

Dear Christopher,

As you may already know, each astronaut is allowed to take a limited amount of items with them into space. This policy presents a wonderful opportunity for me to recognize many of the people and organizations who have made a difference in my life and without whom I would not have this chance to fly on the Space Shuttle.

You clearly fall into that category, and I would very much like to take something of yours to be returned to you at the end of the mission.

Volume and weight are limited, so please do not send me your favorite bowling ball! I am allocated a shoebox-sized container into which I have to fit about 40 items including yours. The item is yours to choose. Common items have included: rings, photographs, pins, patches, and charms, but feel free to get creative. Alternatively you can purchase a gold or silver medallion engraved with the mission patch. Please contact me for details if you wish to purchase the medallion option.

More rules are enclosed in the document titled 'PPK Guidelines'. The deadline for getting the item to me is October 31. If you wish to mail it, you can send it to:

Garrett Reisman
NASA – JSC
Mail Code CB
2101 NASA Parkway
Houston, TX 77058

If you have any questions, feel free to contact me by e-mail at: garrett.e.reisman@nasa.gov

Thank you very much for making this all possible,

A handwritten signature in blue ink that appears to read "Garrett E. Reisman".

Garrett E. Reisman
STS-123 Expedition 16 Expedition 17

Enclosure

Chris -

Been thinking of you + Doreen
a lot lately.

All my best,

A handwritten signature in blue ink that appears to read "Christopher E. Brennen".

GUIDELINES FOR PPK ITEMS

PERSONAL PREFERENCE KIT (PPK):

PPK item restrictions/guidelines:

1. Only one (1) item per recipient.
2. Items should be personal and small (charms, rings, watches, medallions, etc.).
3. Religious items are allowed in the PPK.

The following guidelines apply to all items in the crew preference allocation.

<u>ITEMS ALLOWED</u>	<u>ITEMS DISALLOWED</u>
Flags (city, school, military, etc.)	Glass or anything breakable
Banners	Decals and Papers that cannot be folded
Seals/Stickers	Large items made of wood
Patches	Large metal objects (plaques)
Small medals or medallions	Stamps
Anything made of cloth (within reason)	Philatelic covers
Small stuffed animal	Charm bracelets
Anything made of paper as long as it can be folded	Items with Batteries
	Large sports equipment (bats, helmets, etc.)
	Signed original artwork
	Items of commercial value
	Anything that cannot be compressed by vacuum packing
	U.S. or foreign currency (coins & paper money in circulation as a medium of exchange)
	Anything out of circulation that could be sold



Cocktail Party!



Please join us the day before launch to celebrate
Garrett's imminent blastoff into space!



March 10
3:30 to 6:30 pm

at

Fox Lake Park in Titusville



Beer!
Wine!
Hors d'oeuvres!

All the cool people will be there!



Dress is casual!

RSVP by March 3 to Sheila Reisman: lrchfan@comcast.net

Please include the number of adults (ages 10 and older),
children (ages 3-10) and wee ones (younger than 3) in your party.

Fox Lake Park is off of I-95 in Titusville:

From Cocoa Beach, head north on SR-A1A and continue
on SR-528 westbound across the Banana and Indian Rivers.

Take exit 42B to I-95 north, then exit 215 toward Titusville.

Merge onto Cheney Hwy/SR-50 E

Turn left at SR-405 N (about 0.3 mi)

Turn left at Fox Lake Rd (about 2.2 mi), then continue
1.6 mi to the parking lot (allow about 40 minutes total)

From the KSC Visitor Complex, head west on NASA Pkwy and
continue west and then north on Columbia Blvd/SR-405 N.

Turn left at Fox Lake Rd (about 2.2 mi), then continue
1.6 mi to the parking lot (allow about 25 minutes total)

The party will be outside, under a pavilion,
so check the weather and dress accordingly!

Important Launch Information – for Families and Friends:

You must check in with Alisa at the NASA Guest Operations Center prior to launch day. If you are facing the main entrance to the Visitors Complex, look for the white building through the gate to your left. Alisa will be at NASA Guest Station Five.

When you check in, each member of your party will receive a complimentary pass good for free admission into the KSC Visitor Complex one time prior to the launch. If you would like to view an IMAX movie, you will need to purchase an additional ticket.

At the KSC Visitors Center, all guests are subject to an airport-type security screening that includes passing through a metal detector and certain items considered high-risk (scissors, metal nail files, etc.) will be confiscated. Additionally, backpacks coolers, and large carry-on bags will not be permitted on either the bus tour or the bus taken to view the launch. Items that can be held in your lap such as small strollers, diaper bags, camera/video recording bags, and purses will be permitted, but may be searched – expect to be delayed. Staying within regulations and compliance to rules will help expedite passage through security; we sincerely appreciate your cooperation.

Launch minus 2 days (L-2)

- You may pick up your briefing and tour ticket and launch day bus pass by checking in with Alisa at the **KSC Guest Operations Center Station Five** between 12:00 noon and 4:00 pm.
- L-2 is a good time to look around before the large crowds arrive and you can avoid the line the next morning if you plan to attend the briefing and tour.

Launch minus 1 day (L-1)

- **Family Mission Briefing and Bus Tour** - You may pick up your briefing and tour ticket and launch day bus pass by checking in with Alisa at the **KSC Guest Operations Center Station Five** between 8:00 and 9:15 am.
 - The driving tour of KSC will begin at 9:30 a.m. The buses will load at the KSC Visitor Center parking lot and the tour will last 1-2 hours. Following the tour, the briefing will begin at 11:30 a.m. in the Astronaut Encounter Theater.
 - There will not be a chance to eat during these events so you may want to eat a good breakfast.
- If you are NOT planning to attend the briefing or tour, you may pick up your launch day bus boarding pass and complimentary visitor complex pass from Alisa between 9:00 am and 4:00 pm.

