



Lockheed Martin Management Association Retirees Newsletter

Looking Forward Towards A Wonderful Retiree Future!

DECEMBER 2014

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Needed: Staff Help

LMMAR needs volunteers to help keep LMMAR going. We have several vacancies on the Board and we particularly need a newsletter editor. If you think you can help please contact:

Norm Dhom, Membership Chair – (408) 732-2742

Jerry Vaughan, Treasurer – (408) 985-2708

Your Story

We need your input. Have you have done anything exciting lately? Do you

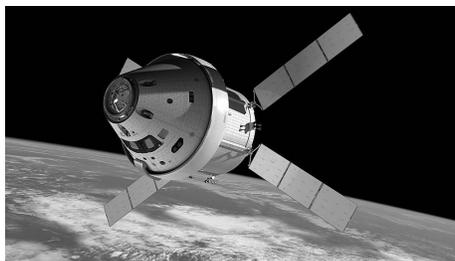


have any news that might be of interest to our members? Your story and photo is welcome!

Email it to jerry_vaughan@yahoo.com.

Orion Multi-Purpose Crew Vehicle

The Orion Multi-Purpose Crew Vehicle (MPCV) is a spacecraft intended to carry a crew of up to astronauts to destinations beyond-low Earth orbit (LEO). Currently under development by NASA- for launch on the Space Launch Sys-



tem, [Orion will facilitate human exploration of the Moon, asteroids and Mars.

The MPCV was announced by NASA on May 24, 2011. Its design is based on the Orion Crew Exploration Vehicle from the cancelled Constellation pro-

gram. The Orion command module is being built by Lockheed Martin. The Orion Service Module, provided by the European Space Agency, is being built by Airbus Defence and Space.

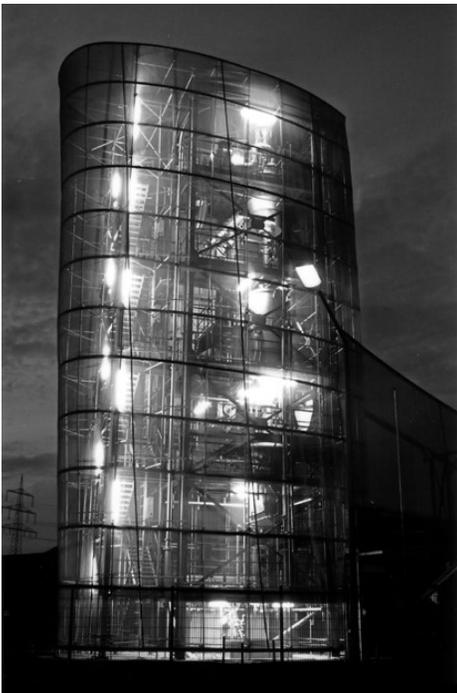
The MPCV's debut uncrewed test flight, known as Exploration Flight Test 1 (EFT-1), is scheduled to be launched aboard a Delta IV Heavy rocket on December 4, 2014. The first crewed mission is expected to take place after 2020.

Power Generation Facility

BALTIMORE, Md., Nov. 19, 2014 – Lockheed Martin [NYSE: LMT] and teammate Concord Blue announced a new contract to build a power generation facility that will provide a new, clean energy source to meet the needs of 5,000 homes and businesses in

Herten, Germany.

The five-megawatt power generation facility will transform forestry waste to power using Concord Blue's Reformer® technology, which converts waste to energy through advanced gasification. Under this engineering, procurement and construction (EPC) contract, Lockheed Martin will provide overall project management, engineering and



Current Concord Blue Reformer® in Herten, Germany. Photo courtesy Concord Blue.

design, procurement and construction for the new facility.

“Lockheed Martin is excited to manufacture the Concord Blue technology, which advances how the world addresses clean energy and waste reduction challenges,” said Mauricio “Mo” Vargas, bioenergy lead for Lockheed Martin’s Mission Systems and Training business. “The Herten facility will

demonstrate the accessibility of innovative energy technology to global customers.”

