



1  
00:00:07,040 --> 00:00:14,200  
This Week at NASA...

2  
00:00:14,200 --> 00:00:18,590  
October 7 is the launch date for SpaceX's  
Dragon spacecraft on the first commercial

3  
00:00:18,590 --> 00:00:21,900  
resupply mission to the International Space  
Station.

4  
00:00:21,900 --> 00:00:27,020  
This will be the first of 12 contracted flights  
by SpaceX to resupply the space station under

5  
00:00:27,020 --> 00:00:32,340  
the Commercial Resupply Services contract  
and will restore an American capability to

6  
00:00:32,340 --> 00:00:36,500  
transport cargo to and from the orbiting laboratory.

7  
00:00:36,500 --> 00:00:41,500  
Dragon will be sent aloft from Cape Canaveral  
Air Force Station in Florida by SpaceX's

8  
00:00:41,500 --> 00:00:42,870  
Falcon 9 rocket.

9  
00:00:42,870 --> 00:00:47,640  
A back up launch opportunity is available  
on Oct. 8.

10  
00:00:47,640 --> 00:00:54,310  
Hello, my name is Sanjeev Gupta and I am a  
long term planner for the Mars Curiosity rover.

11  
00:00:54,310 --> 00:00:56,610  
This is your Curiosity rover update.

12  
00:00:56,610 --> 00:01:01,310  
We've now been on Mars for almost 2 months  
and we have been witnessing the amazing new

13  
00:01:01,310 --> 00:01:06,060  
vistas of the never-before-seen Gale landscape  
taken with our wonderful cameras.

14  
00:01:06,060 --> 00:01:10,990  
However, much of the science team have had  
their eyes and the rover's eyes FIRMLY focused

15  
00:01:10,990 --> 00:01:11,990  
on the ground.

16  
00:01:11,990 --> 00:01:12,990  
Looking at the ground, the team have made  
an interesting discovery.

17  
00:01:12,990 --> 00:01:17,130  
On the drive from the Bradbury landing site  
to our current location we have been analyzing

18  
00:01:17,130 --> 00:01:22,950  
3 interesting outcrops that are called Goulburn,  
Link, and Hottah.

19  
00:01:22,950 --> 00:01:26,101  
If we look at the Hottah outcrop, we can see  
a distinct layer that has been tilted and

20  
00:01:26,101 --> 00:01:30,470  
eroded and this allows us to look at a cross-section  
through the layer.

21  
00:01:30,470 --> 00:01:34,620  
When we looked at the layer with our high-resolution  
Mastcam camera we found that it was comprised

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00:01:34,620 --> 00:01:39,800

of sand grains and small pebbles that had become cemented to form a hard layer.

23

00:01:39,800 --> 00:01:44,880

Here you can see a pebble that is 3 cm in diameter so smaller than a ping pong ball.

24

00:01:44,880 --> 00:01:48,470

This suggests that this layer is an ancient gravel deposit.

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00:01:48,470 --> 00:01:52,280

The surprising thing is that when we looked at the pebbles closely, we discovered that

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00:01:52,280 --> 00:01:54,680

many of them were quite well rounded.

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00:01:54,680 --> 00:01:58,979

This is very different to the many angular clasts that litter the surface.

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00:01:58,979 --> 00:02:03,100

Here, you can see a rounded pebble from a riverbed on Earth.

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00:02:03,100 --> 00:02:06,840

On Earth rounded pebbles are a common tell tale sign of rocks that have been transported

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00:02:06,840 --> 00:02:10,049

by water, for example in a river or stream.

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00:02:10,049 --> 00:02:14,080

As water flows over a riverbed, if the flow strength is great enough, the pebbles are

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00:02:14,080 --> 00:02:18,430

lifted up into the flow or rolled along the riverbed and they become pounded or battered

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00:02:18,430 --> 00:02:26,489

against each other and this causes them to become rounded through time.

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00:02:26,489 --> 00:02:33,040

The size of the pebbles tells us that these rocks could not have been transported by wind

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00:02:33,040 --> 00:02:36,500

action so it seems clear that they must have been transported by water.

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00:02:36,500 --> 00:02:38,730

So how did this pebble deposit get to be here?

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00:02:38,730 --> 00:02:42,709

If we look more broadly in Gale Crater, we can see that there is a prominent feature

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00:02:42,709 --> 00:02:45,030

that geologists call an alluvial fan.

