This Week at NASA…

“How do you see the evolution of commercially sponsored research sort of taking place down the road?”

A discussion about the ground-breaking science research being conducted aboard the International Space Station was part of a series of NASA briefings at the Kennedy Space Center.

“We really have, as you’ve heard, great capacity on the ISS to meet the needs of a large number of users And it just provides the opportunity for real innovation and for things to advance quite quickly.”

During another session, NASA officials talked about the agency’s human deep space exploration efforts with a progress update from the Orion and Space Launch System programs.

“It is a very key element of our overall plan to get humans back beyond Earth orbit as quickly as we can.”
We are working very diligently to our first test flight which will come up in September 2014, called Exploration Flight Test-1.”

Orion and SLS will enable astronauts to travel beyond low Earth orbit, to the most distant destinations ever.

Powering the upper stage of the SLS will be the J-2X engine.

Engineers at the Stennis Space Center continued the year’s second test of the J-2X.

The full duration 550-second test firing provided critical information on the combustion stability of the engine and on its performance with the nozzle extension.

The exercise was also used to further evaluate the clamshell configuration of the A2 test stand, as well as calibration of the facility's cryogenic flow meters.

Parts for the next-generation Space Launch System are being created here, at the National Center for Advanced Manufacturing Rapid Prototyping Facility.
NASA Administrator Charlie Bolden was at the Marshall Space Flight Center to tour the high-tech manufacturing facility that impacted America's manufacturing sector last year to the tune of an estimated 5-billion dollars.

Bolden watched a type of additive manufacturing called “selective laser melting” create complex parts for the J-2X and RS-25 rocket engines.

“Anything that we do in spaceflight, whether it’s human spaceflight or otherwise, Marshall’s involved. People who live here should know that Marshall is an integral part of NASA – it’s who we are.”

Done without welding, “selective laser melting” also saves time and reduces the cost of creating component parts for what will be the largest launch vehicle ever built.

NASA’s Van Allen Probes have discovered a previously unknown third radiation belt.
around Earth.

Traditional observations long showed the Van Allen belts as two distinct regions of trapped radiation.

These new high-resolution observations by the first dual-spacecraft mission to fly through them show that there can be three long-lasting belt structures with the emergence of a second "slot" (or empty) region.

“The International Space Station is down below the inner belt.

This new ring is actually much further out than that, it's at about 12,000 miles above the surface.”

These radiation belts, named for their discoverer, Dr. James Van Allen, are affected by solar storms in the form of coronal mass ejections – space weather – and can swell dramatically.

When this occurs, they can pose dangers to communications and GPS satellites, as well.
as human spaceflight activities.

“This is going to teach us a lot about how effectively the magnetosphere can store and maintain an electron population for extended periods of time.”

Scientists using particle detection instruments flying on board the twin spacecraft also found unexpected structures and processes within these hazardous regions of near space.

The new discovery shows the dynamic and variable nature of the radiation belts and will improve our understanding of how they respond to solar activity.

The spin rate of a supermassive black hole has been measured definitively for the first time.

NASA's X-ray observatory, Nuclear Spectroscopic Telescope Array, or NuSTAR, teamed with the European Space Agency's XMM-Newton for the findings.

They solve a long-standing debate about similar measurements in other black holes and will
lead to a better understanding of how black holes and galaxies evolve.

The observations are also a powerful test of Einstein's theory of general relativity, which holds that gravity can bend light and space-time.

The X-ray telescopes detected these warping effects in the most extreme environments, where the immense gravity field of a black hole is severely altering space-time.

The annual Aerospace @ Annapolis Day, organized by Goddard Space Flight Center, attracted about 400 people, including state lawmakers and midshipmen from the Naval Academy.

NASA exhibits on hand included a full-size model of the Mars Curiosity rover.

Attendees spoke with scientists who work with “Sample Analysis at Mars” one of Curiosity's main instruments – that was built at Goddard.
to NASA and the local community.