Launch Day

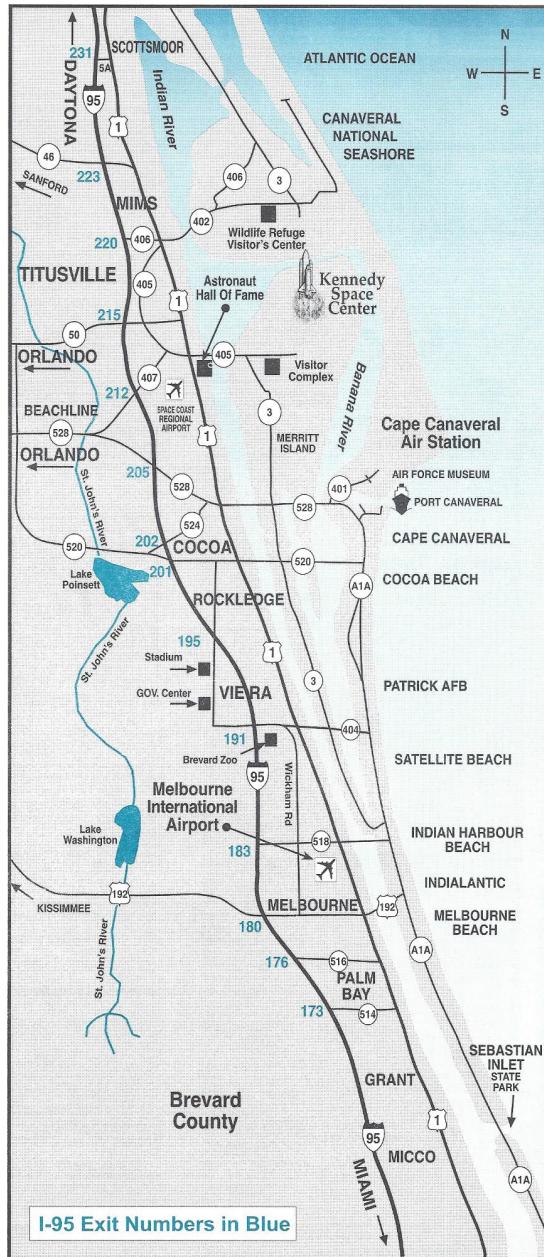
- Please dress accordingly as the launch viewing location is outdoors.
- With launch bus pass in hand, please meet off-site at Kiwanis Island (see map included) 3-4 hours before the launch. The exact bus loading and departure times will be given to you when you pick up your bus pass.
- Following the bus arrival, the support staff will board the lead bus for a safety and security briefing. Once this is complete, the staff will get back off the bus and open the other buses for guest loading.
- Once the busses are loaded, guests will be taken to the KSC Banana Creek viewing area.
- The buses will depart approximately 3 hours before launch – there is only one departure.
- Guests will have the opportunity to tour the Apollo/Saturn V building prior to launch while at Banana Creek. Souvenirs, exhibits, a food area, and restroom facilities are available.

Launch Delays

- The launch information hotline (281-483-3899) and mission website http://www.nasa.gov/mission_pages/shuttle/launch/index.html will be updated as soon as we have official confirmation of any schedule change.
- Each day we delay will move the meeting and departure times earlier by 30 minutes.

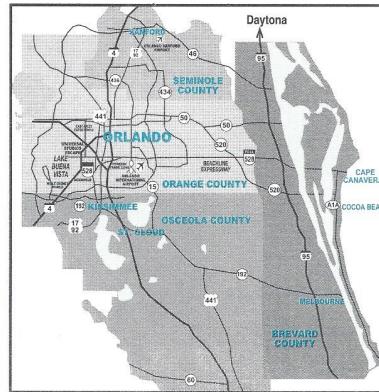
General Information

- Parents may pick up passes for children.
- Guests may pick up launch credentials for other guests if Alisa is notified by the recipient in advance.
- Alisa's number at Johnson Space Center in Houston (281) 244-0167 through L-4.
- Alisa at the Guest Operations Desk at KSC beginning at noon on L-2 (321) 867-2144.
- Alisa's cell phone from L-3 through landing (281) 844-8304.



MELBOURNE • PALM BAY • COCOA BEACH • TITUSVILLE

Welcome to Florida's Space Coast.



Space Coast Office of Tourism

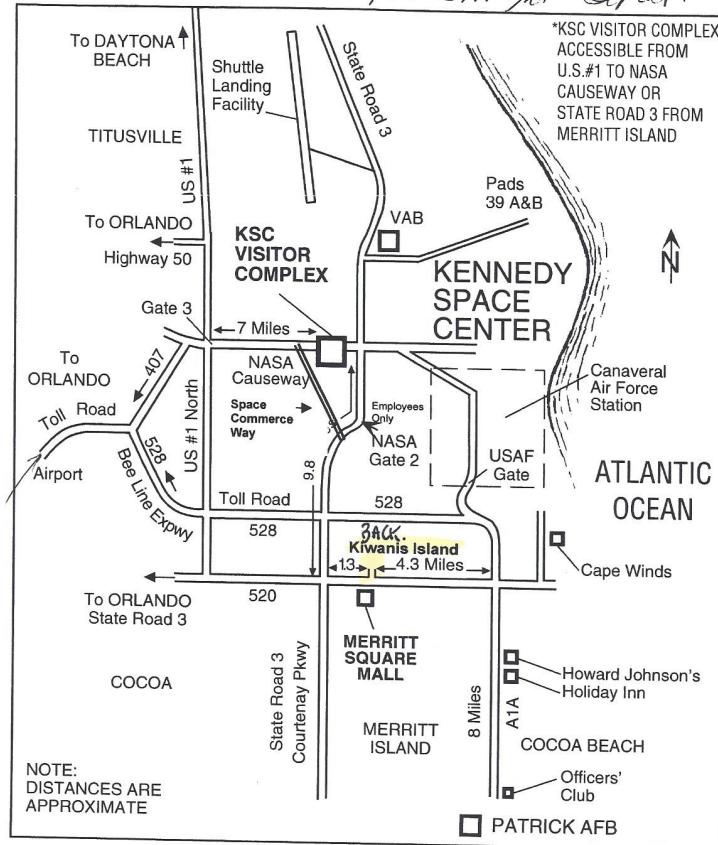
430 Brevard Avenue
Suite #150
Cocoa Village, Florida 32922