Concord Blue's Reformer technology is feedstock-flexible, converting nearly any kind of organic waste into clean, sustainable energy. Unlike other available waste-to-energy processes, Concord Blue's unique process employs a patented technology called steam thermolysis to convert waste material using heat transfer instead of incineration.

“Located at the Hydrogen Competence Center in Herten, this Concord Blue Reformer [CBR] will be a landmark in the region that receives international interest,” said Concord Blue's founder and CEO Charlie Thannhaeuser. “This project represents the sixth commercial CBR, a testament not only to the technological quality of our waste-to-energy solution, but also to the economic viability.”

In 2013, Lockheed Martin and Concord Blue signed an agreement to develop an advanced waste conversion system to address waste disposal, energy security and climate control issues through clean energy production. In Oct. 2014, Lockheed Martin was selected as the exclusive manufacturing provider of the Concord Blue Reformer.

Concord Blue's unique technology benefits the environment, fulfilling all international, Environmental Protection Agency and European regulations for renewable energy and air emissions. Concord Blue operates globally, with offices in the United States, Germany, India and Dubai.

Lockheed Martin takes a comprehensive approach to solving global energy and climate challenges, delivering solutions in the areas of energy efficiency, smart energy management, alternative power generation and climate monitoring. The company brings high-level capabilities in complex systems integration, project management, information technology, cyber security, and advanced manufacturing techniques to help address these challenges. Today, Lockheed Martin is partnering with customers and investing talent in clean, secure, and smart energy – enabling global security, a strong economic future and climate protection for future generations.

NASA's Mars Lander Spacecraft

DENVER, Nov. 17, 2014 – Lockheed Martin [NYSE: LMT] has started the assembly, test and launch operations (ATLO) phase for NASA's InSight Mars lander spacecraft. The InSight mission will record the first-ever measurements of the interior of the red planet, giving scientists unprecedented detail into the evolution of Mars and other terrestrial planets. InSight is scheduled to launch in March 2016.

A critical stage in the program, ATLO is when assembly of the spacecraft starts, moves through environmental testing and concludes with its launch. Over the next six months, technicians will install subsystems such as avionics, power, telecomm, mechanisms, thermal systems, and guidance, navigation and control. Science instruments will also be delivered by the mission partners to Lockheed Martin for integration with the spacecraft.

In addition to the lander, the spacecraft's protective aeroshell capsule and cruise stage (which provides com-

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munications and power during the journey to Mars) are also undergoing assembly and testing alongside the lander. Once the spacecraft has been fully assembled, it will undergo rigorous environmental testing in the summer of 2015.

“The InSight mission is a mix of tried-and-true and new-and-exciting. The spacecraft has a lot of heritage from Phoenix and even back to the Viking landers, but the science has never been done before at Mars,” said Stu Spath, InSight program manager at Lockheed Martin Space Systems. “Physically, InSight looks very much like the Phoenix lander we built, but most of the electronic components are similar to what is currently flying on the MAVEN spacecraft.”



Mars Lander Starts Taking Shape in Clean Room

InSight stands for “Interior Exploration using Seismic Investigations, Geodesy and Heat Transport” and it is more than a Mars mission. This NASA Discovery-class mission is a terrestrial planet explorer that will address one of the most fundamental issues of planetary and solar system science; understanding the processes that shaped the rocky planets of the inner solar system (including Earth) more than four billion years ago.

The InSight mission is led by Bruce Banerdt of the Jet Propulsion Laboratory (JPL). The science team includes

U.S. and international co-investigators from universities, industry and government agencies. The German Aerospace Center (DLR) and the French space agency (CNES) are also each contributing an instrument to the two-year scientific mission.

Along with providing an onboard geodetic instrument to determine the planet’s rotation axis, plus a robotic arm and two cameras used to deploy and monitor instruments on the Martian surface, JPL performs project management for NASA’s Science Mission Directorate. NASA’s Marshall Space Flight Center in Huntsville, Alabama, manages the overall Discovery Program for the agency’s Science Mission Directorate in Washington.