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00:02:45,030 --> 00:02:50,040

Alluvial fans are cone-shaped deposits of gravel and sand that accumulate where streams

40

00:02:50,040 --> 00:02:51,599

exit mountains.

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00:02:51,599 --> 00:02:56,889

In Gale crater, there is a 10 km long fan formed at the mouth of 30 m deep canyon that

42

00:02:56,889 --> 00:02:59,590

is derived from the crater rim.

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00:02:59,590 --> 00:03:03,700

On the fan itself we can see evidence for multiple channels suggesting that the streambed

44

00:03:03,700 --> 00:03:05,909

direction changed through time.

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00:03:05,909 --> 00:03:09,219

When we look at the location of the Curiosity landing site with respect to the alluvial

46

00:03:09,219 --> 00:03:13,489

fan we can see that the rover landed downstream of the fan.

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00:03:13,489 --> 00:03:18,209

The rounded pebbles likely represent long distance transport down the alluvial fan.

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00:03:18,209 --> 00:03:22,310

So this is really exciting news for the science team because this is the first time we're

49

00:03:22,310 --> 00:03:26,400

seeing gravel transported by water on the surface of Mars.

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00:03:26,400 --> 00:03:30,000

This has been another exhilarating week for Curiosity on Mars and for the scientists here

51

00:03:30,000 --> 00:03:31,529

in Pasadena.

52

00:03:31,529 --> 00:03:33,700

This has been your Curiosity rover report.

53

00:03:33,700 --> 00:03:37,699

Check back for more updates.

54  
00:03:37,699 --> 00:03:42,519  
The next crew slated to live aboard the International Space Station continues to ready itself for

55  
00:03:42,519 --> 00:03:43,690  
the mission.

56  
00:03:43,690 --> 00:03:49,370  
Expedition 33/34 Soyuz Commander Oleg Novitskiy of the Russian Federal Space Agency, NASA

57  
00:03:49,370 --> 00:03:54,439  
Flight Engineer Kevin Ford and Russian Flight Engineer Evgeny Tarelkin took a break from

58  
00:03:54,439 --> 00:03:59,489  
training to field questions from the news media at the Gagarin Cosmonaut Training Center

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00:03:59,489 --> 00:04:01,319  
in Star City, Russia.

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00:04:01,319 --> 00:04:05,790  
They also participated in traditional ceremonies in Moscow's Red Square.

61  
00:04:05,790 --> 00:04:11,309  
The trio will ride a Soyuz spacecraft to the ISS in mid-October, where they'll join Expedition

62  
00:04:11,309 --> 00:04:17,070  
33 Commander Suni Williams of NASA, Flight Engineer Aki Hoshide of the Japan Aerospace

63  
00:04:17,070 --> 00:04:23,660  
Exploration Agency and Russian Flight Engineer Yuri Malenchenko.

64  
00:04:23,660 --> 00:04:29,120

Space shuttle Endeavour is back on the ground following its removal from NASA 905, the Shuttle

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00:04:29,120 --> 00:04:34,160

Carrier Aircraft that transported Endeavour from Kennedy Space Center to Los Angeles International

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00:04:34,160 --> 00:04:36,060

Airport (LAX).

67

00:04:36,060 --> 00:04:41,320

Following its "demating" from the modified 747, Endeavour was moved into a United Airlines

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00:04:41,320 --> 00:04:45,430

hangar, where it will be prepped for its two-day journey through the streets of Inglewood and

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00:04:45,430 --> 00:04:49,430

Los Angeles to its new home at the California Science Center.

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00:04:49,430 --> 00:04:54,260

Endeavour, the youngest of NASA's five space shuttles, was rolled out of the Palmdale,

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00:04:54,260 --> 00:05:00,060

California Assembly plant in April 1991, and flew the first of its 25 missions the next

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00:05:00,060 --> 00:05:03,280

year.

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00:05:03,280 --> 00:05:08,200

Astronomers compiled 10 years worth of photographs taken by NASA's Hubble Space Telescope to

74

00:05:08,200 --> 00:05:15,040

make the Extreme Deep Field or XDF, the deepest image ever taken of our universe.

