

National Aeronautics and  
Space Administration



15 YEARS OF HUMAN PRESENCE

INTERNATIONAL SPACE STATION

*Off the Earth,  
For the Earth*

2015  
*calendar*



# A message from the Program Manager for the International Space Station



As we reflect on the first 15 years of the International Space Station (ISS), we have achieved much in advancing human knowledge through research, enabling the first steps in commercialization of space, fostering peaceful international cooperation and enabling exploration beyond low earth orbit.

The ISS has served as a unique microgravity laboratory to perform over 1600 experiments from researchers in over 80 countries. These experiments are making discoveries that provide direct benefits to people on Earth and to expand our knowledge to enable humans to work, live and explore further into our solar system than ever before.

To kindle the spirit of human exploration, we must invest in our future through education and educators. At every level and across every discipline, teachers inspire and prepare the next generation of tomorrow's leaders and explorers to shape the course of humankind.

I hope you enjoy this calendar featuring highlights over 15 years of human presence onboard the space station. I also hope it will inspire you and your students to learn more about the ISS and its contribution to humanity and what can be accomplished through peaceful global collaboration.

Regards,

**MICHAEL T. SUFFREDINI**

**ISS Program Manager**

*FRONT COVER: A fish-eye lens was used to capture this image of NASA astronaut Reid Wiseman participating in a session of an extravehicular activity (EVA). During the six-hour, 13-minute spacewalk, Wiseman and European Space Agency astronaut Alexander Gerst (out of frame) worked outside the space station's Quest airlock relocating a failed cooling pump to external stowage and installing gear that provides back up power to external robotics equipment. INSIDE FRONT COVER: The night lights of cities in North and South America glow in this image captured by the Suomi NPP satellite and mapped over existing imagery of Earth and the International Space Station.*



NASA Elements



JAXA Elements



ROSCOSMOS Elements



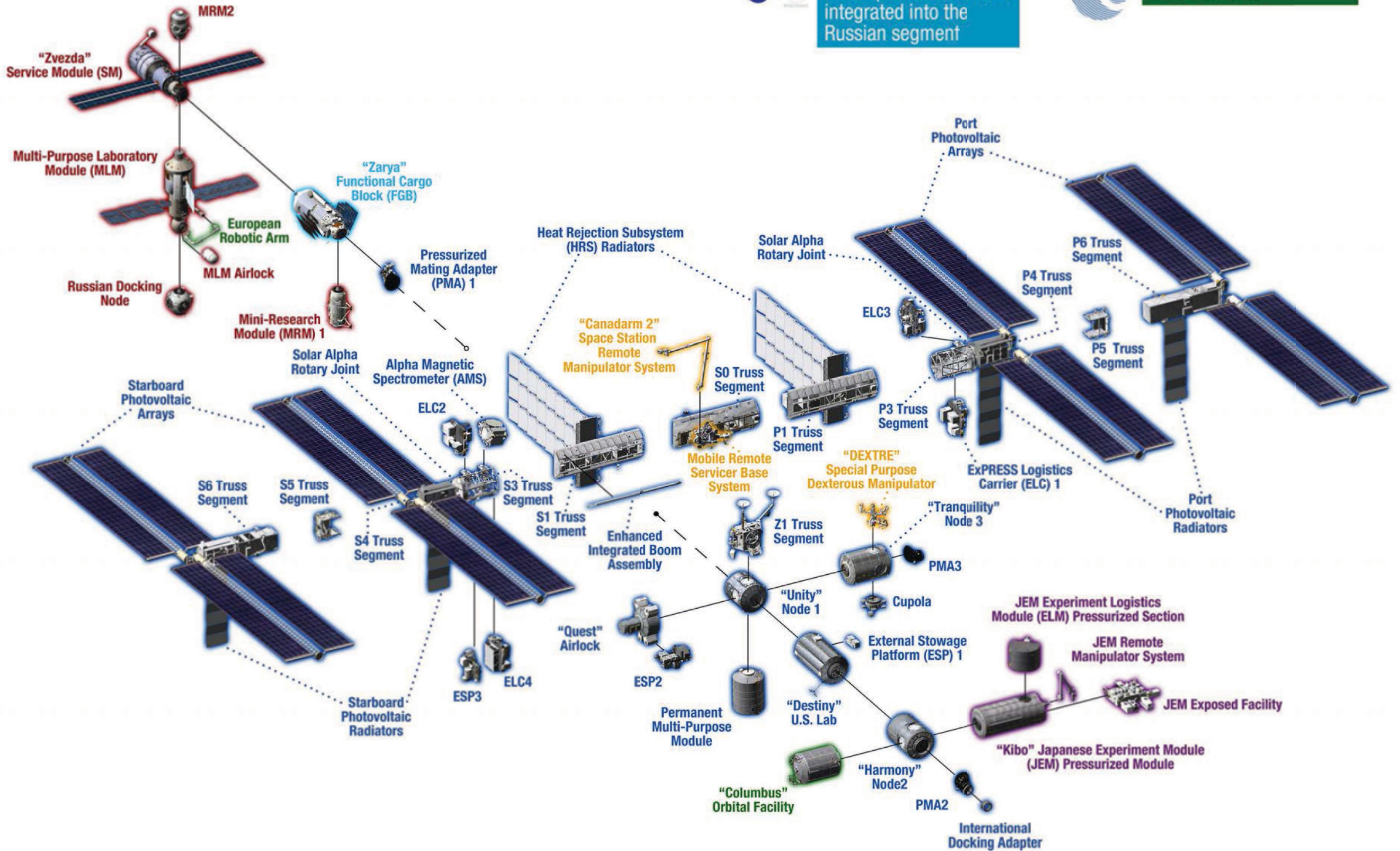
CSA Elements



NASA-provided element integrated into the Russian segment



ESA Elements



JANUARY 2015

On January 25, 1984 President Regan announces U.S. plans to build a space station. The International Space Station is a partnership of five space agencies and 15 nations. It is one of the greatest technological, geopolitical and engineering achievements in history. It was launched in many parts, sometimes lifting off from different nations, and assembled in space using spacewalks and complex robotics.