WWW.SPACE-COAST.COM

**1-877-57-BEACH
321-433-4470
FAX: 321-433-4476**



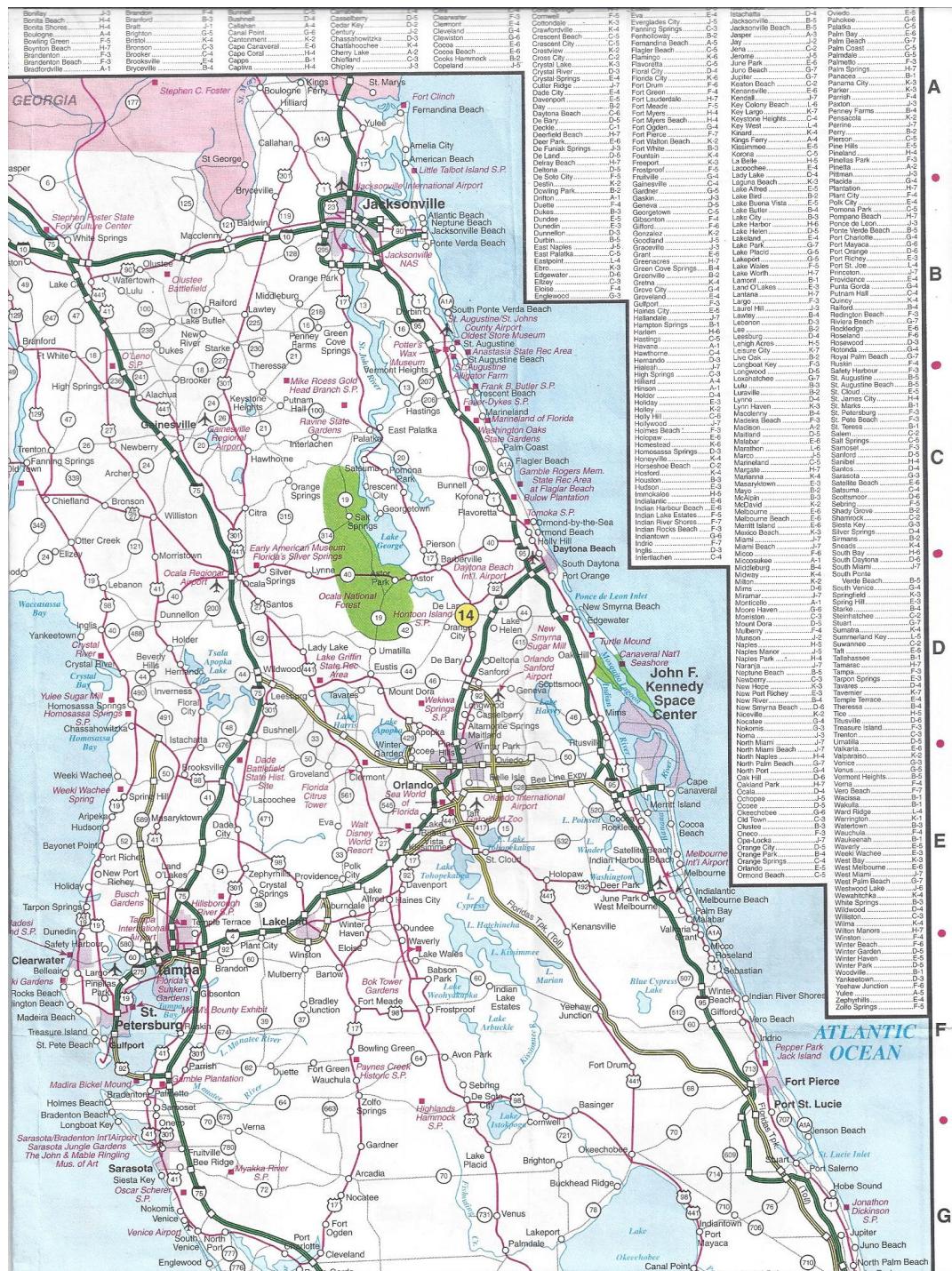
11:15 meet
11:45 Board
Midnight Depart



Cocoa Beach Area Map:

- The Bee Line is changing to the Beach Line.
 - Kiwanis Island is located on 520 between Wal-mart and Merritt Square Mall.
 - There is only one departure. Be sure to confirm the departure time when you check in. **Please plan for traffic.**

Travels - Christopher E. Brennen



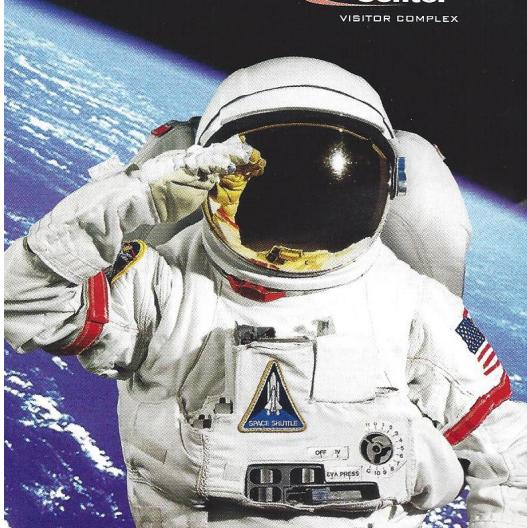
UPGRADE TO AN ANNUAL PASS TODAY

- See the U.S. Astronaut Hall of Fame Induction Ceremony
- Receive invitations to special annual passholder events
- Save on additional KSCVC admissions and on education programs

APPLY TODAY'S TICKET PURCHASE TOWARDS AN ANNUAL PASS AT THE TICKET BOOTHS.

www.KennedySpaceCenter.com

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NEW SHUTTLE LAUNCH EXPERIENCE!



