TY@N

THIS YEAR @ NASA

2020

1
00:00:00,459 --> 00:00:02,570
2020 was historic for NASA.

2
00:00:02,570 --> 00:00:07,130
We launched humans to the International Space
Station from America again, made progress

3
00:00:07,130 --> 00:00:12,700
on our plans to return humans to the Moon
and explore Mars, had an unprecedented encounter

4
00:00:12,700 --> 00:00:18,609
with an asteroid, and displayed perseverance
and resilience in space and on Earth … all,

5
00:00:18,609 --> 00:00:21,210
while helping the country deal with a global
crisis.

6
00:00:21,210 --> 00:00:27,939
Here’s a look back at highlights from those
and other things we did this year at NASA.

7
00:00:27,939 --> 00:00:32,279
Early in the year, as the initial impacts
of the coronavirus pandemic were being felt

8
00:00:32,279 --> 00:00:36,899
across the country, the NASA workforce stepped
up to the challenge – developing innovative

9
00:00:36,899 --> 00:00:43,050
technologies including a ventilator prototype,
an oxygen hood, and a device for sterilizing

10
00:00:43,050 --> 00:00:44,050
medical equipment.

11
00:00:44,050 --> 00:00:48,379

“NASA is an amazing little agency that does
astonishing things every day.”

12
00:00:48,379 --> 00:00:53,290
And, “astonishing” is a good way to describe
the mission-critical work NASA continued and

13
00:00:53,290 --> 00:00:57,870
accomplished in 2020, in spite of the challenges.

14
00:00:57,870 --> 00:01:03,050
“Liftoff of the Falcon 9 and Crew Dragon.

15
00:01:03,050 --> 00:01:04,050
Go NASA.

16
00:01:04,050 --> 00:01:05,050
Go SpaceX.

17
00:01:05,050 --> 00:01:06,050
Godspeed Bob and Doug!”

18
00:01:06,050 --> 00:01:08,820
It was a landmark year for humans in space
– and for how we get them there.

19
00:01:08,820 --> 00:01:13,979
Our SpaceX Demo-2 test flight to the International
Space Station was the first human space mission

20
00:01:13,979 --> 00:01:20,240
to launch to the station from America since
the end of the Space Shuttle program in 2011.

21
00:01:20,240 --> 00:01:24,620
That was followed by the first commercial
crew rotational flight to the station – carrying

22
00:01:24,620 --> 00:01:29,939

four astronauts aboard a SpaceX Crew Dragon
spacecraft named, “Resilience.”

23
00:01:29,939 --> 00:01:35,450
November marked the 20th year of humans continuously
living and working aboard the space station

24
00:01:40,780 --> 00:01:36,450
…

25
00:01:40,780 --> 00:01:45,770
the orbital outpost – the most time spent
in space on a single mission by any woman.

26
00:01:45,770 --> 00:01:50,790
Meanwhile, astronauts Bob Behnken and Chris
Cassidy each completed record-tying 10th spacewalks

27
00:01:50,790 --> 00:01:52,139
on the same outing in July …

28
00:01:52,139 --> 00:01:57,899
… and we graduated the first class of astronaut
candidates for future missions to the station,

29
00:01:57,899 --> 00:02:02,560
the Moon, and Mars, and accepted more than
12,000 applications for the next class of

30
00:02:02,560 --> 00:02:05,240
Artemis Generation candidates.

31
00:02:05,240 --> 00:02:10,450
It was a big year for our Artemis plans, capped
off in December with the introduction of 18

32
00:02:10,450 --> 00:02:14,980
astronauts that will help pave the way for
human missions on and around the Moon, including

33
00:02:14,980 --> 00:02:18,850
landing the first woman and next man on the
Moon by 2024.

34
00:02:18,850 --> 00:02:25,510
“My fellow Americans, I give you the heroes
of the future who will carry us back to the

35
00:02:25,510 --> 00:02:26,730
Moon and beyond …”

36
00:02:26,730 --> 00:02:31,890
We continued testing the Space Launch System
or SLS rocket's core stage for Artemis I with

37
00:02:31,890 --> 00:02:37,530
the Green Run test series to verify the core
stage is launch ready for 2021.

