



**Observing Earth**

1  
00:00:07,009 --> 00:00:11,190  
This Week at NASA...

2  
00:00:11,190 --> 00:00:15,240  
One of the International Space Station's  
most prominent scientific experiments has

3  
00:00:15,240 --> 00:00:17,730  
produced its first results.

4  
00:00:17,730 --> 00:00:23,490  
The Alpha Magnetic Spectrometer is a state-of-the-art  
cosmic ray particle physics detector located

5  
00:00:23,490 --> 00:00:26,530  
on the exterior of the orbiting laboratory.

6  
00:00:26,530 --> 00:00:32,500  
MIT's Sam Ting, AMS principal investigator,  
spoke from a science conference in Switzerland

7  
00:00:32,500 --> 00:00:33,829  
where the results were announced.

8  
00:00:33,829 --> 00:00:39,840  
"Are you reporting today that you think  
you've seen the first evidence of dark matter?"

9  
00:00:39,840 --> 00:00:47,670  
"Our evidence supports that this is a dark  
matter, but cannot rule out that the origin

10  
00:00:47,670 --> 00:00:53,629  
comes from pulsars but because we will be  
on the space station for the lifetime of the

11  
00:00:53,629 --> 00:00:56,399  
space station, we should be able to solve  
this problem."

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00:00:56,399 --> 00:00:57,399  
Scientists hope that by measuring cosmic rays,  
AMS will provide new data about the formation

13  
00:00:57,399 --> 00:00:58,399  
of the Universe, antimatter, and evidence  
of the mysterious dark matter believed to

14  
00:00:58,399 --> 00:00:59,399  
make up most of the Universe.

15  
00:00:59,399 --> 00:01:00,569  
“Space Station is a really nice platform,  
well suited for this instrument.

16  
00:01:00,569 --> 00:01:05,710  
It allows for a long, long duration of observation  
time, which is important to this instrument.

17  
00:01:05,710 --> 00:01:10,100  
This is a good a good indication of some of  
the results that are going to come from Space

18  
00:01:10,100 --> 00:01:20,050  
Station  
in the future.”

19  
00:01:20,050 --> 00:01:29,270  
The  
Materials on International Space Station Experiment,

20  
00:01:29,270 --> 00:01:33,460  
or MISSE, is a multi-generational study conducted  
on station.

21  
00:01:33,460 --> 00:01:38,710  
A suitcase-like structure filled with various  
coin-shaped samples of materials is mounted,

22  
00:01:38,710 --> 00:01:44,160  
like the AMS, outside the station – exposing  
the materials to space and the Sun's unfiltered

23  
00:01:44,160 --> 00:01:46,320  
ultraviolet radiation.

24  
00:01:46,320 --> 00:01:51,560  
Examination of the returned samples has helped  
qualify a variety of materials for space flight

25  
00:01:51,560 --> 00:01:56,180  
– including the white protective thermal  
control coating used on the SpaceX Dragon

26  
00:01:56,180 --> 00:02:01,659  
spacecraft and the coating used to protect  
the cooling fins of the Curiosity Mars rover's

27  
00:02:01,659 --> 00:02:03,500  
power unit.

28  
00:02:03,500 --> 00:02:08,950  
And, at the Langley Research Center, scientists  
and engineers are preparing the Stratospheric

29  
00:02:08,950 --> 00:02:14,780  
Aerosol and Gas Experiment, or SAGE-3 Earth  
observing science instrument for its trip

30  
00:02:14,780 --> 00:02:16,590  
to the International Space Station.

31  
00:02:16,590 --> 00:02:23,090  
Due for delivery to the ISS by SpaceX late  
next year or early 20-15, SAGE-3 will help

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00:02:23,090 --> 00:02:28,370  
scientists better understand the Earth's

atmosphere by gathering long-term measurements

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00:02:28,370 --> 00:02:32,049

of ozone, aerosols and other gases.

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00:02:32,049 --> 00:02:36,930

The International Space Station, the world's only laboratory in microgravity, is home to

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00:02:36,930 --> 00:02:42,650

more than 150 scientific experiments and studies.

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00:02:42,650 --> 00:02:48,840

NASA's Hubble Space Telescope has found the farthest supernova of the Ia type used by

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00:02:48,840 --> 00:02:52,829

scientists to measure cosmic distances.

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00:02:52,829 --> 00:02:59,239

Supernova UDS10Wil, nicknamed SN Wilson after American President Woodrow Wilson, exploded

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00:02:59,239 --> 00:03:01,529

more than 10 billion years ago.