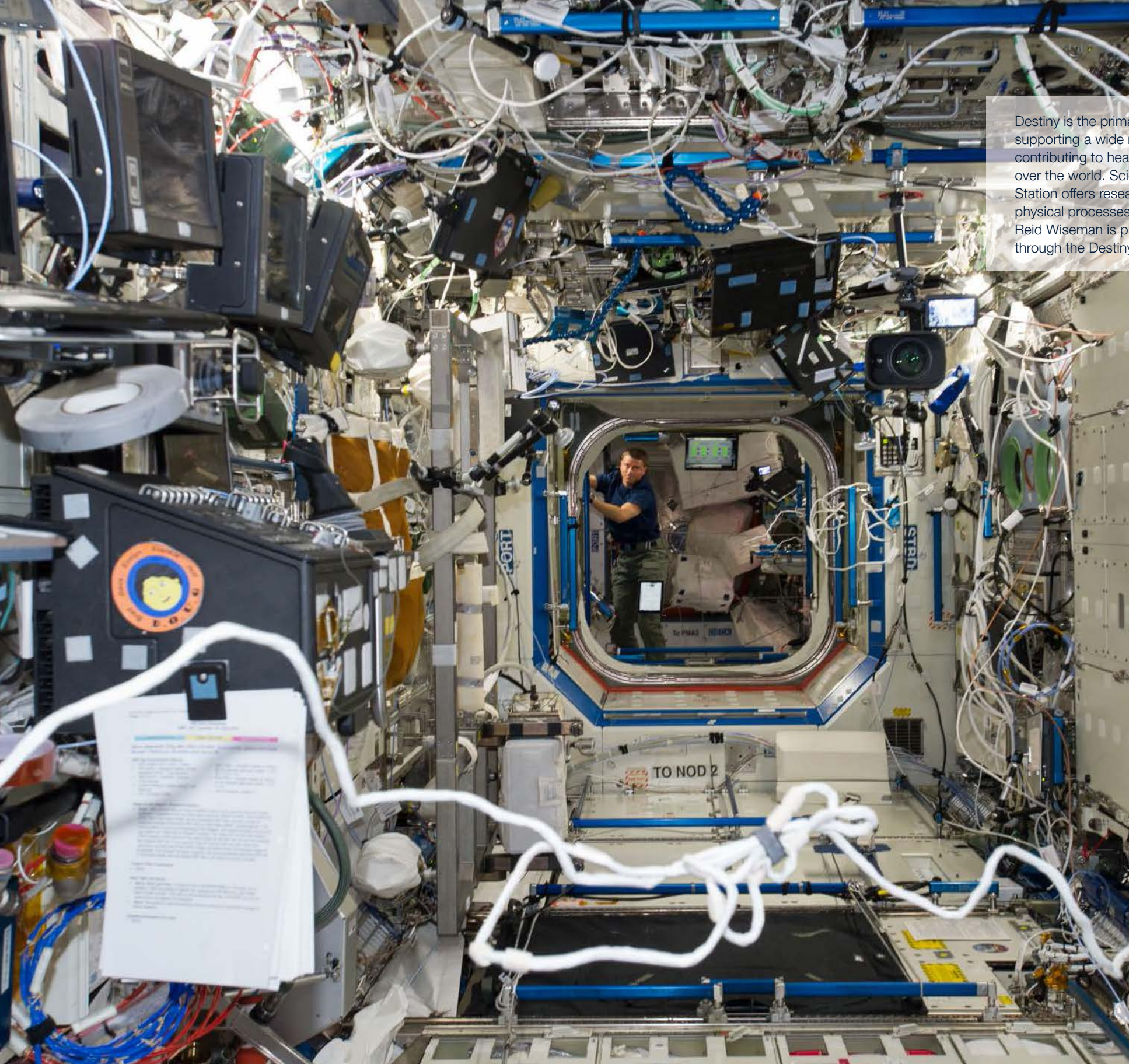
- 1) NASA astronaut Karen Nyberg, conducts a session with the Capillary Flow Experiment (CFE) in Harmony. CFE is a suite of fluid physics experiments that investigate how fluids behave in microgravity which could benefit water and fuel delivery systems on future spacecraft.
- 2) The resin used in the International Space Station water processor assembly has been applied to the development of a commercial water filtration solution and can be used in places where there are water quality problems. These systems have been deployed in disaster and humanitarian relief situations in a number of countries including Mexico, Iraq, and Pakistan.

# JANUARY 2015

December												February						
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28	29	30	31															

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1 New Year's Day	2 1959: Luna 1, first spacecraft to reach escape velocity and orbit the sun	3 2004: Spirit lands on Mars
4	5 	6	7	8	9	10
11	12 1997: STS-81, Shuttle - Mir	13 	14	15	16	17
18	19 Martin Luther King, Jr. Day	20 	21 2003: STS-107, Inaugural Spacehab flight	22 1998: STS-89 Shuttle - Mir	23	24 1986: Voyager 2, first spacecraft to observe Uranus; 2004: Opportunity lands on Mars
25 1984: President Ronald Reagan announces U.S. plans to build a space station	26	27 1967: Apollo 1 fire 	28 1986: STS-51L, Space Shuttle Challenger accident	29 1998: Intergovernmental Agreement on Space Station Cooperation signed	30	31 1958: Explorer 1, first U.S. satellite

Destiny is the primary research laboratory for U.S. payloads, supporting a wide range of experiments and studies contributing to health, safety and quality of life for people all over the world. Science conducted on the International Space Station offers researchers an unparalleled opportunity to test physical processes in the absence of gravity. NASA astronaut Reid Wiseman is pictured in the Harmony node looking through the Destiny laboratory.



1) In space, fuels burn as oval balls rather than with an upward pointed cone flame as they do on Earth. The Burning and Suppression of Solids –II (BASS-II) investigation enables researchers to evaluate computer models of fuel burning. These models can then be used to more accurately study flames on Earth, such as in wildfires, building fires, energy recapture from waste recycling, and other combustion problems. 2) Robonaut is a humanoid robot designed with the versatility and dexterity to manipulate hardware, work in high risk environments, and respond safely to unexpected obstacles. The Robonaut Teleoperations System enables Robonaut to mimic the motions of a crewmember (NASA astronaut Chris Cassidy) wearing specialized gloves, a vest and a visor providing a three-dimensional view through Robonaut's eyes.

