ICARE – USA Human Space Flight Events in 2011 **greg oliver**

NASA Announces Plans for Human Exploration of Deep Space, Fosters Commercial Spaceflight and Makes Major Discoveries in 2011

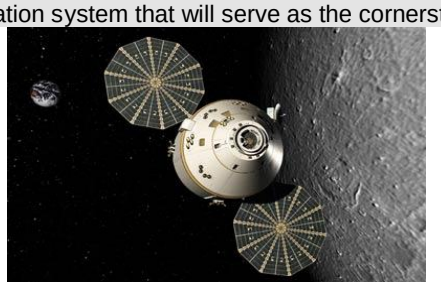
WASHINGTON -- In 2011, NASA began developing a heavy-lift rocket for the human exploration of deep space, helped foster a new era of commercial spaceflight and technology breakthroughs, fully utilized a newly complete space station, and made major discoveries about the universe we live in, many of which will benefit life on Earth.

"The year truly marks the beginning of a new era in the human exploration of our solar system," NASA Administrator Charles Bolden said. "Just as important are the ground-breaking discoveries about Earth and the universe, as well as our work to inspire and educate a new generation of scientists and engineers, and our efforts to keep the agency on a firm financial footing with its first clean audit in nine years. It's been a landmark year for the entire NASA team."

The following are some of NASA's top stories for the past calendar year:

NASA DECIDES ARCHITECTURE FOR FUTURE HUMAN DEEP SPACE EXPLORATION

NASA reached several milestones in developing a new U.S. space transportation system that will serve as the cornerstone for America's future human space exploration efforts. The first decision came in late May, when NASA Administrator Bolden selected the Orion Crew Exploration Vehicle as the spacecraft that would take astronauts beyond Earth orbit. In addition to exceeding the requirements necessary for deep travel, it was consistent with the NASA Authorization Act of 2010 to retain much of the current workforce and its critical skills as possible. In September, Bolden announced the design of a new Space Launch System heavy-lift rocket that will take our astronauts farther into space than ever before, create high-quality jobs here at home, and provide the cornerstone for America's future human space exploration efforts.



In November, NASA announced it planned to add an unpiloted flight test of the Orion spacecraft in early 2014 to its contract with Lockheed Martin Space Systems. The Exploration Flight Test, or EFT-1, will fly two orbits to a high-apogee and make a high-energy re-entry through Earth's atmosphere. Orion will land off the California coast and be recovered using operations planned for future human exploration missions. Throughout the year, engineers conducted multiple test firings of the agency's J-2X engines at NASA's Stennis Space Center in Mississippi and performed several Orion water drop tests at NASA's Langley Research Center in Virginia. In September, NASA and ATK Space Systems successfully completed a two-minute, full-scale test of Development Motor-3, the agency's largest and most powerful solid rocket motor ever designed for flight.

http://www.nasa.gov/exploration

COMMERCIAL SPACE EFFORTS ACCELERATE

NASA awarded four Space Act Agreements worth $269.3 million in the second round of the agency's Commercial Crew Development effort in April. Each company received between $22 million and $92.3 million to advance commercial crew space transportation system concepts and mature the design and development of systems elements, such as launch vehicles and spacecraft. The four companies, Blue Origin in Kent, Wash., Sierra Nevada Corporation in Louisville, Colo., Space Exploration Technologies in Hawthorne, Calif., and The Boeing Company in Houston, are working to accelerate the availability of U.S. commercial crew transportation to the International Space Station and reduce the gap in American human spaceflight capability. This activity is expected to spur economic growth as potential new markets are created. Crew transportation capabilities then could become available to commercial and government customers.

