1
00:00:06,890 --> 00:00:09,830
This Week at NASA…

2
00:00:09,830 --> 00:00:15,600
The second SpaceX resupply mission to the
International Space Station was successfully

3
00:00:15,600 --> 00:00:20,109
launched from Cape Canaveral Air Force Station
in Florida Friday at 10:10am EST.

4
00:00:20,109 --> 00:00:27,640
The company’s Dragon cargo capsule, loaded
with more than 1200 pounds of scientific experiments

5
00:00:27,640 --> 00:00:31,050
and cargo, rode atop a Falcon 9 rocket.

6
00:00:31,050 --> 00:00:36,110
Shortly after separation from the rocket's
second stage, Dragon was unable to command

7
00:00:36,110 --> 00:00:38,670
three of its four thruster pods.

8
00:00:38,670 --> 00:00:44,030
SpaceX engineers worked to purge blocked valves
and get the pods back online, restoring the

9
00:00:44,030 --> 00:00:46,039
spacecraft’s attitude control.

10
00:00:46,039 --> 00:00:50,760
Upon its arrival to the orbital laboratory
on Sunday, Dragon was captured by the crew

11
00:00:50,760 --> 00:00:56,010
with the station’s robotic arm and berthed
to the International Space Station at 8:56

12
00:00:56,010 --> 00:00:58,019
a.m. EST.

13
00:00:58,019 --> 00:01:02,230
The delivery flight is the second contracted
resupply mission by the company under NASA's

14
00:01:02,230 --> 00:01:05,110
Commercial Resupply Services contract.

15
00:01:05,110 --> 00:01:10,160
The Dragon capsule is scheduled to spend 22
days attached to the station before returning

16
00:01:10,160 --> 00:01:15,430
for a splashdown in the Pacific Ocean off
the coast of Baja California March 25.

17
00:01:15,430 --> 00:01:23,729
“How do you see the evolution of commercially
sponsored research sort of taking place down

18
00:01:23,729 --> 00:01:24,729
the road?”

19
00:01:24,729 --> 00:01:28,560
A discussion about the ground-breaking science
research being conducted aboard the International

20
00:01:28,560 --> 00:01:33,050
Space Station was part of a series of NASA
briefings at the Kennedy Space Center.

21
00:01:33,050 --> 00:01:37,560
“We really have, as you’ve heard, great
capacity on the ISS to meet the needs of a

22
00:01:37,560 --> 00:01:41,340

large number of users And it just provides
the opportunity for real innovation and for

23
00:01:41,340 --> 00:01:43,000
things to advance quite quickly.”

24
00:01:43,000 --> 00:01:47,930
During another session, NASA officials talked
about the agency’s human deep space exploration

25
00:01:47,930 --> 00:01:52,200
efforts with a progress update from the Orion
and Space Launch System programs.

26
00:01:52,200 --> 00:02:00,439
“It is a very key element of our overall
plan to get humans back beyond Earth orbit

27
00:02:00,439 --> 00:02:02,200
as quickly as we can.”

28
00:02:02,200 --> 00:02:06,520
We are working very diligently to our first
test flight which will come up in September

29
00:02:06,520 --> 00:02:09,870
2014, called Exploration Flight Test-1.”

30
00:02:09,870 --> 00:02:15,340
Orion and SLS will enable astronauts to travel
beyond low Earth orbit, to the most distant

31
00:02:15,340 --> 00:02:20,650
destinations ever.

32
00:02:20,650 --> 00:02:25,680
Powering the upper stage of the SLS will be
the J-2X engine.

33

00:02:25,680 --> 00:02:30,129
Engineers at the Stennis Space Center continued
the year’s second test of the J-2X.

34
00:02:30,129 --> 00:02:35,540
The full duration 550-second test firing provided
critical information on the combustion stability

35
00:02:35,540 --> 00:02:39,650
of the engine and on its performance with
the nozzle extension.

36
00:02:39,650 --> 00:02:45,011
The exercise was also used to further evaluate
the clamshell configuration of the A2 test

37
00:02:45,011 --> 00:02:52,150
stand, as well as calibration of the facility’s
cryogenic flow meters.

38
00:02:52,150 --> 00:02:56,490
Parts for the next-generation Space Launch
System are being created here, at the National

39
00:02:56,490 --> 00:03:00,940
Center for Advanced Manufacturing Rapid Prototyping
Facility.