# FEBRUARY 2015

January							March									
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25	26	27	28	29	30	31	29	30	31							

SUNDAY MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY

1 **2003:** STS-107, Space Shuttle *Columbia* accident

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3 **1995:** STS-63, Eileen Collins first female space shuttle pilot

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7 **1984:** STS-41B, first untethered spacewalks; **2001:** STS-98/5A, U.S. - Destiny Laboratory launched; **2008:** STS-122/1E, ESA-Columbus launched

8 **2010:** STS-130/20A, U.S. - Tranquility Connecting Module and ESA-Cupola launched

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16 **Presidents' Day**

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18 **1977:** Space Shuttle *Enterprise* first flight test atop Boeing 747 Shuttle Carrier Aircraft

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20 **1962:** Friendship 7, John Glenn first American to orbit Earth

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24 **2011:** STS-133/ULF5, ELC4, PMM launched

25

26 **1966:** Apollo/Saturn 201, first flight of the Saturn 1B launch vehicle with an Apollo command and service module attached

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The European Space Agency's module, Columbus, provides room for researchers on the ground, aided by the station's crew, to conduct experiments in a weightless environment not possible on Earth. Shown: NASA astronaut Steve Swanson harvest plants for the VEG-01 investigation. Plants can be cultivated for educational outreach, fresh food and even recreation for crew members on long-duration missions.



1) Sonographic Astronaut Vertebral Examination (Spinal Ultrasound) seeks to provide evidence-based information to expand the role of ultrasound into the realm of spinal evaluation and will significantly contribute to medical care on Earth in settings where there is limited access to advanced imaging such as MRI. NASA astronauts Chris Cassidy and Luca Parmiteno use the onboard ultrasound as part of the crew health study. 2) The Dietary Intake Can Predict and Protect Against Changes in Bone Metabolism during Spaceflight and Recovery (Pro K) investigation is NASA's first evaluation of a dietary countermeasure to lessen bone loss of astronauts. Japanese astronaut Akihiko Hoshida is shown after undergoing a generic blood draw.







# MARCH 2015

February

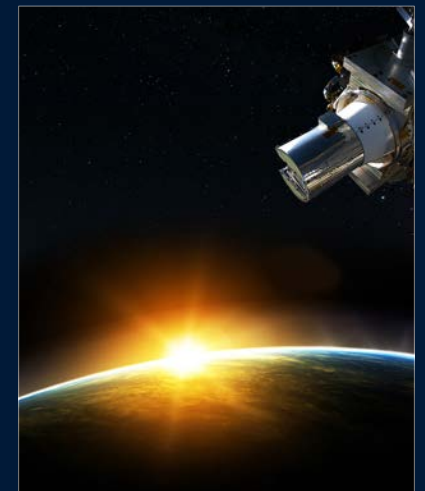
April

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22	23	24	25	26	27	28	29	30			

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2	3 <b>1959:</b> Pioneer 4, first successful lunar mission by U.S. spacecraft; <b>1969:</b> Apollo 9, first manned flight of the Command/Service Module along with the Lunar Module	4	5 	6	7
8 <b>2001:</b> STS-102/5A.1, first MPLM flight, ESP-1 launched, & ISS Expedition 2, first crew rotation	9 <b>2008:</b> First ESA ATV	10 <b>2014:</b> ISS Expedition 39	11 <b>2008:</b> STS-123/1JA, JAXA-ELM-PS launched	12	13 	14
15 <b>2009:</b> STS-119/15A, S6 truss and solar arrays launched, <b>2013:</b> Chris Hadfield became first Canadian Commander of Station, 2013: ISS Expedition 35	16 <b>1926:</b> First liquid-fueled rocket; <b>1966:</b> Gemini VIII, first docking of two spacecraft in orbit; <b>2011:</b> ISS Expedition 27	17	18 <b>1965:</b> Cosmonaut Alexei Leonov, first person to spacewalk; <b>2010:</b> ISS Expedition 23	19	20  Spring Begins	21
22	23 <b>1965:</b> Gemini III, first crewed mission of Gemini Project	24	25	26 <b>2009:</b> ISS Expedition 19	27 	28
29 <b>2006:</b> ISS Expedition 13, Anniversary of 1st 4 orbit launch to docking of an ISS crew	30	31				

APRIL 2015

Canadarm2 is a robotic arm that assembled the International Space Station while in space. It is routinely used to move supplies, equipment and even astronauts. As well as supporting the Station's maintenance, it is responsible for capturing and berthing of unpiloted spacecraft that carry everything from science payloads to necessities for the crew.



- 1) The development and use of robotic arms in space has led to the development of NeuroArm, the world's first robot capable of performing surgery inside Magnetic Resonance Imaging machines. NeuroArm enhances the senses of vision, touch, and hearing for surgeons and has been used to successfully treat dozens of patients.
- 2) The SAGE III is an upcoming facility that will observe Earth's middle and lower atmosphere from space, measuring the ozone layer and atmospheric gases that act as Earth's sunscreen.

# APRIL 2015

March							May								
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22	23	24	25	26	27	28			17	18	19	20	21	22	23
29	30	31					24 <sup>31</sup>	25	26	27	28	29	30		

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1	2	3	4 
5 <b>2010:</b> STS-131/19A, MPLM launched	6 <b>1984:</b> STS-41C, first orbital satellite repair mission	7 <b>2007:</b> ISS Expedition 15	8 <b>1964:</b> Gemini I test flight; <b>2002:</b> STS-110/8A, SO truss launched; <b>2008:</b> ISS Expedition 17	9 <b>1959:</b> NASA announces Mercury 7, NASA's first astronaut class	10	11
 12 <b>1961:</b> Cosmonaut Yuri Gagarin, first human in space; <b>1981:</b> STS-1, first space shuttle ( <i>Columbia</i> ) mission	13	14 <b>2005:</b> ISS Expedition 11	15	16	17	18  <b>2004:</b> ISS Expedition 9
19 <b>2001:</b> STS-100/6A, CSA-Canadarm2 & MPLM launched	20	21 <b>2013:</b> Antares Test Flight at Wallops Island	22	23	24 <b>1967:</b> Soyuz 1 accident; <b>1990:</b> STS-31, Hubble Space Telescope launched	25  <b>2003:</b> ISS Expedition 7
26	27 <b>2012:</b> ISS Expedition 31	28	29	30		

MAY 2015

The Japanese Experiment Module, or JEM, called Kibo – which means “hope” in Japanese – is Japan’s first human space facility and enhances the unique research capabilities of the International Space Station (ISS). Pictured, European Space Agency astronaut Alexander Gerst prepares to transfer a multi-purpose experiment platform.