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00:03:01,529 --> 00:03:07,579

SN Wilson and its consistent level of brightness will serve as a reference point by which astronomers

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00:03:07,579 --> 00:03:13,219

can measure the expansion of the Universe and better understand the dark energy accelerating

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00:03:13,219 --> 00:03:16,409

that expansion.

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00:03:16,409 --> 00:03:21,560

This animated series of still images captured

by NASA's Mars Reconnaissance Orbiter shows

44

00:03:21,560 --> 00:03:26,980

the parachute that helped safely land the Curiosity Mars rover last August changing

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00:03:26,980 --> 00:03:30,620

shape in response to wind on the Martian surface.

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00:03:30,620 --> 00:03:35,090

Still attached to the Mars Science Laboratory spacecraft's back shell, the parachute is

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00:03:35,090 --> 00:03:36,249

about 165 feet long.

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00:03:36,249 --> 00:03:46,859

The images were captured by MRO's High Resolution Imaging Science Experiment, or HiRISE camera.

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00:03:46,859 --> 00:03:47,859

The month of April is all about Earth here at NASA.

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00:03:47,859 --> 00:03:51,620

The 'Earth Month' section of [nasa.gov](http://nasa.gov) is full of the latest news, events, and interactive

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00:03:51,620 --> 00:03:58,200

material -- including a Google Plus Hangout on sea level rise, classic images of Earth,

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00:03:58,200 --> 00:04:03,040

and feature stories about NASA's ongoing mission to help understand and sustain our

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00:04:03,040 --> 00:04:05,019

home planet.

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00:04:05,019 --> 00:04:11,489

NASA's Lunar Atmosphere and Dust Environment Explorer or LADEE spacecraft is undergoing

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00:04:11,489 --> 00:04:16,959

final checks and testing in preparation for its scheduled launch late this year.

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00:04:16,959 --> 00:04:21,430

Built at the Ames Research Center, the spacecraft will be the first to collect extensive amounts

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00:04:21,430 --> 00:04:24,690

of data about the Moon's extremely thin atmosphere.

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00:04:24,690 --> 00:04:25,980

"We're pretty excited.

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00:04:25,980 --> 00:04:28,890

There's a lot of work that went into this for the team.

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00:04:28,890 --> 00:04:35,190

It's really nice to see the spacecraft operate as you expect it to in the environmental testing,

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00:04:35,190 --> 00:04:39,290

so I can tell the team is all excited about getting it to the range and getting a chance

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00:04:39,290 --> 00:04:40,820

to launch it."

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00:04:40,820 --> 00:04:45,780

The data collected by LADEE will help prepare future robotic and human missions to the lunar

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00:04:45,780 --> 00:04:49,040

surface.

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00:04:49,040 --> 00:04:54,310  
Members of the media were invited inside the Johnson Space Center's Chamber A, the world's

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00:04:54,310 --> 00:04:59,670  
largest thermal-vacuum chamber, to check out upgrades being made to prepare the 400,000

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00:04:59,670 --> 00:05:04,820  
cubic foot facility for testing of the agency's James Webb Space Telescope.

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00:05:04,820 --> 00:05:10,560  
Scheduled for launch in 2018, JWST, the successor to the Hubble Space Telescope is designed

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00:05:10,560 --> 00:05:17,940  
to enable scientists to see farther back into history than ever before.

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00:05:17,940 --> 00:05:24,080  
Forty years ago on April 5, 1973, the Pioneer 11 spacecraft launched from Cape Canaveral

71  
00:05:24,080 --> 00:05:29,270  
to study the asteroid belt, the environment around Jupiter and Saturn and eventually,

72  
00:05:29,270 --> 00:05:32,650  
the far reaches of the solar system and heliosphere.

73  
00:05:32,650 --> 00:05:37,210  
It was the first probe to encounter and take close-up pictures of Saturn and the second

74  
00:05:37,210 --> 00:05:40,790  
to fly through the asteroid belt and past Jupiter.

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00:05:40,790 --> 00:05:47,350

During its flyby of the gas giant on December 2nd, 1974, Pioneer 11 obtained dramatic images

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00:05:47,350 --> 00:05:53,680

of the Great Red Spot and made the first observation of the planet's immense polar regions.

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00:05:53,680 --> 00:05:58,750

Its 22-and-a-half year mission officially ended when communication with Pioneer 11 was

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00:05:58,750 --> 00:06:00,820

lost in the fall of 1995.

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00:06:00,820 --> 00:06:04,080

And that's This Week @NASA.