Kennedy Space Center is a working spaceflight facility. Tours, films, and exhibits may be altered or closed due to operational requirements. Some exhibits may be closed due to inclement weather. Seating available on a first come basis. Some exhibits may have limited seating due to group reservations. No admittance once films begin. We suggest arriving 15 minutes prior to movie time. Tickets are non-refundable. Printed on recycled paper.



Astronaut Guest Launch Bus Boarding Pass



- This pass entitles the bearer to bus transportation to a site to view the Space Shuttle launch.
- Buses will depart **Kiwanis Island Park** on Merritt Island at specified time.
- Immediately after launch, buses will return to **Kiwanis Island Park**.
- For up-to-date launch status call 1-877-893-NASA.

No. 1155

KSC FORM 42-75 NS (REV. 11/07)

Astronaut Guest Briefing and Tour

11:30 AM Briefing in Astronaut Encounter

9:30 A.M. Tour departs from Debus Conference Facility Parking Area #1

Your bus will return in approximately 2 hours to the point of departure. No. 1229

KSC FORM 42-73 NS (REV. 11/07)

Guest Registration Instructions:

Please RSVP by October 25, 2007.

If you have questions or problems with registration, contact Alisa Halla at 281-244-0167 or alisa.d.halla@nasa.gov

Type in the address: <http://gueslist.jsc.nasa.gov>

Select STS-123 from the drop down menu. Enter your UserName and password exactly as it is shown on the back of the invitation letter.

Create a new UserName and password. You will have to enter this UserName and password in order to sign onto the system each time, so please write this information down.

Under Invitation on the left, select RSVP. Complete or update your mailing address, contact information and check for misspellings.

Please identify first, middle, & cell number. Please include a cell phone number for use while in Florida.

Proceed to Guest Registration
 Add one guest per line of your invited family (start with yourself)
 Add ages for children under 3 years old
 To edit or delete a guest, edit the respective name

Please indicate if non-U.S. citizen
 You will be taken to a screen to enter the passport information.
 Select finished with guest registration to enter.
 Select finished with guest registration or continue to complete the RSVP.

- You will be directed to a summary information page; if the information is not correct, select RSVP to go back or use your back arrows. If the information is correct, you may select 'click to logout' under 'username'.
- To access the newsletter your crew has prepared for you containing mission and crew information, select the crew newsletter link in the upper left corner of the Welcome page.
- Logout.



SAFETY STATEMENT

- Please be advised that hazards are inherent in viewing a Space Shuttle launch or landing. By accepting this, you do so with the understanding of the potential risk.
- Although NASA applies stringent range safety principles and techniques to protect the general public, workforce, and property for all areas of the Kennedy Space Center, in the event of an inadvertent circumstance, hazards including debris, blast, and toxics could occur.
- Additionally, dangerous weather conditions (particularly lightning) are known to occur in this area. It is imperative that you stay within controlled areas, stay with your group, listen for all announcements, and strictly follow all instructions provided by NASA.

LIGHTNING WARNINGS

- Phase I Lightning warning – people need to be aware that lightning is in the area
- Phase II Lightning warning – people must seek shelter
 - Banana Creek – proceed inside the ASVC
 - OSB II – Proceed inside the OSB II – 5th Floor
 - NASA Causeway East – return to the bus
 - NASA Causeway West – return to their vehicle
 - Turn Basin – return to their vehicle

ACID RAIN STATEMENT

- At ignition, the Space Shuttle's twin solid rocket boosters produce an exhaust cloud containing droplets of hydrochloric acid. This cloud drifts with the wind after the launch, slowly dissipating as it travels. These droplets are not strong enough to cause anything other than a minor irritation and are easily rinsed off with water.
- Launch viewing sites are far enough away from the launch site that there is ample time for visitors to return to the bus. It is imperative that you listen for all announcements and strictly follow all instructions provided by NASA.

OPINION

Caltech goes to space

SOUTHERN Californians are used to having deep ties to the aerospace program.

While Cape Canaveral has its launch site, and Huntsville, Ala., its rocket-construction complex, and Houston its Mission Control, it was in Los Angeles County that the aerospace industry was essentially invented.

From the TRW's to the Hughes to the Aerojets, a great deal of that work over the past 60 years was created in the private sector — which is the American way, and as it should be. Without the work of our space pioneers, Americans would never have made it into orbit, much less set foot on the moon.

But in recent decades it's been the extraordinary successes of the Jet Propulsion Laboratory's unmanned space probe that have been grabbing headlines around the world.

The La Cañada Flintridge lab, managed for NASA by Pasadena's Caltech, has given us great insight into both the science and the sheer visual beauty of our solar system from its missions to gaseous giants like Jupiter, to the asteroid belt and most especially to Mars, where orbiters and rovers continue to produce astonishing pictures and data every day.

Today, though, Caltech will be instrumental in the people part of our space program when two of its graduates board the space shuttle Endeavour and blast off into orbit en route to a rendezvous with the International Space Station as part of a seven-man team.