1) NASA astronaut Nicole Stott works at the Protein Crystallization Research Facility. Protein crystal studies beginning with Expedition 1 led to the discovery of a water molecule in a protein-inhibitor complex that is now being used in the development of a treatment for Duchenne muscular dystrophy.  
2) Miniaturized satellites (CubeSats) are shown after being released via the Kibo Remote Manipulator system from the Kibo laboratory. CubeSats provide opportunities for small satellites used in space research to fly on rockets planned for upcoming launches.




# MAY 2015

April

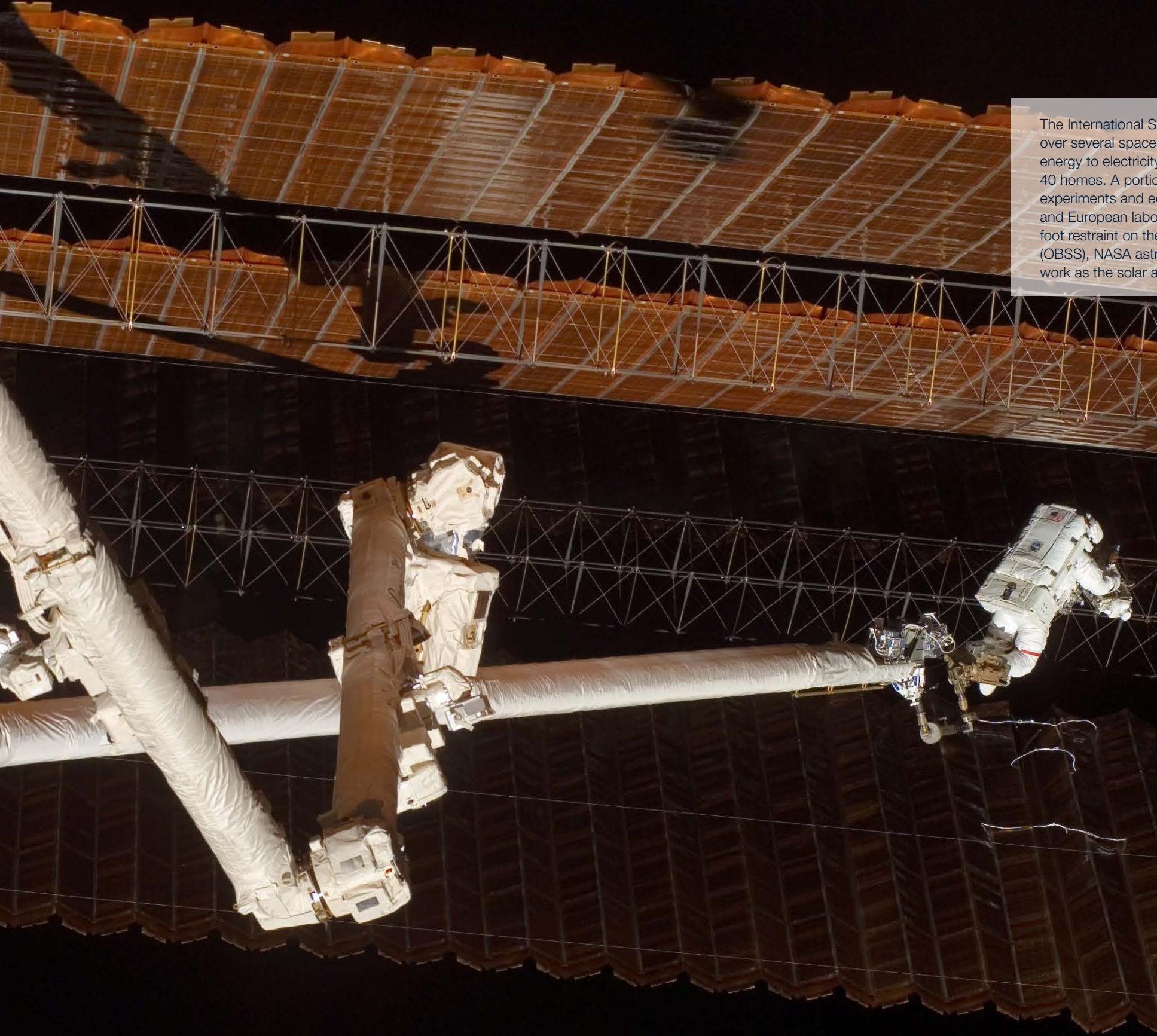
June

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SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1	2
3	4 	5 <b>1961:</b> <i>Freedom 7</i> , Alan Shepard Jr., first American in space	6	7	8	9
10 <b>Mother's Day</b>	11 	12	13 <b>2014:</b> ISS Expedition 40	14 <b>1973:</b> Skylab space station launched; <b>2010:</b> STS-132/ULF4, MRM1 launched; <b>2013:</b> ISS Expedition 36	15	16 <b>2011:</b> STS-134/ULF6 launched
17	18 	19 <b>2000:</b> STS-101/2A.2a, Spacehab launched	20	21	22 <b>2012:</b> Launch of <i>Space-X/Dragon</i> , first commercial craft to launch to the space station	23 <b>2011:</b> Expedition 28
24/31 <b>2008:</b> STS-124/1JA, JAXA- JEM-PM, JEM-RMS launched	25 <b>Memorial Day</b> <b>1973:</b> Skylab 2, first U.S. space station crew; <b>2012:</b> Docking of <i>SpaceX/Dragon</i> capsule, first docking of a commercial craft to the space station	26	27 <b>1999:</b> STS-96/2A-1 launched, first space shuttle to dock with ISS; <b>2009:</b> ISS Expedition 20, marked beginning of six person crew	28	29	30

The International Space Station's solar arrays were installed over several space shuttle missions. The arrays convert solar energy to electricity, enough to provide power to more than 40 homes. A portion of the electricity produced is used to run experiments and equipment in the U.S., Russian, Japanese and European laboratories. Pictured: While anchored to a foot restraint on the end of the Orbiter Boom Sensor System (OBSS), NASA astronaut Scott Parazynski assesses his repair work as the solar array is fully deployed



1) The SOLAR experiment facility monitor the Sun's radiation outside of the Earth's atmosphere over a large electromagnetic spectrum and correlates it with parallel observations with other space missions and on ground. This helps provide the accurate data required to support predictive models and anticipate on the influence of sun radiation on our environment. 2) The Alpha Magnetic Spectrometer (AMS) is a particle physics detector installed by the Canadarm2. The AMS is collecting information from cosmic sources emanating from stars and galaxies millions of light years beyond the Milky Way. The data collected is to advance knowledge of the universe and lead to the understanding of its origin.