40
00:03:00,940 --> 00:03:05,390
NASA Administrator Charlie Bolden was at the
Marshall Space Flight Center to tour the high-tech

41
00:03:05,390 --> 00:03:10,640
manufacturing facility that impacted America's
manufacturing sector last year to the tune

42
00:03:10,640 --> 00:03:13,440
of an estimated 5-billion dollars.

43
00:03:13,440 --> 00:03:18,721

Bolden watched a type of additive manufacturing called “selective laser melting” create

44
00:03:18,721 --> 00:03:23,069
complex parts for the J-2X and RS-25 rocket engines.

45
00:03:23,069 --> 00:03:28,530
“Anything that we do in spaceflight, whether it’s human spaceflight or otherwise, Marshall’s

46
00:03:28,530 --> 00:03:29,530
involved.

47
00:03:29,530 --> 00:03:34,530
People who live here should know that Marshall is an integral part of NASA – it’s who

48
00:03:34,530 --> 00:03:35,530
we are.”

49
00:03:35,530 --> 00:03:41,239
Done without welding, “selective laser melting” also saves time and reduces the cost of creating

50
00:03:41,239 --> 00:03:46,769
component parts for what will be the largest launch vehicle ever built.

51
00:03:46,769 --> 00:03:53,370
NASA’s Van Allen Probes have discovered a previously unknown third radiation belt

52
00:03:53,370 --> 00:03:54,970
around Earth.

53
00:03:54,970 --> 00:04:00,269
Traditional observations long showed the Van Allen belts as two distinct regions of trapped

54
00:04:00,269 --> 00:04:01,629
radiation.

55
00:04:01,629 --> 00:04:06,400
These new high-resolution observations by
the first dual-spacecraft mission to fly through

56
00:04:06,400 --> 00:04:12,120
them show that there can be three long-lasting
belt structures with the emergence of a second

57
00:04:12,120 --> 00:04:13,470
“slot” (or empty) region.

58
00:04:13,470 --> 00:04:17,460
“The International Space Station is down
below the inner belt.

59
00:04:17,460 --> 00:04:24,380
This new ring is actually much further out
than that, it’s at about 12,000 miles above

60
00:04:24,380 --> 00:04:25,380
the surface.”

61
00:04:25,380 --> 00:04:30,970
These radiation belts, named for their discoverer,
Dr. James Van Allen, are affected by solar

62
00:04:30,970 --> 00:04:37,050
storms in the form of coronal mass ejections
– space weather – and can swell dramatically.

63
00:04:37,050 --> 00:04:43,190
When this occurs, they can pose dangers to
communications and GPS satellites, as well

64
00:04:43,190 --> 00:04:45,060
as human spaceflight activities.

65
00:04:45,060 --> 00:04:50,510
“This is going to teach us a lot about how
effectively the magnetosphere can store and

66
00:04:50,510 --> 00:04:54,400
maintain an electron population for extended
periods of time.”

67
00:04:54,400 --> 00:05:00,590
Scientists using particle detection instruments
flying on board the twin spacecraft also found

68
00:05:00,590 --> 00:05:06,250
unexpected structures and processes within
these hazardous regions of near space.

69
00:05:06,250 --> 00:05:12,140
The new discovery shows the dynamic and variable
nature of the radiation belts and will improve

70
00:05:12,140 --> 00:05:15,360
our understanding of how they respond to solar
activity.

71
00:05:15,360 --> 00:05:23,730
The spin rate of a supermassive black hole
has been measured definitively for the first

72
00:05:23,730 --> 00:05:24,730
time.

73
00:05:24,730 --> 00:05:30,860
NASA's X-ray observatory, Nuclear Spectroscopic
Telescope Array, or NuSTAR, teamed with the

74
00:05:30,860 --> 00:05:35,150
European Space Agency's XMM-Newton for the
findings.

75
00:05:35,150 --> 00:05:40,180
They solve a long-standing debate about similar measurements in other black holes and will

76
00:05:40,180 --> 00:05:44,480
lead to a better understanding of how black holes and galaxies evolve.

77
00:05:44,480 --> 00:05:50,250
The observations are also a powerful test of Einstein's theory of general relativity,

78
00:05:50,250 --> 00:05:54,260
which holds that gravity can bend light and space-time.