Alumni Robert Behnken and Garrett Reisman both received their master's and doctoral degrees in mechanical engineering at Caltech. Reisman, a space station flight engineer, will remain aboard the station for about six months; Behnken will return to Earth after 16 days in orbit. A third Caltech alum, Greg Chamitoff, will then head back up on the Endeavour later this month on its next mission.

There have been individual Caltechers in orbit before. But the institute as the primary

OUR VIEW

breeding ground for those who have the right stuff — who knew?

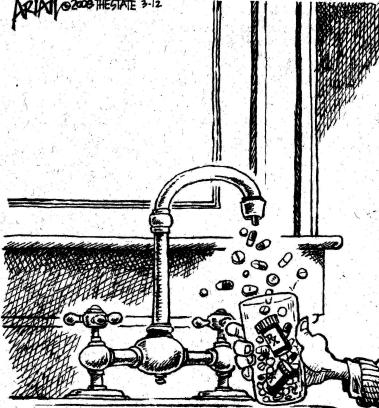
In his pre-flight interview for NASA, Reisman said: "If you came to me when I was a kid and you said, 'Hey, the space shuttle's leaving tomorrow. How about you pack your bag if you want to come with us?' I would have been all over it. But I never really thought I could do it." He added, "I've seen myself as a profession, mostly because I guess I never really considered myself within the realm of possibility. But when I got off to college, I started looking at some of the backgrounds of some of the mission specialists here at NASA and it seemed to be not all that far from what I was doing with my life. I thought, 'Wow, you know — this might actually ... maybe.'"

Reisman said that working with famed engineering professor Chris Brennen at Caltech not only shaped his science — it changed his attitude about life: "He would start drawing these mountains in the San Gabriels [on an office blackboard], and these little canyons, and he'd say, 'You know, I think we can rappel down into this canyon, and we can get over this waterfall and come down here.' So he did more than just teach me the technical side of things. He also sparked a great sense of adventure and exploration, too. So that was a fantastic experience at Caltech."

Behnken, an Air Force major and test pilot, will get to take five EVAs — space walks — to do some repair work on the space station, and he relates what he'll do in surprisingly down-to-earth terms: "We'll actually take a couple of bags of equipment with us, all the things that you might have in your garage if you were going to do some spackling and some dry-wall repair.... We'll have scrapers and brushes and all that sort of equipment."

It's the kind of work for which there's no one better suited than a couple of Caltech engineering grads. Godspeed!

ARIAT ©2008 THE STATE 3-12



Operation Mend

The American Legion Auxiliary is known for its support of our communities and our veterans.

Veterans Affairs and Rehabilitation Chairman Margaret Quinones of La Puente has just been alerted to another opportunity to help our wounded soldiers returning home with serious facial injuries by providing access to the country's best plastic and reconstructive surgeons in the private sector. This wonderful program at UCLA called Operation Mend started with a man named Ronald Katz, a well-regarded inventor, who although not a veteran himself, always had a deep affection for the military through the eyes and talent of his father, a World War II USAF performer. Michael Katz provided the lead gift for the new Fisher House at the Brook Army Medical center in San Antonio, Texas.

Katz made a visit in August 2006, and after touring the hospital and seeing the faces blown away by IEDs, he was determined to help. On returning home, he talked the director of plastic surgery and others into going to the Brooke Medical Center to see what could be done. Although the Army hospital was doing great work for these wounded soldiers, they could not provide the level of plastic and reconstructive surgery that UCLA could. The partnership was formed.

YOUR VI

- We welcome your letters. Keep them brief, please.
- Letters are subject to editing.
- Writers are requested to include frequency of submissions, gender, name and hometown.

- Sign full name and give telephone number for Only name and hometown
- Send to: Your View, Pasadena Star-News, 911 E. Colorado Blvd., Pasadena, CA 91106
- Fax to: (626) 856-2751
- E-mail to: letters.star.com

On the Web at
www.pasadenastarnews.com

By the fall of 2007, logistics worked out so that the first arrived from Brooke Medics has now undergone three stages of final surgery coming in December. Katz did not stop there. His foundation helps families with medical costs and doctors, nurses and support for these surgeries volunteer. However, donations are needed.

Expand support for

By Senator Dianne Feinstein

GUEST VIEW

ONE of the best ways to give a low-income child a jump start in life is through the federal



Ready for launch



*Ready for launch**STS123 prepares for launch**Lift-off**In orbit*



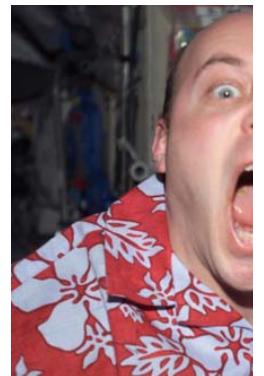
In orbit



In orbit



In orbit



In orbit



In orbit



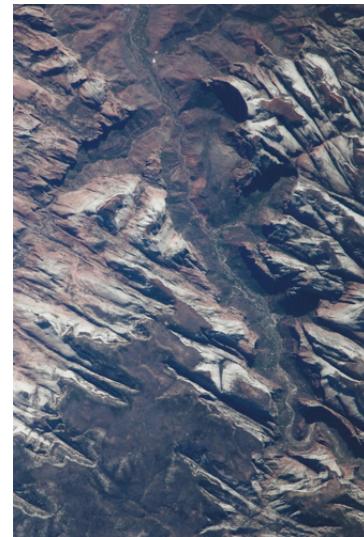
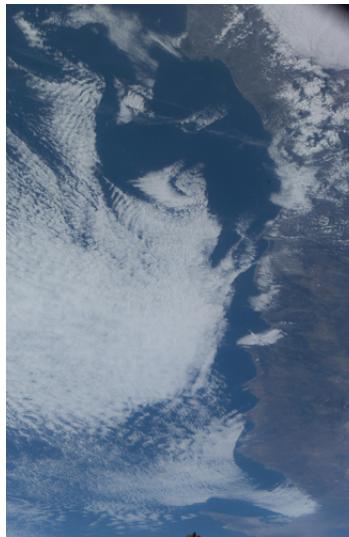
Space Walk



