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## 3-2-1 and holding: Space Shuttle Endeavor

Posted By [joseph.pena](#) On July 2, 2009 @ 12:39 pm In [Columns](#), [Lifestyle](#) | [6 Comments](#)

On Friday, June 12, 2009, at T-minus eight hours to liftoff of the space shuttle Endeavor, I received an e-mail from Chris Cassidy, a college classmate, who was an astronaut assigned to the next space shuttle mission (STS-127): "Joe," it read. "Have a great time tomorrow! I know I will ... Chris."

Sixty minutes later, Cassidy's 7:17 a.m. launch was officially scrubbed due to a hydrogen leak while fueling the external tank. I heard the news just as I was getting ready to head out to the Kennedy Space Center (KSC) to watch the launch, and I was disappointed. I can't imagine how heartbreaking it had to be for Cassidy. Once this mission gets off the ground, Cassidy will officially be the 500th person in history to fly into space.



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We met when we sat next to each other in English class at the Naval Academy Preparatory School in 1988. After graduation from the Naval Academy, Cassidy went on to become a SEAL. He deployed twice to Afghanistan; the first time, just a couple of weeks after the 9/11 attacks.

Space Shuttle Endeavor

With a little luck, Cassidy has a chance to go to the moon by the end of his astronaut career. Apollo 17 was the last mission to the moon, and since the lunar module, Challenger left there in December 1972, no one has returned. Only a dozen people, all American, have walked on the moon.

The hydrogen leak that scrubbed the June 12 shuttle launch was similar to a problem that delayed March's launch of the space shuttle Discovery. To remedy the problem, a seal was replaced in March. However, the root cause of the leak was never determined.

After June 13's scrubbed launch, the soonest that Cassidy's mission could be launched into orbit to rendezvous with the International Space Station would be four days later on Wednesday, June 17. Unfortunately, this launch date conflicted with the Lunar Reconnaissance Orbiter and Lunar Crater Observation and Sensing Satellite that was also scheduled to launch on June 17.

Because I wanted to watch the launch, I delayed my return to San Diego.

Since I was sticking around, I took a tour of the KSC which is absolutely fascinating.

Although NASA has been launching rockets from the KSC for half a century, the 219 square mile

site has a surprisingly small number of buildings since it is also a wildlife sanctuary. The most noticeable building is the huge Vehicle Assembly Building (VAB), which, standing at 525 feet tall, is the tallest single story building ever built and it is the fourth largest building in the world by volume. Surrounding the VAB are several shuttle storage hangars and the rocket launch site (not to be confused with the Mission Control Center, located in Houston, Texas, that handles each manned spacecraft once it clears the tower until it returns to earth).

Although NASA could not determine the root cause of the hydrogen leak, it announced that the next launch attempt of Endeavor would be on Wednesday, June 17. Since each day STS-127 was delayed, pushing back the launch time by 22 minutes, Wednesday's mission would liftoff at 5:40 a.m. The predawn launch meant that I'd be arriving at the KSC around 1 a.m. to beat the traffic and clear the security check points.

For the crew of the space shuttle, the launch comes near the end of their "day." Since day and night are meaningless in orbit, the crew is put on a sleep cycle, before they launch, corresponding to what is required once they are in orbit. That means waking up about 12 hours before liftoff. Beginning around three hours before launch, once the space shuttle fueling is complete (a three hour process known as "tanking"), the crew is strapped in awaiting their 8½ minute journey into orbit.

For Wednesday morning's June 17 launch, tanking was scheduled to begin at 8:15 p.m. the night before. However, due to later than expected thunderstorms, tanking was delayed for three hours since hydrogen and lightning do not mix. The latest tanking had ever been delayed for a shuttle mission was about 90 minutes while still making an on-time launch. With this in mind, I headed out into the rainy night at midnight wondering if this launch would be scrubbed just like it was several days before.

I arrived at the KSC Visitor's Center about 1 a.m. to watch the launch along with several hundred other spectators. I was surprised that the Visitor's Center was open to accommodate us. Then, around 1:55 a.m., as I was queued up to ride a bus to the viewing location about three miles from launch pad 39A, the bad news came over the loudspeakers. This launch was scrubbed due to another hydrogen leak near the end of the tanking process.

NASA now believes it has identified the cause of the previous leaks which may be due to a slight misalignment in the way a vent port on the shuttle Endeavor's external tank was built into the structure. NASA will test out its theory by using a different type of seal, and it is planning a refueling test on the launch pad. If all goes well, the next launch window will open Saturday, July 11 at 7:39 p.m. EDT. In the meantime, the crew of the shuttle returned home, to Houston, to continue training for their upcoming mission.

*Joe Moreno, a graduate of the U.S. Naval Academy, is the president of Adjix, which allows people to advertise on Twitter. Joe lives in Carlsbad with his wife, Laura, and their beagle Cocoa.*



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Astronaut Chris Cassidy and friend Joe Moreno

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