79
00:05:54,260 --> 00:05:59,250
The X-ray telescopes detected these warping effects in the most extreme environments,

80
00:05:59,250 --> 00:06:03,680
where the immense gravity field of a black hole is severely altering space-time.

81
00:06:03,680 --> 00:06:11,770
The annual Aerospace @ Annapolis Day, organized by Goddard Space Flight Center, attracted

82
00:06:11,770 --> 00:06:17,370
about 400 people, including state lawmakers and midshipmen from the Naval Academy.

83
00:06:17,370 --> 00:06:22,780
NASA exhibits on hand included a full-size model of the Mars Curiosity rover.

84
00:06:22,780 --> 00:06:28,820
Attendees spoke with scientists who work with “Sample Analysis at Mars” one of Curiosity’s

85
00:06:28,820 --> 00:06:30,360
main instruments –that was built at Goddard.

86
00:06:30,360 --> 00:06:36,090
Goddard Center Director Chris Scolese talked
about the significance of events like this

87
00:06:36,090 --> 00:06:37,490
to NASA and the local community.

88
00:06:37,490 --> 00:06:38,890
“The purpose is to go off and inspire students
and educators to pursue and teach the science

89
00:06:38,890 --> 00:06:47,920
technology engineering and mathematics fields,
so that we can inspire the next generation

90
00:06:47,920 --> 00:06:52,690
to move on, so people can see that they can
work here in Maryland and accomplish some

91
00:06:52,690 --> 00:06:53,960
really great things.”

92
00:06:53,960 --> 00:06:56,130
\h
Other missions showcased included the Landsat

93
00:06:56,130 --> 00:07:01,680
Data Continuity Mission and the recent successful
on-orbit demonstration of the Robotic Refueling

94
00:07:01,680 --> 00:07:03,250
Mission.

95
00:07:03,250 --> 00:07:07,720
The event, hosted by the Maryland General
Assembly, was also an opportunity for NASA

96
00:07:07,720 --> 00:07:10,730
to get valued feedback – and Scolese liked
what he heard.

97
00:07:10,730 --> 00:07:11,730
“Yes I did.

98
00:07:11,730 --> 00:07:15,070
We met with the governor today and he was
very interested in what NASA’s doing and

99
00:07:15,070 --> 00:07:22,030
looking forward to greater things from the
Goddard Space Flight Center.”

100
00:07:22,030 --> 00:07:26,780
The Kennedy Space Center Visitor Complex unveiled
a new logo for the Space Shuttle Atlantis

101
00:07:26,780 --> 00:07:30,840
exhibit still under construction at the Florida
spaceport.

102
00:07:30,840 --> 00:07:35,490
Atlantis, the shuttle that flew the final
mission of the 30-year-long shuttle program,

103
00:07:35,490 --> 00:07:40,440
has been positioned inside the exhibit hall
as it will be displayed: wheels up, tilted

104
00:07:40,440 --> 00:07:46,310
43 degrees to give it the same look it had
when leaving the International Space Station.

105
00:07:46,310 --> 00:07:51,460
By the time the Atlantis exhibit opens June
29, Atlantis will have its cargo bay doors

106
00:07:51,460 --> 00:07:54,940
open and its robotic arm extended.

107
00:07:54,940 --> 00:07:59,620
The Space Shuttle Atlantis attraction will
feature dozens of interactive displays highlighting

108
00:07:59,620 --> 00:08:04,140
different aspects of the space shuttle and
Atlantis itself.

109
00:08:04,140 --> 00:08:08,580
The exhibit will be on Kennedy property only
a few miles from the runway Atlantis touched

110
00:08:08,580 --> 00:08:15,830
down on July 21, 2011, to close out NASA's
longest human spaceflight program.

111
00:08:15,830 --> 00:08:23,090
John Palguta, vice-president for policy with
the Partnership for Public Service, and Jeri

112
00:08:23,090 --> 00:08:27,830
Buchholz, assistant administrator for NASA
Human Capital Management, visited the Stennis

113
00:08:27,830 --> 00:08:33,060
Space Center to officially recognize the center’s
high ranking in the U.S. Office of Personnel

114
00:08:33,060 --> 00:08:35,710
Management’s Employee Viewpoint Survey.