Wedding rings in space



Wedding rings in space



Photos from space: Mount Fuji, LA??, Zion NP, Pasadena



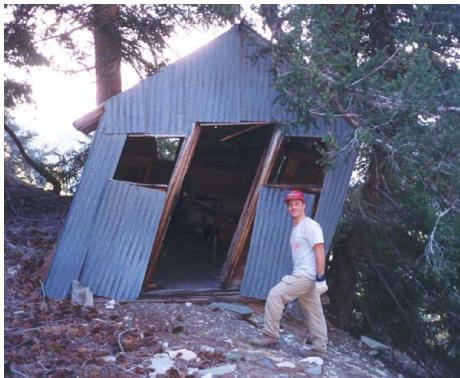
The bus home and landing

From "The Skywalker" in "The Far Side of the Sky":

The tears of emotion rolled uncontrollably down my cheeks as the magnificent machine roared into the night sky in a blaze of lightning, flame and thunder. Volatile waves of pride, joy, elation, fear, and sorrow all coursed through my body. Pride in the two magnificent young men, Garrett Reisman and Bob Behnken, whom I had tutored and who rode this monster into space. Fear, of course, for their safety and the well-being of another student, Simone Francis, who stood just a few yards away. This is dangerous business and all of us, though we know the danger only too well, are adventurers willing to pay those costs should they come. Pride that I had some small part in the development of the incredible turbopumps at the heart of Space Shuttle engines, perhaps the most remarkable turbomachines ever built. It had all begun in the early 1970s when, as a young scientist/engineer I first became involved with the space program studying the instabilities of liquid-propelled rocket engines and learning how the Main Engines of the Space Shuttle could avoid potentially catastrophic failure due to those instabilities. Named the Pogo instabilities because the vehicle vibration that resulted could be likened to the child's toy of the same name, the Pogo instability had plagued many of the earlier rocket engines including the Saturn rockets that carried men to the moon. Ultimately the facilities I helped to construct and the understanding that I helped uncover led to designs (and particularly the Space Shuttle Main Engine design) that avoided this malaise. And so as Endeavor cleared the launch gantry I felt a sense of having contributed to the safe passage of all who rode that magnificent machine. There was also sorrow for Garrett carried with him mementoes of my son Patrick and my late wife Doreen, symbols of lost loves being carried high into the heavens. Among these Doreen and my wedding rings linked together and the two Celtic crosses Doreen and I wore around our necks in remembrance of Patrick. But there was also hope for the future, for my eldest daughter Dana and her two children were there to witness the launch. And, at the last moment, the future wedding rings of Barbara and myself were sneaked aboard in Garrett's pocket.

This moment, 2.28am on March 11, 2008, was truly a defining time in my life, a vertex of almost all I had been or would be. The Florida night sky was suddenly and explosively filled with light and thunder as fire and smoke shot across the swamp and the spacecraft accelerated vertically into the sky. The Space Shuttle Endeavor on Mission STS123 soared skyward on its way to outer space. I stood transfixed as it rose into the clouds with the noise and vibration of thunders crashing down all around me. It was minutes before I could stir myself to follow the crowds back to the buses in time to avoid the acid clouds drifting toward us across the swamp water.

It had all begun many years before in the summer of 1991. Earlier in that year when I was looking for a new graduate student to bring to Caltech as a member of my research team, I encountered the application of a student at the University of Pennsylvania by the name of Garrett Reisman. He had an excellent academic record like so many of our applicants. But what I liked about this young man was his versatility and his conviviality for I thought to put him to work in a group of accomplished but individualistic students. We talked by phone and he made the decision to come to Caltech for his graduate studies. Thus in October of 1991 he embarked on four years of classes and research that ultimately led to his Ph.D. He turned out to be a careful, thorough and imaginative experimentalist who was an excellent presenter of his research work. His Ph.D. thesis involved water tunnel investigations of the phenomenon of cloud cavitation. He was able to photograph and recognize the presence of bubble collapse shock waves within collapsing clouds of cavitation bubbles. It was very nice work and I still show the photographs and results he obtained in seminars I give on the subject.

*At Gold Dollar Mine**Climbing the Grand Teton - second from right*

But that is much less than half of our relationship and a digression is needed to fill in the rest. It so happened that in the 1980s I had begun to do a great deal of hiking and mountain biking in the local San Gabriels mountains with which I had always been fascinated. Indeed, in a small way, I had been exploring them ever since I arrived in Southern California in 1969 and my children recall, as youngsters, climbing up waterfalls and dangling from makeshift ropes. But the 1980s saw me greatly expand my solo excursions. I began exploring beyond the end of the trails as described elsewhere in these journals. Then, about 1993, I was focussing on trying to find a way to descend a steep side canyon that we called Skull Canyon in order to access the middle section of the larger Devil's Canyon. I recruited several of the newer graduate students to accompany me on a Skull Canyon expedition. One of the most eager and enthusiastic was Garrett. Our successful descent of Skull Canyon that day began a whole raft of explorations in the San Gabriel mountains. During all those hours spent together Garrett and I became close friends and would remain so throughout our lives. After my son, Patrick, was tragically killed in an automobile accident Garrett became like a son to me and this relationship was further cemented after his own father died of cancer.

