1
00:00:06,890 --> 00:00:10,260
This Week at NASA…

2
00:00:10,260 --> 00:00:21,290
The Soyuz spacecraft carrying Expedition 34
Commander Kevin Ford of NASA and his Russian

3
00:00:21,290 --> 00:00:26,529
crewmates, Soyuz Commander Oleg Novitskiy
and Flight Engineer Evgeny Tarelkin, put down

4
00:00:26,529 --> 00:00:31,460
safely on the Kazakh steppes to complete their
successful mission aboard the International

5
00:00:31,460 --> 00:00:33,210
Space Station.

6
00:00:33,210 --> 00:00:38,360
Left by Ford to command the orbital laboratory
was Chris Hadfield, the first Canadian Space

7
00:00:38,360 --> 00:00:43,730
Agency astronaut so entrusted, who received
a congratulatory call from Canadian Prime

8
00:00:43,730 --> 00:00:45,190
Minister Stephen Harper.

9
00:00:45,190 --> 00:00:48,140
“Commander I just want to congratulate you
on this historic achievement.

10
00:00:48,140 --> 00:00:51,900
You’re the first Canadian ever to command
the International Space Station -- we’re

11
00:00:51,900 --> 00:00:53,450
all very proud of you here.”

12
00:00:53,450 --> 00:00:59,859
“I ask every Canadian from the machine shops
that helped build this place to the software

13
00:00:59,859 --> 00:01:06,610
labs, to the inventors – the creative minds
that made all this possible – when they

14
00:01:06,610 --> 00:01:13,299
look up and see the point of light that is
the International Space Station, all Canadians

15
00:01:13,299 --> 00:01:16,689
should take pride in what we can do together.”

16
00:01:16,689 --> 00:01:21,780
Hadfield and Flight Engineers Tom Marshburn
of NASA and Roman Romanenko of the Russian

17
00:01:21,780 --> 00:01:28,560
Federal Space Agency are scheduled to be joined
on March 29 by Expedition 35/36 crew members

18
00:01:28,560 --> 00:01:34,079
Pavel Vinogradov, NASA Flight Engineer Chris
Cassidy and Flight Engineer Alexander Misurkin

19
00:01:34,079 --> 00:01:35,860
of Russia.

20
00:01:35,860 --> 00:01:42,370
“When we think about the Mars Science Laboratory
event that we had last August, the landing

21
00:01:42,370 --> 00:01:48,180
of Curiosity on the planet Mars, often what
comes to mind is the seven minutes of terror.”

22

00:01:48,180 --> 00:01:51,520
“Touchdown confirmed … we’re safe on
Mars … (applause).

23
00:01:56,290 --> 00:01:52,520
“

24
00:01:56,290 --> 00:01:57,890
to hear about today.”

25
00:01:57,890 --> 00:02:02,930
A news briefing Tuesday at NASA Headquarters
focused on analysis of the first ever sample

26
00:02:02,930 --> 00:02:08,729
of rock powder collected on Mars by the Curiosity
rover and the big news resulting from that

27
00:02:08,729 --> 00:02:13,950
analysis – an answer to the fundamental
question on which the rover’s prime mission

28
00:02:13,950 --> 00:02:20,160
is based – Was the Gale Crater area of the
Red Planet ever capable of supporting microbial

29
00:02:20,160 --> 00:02:21,160
life?

30
00:02:21,160 --> 00:02:22,160
“I think the answer is yes!

31
00:02:22,160 --> 00:02:27,160
I think this is probably the only definitively
habitable environment that we’ve described

32
00:02:27,160 --> 00:02:28,160
and recorded.”

33

00:02:28,160 --> 00:02:34,550
“We have found a habitable environment that
is so benign and supportive of life that probably

34
00:02:34,550 --> 00:02:38,230
if this water was around and you had been
on the planet you would have been able to

35
00:02:38,230 --> 00:02:39,230
drink it.”