# JUNE 2015

May										July						
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24/31	25	26	27	28	29	30				26	27	28	29	30	31	

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 <b>2010:</b> ISS Expedition 24	2 <b>1966:</b> Surveyor 1, first U.S. spacecraft to soft land on the moon	3	4 <b>2010:</b> SpaceX Falcon 9 Block 1, first successful flight	5 <b>2002:</b> STS-111/UF-2, MBS & MPLM launched & ISS Expedition 5	6
7	8 <b>2007:</b> STS-117/13A, S3/S4 truss and solar arrays launched	9	10	11	12	13
14	15	16 <b>1963:</b> Cosmonaut Valentina Tereshkova, first female in space	17	18 <b>1983:</b> STS-7, Sally Ride, first U.S. female in space	19	20 Summer Begins (Summer Solstice, 1:04am EDT)
21 <b>Father's Day,</b> Summer Begins	22	23	24	25	26	27
28	29 <b>1995:</b> STS-71 <i>Atlantis</i> , first shuttle to dock with Russian Mir space station	30 <b>1971:</b> Soyuz 11 accident				

JULY 2015

Russian cosmonaut Sergei Volkov, checks the progress of a new growth experiment on the BIO-5 Rasteniya-2 (Plants-2) payload with its LADA-01 greenhouse in the Zvezda Service Module of the International Space Station. Zvezda, meaning "star" is the center of the Russian portion of the station.








1) Russian cosmonaut Gennady uses a still camera to photograph the Russian student-developed payload OBR-1-2/Fizika-Faza (Phase) experiment in the Zvezda Service Module of the International Space Station. 2) NASA astronaut Mike Fincke on the ISS HAM Radio (Amateur Radio on the International Space Station / ARISS) in the Zvezda Service Module (SM). The overall goal of ARISS is to get students interested in mathematics and science by allowing them to talk directly with the crews living and working aboard the ISS.



# JULY 2015

June							August												
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21	22	23	24	25	26	27							16	17	18	19	20	21	22
28	29	30											23/30	24/31	25	26	27	28	29

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1 <b>1962:</b> Cape Canaveral, Fla., established as NASA Launch Operations Center; <b>2012:</b> ISS Expedition 32	2 	3	4 <b>Independence Day</b> <b>1997:</b> Pathfinder lands on Mars; <b>2006:</b> STS-121/ULF1-1, MPLM launched
5	6	7	8  <b>2011:</b> STS-135/ULF7 launched (Final shuttle mission)	9 <b>2013:</b> First Italian Spacewalk, Luca Parmitano	10 <b>1962:</b> Telstar-1, first commercial communications satellite	11 <b>1979:</b> Skylab re-enters Earth's atmosphere
12 <b>2001:</b> STS-104/7A, U.S.-Quest Airlock launched; <b>2000:</b> Proton/1R, Russia-Zvezda Service Module launched	13	14 <b>1965:</b> Mariner 4 takes first close-up pictures of Mars	15 <b>1975:</b> Apollo-Soyuz, first joint Russia-U.S./Soyuz spaceflight; <b>2009:</b> STS-127/2JA, JAXA-JEM-EF and ELM-ES launched	16 	17	18
19	20 <b>1969:</b> Apollo 11, first manned lunar landing; <b>1976:</b> Viking 1, first U.S. spacecraft to land on Mars	21	22	23 <b>1999:</b> STS-93, Eileen Collins, first female space shuttle commander	24 	25
26 <b>1963:</b> Syncom 2, world's first geosynch comm. satellite; <b>2005:</b> STS-114, first shuttle flight following the Space Shuttle Columbia accident	27	28 <b>1973:</b> Skylab 3	29 <b>1958:</b> President Eisenhower signed the National Aeronautics and Space Act; <b>2014:</b> Anniversary of last ESA ATV launch	30	31 	

AUGUST 2015

In 2009, Expedition 20 was the first 6-person crew to remain on the International Space Station. Pictured clockwise from the bottom (center) are cosmonaut Gennady Padalka, commander; NASA astronaut Tim Kopra, Canadian Space Agency astronaut Robert Thirsk, cosmonaut Roman Romanenko, European Space Agency astronaut Frank De Winne and NASA astronaut Michael Barratt, all flight engineers.



1) Nutritional Status Assessment (Nutrition) is a comprehensive in-flight study designed to understand changes in human physiology during long-duration space flight. This study includes measures of bone metabolism, oxidative damage, and chemistry and hormonal changes; as well as assessments of the nutritional status of the crewmembers participating in the study. The results have an impact on the definition of nutritional requirements and development of food systems for future exploration missions to the Moon and Mars. This experiment also helps researchers understand the effectiveness of measures taken to counteract the effects of space flight, as well as the impact of exercise and pharmaceutical countermeasures on nutritional status and nutrient requirements for crewmembers. 2) Evaluation of Maximal Oxygen Uptake and Submaximal Estimates of  $VO_{2max}$  Before, During, and After Long Duration International Space Station Missions ( $VO_{2max}$ ) documents changes in maximum oxygen uptake for crewmembers on board the International Space Station (ISS) during long-duration missions.

