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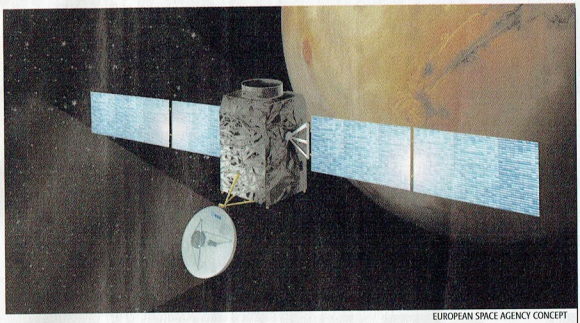

EUROPEAN SPACE AGENCY CONCEPT

COMMENTARY

Instrument Suite

Joint Mars orbiter promises methane mapping

U.S.-European cooperation in exploring Mars moves a step closer with the selection of instruments for the first of three joint missions to the red planet. Set for launch in 2016, the NASA/European Space Agency ExoMars Trace Gas Orbiter (see illustration) will mark a thousandfold improvement in the sensitivity of atmospheric measurements at Mars. One of the gases it will seek—methane—could be a signature of biological processes on the planet, and already has generated intriguing readings from less capable sensors.

"Mapping methane allows us to investigate further that most important of questions: Is Mars a living planet and, if not, can or will it become so in the future," says David Southwood, ESA's science director. Instruments selected for the trace-gas probe are a California Institute of Technology spectrometer to detect very low concentrations of gas; a Belgian spectrometer designed to map atmospheric components relative to the planet's surface, and a Jet Propulsion Laboratory infrared radiometer that will measure the vertical distribution of dust, water vapor and other components to provide context for the spectrometers. Two other instruments round out the suite. The High-Resolution Color Stereo Imager provided by the University of Arizona will produce four-color imaging with a resolution of 2 million pixels on an 8.5-km. swath, and the Mars Atmospheric Global Imaging Experiment will produce wide-angle multispectral images for a global perspective. The latter is being developed by Malin Space Science Systems of San Diego. ESA will supply the spacecraft, and NASA will launch it. Europe will also provide a small lander demonstration that will lay the groundwork for a two-rover landing in 2018, and a joint sample-return mission after 2020.

OLD FRIENDS

India and Russia continue their long-standing cooperation in space with top-level talks on possible human missions. Meeting in Moscow last week, Anatoly Perminov, head of Russian space agency Roscosmos, and D. Radhakrishnan, chairman of the Indian Space Research Organization (ISRO), discussed ways Roscosmos and RSC Energia—builder of Russia's Soyuz spacecraft—could help India's nascent human-spaceflight effort. Also on the agenda was shipment of more Russian upper-stage engines for India's Geostationary Satellite Launch Vehicle while ISRO engineers figure out why the all-Indian cryogenic engine failed its first flight test; plans for Russia to supply a lander for the Chandrayaan-2 lunar mission were discussed, too (*AW&ST* July 19, p. 32; June 14, p. 62).

ANOTHER CONSTELLATION

China expects to have as many as 15 timing and navigation spacecraft in orbit by 2012 for regional coverage, and a constellation of "more than 30 satellites" by 2022 for worldwide coverage, according to Sun Jiadong, head of the Beidou (Compass) satnav program. *China Daily* cited a television interview by Sun in reporting launch of another Beidou on a Long March 3A lifting off from the Xichang space center in southwest China on Aug. 1. Use of the Long March 3A suggests that the satellite is one of the 30 that will operate in low Earth orbit. A Long March 3C lofted the third of the five geostationary satellites planned for the system on Jan. 17, and the fourth on June 2. The system "is being built to rival the U.S.-developed GPS, the European Union's Galileo and Russia's Global Navigation Satellite System," *China Daily* noted.

GOING FOR GOLD

A California company has a bright idea for deorbiting spent spacecraft that otherwise would turn into space junk. Dubbed GOLD for Gossamer Orbiter-Lowering Device, the Global Aerospace Corp. concept is a lightweight balloon that would increase drag on potential debris and pull it back into the atmosphere to burn up. The company says a 100-meter-dia. envelope could be folded and stowed in the volume of a medium-size suitcase, attached to a spacecraft or upper stage before launch and deployed at the end of the mission. It would weigh and cost less than the extra fuel needed to deorbit a spacecraft at the end of its life, the company says.