36
00:02:39,230 --> 00:02:43,720
Here, now in this week’s Curiosity Rover
Report – the details of the work behind

37
00:02:43,720 --> 00:02:44,720
this big discovery …

38
00:02:44,720 --> 00:02:52,400
Hi, I'm Joel Hurowitz, a scientist with the
surface sampling system team and this is your

39
00:02:52,400 --> 00:02:54,760
Curiosity rover report.

40
00:02:54,760 --> 00:02:59,610
This week the Curiosity science team released
its initial findings from its first ever drilled

41
00:02:59,610 --> 00:03:01,370
sample on Mars.

42
00:03:01,370 --> 00:03:05,260
This sample was collected from the “John
Klein” drill site, which is located about

43
00:03:05,260 --> 00:03:09,050
500 meters east of where we landed about 7
months ago.

44
00:03:09,050 --> 00:03:14,489
Curiosity obtained her first drill sample
and passed that sample on to her onboard analytical

45
00:03:14,489 --> 00:03:16,860
lab instruments, called CheMin and SAM.

46
00:03:16,860 --> 00:03:21,330
These powerful instruments tell us about what
minerals are present in these rocks and whether

47
00:03:21,330 --> 00:03:25,310
they contain the ingredients necessary to
sustain life as we know it.

48
00:03:25,310 --> 00:03:28,879
What the Curiosity team has found is incredibly
exciting.

49
00:03:28,879 --> 00:03:34,069
When we combine what we have learned from
our remote sensing and contact science instruments

50
00:03:34,069 --> 00:03:40,000
with the data that’s coming in from CheMin
and SAM, we get a picture of an ancient watery

51
00:03:40,000 --> 00:03:43,250
environment, which would have been habitable
had life been present in it.

52
00:03:43,250 --> 00:03:47,440
As an example, the information that we’re
getting from the CheMin instrument, tells

53
00:03:47,440 --> 00:03:52,189
us that the minerals that are present in this
lakebed sedimentary rock at John Klein are

54

00:03:52,189 --> 00:03:56,220
very different from just about anything we've
ever analyzed before on Mars.

55
00:03:56,220 --> 00:04:01,760
And they tell us that the John Klein rock
was deposited in a fresh water environment.

56
00:04:01,760 --> 00:04:06,560
This is an important contrast with other sedimentary
environments that we've visited on Mars,

57
00:04:06,560 --> 00:04:10,750
like the Meridiani Planum landing site where
the Mars Exploration Rover, Opportunity, has

58
00:04:10,750 --> 00:04:12,409
been operating since 2004.

59
00:04:12,409 --> 00:04:17,780
At that site, the sedimentary rocks record
evidence of an environment that was only wet

60
00:04:17,780 --> 00:04:22,650
on a very intermittent basis, and when it
was, the waters that were there were highly

61
00:04:22,650 --> 00:04:27,760
acidic, very salty, and not favorable for
the survival of organic compounds.

62
00:04:27,760 --> 00:04:32,000
This is in direct contrast to the fresh water
environment we're seeing here at the John

63
00:04:32,000 --> 00:04:33,330
Klein Site.

64
00:04:33,330 --> 00:04:37,220
The SAM instrument is telling us that these

rocks contained all of the ingredients necessary

65
00:04:37,220 --> 00:04:38,900
for a habitable environment.

66
00:04:38,900 --> 00:04:43,370
We found carbon, sulfur and oxygen, all present
and a number of other elements in states that

67
00:04:43,370 --> 00:04:45,420
life could have taken advantage of.

68
00:04:45,420 --> 00:04:49,420
All in all, these few tablespoons of powder
from a Martian rock have provided the Curiosity

69
00:04:49,420 --> 00:04:54,200
science team with an exciting new dataset
that tells us that Gale Crater, and perhaps

70
00:04:54,200 --> 00:04:57,330
all of Mars, contained habitable environments.