# AUGUST 2015

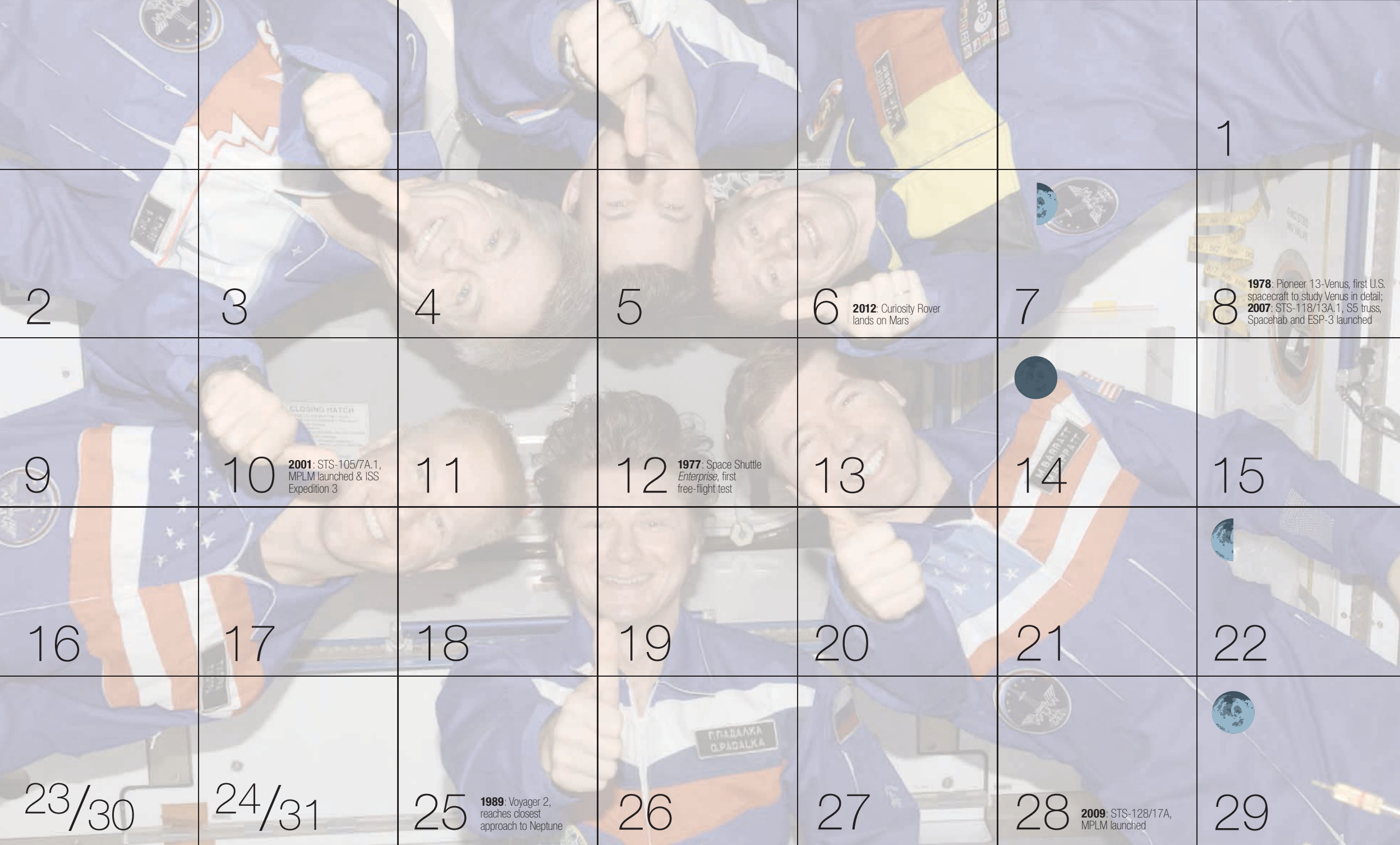
July

September

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SUNDAY MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY



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2012: Curiosity Rover lands on Mars

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1978: Pioneer 13-Venus, first U.S. spacecraft to study Venus in detail; 2007: STS-118/13A.1, S5 truss, Spacehab and ESP-3 launched

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2001: STS-105/7A.1, MPLM launched & ISS Expedition 3

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1977: Space Shuttle Enterprise, first free-flight test

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1989: Voyager 2, reaches closest approach to Neptune

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2009: STS-128/17A, MPLM launched

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European Space Agency astronaut Alexander Gerst enjoys the view of Earth from the windows in the Cupola of the International Space Station. The Cupola is a European Space Agency built observatory module. The Cupola provides an observation and work area for the crew giving visibility to support the control of the space station robotic system (Canadarm2) and external viewing of Earth, celestial objects and visiting vehicles. Astronauts can observe and collect camera images of events as they unfold, which is critical in capturing unexpected natural events such as volcanic eruptions and earthquakes, as well as in documenting global changes, weather, and urban growth.



1) Mt. Etna's spectacular eruption plume and smoke from fires triggered by the lava as it flowed down the 11,000 ft mountain. 2) European astronaut Alexander Gerst uses a still camera at a window in the Cupola of the International Space Station as the SpaceX Dragon commercial cargo craft (one of the station's visiting vehicles) approaches. 3) One of the Expedition 40 crew members aboard the International Space Station recorded this colorful image of Aurora Australis. Achernar (just to the right of center) is the brightest and most easily recognizable star in this generally southward view. Two solar array panels are partially visible in an edge-on angle on the right side of the frame.

# SEPTEMBER 2015

August							October							
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23/30	24/31	25	26	27	28	29	25	26	27	28	29	30	31	

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2	3	4	5 <b>1977:</b> Voyager 1 returns first spacecraft photo of Earth and Moon
6	7 <b>Labor Day</b>	8 <b>2000:</b> STS-106/2A.2b, Spacehab launched; (N)	9 <b>1975:</b> Viking 2 launched, first spacecraft to successfully land on Mars; <b>2006:</b> STS-115/12A, P3/P4 truss launched; <b>2011:</b> ISS Expedition 29	10 <b>2009:</b> First JAXA HTV launched; <b>2013:</b> ISS Expedition 37; <b>2014:</b> ISS Expedition 41	11	12
13	14 <b>2001:</b> Soyuz/4R, Pirs docking compartment launched	15	16	17 <b>2012:</b> ISS Expedition 33	18 <b>2006:</b> ISS Expedition 14	19
20	21 <b>2003:</b> Galileo, first spacecraft to enter Jupiter's atmosphere	22 Autumn Begins (Fall Equinox)	23	24	25	26
27	28	29 <b>1988:</b> STS-26, first shuttle flight following the Space Shuttle Challenger accident	30 <b>2005:</b> ISS Expedition 12			

OCTOBER 2015

The Quest Airlock is a pressurized International Space Station module, which is the primary path for spacewalk entry and departure. This calendar year marks the 50th anniversary of the first American spacewalk conducted by Ed White during the Gemini 4 mission in 1965. Spacewalks, also called Extravehicular Activities or EVAs, continue to play a vital role in conducting research outside the station.



