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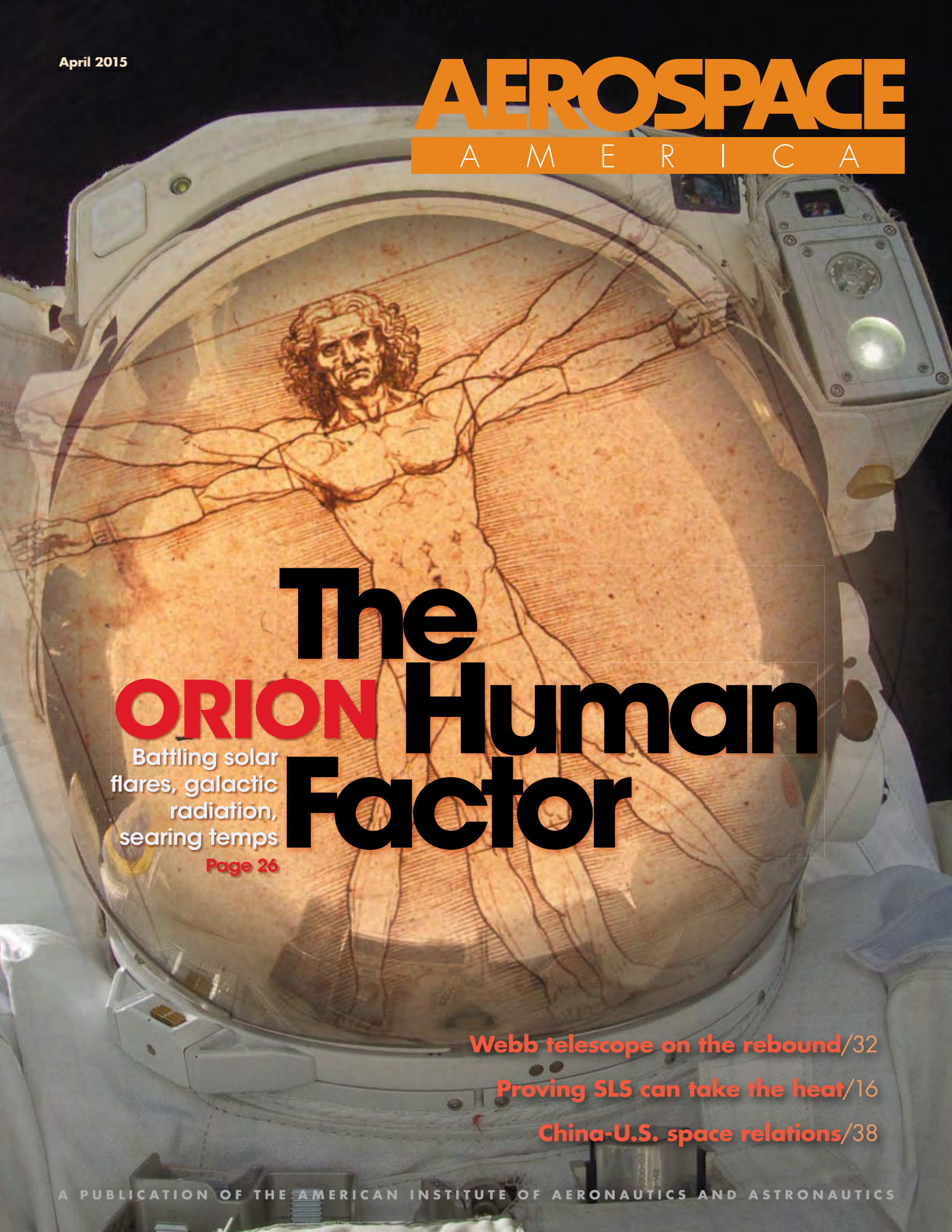

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Coming soon: ESA's full account of IXV flight

A Vega rocket carrying the experimental spaceplane IXV lifts from Europe's Spaceport in Kourou, French Guiana, on Feb. 11.

European Space Agency

Detailed mission results from the February flight of the unmanned Intermediate Experimental Vehicle spaceplane are to be announced by the European Space Agency by June 15.

Those results will indicate how the craft's thermal protection and other systems held up. For now, the craft's landing west of the Galapagos Islands in the Pacific Ocean looks like a high mark in ESA's long-term plan to build a relatively low-cost reusable vehicle that can fly to various orbits, operate missions such as servicing satellites or conducting microgravity experiments, and return them to Earth by landing on a runway.

The IXV reached an altitude of 412 kilometers and a top speed during descent of 7.5 kilometers per second before coming down 40 minutes after launch just as planned, according to ESA. It was then taken to Genoa in Italy for more detailed study of the mission results.

The craft and mission were funded by the European Space Agency and built by Thales Alenia Space of Italy. It is the size of an automobile, weighs nearly 2 tons and is 5 meters (16 feet) long.

The vehicle has a lifting body shape — meaning it produced lift without wings — and is equipped with a complex outer thermal protection layer and an advanced inner composite structure that divides the vehicle into four bays, ESA fact sheets state. The lifting body configuration was selected after a comparison of performance trade-offs and was designed from experience gained with the ESA's Atmospheric Reentry Experimental Vehicle and the French government's Centre National d'Etudes Spatiales' PRE-X reusable atmospheric re-entry concepts.

Critical technologies tested included the overall design, some complex new materials and an innovative flight management system.

New ceramics matrix composites were used on the nose, shingles, hinges and flaps, and ablatives such as cork and silicon-based materials were used on the vehicle's leeward surfaces. The IXV automatically controlled flight through a combination of thrusters and flaps, using guidance algorithms obtained through the coupling of inertial measurements and GPS.

The IXV is the second of three vehicles planned by ESA to master the key technologies for shuttle-like operations. First came the Advanced Reentry Demonstrator mission launched on the third flight of the Ariane 5 in October 1998, then the IXV and now agency scientists are working on the follow-on project — the Programme for Reusable In-orbit Demonstrator in Europe, or PRIDE.

"In my opinion, the most significant technical success [of the IXV] is to be seen in the demonstrated capability of Europe to integrate a number of on-the-edge re-entry technologies into a flying vehicle," Roberto Provera, director of Human Spaceflights and Transportation Programs at Thales Alenia Space, said in an email. "The capability to master aerothermodynamics, advanced shape (lifting body), thermal protection system, guidance, navigation and control, and to harmonize them into a reliable system is the basis for the future PRIDE."

PRIDE is being developed as an orbital platform to test multiple applications such as future reusable launchers stages, Earth observation, robotic exploration, microgravity experimentation and transport of crew and cargo to and from the International Space Station. ESA says the PRIDE space plane would be comparable — albeit smaller, cheaper and under civilian management — to the U.S. Air Force's X-37B.

One of the key design criteria for both the IXV and PRIDE is affordability: The IXV mission (excluding the cost of the launcher) cost 150 million euros ($167 million) and PRIDE mission costs are targeted at 200 million euros. The go-ahead for PRIDE was approved at the ESA's Ministerial Conference in December 2014 and the mission is most likely to take place in 2019 or 2020, according to an agency press officer.

"Thanks to the data collected during the flight, we are paving the way for the development of new-generation re-entry vehicles in Europe," Elisio Prette, president and chief executive officer of Thales Alenia Space Italia, said in a news release.

Philip Butterworth-Hayes
phayes@mistral.co.uk