115
00:08:35,710 --> 00:08:39,000
“What is our ranking in the best places
to work?

116
00:08:39,000 --> 00:08:40,180

One!!

117
00:08:40,180 --> 00:08:41,370
Excellent!”

118
00:08:41,370 --> 00:08:46,410
NASA was named the best place to work in the
federal government among large agencies – with

119
00:08:46,410 --> 00:08:51,730
Stennis ranking second among 292 agency subcomponents.

120
00:08:51,730 --> 00:08:55,020
“He would come up to ya and spit water at
you.

121
00:08:55,020 --> 00:08:57,720
So that was a neat part of the job.

122
00:08:57,720 --> 00:08:58,720
Dolphins are pretty smart.”

123
00:08:58,720 --> 00:09:02,720
The Wallops second annual job shadow day provided
an opportunity for NASA employees to help

124
00:09:02,720 --> 00:09:05,410
students experience STEM careers firsthand.

125
00:09:05,410 --> 00:09:07,080
“I’m a huge science nerd.

126
00:09:07,080 --> 00:09:11,680
I’ll admit that and I like the organisms
in marine biology.”

127
00:09:11,680 --> 00:09:17,810
“I didn’t know there was so much going
on here, like weather satellites, I didn’t

128
00:09:17,810 --> 00:09:19,990
know any of that happened here.”

129
00:09:19,990 --> 00:09:25,810
“I think this opportunity really gives me
a chance to understand which area means and

130
00:09:25,810 --> 00:09:28,460
which one I would be more happy going into.”

131
00:09:28,460 --> 00:09:32,470
The experience can also provide students with
a pretty compelling reason to stay in school

132
00:09:32,470 --> 00:09:36,320
by helping them make the connection between
education and success.

133
00:09:36,320 --> 00:09:40,350
“I like to tell them about my background
a little bit so that they can try and understand

134
00:09:40,350 --> 00:09:46,450
where I’m coming from, see sort of the steps
that I took to get to the position I’m in.”

135
00:09:46,450 --> 00:09:51,470
“More students should apply for this program
because it is a great experience.”

136
00:09:51,470 --> 00:10:01,980
“And liftoff of space shuttle Columbia to
broaden our view of the universe through the

137
00:10:01,980 --> 00:10:03,060
Hubble Space Telescope.”

138
00:10:03,060 --> 00:10:09,750

On March first, 2002, space shuttle Columbia launched on STS-109 – also known as “Hubble

139
00:10:09,750 --> 00:10:14,390
Servicing Mission 3-B” – the fourth servicing mission to the Hubble Space Telescope.

140
00:10:14,390 --> 00:10:19,050
During the 11-day mission Columbia’s crew of seven installed new equipment that, among

141
00:10:19,050 --> 00:10:24,650
other improvements, dispensed the telescope’s newly-increased power, and doubled the camera’s

142
00:10:24,650 --> 00:10:27,270
coverage area with more speed and clarity.

143
00:10:27,270 --> 00:10:32,400
In 2009, work was performed during a final servicing mission that is expected to keep

144
00:10:32,400 --> 00:10:35,950
HST in operation through 2014.

145
00:10:35,950 --> 00:10:45,551
And, 41 years ago, on March 2, 1972, Pioneer 10 launched on what would prove to be a mission

146
00:10:45,551 --> 00:10:47,550
lasting more than three decades!

147
00:10:47,550 --> 00:10:53,530
Pioneer 10 was the first spacecraft to travel through the Asteroid belt, and the first spacecraft

148
00:10:53,530 --> 00:10:58,940
to make direct observations and obtain close-up images of Jupiter and its moons.

149
00:10:58,940 --> 00:11:04,230
This historic event marked humans' first approach
to the gas giant and opened the way for exploration

150
00:11:04,230 --> 00:11:12,070
of the outer solar system by future spacecraft
like Voyager, Ulysses, Galileo and Cassini.

151
00:11:12,070 --> 00:11:17,740
After more than 8 billion miles traveled over
more than 30 years, Pioneer 10 sent its last

152
00:11:17,740 --> 00:11:21,520
signal to Earth on January 23, 2003.

153
00:11:21,520 --> 00:11:24,830
And that’s This Week @NASA.

154
00:11:24,830 --> 00:11:30,830
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