1) NASA astronaut Randolph Bresnik is seen during an EVA with an antenna attached to the module Columbus for use in experimental tracking of VHF signals of ships at sea for the Vessel ID system (VIS). VIS on the International Space Station tracks an individual ship's speed, position, course, cargo, and voyage information in open waters. 2) The Materials International Space Station Experiment a test bed for materials and coatings attached to the outside of the space station is being evaluated for the effects of atomic oxygen, direct sunlight, and extremes of heat and cold. This experiment allows the development and testing of new materials to better withstand the rigors of space environments.

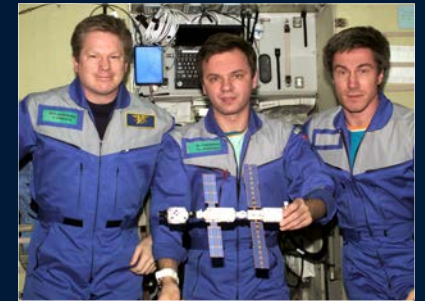
# OCTOBER 2015

September					November								
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27	28	29	30	31	29	30							

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1 1958: NASA officially begins operations	2	3
4 1957: Sputnik 1 (U.S.S.R.), first satellite	5	6	7 2002: STS-112/9A, S1 truss launched; 2010: ISS Expedition 25	8	9	10 2007: ISS Expedition 16, Peggy Whitson, first female ISS commander
11 1958: Pioneer 1, first NASA Launch; 1968: Apollo 7, first crewed Apollo mission; 2000: STS-92/3A, Z1 truss launched; 2009: ISS Expedition 21	12 Columbus Day 1964: Voskhod 1 (U.S.S.R.), first flight with multiple crew members; 2008: ISS Expedition 18	13	14	15	16	17
18 2003: ISS Expedition 8	19	20	21	22	23 2007: STS-120/10A, ESA- Harmony Connecting Module launched	24
25	26	27	28 2009: Ares-1X launch	29	30	31

NOVEMBER 2015

This picture of a mass of storm clouds was the first Earth observation still image downlinked by the first humans (Expedition 1) on the International Space Station (ISS) on November 2, 2000. This calendar year marks 15 years of continuous human presence onboard.






1) The crew of Expedition One was launched from Baikonur Cosmodrome, Kazakhstan on a Soyuz rocket and docked with ISS. This calendar year marks 15 years of continuous human presence onboard. Pictured, from the left, are cosmonaut Yuri P. Gidzenko, astronaut William M. Shepherd and cosmonaut Sergei K. Krikalev. 2) Cosmonaut Sergei K. Krikalev from Expedition 1 works in the Destiny module of the ISS.