Surface Navy Innovation Center

MOORESTOWN, N.J., Nov. 18, 2014 – Lockheed Martin [NYSE: LMT] has opened the Surface Navy Innovation Center (SNIC) to support the development of new technologies for the U.S. Navy. The SNIC is a research, development and demonstration facility that brings together industry, government and academia to design the next generation of capabilities the surface fleet needs to combat evolving threats around the world.

“The SNIC establishes a community space to promote rapid technology fielding that addresses the Navy’s most pressing challenges,” said Jim Sheridan, director of Aegis U.S. Navy programs. “As the maritime security environment changes, we will find new ways to use products and best practices to benefit the sailors who rely on these systems to defend our nation.”

The center will foster collaboration among key organizations to rapidly develop emerging technologies and quickly put them into service. To stay ahead of threats, Lockheed Martin is committed to making ongoing improvements to its current systems and integrating the most advanced technologies to meet the needs of its U.S. Navy customers.

Building on Lockheed Martin’s 100-year history of innovation, the SNIC also continues the development of the Aegis Combat System to meet new security challenges, building on the company’s 40 years of partnership with the Surface Navy on this program. Aegis already is the premier naval combat system, globally deployed counter ballistic missiles and other advanced air and missile threats. The SNIC will serve as a collaboration space to continue Aegis’ evolution, advancing modernization efforts and pushing the system to new levels of defense for sailors and citizens.

Space Junk Tracking

PALO ALTO, Calif., Nov. 6, 2014 – Lockheed Martin [NYSE: LMT] has partnered with the University of Arizona to operate the United Kingdom Infrared Telescope (UKIRT) located on Maunakea, Hawaii. The agreement expands the corporation’s support of scientists pursuing a broad range of research, from the study of orbital debris to deep space astronomy.

For 35 years, UKIRT has been one of the most productive observatories in the world, with more than 200 scien-

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tific publications annually. The largest IR telescope in the Northern Hemisphere, UKIRT's ownership transferred from the UK's Science and Technology Facilities Council (STFC) to the University of Hawai'i in October.

"Our team, composed of the universities of Arizona and Hawai'i and NASA, will extend the life of this important telescope," said Matthew Bold, Lockheed Martin program manager. "We plan to grow capability and continue addressing pressing questions about our universe, as well as the space surrounding our planet."

Located at one of the best sites for infrared astronomy, UKIRT and its wide range of instruments will continue to study the evolution of the universe from the big bang to present. At the same time, its mission will be expanded to study near-earth space debris and asteroids. Working with the NASA Orbital Debris Program Office at the Johnson Space Center, Lockheed Mar-



SNIC will foster collaboration, problem-solving

tin is studying the potential impact space debris could have on operating satellites and the effects on global communication, weather prediction,

resource management, disaster preparedness and commerce.

Rosetta

Rosetta is a robotic space probe built and launched by the European Space Agency which is performing a detailed study of comet 67P/Churyumov-Gerasimenko (67P) with both an orbiter and a lander module Philae.

Rosetta was launched on 2 March 2004 on an Ariane 5 rocket and reached the comet on 6 August 2014, becoming the first spacecraft to orbit a comet. (Previous missions had conducted successful flybys of seven other comets.) It is part of the ESA Horizon 2000 cornerstone missions. The spacecraft consists of two main elements: the Rosetta space probe orbiter, which features 12 instruments, and the Philae robotic lander, with nine additional instruments. The Rosetta mission will orbit 67P for 17 months and is designed to complete the most detailed study of a comet ever attempted. The spacecraft is controlled from the European Space Operations Centre (ESOC), in Darmstadt, Germany. The planning for the operation of the scientific payload, together with the data retrieval, calibration, archiving and distribution, is performed from the European Space Astronomy Centre (ESAC), in Villanueva de la Cañada, near Madrid Spain.