38
00:02:37,530 --> 00:02:42,470
Teams began stacking the SLS solid rocket
boosters, and practiced rollout with the mobile

39
00:02:42,470 --> 00:02:44,560
launcher that will be used for the flight.

40
00:02:44,560 --> 00:02:50,510
And after rigorous environmental testing,
we began final preparations on our Orion spacecraft

41
00:02:50,510 --> 00:02:52,870
for the uncrewed Artemis I mission.

42
00:02:52,870 --> 00:02:58,620
Artemis I is the first in a series of increasingly
complex missions to the Moon that will ultimately

43
00:02:58,620 --> 00:03:01,530
lead to human exploration of Mars.

44
00:03:01,530 --> 00:03:06,930
In October, NASA and 7 partner countries signed
the Artemis Accords for international participation.

45
00:03:06,930 --> 00:03:09,250
An 8th partner joined later.

46
00:03:09,250 --> 00:03:13,690
We finalized agreements with the European
Space Agency and the Canadian Space Agency

47
00:03:13,690 --> 00:03:17,180
to collaborate on our Gateway lunar outpost.

48
00:03:17,180 --> 00:03:21,080
We worked with private industry on Artemis
– selecting three U.S. companies – Blue

49
00:03:21,080 --> 00:03:26,300
Origin, Dynetics, and SpaceX – to design
and develop human lunar landing systems.

50
00:03:26,300 --> 00:03:31,070
We also selected SpaceX to be the first U.S.
company to deliver experiments and other critical

51
00:03:31,070 --> 00:03:32,760
cargo to the Gateway.

52
00:03:32,760 --> 00:03:38,260
We announced the first scientific investigations
for the Gateway will be a study on solar particles

53
00:03:38,260 --> 00:03:43,050
and solar wind, and one on how to keep astronauts
safe from radiation.

54
00:03:43,050 --> 00:03:47,890

We made multiple task order awards and payload assignments as part of our Commercial Lunar

55
00:03:47,890 --> 00:03:53,020
Payload Services, or CLPS, initiative to work with American companies to send science and

56
00:03:53,020 --> 00:03:55,520
technology to the lunar surface.

57
00:03:55,520 --> 00:04:00,820
We selected Astrobotic to send a golf cart-sized robot called VIPER to the Moon’s South Pole

58
00:04:00,820 --> 00:04:02,650
in search for water.

59
00:04:02,650 --> 00:04:07,840
And solicited bids from CLPS partners to fly a suite of science and technology payloads

60
00:04:07,840 --> 00:04:09,440
to the Moon in 2022.

61
00:04:09,440 --> 00:04:13,350
We had a steady stream of groundbreaking science missions in 2020.

62
00:04:13,350 --> 00:04:14,350
“And we have touchdown!

63
00:04:14,350 --> 00:04:15,350
Touchdown declared! (applause and cheering)”

64
00:04:15,350 --> 00:04:23,270
October saw a first for the agency, when our OSIRIS-REx spacecraft touched asteroid Bennu

65
00:04:23,270 --> 00:04:25,620

and collected sample material.

66
00:04:25,620 --> 00:04:29,479
When it is returned to Earth, we hope the
ancient material teaches us more about the

67
00:04:29,479 --> 00:04:31,469
origins of the solar system.

68
00:04:31,469 --> 00:04:35,810
“And liftoff … as the countdown to Mars
continues.”

69
00:04:35,810 --> 00:04:41,009
We launched the Perseverance rover and Ingenuity
helicopter on our Mars 2020 mission.

70
00:04:41,009 --> 00:04:45,479
Both named by students – Perseverance will
be the first Mars rover to collect samples

71
00:04:45,479 --> 00:04:50,740
for future return to Earth, while Ingenuity
will be the only aircraft to attempt flight

72
00:04:50,740 --> 00:04:52,400
on another world.

73
00:04:52,400 --> 00:04:56,780
We teamed with the European Space Agency on
the Solar Orbiter mission that will provide

74
00:04:56,780 --> 00:05:01,689
the first-ever images of the Sun’s poles,
and unique insight into how the Sun affects

75
00:05:01,689 --> 00:05:03,409
the space environment.