71
00:04:57,330 --> 00:05:01,360
This is an incredible success for the Curiosity
mission to Gale, and the science team is looking

72
00:05:01,360 --> 00:05:06,350
forward to digging deeper into Mars' ancient
watery past in the weeks, months, and years

73
00:05:06,350 --> 00:05:07,350
ahead.

74
00:05:07,350 --> 00:05:08,950
This has been your Curiosity rover report.

75
00:05:08,950 --> 00:05:13,480
Please check back for more updates.

76
00:05:13,480 --> 00:05:18,140
NASA has announced the creation of a new Space Technology Mission Directorate.

77
00:05:18,140 --> 00:05:24,890
STMD will be a catalyst for creating cross-cutting, advanced technologies and innovations needed

78
00:05:24,890 --> 00:05:28,210
for future space missions and bettering life here on Earth.

79
00:05:28,210 --> 00:05:32,240
“To do the things that we want to go do – we need to solve some problems.

80
00:05:32,240 --> 00:05:34,330
We need technology to be able to help us go do these things.

81
00:05:34,330 --> 00:05:37,210
We are a focal point right now of change for the agency.

82
00:05:37,210 --> 00:05:41,600
We unleash the talent and the innovation that exists in the agency to go work on these tough

83
00:05:41,600 --> 00:05:42,600
problems.”

84
00:05:42,600 --> 00:05:47,550
The Space Technology Mission Directorate will employ a portfolio approach, spanning a range

85
00:05:47,550 --> 00:05:52,130
of discipline areas and technology readiness levels.

86
00:05:52,130 --> 00:05:57,121
Research and technology development will take
place within NASA centers, in academia, and

87
00:05:57,121 --> 00:06:02,010
industry, and leverage collaboration with
other government and international partners.

88
00:06:02,010 --> 00:06:04,530
“We are tapping into the nation’s brightest
and best.

89
00:06:04,530 --> 00:06:08,600
We’re all harnessing those folks and it’s
really the people that are a key to go solve

90
00:06:08,600 --> 00:06:09,600
these problems.”

91
00:06:09,600 --> 00:06:14,990
The formation of STMD is in keeping with the
Obama Administration's recognition of the

92
00:06:14,990 --> 00:06:20,930
critical role of space technology and innovation
in maintaining U.S. leadership in space while

93
00:06:20,930 --> 00:06:25,930
benefiting our economy here at home.

94
00:06:25,930 --> 00:06:32,030
At the Johnson Space Center, with NASA’s
next spacecraft, Orion, as their backdrop,

95
00:06:32,030 --> 00:06:37,400
Administrator Charlie Bolden, Associate Administrator
for Education Leland Melvin and officials

96
00:06:37,400 --> 00:06:43,470

from the spacecraft's prime contractor,
Lockheed Martin, unveiled details about the

97
00:06:43,470 --> 00:06:46,880
agency's new Exploration Design Challenge.

98
00:06:46,880 --> 00:06:52,500
The unique, STEM-based program seeks K through
12 students around the world to play a role

99
00:06:52,500 --> 00:06:55,100
in the future of human spaceflight.

100
00:06:55,100 --> 00:07:01,660
The students are to think and act like scientists
to overcome one of the major hurdles of long-duration

101
00:07:01,660 --> 00:07:02,660
exploration.

102
00:07:02,660 --> 00:07:05,380
"This will require new technology.

103
00:07:05,380 --> 00:07:11,000
Including new ways to keep our astronauts
safe from deep space radiation.

104
00:07:11,000 --> 00:07:15,560
That is the purpose of this challenge and
we're excited that American students will

105
00:07:15,560 --> 00:07:17,660
be helping us solve that problem."

106
00:07:17,660 --> 00:07:22,250
"The things that we're trying to do with
Orion and the Exploration Design Challenge

107
00:07:22,250 --> 00:07:27,680

will help you find that curiosity, will help
you solve problems – to help our astronauts

108
00:07:27,680 --> 00:07:31,190
and maybe even you one day to fly on Orion
to Mars."