The probe is named after the Rosetta Stone, a stele of Egyptian origin featuring a decree in three scripts. The lander is named after the Philae obelisk bearing a bilingual Greek and Egyptian hieroglyphic inscription. A comparison of its hieroglyphs with

those on the Rosetta Stone catalysed the deciphering of the Egyptian writing system. Similarly, it is hoped that these spacecraft will result in better understanding of comets and the early Solar System. In a more direct analogy to its namesake, the Rosetta spacecraft also carries a micro-etched nickel alloy Rosetta disc donated by the Long Now Foundation inscribed with 13,000



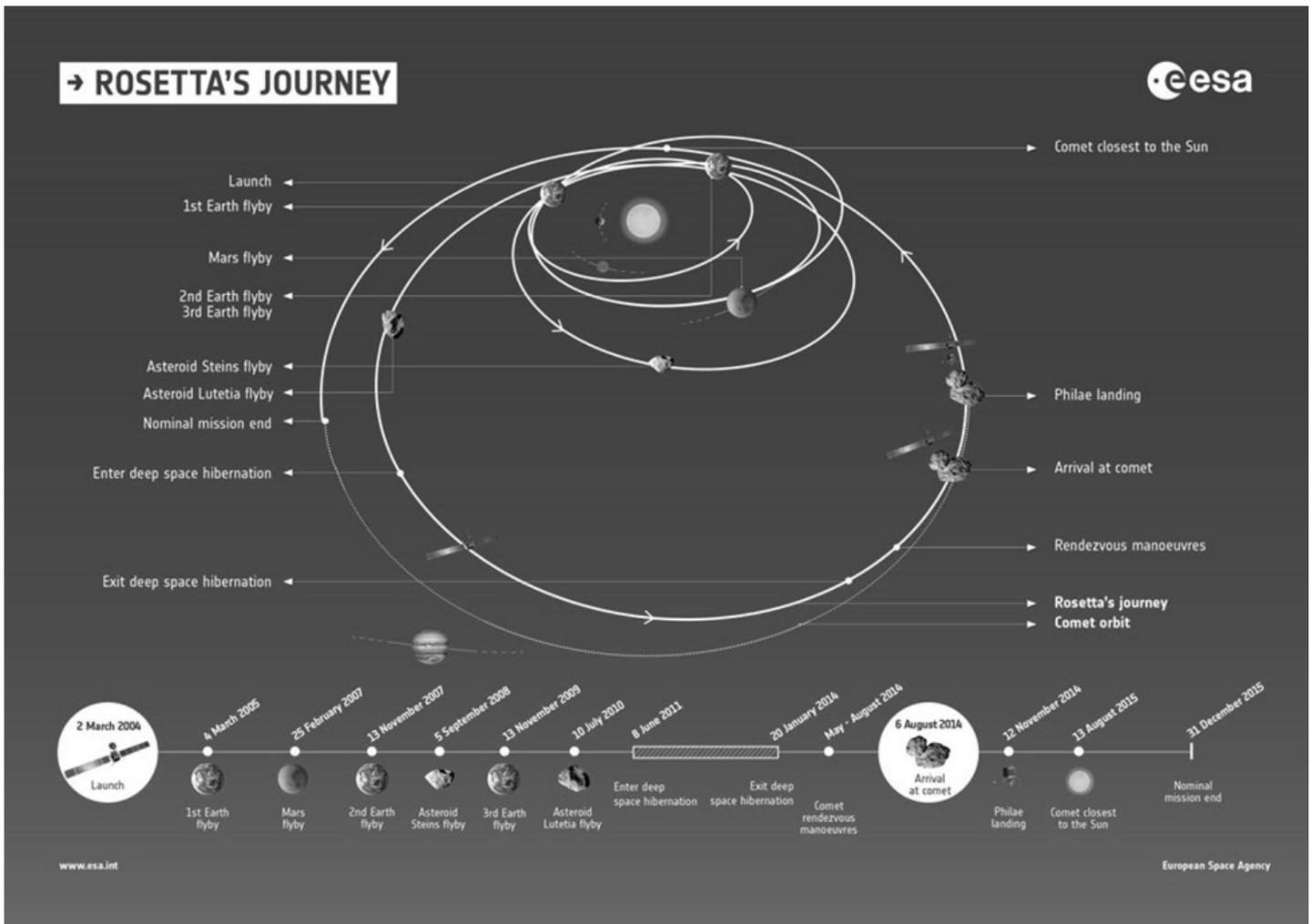
Lockheed Martin teamed up with NASA and the universities of Arizona and Hawai'i to use one of the World's largest infrared telescopes to study near-earth space debris and asteroids. The United Kingdom Infrared Telescope (UKIRT), pictured here, is the largest IR telescope in the Northern Hemisphere and is located atop Maunakea, Hawaii. (Photo courtesy of UKIRT)

pages of text in 1200 languages.