76

00:05:03,409 --> 00:05:08,599
The SOFIA flying observatory confirmed, for
the first time, the existence of water molecules

77
00:05:08,599 --> 00:05:10,990
on the sunlit surface of the Moon.

78
00:05:10,990 --> 00:05:15,469
We identified a molecule in the atmosphere
of Saturn's moon Titan that has never been

79
00:05:15,469 --> 00:05:18,039
detected in any other atmosphere.

80
00:05:18,039 --> 00:05:23,590
This could point to the presence of more complex
compounds there that are favorable to life.

81
00:05:23,590 --> 00:05:27,790
And we celebrated 30 years of our Hubble Space
Telescope, which continues to enhance our

82
00:05:27,790 --> 00:05:33,439
understanding of the cosmos and, quite literally,
our view of it.

83
00:05:33,439 --> 00:05:39,069
NASA space technology in 2020 helped to advance
future exploration, science and aeronautics

84
00:05:39,069 --> 00:05:42,210
capabilities, and benefit life on Earth.

85
00:05:42,210 --> 00:05:47,180
A NASA-developed sensor suite that could help
robotic and crewed missions make precise,

86
00:05:47,180 --> 00:05:51,810
soft landings on the Moon was launched on
a Blue Origin suborbital rocket.

87
00:05:51,810 --> 00:05:56,259
We continued developing two instruments to
study using lunar resources.

88
00:05:56,259 --> 00:06:02,469
MSolo and TRIDENT will conduct chemical analysis
and drill for resources, respectively.

89
00:06:02,469 --> 00:06:08,120
A NASA project is making gears housed inside
a “metallic glass” material that can withstand

90
00:06:08,120 --> 00:06:13,120
the extreme cold on the Moon without being
heated to keep them operational.

91
00:06:13,120 --> 00:06:18,070
We announced 20 partnerships to mature U.S.
industry-developed space technologies for

92
00:06:18,070 --> 00:06:23,770
the Moon and beyond, including a 3D printing
system for Artemis, testing of a simple method

93
00:06:23,770 --> 00:06:27,580
to remove dust from planetary solar arrays,
and more.

94
00:06:27,580 --> 00:06:32,770
Our Green Propellant Infusion Mission successfully
proved that space missions can use less toxic

95
00:06:32,770 --> 00:06:34,729
fuel for future missions.

96
00:06:34,729 --> 00:06:39,660
And for the first time, an experiment that
bounces a laser beam from Earth off a reflector

97
00:06:39,660 --> 00:06:45,020
the size of a paperback book that is mounted
on our Lunar Reconnaissance Orbiter, received

98
00:06:45,020 --> 00:06:46,529
a signal back.

99
00:06:46,529 --> 00:06:52,370
This could enhance laser experiments used
to study the physics of the universe.

100
00:06:52,370 --> 00:06:57,039
NASA and partner agencies observing our home
planet witnessed record-breaking activity

101
00:06:57,039 --> 00:06:58,270
in 2020.

102
00:06:58,270 --> 00:07:03,460
The Atlantic hurricane season produced 30
named storms – the most ever on record – with

103
00:07:03,460 --> 00:07:05,830
13 of those reaching hurricane status.

104
00:07:05,830 --> 00:07:10,630
Meanwhile, a devastating wildfire season in
the western part of the country saw more than

105
00:07:10,630 --> 00:07:14,210
3 million acres burned in California alone.

106
00:07:14,210 --> 00:07:19,449
NASA instruments on spacecraft, satellites
and aircraft provided data to responding agencies

107
00:07:24,860 --> 00:07:20,449
…

108
00:07:24,860 --> 00:07:26,750
toward the eastern part of the country.

109
00:07:26,750 --> 00:07:27,750
“And liftoff …”

110
00:07:27,750 --> 00:07:31,449
The Sentinel-6 Michael Freilich satellite
launched in November.

111
00:07:31,449 --> 00:07:36,259
It is the first of two identical satellites
scheduled to make global sea level observations

112
00:07:36,259 --> 00:07:38,370
for at least the next decade.