*In Bailey Canyon**In the Great Falls of the Fox**In the Great Falls of the Fox*

In the years which followed we became more and more ambitious in tackling canyons that presented more serious obstacles. Eaton Canyon held a special fascination for us. We had hiked up to Idlehour Campground and explored down as far as a place we came to know as the "Point of No Return", where a small slide down into a deep swimming pool meant that return upstream would be exceedingly difficult without a rope. We had also conducted several expeditions in which we tried to get as far as we could up Eaton Canyon from the bottom. In these efforts we bypassed the big falls at the bottom by climbing over the ridge above where wooden stairways had once been a fixture. Upstream of that we arrived at a deceptively easy looking obstacle that we came to call "Naked Triumph Falls" after Garrett led the way by swimming the pool naked before leaping out of the deep water to ascend the small falls. It was an epic but characteristic Reisman moment, remembered ever after by all those who witnessed it. His effort allowed the rest of us to ascend and pass the falls. But, further upstream, we were never able to find a way around the large deep pool and 12 foot falls that descenders now jump during a descent. Worryingly, the topo map showed there could be many difficult obstacles between the "Point of No Return" and these 12 foot falls. Though we were determined to attempt a descent, we could find no information anywhere that might guide us.

It had become obvious to all of the group that, in order to get to some of the more interesting and exciting places in Eaton Canyon and elsewhere in the San Gabriels (and other mountainous locales in the southwest), it would be necessary to acquire technical rock climbing skills and equipment. Since Garrett had some rock climbing experience, it was natural that we would arrange an opportunity for him to teach us some basic skills. And it was typical of our young, cavalier approach that we decided that this learning would be done, not in some boring gymnasium, but while descending one of the major San Gabriel canyons. I had picked out Bear Canyon in the Devil's Canyon Wilderness Area as one I would like to explore. So, one Saturday in the early 1990s, we collected together some ropes and climbing harnesses and set off in the early morning for the road above Crystal Lake in order to descend into upper Bear Canyon. There were about seven of us and only Garrett had ever rappelled before. He claimed it was easy and he would teach us "on the job" as it were. In that group was another future astronaut, Bob Behnken, and Bob, I remember, came dressed in what he considered appropriate attire for this adventure, full army fatigues and big, black army boots. Even a camouflage hat. When I think back that somehow epitomizes how naive we all were - and we didn't have a single helmet in the whole group! What happened became a much-storied legend in the group of astronauts that Garrett and Bob joined a number of years later and so I digress briefly to relate it.

We dropped down into Bear Creek from the end of the highway at Crystal Lake and penetrated quite deeply into the canyon before we encountered the first necessary rappel, a drop that would be trivial for us today. It consisted of a vertical 12 foot drop into a deep pool. There was a very convenient tree about 10 feet back from the sharp lip at the top of the drop. Garrett took over. After much talk (as always with Garrett!) he rigged the rope around the base of the tree and asked for the first volunteer. Bob stepped forward in his natty fatigues. Garrett instructed him at considerable length and, so instructed, Bob then started backwards toward the lip. Once there, he very slowly began to rotate backwards with his feet on the edge. Unfortunately Garrett had rigged the rope so low on the tree that this rappel entry was much more difficult than it could have been. Bob got about two thirds of the way into his rotation before the inevitable happened. He lost his balance, swivelled sideways and ended upside down just over the lip with the black army boots sticking straight up. Fortunately he hung onto the rope. Garrett rushed forward and peered apprehensively over the edge. Coming face to face, as it were, with Bob's posterior he collapsed in laughter and the rest of us had to rush forward to rescue Bob from a much worse demise. Recognizing Garrett's mistake we elevated the anchor and the rest of the canyon descent proceeded without incident.

Now flash forward several years to when Bob is going through his interviews to be an astronaut and Garrett is already one. Bob tells this story as an example of how he could keep his cool under adverse circumstances. As he remembers, he thinks it helped him to be selected, particularly since it also made fun of Garrett and we all liked to make fun of Garrett. Flash forward another decade when we learn that they have both been selected to be on board STS-123. We also learn that Bob is to make two space walks on the end of the robotic arm. We also learn who is to be in control of the arm: Garrett!

After that ignominious beginning our canyoneering expertise could only improve. We began to learn skill in rappelling by trial and error, by devising our own anchor methods and other rope techniques. Now that we had acquired some technical skills and equipment, we began a series of technical canyoneering descents. One of our first objectives was Eaton Canyon. Though we still had virtually no information on what lay between the "Point of No Return" and the 12 ft falls, Garrett and I decided to attempt a descent without what we would now call "beta". After several irreversible rappels, we arrived at the top of the falls we now call "The Gully". I don't think I will ever forget looking down at the pool at the bottom of that abyss that seemed hundreds of feet away. But we made it down. And to make the descent even more exciting the river was flowing lustily that day so we ended the descent behind the falls and had to do our first swimming disconnect.

In the 1990s others began to join our adventures, in particular three younger graduate students who became key canyoneering pioneers, Clancy Rowley, Mark Duttweiler and Simone Francis. Years later Simone and Garrett were married and I like to think that I helped make that union. Those were years of great adventure. Seemingly every weekend involved a new exploration into the unknown though we tried to interpret the topographical maps in order to predict where it would be necessary to rappel. Sometimes, as with Eaton Canyon, we conducted preliminary reconnaissance hikes. We even made use of the fact that Garrett was a qualified pilot in order to conduct aerial reconnaissance. I remember one afternoon when we circled high over the deep gorge in Fox Canyon to try to glean information on the numerous drops in that spectacular canyon. Garrett would tip the plane over so that I could photograph vertically downwards into the depths. All to no avail for the shadows were much too dark to discern the details in the deep narrow gorge where the drops we came to call the "Great Falls of the Fox" were located. Subsequently we used information from a local search and rescue team member to descend the Great Falls, a truly spectacular adventure that we repeated many times.