The spacecraft has already performed two asteroid flyby missions on its way to the comet. In 2007, Rosetta also performed a Mars swing-by (flyby). The craft completed its fly-by of asteroid 2867 Šteins in September 2008 and of 21 Lutetia in July 2010. On 20 January 2014, Rosetta was taken out of a 31-month hibernation mode and continued towards the comet. It has been estimated that in the decade preceding 2014, some 2,000 people assisted in the mission in some capacity.

Rosetta's Philae lander successfully

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made the first controlled touchdown on a comet nucleus, specifically Comet 67P, on 12 November 2014. Astrophysicist Elizabeth Pearson says although the future of the lander Philae is uncertain, the orbiter Rosetta is the workhorse of the mission and its work will carry on.

LMMAR Bridge

Nov 4 - Individual Duplicate - 1st Place - Chuck Schmidt, 2nd Place - Dave Himmelblau, and 3rd Place - (tie) Roger Abegg and Alex Fucile.

Nov 6 - Pairs Duplicate - 1st Place -

Dave Himmelblau & Dave Topka and 2nd Place - Gary Bea & Chuck Schmidt.

Nov 11 - Individual Duplicate - 1st Place - Dave Topka, 2nd Place - Gary Bea, and 3rd Place - (tie) Roger Abegg and Alex Fucile.

Nov 13 - Pairs Duplicate - No Game.

Nov 18 - Individual Duplicate - 1st Place - (tie) Gary Bea and Ted Hinshaw and, 3rd Place - (tie) Chuck Schmidt and Dave Topka.

Nov 20 - Pairs Duplicate - 1st Place - Dave Himmelblau & Dave Topka and 2nd Place - Roger Abegg & Don Kies.

Nov 25 - Pairs Duplicate - 1st Place - Chet Hayes & Ted Hinshaw and 2nd Place - Dave Himmelblau & Dave Topka.

Nov 27 - Thanksgiving. No Game

Pinochle or Canasta

If anyone is interested in joining a Pinochle or Canasta group, please call Shara Baker at 408-499-7875.



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DECEMBER 2014

Activity Calendar

- **LMMAR Executive Board Meeting.** First Monday of each month unless holiday conflict, then second Monday. 9:30 a.m. Bldg. 157-Satellite Room (off the cafeteria).
- **LMMAR Newsletter Mailing Session.** Volunteers needed. Second Thursday of each month. 9:30 a.m. Bldg. 157-Litrium. Contact Norm Dhom (408) 732-2742.
- **LMMAR Bridge Card Players.** Join the fun! Every Tuesday and Thursday, 11:30 a.m. at the Willow Park Condominiums located at the NE corner of Moffet Blvd. and Middlefield Road in Mountain View. Entrance is from Moffet Blvd. Contact Dave Himmelblau, 'phone No. 650 968-1121.
- **Lockheed Martin Blood Bank Drive.** Second Wednesday of each month. 8:00 a.m.- 3:00 p.m. Bldg. 163. LMMAR Contact Norm Dhom (408) 732-2742.
- **Lockheed Martin Retirees Investment Group (LMRIG).** Meets last Thursday of each month, 1:00-2:00 p.m. in B163 at the corner of J Street and 1st Ave. (Employee Connection Building). Dues are \$2. Contact Don Kinell (650) 948-1520 or Martin Abelow (408) 253-6924. Join us for lunch in the B-157 cafeteria prior to the meeting between 11:40-12:40.

For your financial needs, please contact Star One Credit Union at www.starone.org or (866) 543-5202 toll free.

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