109
00:07:31,190 --> 00:07:36,400
NASA also highlighted the Exploration Design
Challenge with a Google+ hangout.

110
00:07:36,400 --> 00:07:41,720
Melvin was joined by fellow astronaut Rex
Walheim inside an Orion mockup, to discuss

111
00:07:41,720 --> 00:07:46,750
the spacecraft's capabilities and answer
questions about the future of human space

112
00:07:46,750 --> 00:07:48,400
exploration.

113
00:07:48,400 --> 00:07:54,620
"As the World's leading Space Agency,
NASA is a major employer of STEM educated

114
00:07:54,620 --> 00:08:00,590
workers and we need to be even more committed
to full participation of women in STEM fields."

115
00:08:00,590 --> 00:08:06,120
NASA Deputy Administrator Lori Garver provided
the opening remarks for "Women Inspiring

116
00:08:06,120 --> 00:08:11,630
Innovation Through Imagination," a Women's
History Month program at headquarters.

117
00:08:11,630 --> 00:08:15,990
Named for this year's Women's History

Month theme, the presentation celebrated women

118
00:08:15,990 --> 00:08:19,030
in Science, Technology, Engineering and Math.

119
00:08:19,030 --> 00:08:24,900
“We have a lot of very amazing women here
at NASA and they’ve been helping us to create

120
00:08:24,900 --> 00:08:27,840
a brighter future from our earliest days.”

121
00:08:27,840 --> 00:08:34,029
“These women clearly made contributions
in science, technology, engineering and math

122
00:08:34,029 --> 00:08:38,510
and also transcend that particular moment
in time.”

123
00:08:38,510 --> 00:08:43,450
Featured were several speakers and a video
tribute to the late, great NASA astronaut

124
00:08:43,450 --> 00:08:46,650
and space pioneer, Sally Ride.

125
00:08:46,650 --> 00:08:51,460
“And it’s a great day for both New Orleans
and our entire State.”

126
00:08:51,460 --> 00:08:58,450
NASA's Michoud Assembly Facility in New Orleans,
the agency's only large-scale advanced manufacturing

127
00:08:58,450 --> 00:09:03,430
facility, will soon be building liquefied
natural gas tanks with commercial applications

128

00:09:03,430 --> 00:09:04,750
on Earth.

129
00:09:04,750 --> 00:09:10,140
At a ceremony that included Louisiana Gov.
Bobby Jindal, Lockheed Martin Corporation

130
00:09:10,140 --> 00:09:16,290
announced it will tap the unique experience
and equipment at Michoud to manufacture the

131
00:09:16,290 --> 00:09:17,290
LNG tanks.

132
00:09:17,290 --> 00:09:22,860
As prime contractor for NASA's Orion spacecraft
being built at Michoud, Lockheed Martin is

133
00:09:22,860 --> 00:09:24,800
familiar with the facility's capabilities.

134
00:09:24,800 --> 00:09:30,800
“Michoud has been a place where so many
of the nation’s proud, unequaled accomplishments

135
00:09:30,800 --> 00:09:33,680
in space literally came together.”

136
00:09:33,680 --> 00:09:39,080
This new deal represents another innovative
use of the assembly facility, which has a

137
00:09:39,080 --> 00:09:45,510
37-year history of producing the giant external
tanks used by the space shuttle.

138
00:09:45,510 --> 00:09:51,440
NASA's Operation IceBridge is preparing for
another season of Arctic research.

139
00:09:51,440 --> 00:09:56,490
Instrument and aircraft teams at Wallops Flight Facility have been readying the P-3B airborne

140
00:09:56,490 --> 00:10:00,650
laboratory for its March 18 through May 3 campaign.

141
00:10:00,650 --> 00:10:04,890
During that series of flights researchers aboard the aircraft will survey ice in Greenland

142
00:10:04,890 --> 00:10:06,580
and the Arctic Ocean.

