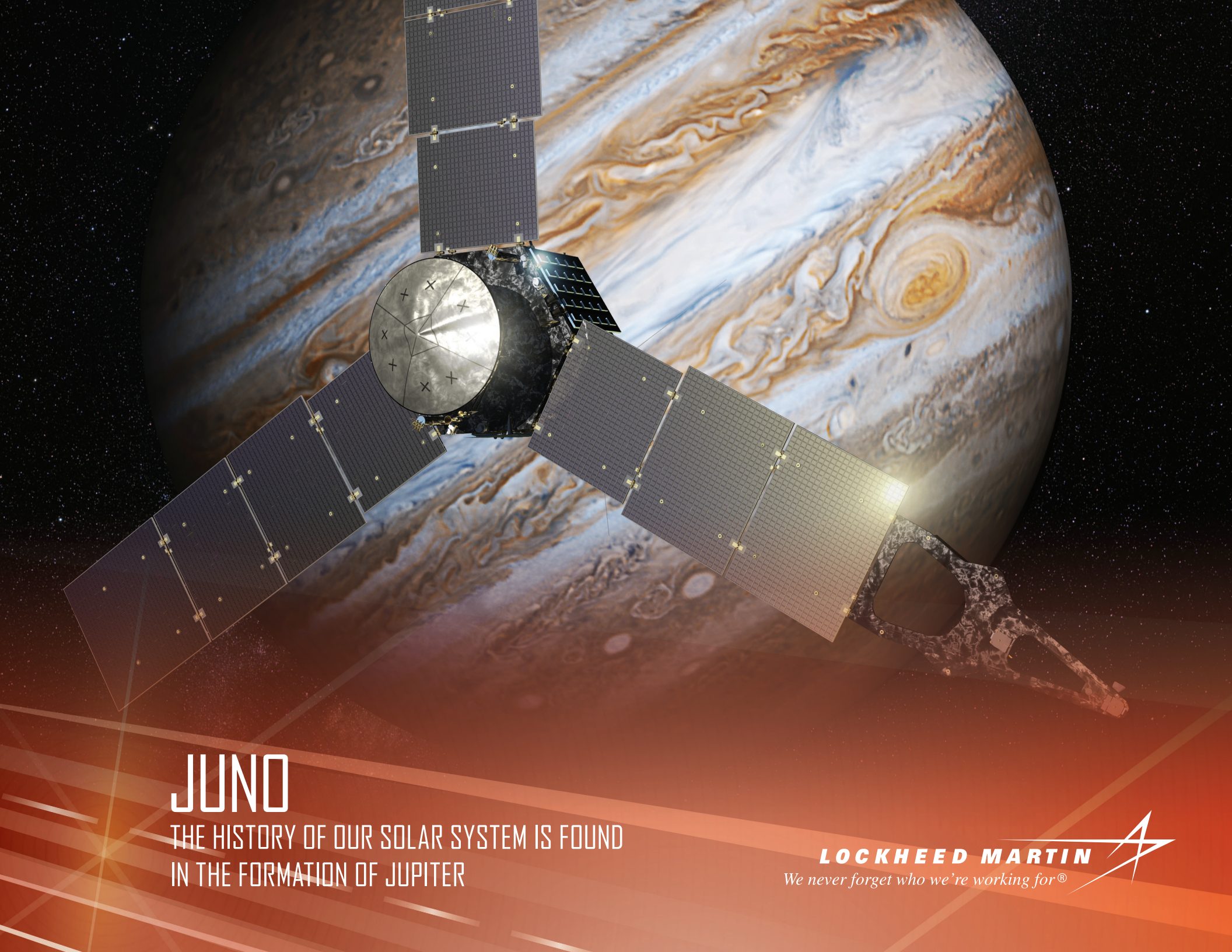
JUNO
THE HISTORY OF OUR SOLAR SYSTEM IS FOUND
IN THE FORMATION OF JUPITER
LOCKHEED MARTIN
We never forget who we're working for®

JUPITER'S STORY IS THE STORY OF OUR SOLAR SYSTEM

As the archetype of the giant planets, Jupiter's interior can reveal fundamental processes of the formation and early evolution of our solar system, extra-solar planetary systems, and conditions needed to form terrestrial-type planets. Jupiter's magnetospheric dynamics and radiation belts generate the brightest aurora in our solar system, providing fertile opportunity to study and understand this remarkable phenomenon, but representing the most severe planetary particle radiation environment in the solar system.

Developed by Lockheed Martin for NASA's Jet Propulsion Laboratory (JPL), the Juno spacecraft carries a suite of instruments capable of observations from radio and microwave through infrared, visible, and ultraviolet frequencies. Particle sensors will capture and characterize electron and ion energies from the magnetosphere, magneto-meters' will quantify Jupiter's magnetic field, and precise X- and Ka-band Doppler measurements will define the shape of Jupiter's gravitational field.

Juno's 53-day elliptical orbit drops under Jupiter's radiation belts to within 3,100 miles of the 88,000 mile diameter planet closer than any previous spacecraft. Tipped 90˚ to Jupiter's equator, the orbit allows observation of Jupiter's full range of latitudes and longitudes, including the first pictures of Jupiter's north and south poles. This unique orbit is key to holding the spacecraft radiation dose to manageable levels. Juno will orbit the planet until 2021 when it will be deliberately flown into Jupiter to protect Jupiter's moons from potential contamination.

Juno is the first solar-powered spacecraft designed to operate at Jupiter and holds the record as the farthest spacecraft from the sun to operate on solar power. To power the spacecraft's computers and instruments it has three 30-foot long solar arrays with a combined 18,698 individual solar cells covering an area of 535 square feet. At Earth the arrays would be capable of generating over 14 kilowatts, yet provide only 500 watts at Jupiter. Launched on Aug. 4, 2011 on an Atlas V 551, the 8,000-pound spacecraft took five years to get to the giant planet, arriving July 4, 2016. Lockheed Martin provides flight operations for the spacecraft with management and navigation provided by JPL.

WHY THE NAME JUNO?

In Roman mythology, the relationship between the god Jupiter and his goddess wife Juno was stormy. In one famous tale, Jupiter was up to no good and drew a veil of clouds over the Earth to hide from Juno. She parted the clouds, and was able to see Jupiter clearly, just as our modern Juno will look through the clouds to study the planet Jupiter.

INSTRUMENTS

Juno's payload spans nine instrument suites, comprised of 26 separate sensors.

Gravity Science X – and Ka-band Doppler gravity measurements will map Jupiter's interior structure (*JPL*).

MAG–Fluxgate magnetometers guided by advanced stellar cameras map Jupiter's interior structure and magnetic dynamo (Goddard Space Flight Center w/Danish Technical University).

MWR–Multiple antennas map Jupiter's microwave brightness for deep atmosphere sounding and composition (*JPL*).

JEDI–Particle detectors map electron energy and ion energy/composition over both Jovigraphic polar regions (*Johns Hopkins University*).

JADE–Electron and ion detectors map electron energy and ion energy/composition over both Jovigraphic polar regions (*Southwest Research Institute*).

Waves–Electric and magnetic antennas measure radio and plasma waves in Jupiter's polar magnetosphere (*University of Iowa*).

UVS–An ultraviolet spectrometer characterizes spatial, spectral and temporal auroral structure (*Southwest Research Institute*).

JIRAM–An infrared camera observes the auroral structure, troposphere structure, and atmospheric sounding (*ASI/SG/INAF*).

Junocam–An education and public outreach visible-light camera provides first pictures of Jupiter's poles (*Malin Space Science Systems*).

Learn more at: www.lockheedmartin.com/juno

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