

CNES science review and outlook

Rosetta – ATV Georges Lemaître – Mars 2020 – SVOM

For its post-summer-recess press conference, CNES trained the spotlight on science missions to which it is contributing that have been making the news in recent months: Rosetta, the ATV Georges Lemaître, Mars 2020 and SVOM. It also pointed up the main science missions planned for the years ahead.

After his opening remarks, CNES President Jean-Yves Le Gall handed over to agency scientists Fabienne Casoli, Deputy Director in charge of Science, and Michel Viso, Head of Exobiology.

Stimulating French space science research is one of the key missions entrusted to CNES by government. Tasked with conceiving programmes and providing its engineering expertise, the agency does not possess its own in-house research laboratories, working instead in partnership with the nation's leading public research bodies.

The press conference reviewed the following missions that have been making headline news over the summer:

Rosetta is an ESA mission to study comet Churyumov-Gerasimenko. Its main aim is to provide new insight into comets, their role in the formation of the solar system and their possible involvement in forming Earth's oceans and seeding our planet with complex molecules from which life emerged. The spacecraft is carrying the Philae module set to land on the comet's surface in November. CNES is assisting the French scientists, industry contractors and international partners working on this mission, providing expertise for preliminary studies and the supply of instruments and components through to operations. It also has the very important responsibility of controlling operations for Philae from the Science Operations and Navigation Centre (SONC) at the Toulouse Space Centre.

The **ATV Georges Lemaître** was launched in July from the Guiana Space Centre to ferry water, food, fuel and science equipment to the International Space Station (ISS) orbiting Earth at an altitude of 400 kilometres. ESA gave CNES the task of docking the ATV to the ISS with centimetre precision, a world first. All five ATVs have thus been flown to the ISS by teams at the Toulouse Space Centre, working with the ISS mission control centres in Houston and Moscow.

Landing on Mars in 2021, **Mars 2020** will attempt to discover if life might once have formed there. This mission could be the first step in a future Mars sample return programme on which NASA is expected to make a decision around 2022-2024. Mars 2020 will collect and cache a few tens of samples of Martian soil for later return to Earth. CNES and the IRAP astrophysics and planetology research institute will supply the laser and telescope with its colour camera. CNES will also be involved—as it already is with the FIMOC (French Instrument Mars Operation Centre) on the current Curiosity mission—in operating the camera instrument.

SVOM (Space-based multiband astronomical Variable Objects Monitor) is an astronomy mission whose chief objective is to observe and characterize gamma-ray bursts, especially those that occurred when the Universe was still in its infancy. Jean-Yves Le Gall and Xu Dazhe, Administrator of the China National Space Administration (CNSA), signed an agreement on 2 August in Beijing under which SVOM is planned to launch in 2021. CNES will oversee the French contribution, consisting of the MXT and ECLAIRs instruments, for which the Toulouse Space Centre (CST) will be prime contractor, and the French elements of the ground segment.

The press conference ended with a presentation of the main science missions planned for the years ahead: Euclid (dark matter), JUICE (Jovian system), PLATO (exoplanets) and Taranis.

At the press conference, Jean-Yves Le Gall stated: “Here today, we wanted to underline the importance that CNES attaches to the national, bilateral, multilateral and European science programmes in which it is involved, as cooperation is written into our agency’s DNA. The most striking thing is the rich diversity of CNES’s science programme, and above all its effectiveness. We are leveraging our resources to work on all fronts, achieving success after success, as events over the summer have eloquently demonstrated. And we firmly intend to continue on this path, as CNES seeks more than ever before to remain a driver of science-based innovation.”

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