113
00:07:38,370 --> 00:07:44,699
We helped you celebrate the 50th anniversary
of Earth Day virtually with the hashtag #EarthDayAtHome,

114
00:07:44,699 --> 00:07:50,590
and online videos, activities, and other resources
available in both English and Spanish.

115
00:07:50,590 --> 00:07:55,550
And people around the world helped us map
out coral reefs by playing a video game that

116
00:07:55,550 --> 00:08:01,680
uses specialized instruments to capture 3D
images that a NASA supercomputer then uses

117
00:08:01,680 --> 00:08:05,319
to map out reefs at unprecedented resolution.

118
00:08:05,319 --> 00:08:10,539
We continued our research in the skies aimed
at helping the aviation industry operate traditional

119
00:08:10,539 --> 00:08:14,419
and next-generation aircraft more safely and efficiently.

120
00:08:14,419 --> 00:08:19,460
The wing and cockpit sections of our X-59 Quiet SuperSonic Technology aircraft began

121
00:08:19,460 --> 00:08:20,740
taking shape.

122
00:08:20,740 --> 00:08:23,830
The plane also received its one-of-a-kind engine.

123
00:08:23,830 --> 00:08:29,770
The X-59 is being developed to create a low-noise sonic boom that can barely be heard – if

124
00:08:29,770 --> 00:08:31,849
at all – by people on the ground.

125
00:08:31,849 --> 00:08:37,600
We made significant progress developing the X-57 Maxwell, our first all-electric experimental

126
00:08:37,600 --> 00:08:42,850
plane, with testing of the high-aspect ratio wing, the electric cruise motors, and the

127
00:08:42,850 --> 00:08:44,450
propeller assemblies.

128
00:08:44,450 --> 00:08:49,790
A pair of NASA research projects flew as part of Boeing’s 2020 ecoDemonstrator program

129
00:08:49,790 --> 00:08:55,460

that could lead to quieter, more fuel efficient future aircraft, and fewer operational flight

130
00:08:55,460 --> 00:08:56,630
delays.

131
00:08:56,630 --> 00:09:01,720
We continued our research efforts to develop an air transportation system for revolutionary

132
00:09:01,720 --> 00:09:08,400
new aircraft, including using a remotely piloted aircraft to simulate an urgent medical transport

133
00:09:08,400 --> 00:09:09,700
mission.

134
00:09:09,700 --> 00:09:14,320
And we used augmented reality software that could make useful information about drones

135
00:09:14,320 --> 00:09:19,640
and other aerial vehicles more widely available to airspace operators.

136
00:09:19,640 --> 00:09:24,390
Whether it’s advancing space exploration, making scientific discoveries, or any of the

137
00:09:24,390 --> 00:09:30,720
other amazing things we do year in and year out, NASA does what it does to benefit you.

138
00:09:30,720 --> 00:09:34,140
Here’s a few more examples from 2020.

139
00:09:34,140 --> 00:09:38,790
In the midst of stay-at-home recommendations due to the COVID-19 pandemic, we compiled

140
00:09:38,790 --> 00:09:44,770
a NASA at Home online resource to help you
stay engaged and explore the universe around

141
00:09:44,770 --> 00:09:45,770
us.

142
00:09:45,770 --> 00:09:51,150
A computer simulation was used to show that
fewer amounts than usual of some pollutants

143
00:09:51,150 --> 00:09:57,910
were found in Earth's atmosphere, due presumably
to changes in human activity because of pandemic-related

144
00:09:57,910 --> 00:09:59,010
restrictions.

145
00:09:59,010 --> 00:10:04,080
And a new traffic management project for emergency
response aircraft looked at how drones might

146
00:10:04,080 --> 00:10:10,440
be used to help responders more safely and
efficiently assist you during future disaster

147
00:10:10,440 --> 00:10:11,490
operations.

148
00:10:11,490 --> 00:10:14,470
Those are some of the highlights from what
NASA did in 2020.

149
00:10:14,470 --> 00:10:18,320
For more details, visit nasa.gov/2020.

150
00:10:18,320 --> 00:10:19,500
Thanks for watching.