143
00:10:06,580 --> 00:10:11,110
Operation IceBridge has been gathering detailed data on ice elevation and thickness in the

144
00:10:11,110 --> 00:10:16,220
Arctic and Antarctic since NASA’s ICESat mission stopped collecting data from orbit

145
00:10:16,220 --> 00:10:17,590
in 2009.

146
00:10:17,590 --> 00:10:23,110
IceBridge will take measurements until the ICESat -2 satellite is up and running in 2016.

147
00:10:23,110 --> 00:10:27,440
The six-year IceBridge mission will yield an unprecedented three-dimensional view of

148
00:10:27,440 --> 00:10:31,380
Arctic and Antarctic ice sheets, ice shelves and sea ice.

149
00:10:31,380 --> 00:10:34,530

IceBridge is managed for NASA by Goddard Space Flight Center.

150
00:10:34,530 --> 00:10:41,760
The P3-B aircraft is based at NASA’s Wallops Flight Facility.

151
00:10:41,760 --> 00:10:46,310
Engineers working on NASA's new Space Launch System at the Marshall Space Flight Center

152
00:10:46,310 --> 00:10:51,130
visited their alma mater of Tennessee Tech University in Cookeville during the school's

153
00:10:51,130 --> 00:10:52,300
Engineers Week.

154
00:10:52,300 --> 00:10:56,991
There, they discussed with area students the value of science, technology, engineering

155
00:10:56,991 --> 00:10:58,540
and math.

156
00:10:58,540 --> 00:11:03,060
These Tennessee Tech alumni took questions from hundreds of grade school STUDENTS over

157
00:11:03,060 --> 00:11:07,280
a distance learning network hosted at the university's STEM Center.

158
00:11:07,280 --> 00:11:11,350
“It has allowed us to reach so many more students than we normally would be able to.

159
00:11:11,350 --> 00:11:14,310
There are so many restrictions on bus travel right now.

160
00:11:14,310 --> 00:11:19,920
To be able to get you all into the classroom
with the flip of a switch is very powerful."

161
00:11:19,920 --> 00:11:24,750
A traveling SLS exhibit was unveiled that
allowed students to check out the different

162
00:11:24,750 --> 00:11:29,380
parts of the next generation rocket that will
allow humans to travel farther into space

163
00:11:29,380 --> 00:11:30,780
than ever before.

164
00:11:30,780 --> 00:11:36,260
The new exhibit helped triple attendance records
at the STEM Center's "FAB Friday" event.

165
00:11:36,260 --> 00:11:40,490
The NASA group also talked with Tennessee
Tech engineering students about space-related

166
00:11:40,490 --> 00:11:43,280
careers during a panel discussion.

167
00:11:43,280 --> 00:11:49,210
Also in Cookeville, SLS Program Manager Todd
May visited nearby Flexial Corporation, where

168
00:11:49,210 --> 00:11:55,010
he gave details on the overall vehicle to
employees who in turn updated May on the progress

169
00:11:55,010 --> 00:11:57,950
of the J-2X engine part being built there.

170
00:11:57,950 --> 00:12:03,010

“Having Todd May here talking to our employees
of corse is a really strong enthusiasm booster.

171
00:12:03,010 --> 00:12:07,870
Now looking forward on SLS for the Space Launch
System these are exciting things.”

172
00:12:07,870 --> 00:12:13,279
Even Cosmo the astronaut got in on the action,
visiting with TN Tech fans during a basketball

173
00:12:13,279 --> 00:12:19,430
game, where outreach volunteers answered questions
about For more information on the Space Launch

174
00:12:19,430 --> 00:12:25,230
System, visit www.nasa.gov/sls

175
00:12:25,230 --> 00:12:35,960
It was a day filled with duct tape boats and
coffee filter lunar landers at NASA’s 2013

176
00:12:35,960 --> 00:12:36,960
Career Days.