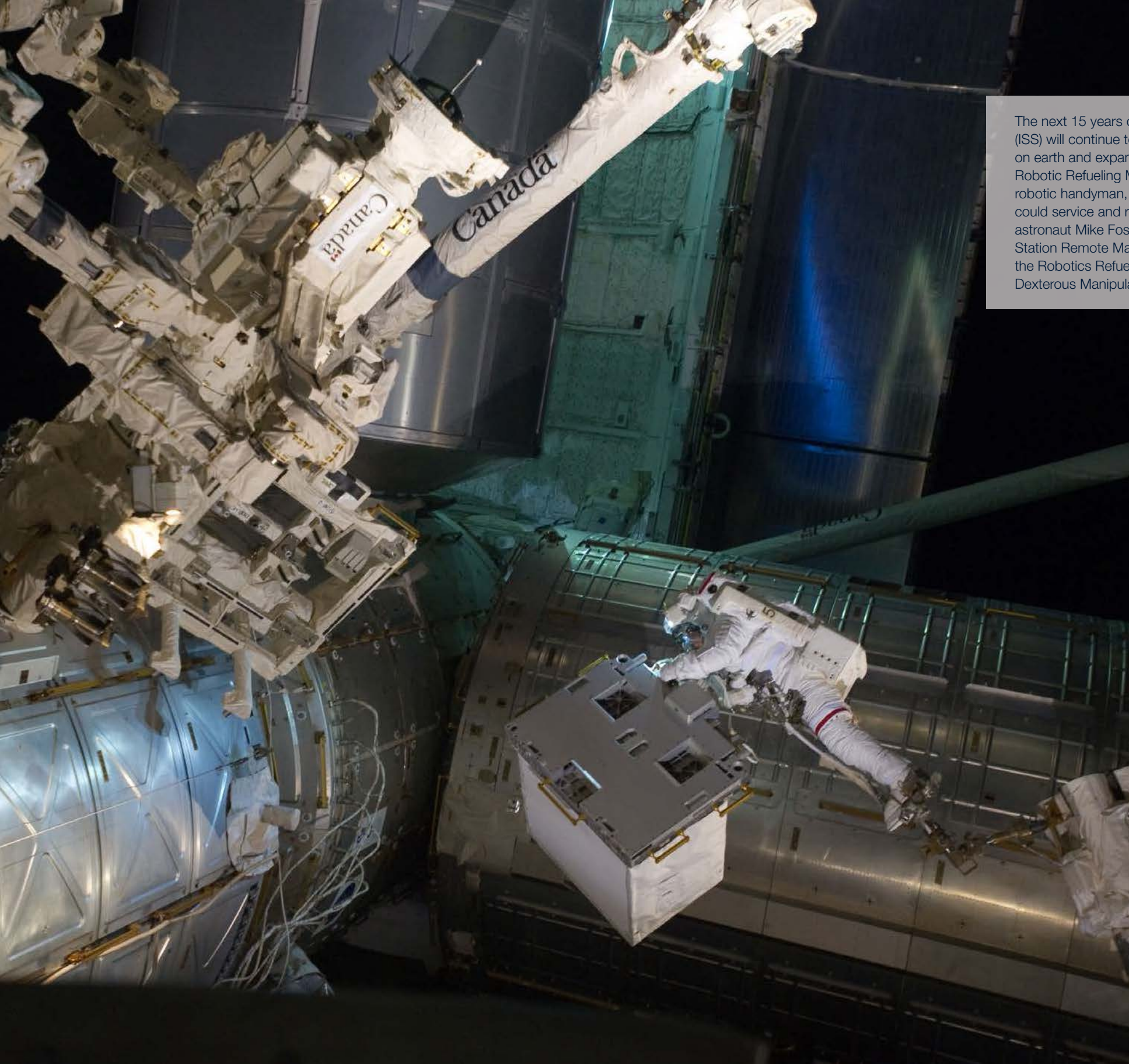


# NOVEMBER 2015

October										December							
				1	2	3							1	2	3	4	5
4	5	6	7	8	9	10					6	7	8	9	10	11	12
11	12	13	14	15	16	17					13	14	15	16	17	18	19
18	19	20	21	22	23	24					20	21	22	23	24	25	26
25	26	27	28	29	30	31					27	28	29	30	31		

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2 <b>2000:</b> Expedition 1 arrives at ISS. Marks the 15 year anniversary of continuous human occupation of ISS.	 3 <b>1973:</b> Mariner 10, first spacecraft to explore Mercury	4	5	6	7
8	9	10 <b>2013:</b> ISS Expedition 38	 11 <b>Veterans Day</b> <b>1982:</b> STS-5, first space shuttle operational mission	12	13 <b>1971:</b> Mariner 9-Mars, first spacecraft to orbit another planet	14 <b>2008:</b> STS-126/ULF2, MPLM launched
15 <b>2010:</b> ISS Expedition 26	16 <b>1973:</b> Skylab 4; <b>2009:</b> STS-129/ULF3, ELC1, and ELC2 launched; <b>2011:</b> ISS Expedition 30	17	18	 19 <b>2012:</b> ISS Expedition 34	20 <b>1998:</b> Proton – Russia, Zarya Control Module, ISS first element launch	21
22	23 <b>2002:</b> STS-113/11A, P1 truss launched; ISS Expedition 6	24	 25	26 <b>Thanksgiving Day</b>	27	28 <b>1983:</b> STS-9, First international agency participates in U.S. mission
29	30 <b>2000:</b> STS-97/4A, P6 truss, first set of solar arrays launched; <b>2009:</b> ISS Expedition 22					

The next 15 years of research on the International Space Station (ISS) will continue to make discoveries with direct benefits to us on earth and expand our knowledge for future exploration. The Robotic Refueling Mission investigation uses the ISS two-armed robotic handyman, Dextre, to demonstrate how future robots could service and refuel satellites in space. Pictured: NASA astronaut Mike Fossum, anchored to the Canadarm2 Space Station Remote Manipulator System (SSRMS), works to transfer the Robotics Refueling Mission (RRM) to Dextre Special Purpose Dexterous Manipulator (SPDM).




1) The Amine Swingbed experiment with NASA astronaut Don Pettit uses an amine-based chemical combined with the vacuum of space to filter and renew cabin air for breathing. Removing carbon dioxide and moisture from consumed air reduces the demand to supply new air. These results will benefit long-duration missions and could also remove carbon dioxide and humidity in tight enclosures such as mines or underwater vessels. 2) Earth and airglow observation with NASA astronaut Don Pettit visible through a window in the Cupola module. ISS offers a unique vantage for capturing unexpected natural events and global changes of the Earth in real-time. Observations made today have implications for understanding global changes in the future.

# DECEMBER 2015

November							January							
1	2	3	4	5	6	7							1	2
8	9	10	11	12	13	14		3	4	5	6	7	8	9
15	16	17	18	19	20	21		10	11	12	13	14	15	16
22	23	24	25	26	27	28		17	18	19	20	21	22	23
29	30						24 <sup>31</sup>	25	26	27	28	29	30	

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2	3  <b>1973:</b> Pioneer 10-first flyby of outer planet (Jupiter)	4  <b>1998:</b> STS-88/2A, Unity Connecting Module, first U.S. component launched	5 <b>2001:</b> STS-108/UF-1, MPLM launched & ISS Expedition 4
6	7 <b>1972:</b> Apollo 17, final Apollo mission	8	9 <b>2006:</b> STS-116/12A.1, Spacehab & P5 truss launched	10	11 	12
13	14 <b>1962:</b> Mariner 2, first flyby of Venus	15 <b>1965:</b> Gemini VI-A and VII, first manned rendezvous between two spacecrafts; <b>1970:</b> Venera 7 (U.S.S.R.), first man-made spacecraft to successfully land on another planet (Venus) and to transmit data from there back to Earth	16	17	18 	19
20	21	22 Winter Begins (Winter Solstice)	23	24 <b>1968:</b> Apollo 8, first crewed mission to orbit the moon	25  <b>Christmas Day</b>	26
27	28	29	30	31		

The International Space Station (ISS) is shown in orbit above Earth. The station's complex structure, including its large solar panel arrays, is clearly visible against the blue and white of the planet. The Earth's surface shows a mix of deep blue oceans, white clouds, and some landmasses with lighter green and brown tones.

## Space Station Research and Technology

[www.nasa.gov/iss-science](http://www.nasa.gov/iss-science)

## Benefits of Space Station Research

[http://www.nasa.gov/mission\\_pages/station/research/benefits/coolstation.html](http://www.nasa.gov/mission_pages/station/research/benefits/coolstation.html)

## Space Station for Students

[http://www.nasa.gov/mission\\_pages/station/research/ops/research\\_student.html](http://www.nasa.gov/mission_pages/station/research/ops/research_student.html)

## Space Station for Educators

[http://www.nasa.gov/mission\\_pages/station/research/ops/research\\_teacher.html](http://www.nasa.gov/mission_pages/station/research/ops/research_teacher.html)

## Information for Prospective Investigators

[http://www.nasa.gov/mission\\_pages/station/research/ops/research\\_information.html](http://www.nasa.gov/mission_pages/station/research/ops/research_information.html)

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## To see when the International Space Station will be flying over your town, go to:

<http://spotthestation.nasa.gov/sightings>