Space Shuttle Discovery on the launch pad



Bob (left) and Garrett in space

In 1996 Garrett went to work with TRW as a Spacecraft Guidance, Navigation and Control Engineer in the Space and Technology Division, Redondo Beach, California, where he designed the thruster-based attitude control system for the NASA Aqua Spacecraft. Since he was close by we still found time for canyoneering. Then, in July 1998, on his second application he was selected by NASA for the 19th group of astronaut candidates as a mission specialist. However, before he actually moved to Houston he asked me to come along on a visit to Edwards Air Force Base where the Shuttle Discovery was undergoing rehab and we were allowed to crawl through it. Even after his move to Houston we found opportunity to get together again, several times for rock climbing and canyoneering but once also when I flew an experiment in the Nasa Zero Gravity KC135 (see "Vomit Comet"). It was a long wait before he was assigned to a Space Shuttle flight, in fact some ten years before he was named to the STS123 crew. During that time his assignments included working on the space station robotic arm, the next generation space shuttle cockpit and living in the Aquarius underwater habitat as a crewmember of the NASA Extreme Environment Mission Operations program. The year after Garrett was selected, Bob Behnken was chosen and we celebrated having two of our Mechanical Engineering graduates together in the astronaut program. I was often asked what I thought made these two young men "the right stuff" for the astronaut program and I would answer that in my view it was a combination of their engineering judgment, athleticism, conviviality and cool-headed-ness.

After the long wait for a Shuttle assignment, Garrett was finally selected to serve with both the Expedition 16 and the Expedition 17 crews as a flight engineer aboard the Space Station. He and Bob were to launch together as members of the STS-123 crew aboard the Space Shuttle Endeavour on March 11, 2008. Bob would come back in the same Shuttle but Garrett would live in the Space Station for 3 months and return to Earth with the crew of STS-124 aboard the Space Shuttle Discovery on June 14, 2008. During his tour of duty aboard the station, he was scheduled to perform one, 7 hour spacewalk and to execute numerous tasks with the Station's robotic arm and new robotic manipulator, Dextre. The two global tasks associated with Garrett's and Bob's spacewalks were the assembly and placement of this Canadian-built robot arm and the installation of a new modular addition to the Station, a Japanese laboratory called "Kibo". Because of the latter, there was heightened interest in this mission in Japan and that gave rise to some personal involvement on my part.



Garrett (center) and Bob (right)



Garrett space walking

So it was that, accompanied by my daughter, Dana, and her two children, I travelled to Cape Canaveral in March, 2008, in order to witness the launch of STS-123. The day before the night launch was taken up with a tour of the NASA launch facilities including a close-up visit to the launch pad prior to the fueling of the liquid propellants. Later in the afternoon, there was a large party in Garrett's honor organized by his family followed by transport to the special visitor viewing area. The launch proceeded on time and in the aftermath we travelled home in something of a benumbed daze.



Zion Canyon from space



Mount Fuji from space

In the days that followed I made my way back to California and then across the Pacific to Japan where I had been invited to spend a three month sabbatical at the University of Tokyo supported, coincidentally, by the Japanese Space Agency, JAXA. There I was scheduled to give a series of lectures to a combined audience of University faculty, researchers and students and JAXA staff members who commuted from as far away as Tsukuba (50 km from Tokyo). The lectures were directly connected with the Japanese Space Program in that they dealt with turbomachine design and performance. The university had kindly arranged an apartment for me quite close to the campus so it was an easy walk back and forth each day. I was able to keep in touch with Garrett by email since he received those emails in the Space Station and he even telephoned me in my apartment one evening. In his spare moments he enjoyed taking photographs of earth and, in particular, relished the challenge of identifying and photographing specific locations on earth. For example, at the request of one of my granddaughters he took some pictures from space of her hometown, Perth, Australia, which she proudly showed to her elementary school class. He also photographed one of our favorite canyoneering destinations, Zion National Park in Utah. And he took a photograph of Mount Fuji which I was able to show at the outset of my lecture the next morning much to the enjoyment of my Japanese audience especially the JAXA staff members. They also enjoyed the photographs of his space walks since a number of them remembered his research work many years before. But, perhaps, the greatest cheer was for Barbara who came on a ten day visit and for the photographs of our wedding rings floating in the air of the Space Station.



Wedding rings in space



The bus home approaches

Of course, for Garrett the two highlights of the adventure were the launch and the spacewalk. The launch involved an extended period of 3g linear acceleration, something that cannot be adequately simulated on earth. Garrett described it as an awesome experience. The spacewalk was not only awesome but also truly exhausting. After seven hours he was barely able to move. But these are unique memories that will be with him for the rest of his life. Garrett's conviviality was a great plus for NASA and was utilized for many public relations stunts including a video tour of the Space Station, an interview on the Steve Colbert show and a ceremonial opening pitch at Yankee Stadium that was conducted in the Space Station. Even his return to Earth on June 14, 2008, was notable. Most astronauts who spend an extended time in the Space Station cannot walk when they first return to Earth. They have to be helped from the Shuttle to a hospital bed. Garrett, on the other hand, not only walked out of the vehicle and down the steps, but also toured the underside of Endeavour with the other crew members. And, that evening he showed up at the local hamburger joint frequented by the astronauts.

In the aftermath of his high adventure, there were not only many public relations chores to attend to but also much contemplation regarding the future. Perhaps he will get to fly again before the Space Shuttles are mothballed in 2010 but it seems unlikely given the size of the astronaut core. Whatever the future holds, it will be impossible to match the extraordinary adventure of those days in 2009. And Garrett himself will never be the same however much he might try. But I do believe that "The Skywalker" has the wisdom to look to the future rather than the past, to reach for the sky in other endeavours and, in his turn, to create new adventures for the next generation.

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Last updated 7/30/99.
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