75  
00:05:15,040 --> 00:05:20,570  
It builds on the work done in the 2003 timeframe when the Ultra Deep Field image revealed distant

76  
00:05:20,570 --> 00:05:23,760  
galaxies that offer clues into the earliest times of the universe.

77  
00:05:23,760 --> 00:05:30,230  
The XDF, is a small patch of the sky that reveals about 5000 galaxies but is only a

78  
00:05:30,230 --> 00:05:32,970  
fraction of the entire universe.

79  
00:05:32,970 --> 00:05:39,870  
It gives us a glimpse of galaxies about 450 million years after the Big Bang.

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00:05:39,870 --> 00:05:44,970  
The Goddard Space Flight Center recently took delivery of the first two of 18 beryllium

81  
00:05:44,970 --> 00:05:49,470  
primary mirror segments for NASA's James Webb Space Telescope.

82  
00:05:49,470 --> 00:05:54,280  
Ball Aerospace in Boulder, Colorado, shipped the two mirrors in custom containers.

83  
00:05:54,280 --> 00:05:58,580  
The remaining 16 mirrors will likewise make their way from Boulder to Goddard over the

84  
00:05:58,580 --> 00:06:03,710  
next 12 months and will be integrated into the telescope in 2015.

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00:06:03,710 --> 00:06:11,370

The Webb, NASA's next Great Observatory, is on track for launch in October 2018.

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00:06:11,370 --> 00:06:16,970

This artist's illustration, based in part on data from NASA's Chandra X-ray Observatory,

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00:06:16,970 --> 00:06:22,800

indicates that our Milky Way Galaxy is surrounded by an enormous halo of hot gas.

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00:06:22,800 --> 00:06:28,150

Extending hundreds of thousands of light years, this hot-gas halo has a mass comparable to

89

00:06:28,150 --> 00:06:33,360

that of all the stars in the Milky Way, and a temperature much hotter than previously

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00:06:33,360 --> 00:06:34,460

believed.

91

00:06:34,460 --> 00:06:40,230

The illustration shows the halo in blue, along with the Milky Way and two neighboring galaxies,

92

00:06:40,230 --> 00:06:43,500

the Small and Large Magellanic Clouds.

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00:06:43,500 --> 00:06:48,800

"And welcome to the Kennedy Space Center's 50th Anniversary Gala."

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00:06:48,800 --> 00:06:53,530

The Kennedy Space Center and the National Space Club Florida Committee marked KSC's

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00:06:53,530 --> 00:06:58,960

fiftieth anniversary with a gala in the Visitor Complex's Apollo/Saturn V Center.

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00:06:58,960 --> 00:07:04,060

With "Celebrating the Past and Preparing for the Future" as their theme, some 650

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00:07:04,060 --> 00:07:09,100

current and former NASA employees, dignitaries and guests noted Kennedy's achievements

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00:07:09,100 --> 00:07:14,930

of the last five decades while discussing the center's next chapter as a hub of commercial

99

00:07:14,930 --> 00:07:15,930

spaceflight.

100

00:07:15,930 --> 00:07:19,820

"The Kennedy Space Center is synonymous with humankind's greatest achievements in

101

00:07:19,820 --> 00:07:22,380

exploration of the Universe.

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00:07:22,380 --> 00:07:26,950

Kennedy and its adjacent Cape Canaveral sites were the launch pads for Alan Shepard's

103

00:07:26,950 --> 00:07:32,590

first flight, John Glenn's first orbit of Earth and Neil Armstrong's first small step."

104

00:07:32,590 --> 00:07:38,210

"Throughout those 50 years there's been on common theme, and that's an insatiable

105

00:07:38,210 --> 00:07:44,470

desire to explore, to send humans and robotic spacecraft beyond the confines of our home

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00:07:44,470 --> 00:07:45,470

planet.”

107

00:07:45,470 --> 00:07:54,220

More than 1,700 people got an inside peek at the programs and projects at Marshall Space

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00:07:54,220 --> 00:07:58,220

Flight Center during its Innovation & Technology Day.

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00:07:58,220 --> 00:08:03,560

The event included a technology expo with more than 70 booths of interactive displays,

110

00:08:03,560 --> 00:08:08,690

exhibits and demonstrations showcasing the latest trends and initiatives in the areas

111

00:08:08,690 --> 00:08:13,970

of information technology, engineering, science programs and projects.