“The purpose is to go off and inspire students and educators to pursue and teach the science and technology engineering and mathematics fields, so that we can inspire the next generation to move on, so people can see that they can work here in Maryland and accomplish some really great things.”

Other missions showcased included the Landsat Data Continuity Mission and the recent successful on-orbit demonstration of the Robotic Refueling Mission.

The event, hosted by the Maryland General Assembly, was also an opportunity for NASA to get valued feedback – and Scolese liked what he heard.

“Yes I did. We met with the governor today and he was very interested in what NASA's doing and looking forward to greater things from the
Goddard Space Flight Center.”

00:06:15,519 --> 00:06:20,269
The Kennedy Space Center Visitor Complex unveiled a new logo for the Space Shuttle Atlantis

00:06:20,269 --> 00:06:24,329
The Kennedy Space Center Visitor Complex unveiled a new logo for the Space Shuttle Atlantis exhibit still under construction at the Florida spaceport.

00:06:24,329 --> 00:06:28,959
Atlantis, the shuttle that flew the final mission of the 30-year-long shuttle program,

00:06:28,959 --> 00:06:33,370
has been positioned inside the exhibit hall as it will be displayed: wheels up, tilted 43 degrees to give it the same look it had when leaving the International Space Station.

00:06:33,370 --> 00:06:39,800
By the time the Atlantis exhibit opens June 29, Atlantis will have its cargo bay doors open and its robotic arm extended.

00:06:39,800 --> 00:06:44,960
The Space Shuttle Atlantis attraction will feature dozens of interactive displays highlighting different aspects of the space shuttle and Atlantis itself.

00:06:44,959 --> 00:06:57,629
The exhibit will be on Kennedy property only a few miles from the runway Atlantis touched down on July 21, 2011, to close out NASA’s longest human spaceflight program.
John Palguta, vice-president for policy with the Partnership for Public Service, and Jeri Buchholz, assistant administrator for NASA Human Capital Management, visited the Stennis Space Center to officially recognize the center’s high ranking in the U.S. Office of Personnel Management’s Employee Viewpoint Survey.

NASA was named the best place to work in the federal government among large agencies – with Stennis ranking second among 292 agency subcomponents.

“He would come up to ya and spit water at you. So that was a neat part of the job.

Dolphins are pretty smart.”

The Wallops second annual job shadow day provided an opportunity for NASA employees to help students experience STEM careers firsthand.

“I’m a huge science nerd. I’ll admit that and I like the organisms in marine biology.”
"I didn't know there was so much going on here, like weather satellites, I didn't know any of that happened here."

"I think this opportunity really gives me a chance to understand which area means and which one I would be more happy going into."

The experience can also provide students with a pretty compelling reason to stay in school by helping them make the connection between education and success.

"I like to tell them about my background a little bit so that they can try and understand where I'm coming from, see sort of the steps that I took to get to the position I'm in."

"More students should apply for this program because it is a great experience."

"And liftoff of space shuttle Columbia to broaden our view of the universe through the Hubble Space Telescope."

On March first, 2002, space shuttle Columbia launched on STS-109 - also known as "Hubble..."
Servicing Mission 3-B" – the fourth servicing mission to the Hubble Space Telescope.

During the 11-day mission Columbia’s crew of seven installed new equipment that, among other improvements, dispensed the telescope’s newly-increased power, and doubled the camera’s coverage area with more speed and clarity.

In 2009, work was performed during a final servicing mission that is expected to keep HST in operation through 2014.

And, 41 years ago, on March 2, 1972, Pioneer 10 launched on what would prove to be a mission lasting more than three decades!

Pioneer 10 was the first spacecraft to travel through the Asteroid belt, and the first spacecraft to make direct observations and obtain close-up images of Jupiter and its moons.

This historic event marked humans' first approach to the gas giant and opened the way for exploration of the outer solar system by future spacecraft like Voyager, Ulysses, Galileo and Cassini.
After more than 8 billion miles traveled over more than 30 years, Pioneer 10 sent its last signal to Earth on January 23, 2003.

And that’s This Week @NASA.

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