177
00:12:36,960 --> 00:12:42,220
The event was a joint collaboration between
NASA Langley and the Newport News shipbuilding,

178
00:12:42,220 --> 00:12:46,340
where 600 high schoolers from Virginia took
on two design challenges.

179
00:12:46,340 --> 00:12:53,550
“So, you are designing a capsule to land
on Mars, just like NASA did in August.”

180
00:12:53,550 --> 00:13:00,400
The second challenge was to build a boat made
out of duct tape and make it float in water,

181
00:13:00,400 --> 00:13:01,850
all while piling weights in it.

182
00:13:01,850 --> 00:13:06,310
As the day went on, students expressed excitement
over what they were learning.

183
00:13:06,310 --> 00:13:13,080
“You really need hands on experience – you
have to talk to people and ask questions to

184
00:13:13,080 --> 00:13:14,080
learn about it.”

185
00:13:14,080 --> 00:13:18,150
And most of all, they learned what it means
to be an explorer.

186
00:13:18,150 --> 00:13:25,130
“Because we need you, because you’re the
next generation of explorers”

187
00:13:25,130 --> 00:13:32,080
Forty-seven years ago, on March 16, 1966,
the Gemini Titan 8 launched from Cape Canaveral,

188
00:13:32,080 --> 00:13:36,670
Florida, on its way to becoming NASA’s first
manned docking mission.

189
00:13:36,670 --> 00:13:42,610
Astronauts Neil Armstrong and Dave Scott successfully
hooked up with an unmanned Agena target vehicle,

190
00:13:42,610 --> 00:13:48,440
but a thruster malfunction caused the combined
vehicles to go into a violent yaw and tumble.

191

00:13:48,440 --> 00:13:53,870
The crew managed to disengage from the target vehicle and eventually stabilize their spacecraft.

192
00:13:53,870 --> 00:13:58,630
However, that maneuver left them short of fuel – requiring an immediate return to

193
00:13:58,630 --> 00:14:02,990
Earth, the first emergency landing of a manned U.S. spacecraft.

194
00:14:02,990 --> 00:14:07,920
Just over 10 hours after launch, Gemini 8 safely splashed down in the western Pacific

195
00:14:07,920 --> 00:14:11,180
Ocean about 500 miles west of Okinawa.

196
00:14:11,180 --> 00:14:16,850
Gemini served as a bridge between the Mercury and Apollo programs -- testing equipment and

197
00:14:16,850 --> 00:14:21,980
procedures, and preparing astronauts and ground crews for future missions to the moon.

198
00:14:21,980 --> 00:14:26,640
On that same day 40 years earlier, Robert Goddard successfully launched the world’s

199
00:14:26,640 --> 00:14:31,029
first liquid-fuel rocket from a field in Auburn, Massachusetts.

200
00:14:31,029 --> 00:14:35,990
Goddard continued his rocket development work throughout the remainder of his life, achieving

201
00:14:35,990 --> 00:14:41,560

numerous milestones, and helping pave the way for contemporary spaceflight.

202
00:14:41,560 --> 00:14:47,330
Established in 1959, the Goddard Space Flight Center in Greenbelt, Maryland is named in

203
00:14:47,330 --> 00:14:48,330
his memory.

204
00:14:48,330 --> 00:14:54,310
And, two years ago, in a different kind of launch, the Women @ NASA Website was first

205
00:14:54,310 --> 00:14:55,310
published.

206
00:14:55,310 --> 00:15:00,420
The site includes a collection of videos and essays from women who contribute to NASA’s

207
00:15:00,420 --> 00:15:05,580
mission in different ways and whose stories illuminate the vibrant community of dedicated

208
00:15:05,580 --> 00:15:09,850
employees playing a vital role across the agency.

209
00:15:09,850 --> 00:15:16,089
Visit the Women @ NASA website at http://women.nasa.gov.

210
00:15:16,089 --> 00:15:18,370
And that’s This Week @NASA.