112

00:08:13,970 --> 00:08:18,320

Innovation & Technology Day was hosted by Marshall’s Chief Information Officer and

113

00:08:18,320 --> 00:08:23,490

the Office of Strategic Analysis & Communications.

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00:08:23,490 --> 00:08:28,290

The moon took center stage for stargazers around the world during International Observe

115

00:08:28,290 --> 00:08:29,880

the Moon Night.

116

00:08:29,880 --> 00:08:33,430

Ames was one of the NASA Centers hosting events.

117

00:08:33,430 --> 00:08:38,130

Astronomers with NASA's Lunar Science Institute held discussions and presentations while amateur

118

00:08:38,130 --> 00:08:42,189

astronomers and astronomy clubs set up telescopes for public viewing.

119

00:08:42,189 --> 00:08:46,829

The moon appeared as "half-full" in what is known as a "first quarter" moon, which

120

00:08:46,829 --> 00:08:52,230

is ideal for viewing.

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00:08:52,230 --> 00:08:56,850

Sputnik 1, the first artificial Earth satellite was launched into an elliptical low Earth

122

00:08:56,850 --> 00:09:01,920

orbit by the Soviet Union fifty-five years ago on October 4, 1957.

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00:09:01,920 --> 00:09:07,819

The surprise launch precipitated the American Sputnik crisis, began the Space Age and triggered

124

00:09:07,819 --> 00:09:11,579

the Space Race, a part of the larger Cold War.

125

00:09:11,579 --> 00:09:14,459

Sputnik was also scientifically valuable.

126

00:09:14,459 --> 00:09:19,570

The density of the upper atmosphere could be deduced from its drag on the orbit, and

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00:09:19,570 --> 00:09:25,699

its radio signals, monitored by amateur radio operators worldwide, gave information about

128

00:09:25,699 --> 00:09:26,699

the ionosphere.

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00:09:26,699 --> 00:09:32,860

After about 37 million miles and 3 months in orbit Sputnik 1 fell back to Earth and

130

00:09:32,860 --> 00:09:37,529

burned up in the atmosphere on January 4, 1958.

131

00:09:37,529 --> 00:09:43,129

"Liftoff the clock has started."

132

00:09:43,129 --> 00:09:49,759

Fifty years ago on October 3, 1962 NASA Astronaut Wally Schirra orbited the Earth six times

133

00:09:49,759 --> 00:09:51,950

in the Sigma 7 spacecraft.

134

00:09:51,950 --> 00:09:57,410

The Mercury-Atlas 8 (MA-8) mission was the fifth United States manned space mission.

135

00:09:57,410 --> 00:10:02,829

The nine-hour flight focused mainly on technical evaluation and was the longest U.S. manned

136

00:10:02,829 --> 00:10:05,880

orbital flight to date in the Space Race.

137

00:10:05,880 --> 00:10:11,129

The flight confirmed the Mercury spacecraft's durability ahead of Gordon Cooper's one-day

138

00:10:11,129 --> 00:10:18,740

Mercury-Atlas 9 mission the next year.

139

00:10:18,740 --> 00:10:23,699

Langley Research Center Director Lesa Roe accepted a "Bridge Builder" award on behalf

140

00:10:23,699 --> 00:10:30,559

of NASA during the Virginia Hispanic Chamber of Commerce's annual Hispanic Gala.

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00:10:30,559 --> 00:10:35,329

The award recognizes Langley's efforts to improve the connection between the Hispanic

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00:10:35,329 --> 00:10:40,740

community and the community at large and its contributions to inspire Hispanic youth via

143

00:10:40,740 --> 00:10:45,769

STEM educational outreach efforts in Virginia and throughout the country.

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00:10:45,769 --> 00:10:50,509

Also presented with a Bridge Builder award was Secretary of Labor, Hilda Solis, who is

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00:10:50,509 --> 00:10:54,189

the first Hispanic woman to serve as a United States Cabinet member.

146

00:10:54,189 --> 00:10:59,959

"No matter where you come from, no matter what zip code, no matter what side of the

147

00:10:59,959 --> 00:11:04,640

aisle or even railroad – what side of the tracks you were born on.

148

00:11:04,640 --> 00:11:07,680

There are great possibilities in this country.”

149

00:11:07,680 --> 00:11:10,129

And that’s This Week @NASA.

150

00:11:10,129 --> 00:11:14,970

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