All of NASA's commercial partners are meeting established milestones. NASA program managers also signed several unfunded Space Act Agreements with commercial partners during the year. In July, NASA and United Launch Alliance (ULA) managers agreed to work together on the Atlas V, a flight-proven expendable launch vehicle used for critical space missions. The agency agreed to share its human spaceflight experience and human certification requirements with ULA to advance its crew transportation system capabilities. ULA will provide feedback to NASA about those requirements, including input on the technical feasibility and cost effectiveness of NASA's proposed certification approach. In September, NASA and Alliant Techsystems agreed to collaborate on the development of the company's Liberty Launch System. The agreement enables the

two parties to review and discuss Liberty system requirements, safety and certification plans, computational models of rocket stage performance and avionics architecture designs. September also marked the release of a draft request for proposals outlining a complete end-to-end transportation system design, including spacecraft, launch vehicles, launch services, ground and mission operations and recovery. The Integrated Design Contract of up to $1.61 billion is scheduled to run from July 2012 through April 2014. In December, NASA announced a modified approach for supporting commercial crew capability. The agency will competitively award Space Act agreements for the next phase of the Commercial Crew Program instead of awarding contracts. The move will keep on track the agency's plan for U.S. companies to transport astronauts into space and ultimately will end outsourcing the work to foreign governments.

http://www.nasa.gov/offices/c3po/home

INTERNATIONAL SPACE STATION SHIFTS TO UTILIZATION AND RESEARCH

NASA and its international partners celebrated 11 years of permanent human habitation on the International Space Station on Nov. 2. More than 1,400 research and technology development experiments have been conducted aboard the orbiting lab,

many of which are producing advances in medicine, environmental systems and our understanding of the universe. NASA selected an independent non-profit organization, the Center for the Advancement of Science in Space (CASIS), to manage U.S. scientific and technological research conducted through the part of ISS that is a National Laboratory, and is transitioning responsibilities to CASIS. Robonaut 2, the first humanoid robot in space, and the Robotics Refueling Mission (RRM), which tests robotic techniques for on-orbit satellite servicing, were delivered to the station in 2011. In preparation for the first commercial resupply missions to ISS in 2012, NASA has been working closely with SpaceX and Orbital Science Corp. of Dulles, Va., to ensure the Dragon and Cygnus cargo vehicles' designs and operations are compatible with the station. Integration activities include verification of physical and operational interfaces, safety assessments, joint software testing, operations planning, crew training and mission simulations. This year, NASA graduated the astronaut class of 2009 and, on Nov. 15, began recruiting its next astronaut class. These new astronauts will advance research aboard the space station to benefit life on Earth and develop the knowledge and skills needed for longer flights to explore the solar system. Those selected also will be among the first to pioneer a new generation of commercial launch vehicles and travel aboard a new heavy-lift rocket to distant destinations in deep space. Qualified individuals can apply to become an astronaut through the federal government's USAJobs.gov website.

http://www.nasa.gov/station

SPACE SHUTTLE FLIES FINAL THREE FLIGHTS, PROGRAM ENDS

NASA's Space Shuttle Program concluded in 2011 with three final missions to the International Space Station. Each mission carried supplies and equipment that will sustain the space station crews until NASA's new Commercial Resupply Service providers take over this role.

Shuttle Discovery launched the STS-133 mission on Feb. 24, carrying the retrofitted, Italian-built multipurpose logistics module (MPLM) "Leonardo" to the space station. On May 16, Endeavour launched STS-134 and, along with supplies and equipment, brought the Alpha Magnetic Spectrometer-2 (AMS) to the space station. The AMS is a particle physics experiment module designed to search for unusual matter by measuring cosmic rays. STS-135 launched on July 8, making the space shuttles' final delivery of supplies to the space station. Just before returning to Earth, STS-135 Commander Chris Ferguson presented the station's crew with a U.S. flag flown on the first space shuttle mission, STS-1, in April 1981. The flag will remain displayed aboard the station until the next crew launched from the U.S. retrieves it for return to Earth so it can be carried by the first crew launched from the U.S. on a journey of exploration beyond low-Earth orbit.

http://www.nasa.gov/shuttle