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MATISSE to shed light on the formation of Earth and planets

The MATISSE instrument is ready to be sent to Chile, where in the next few weeks it will be installed on the Very Large Telescope (VLT), the world's most powerful astronomical observatory. This achievement is the outcome of fifteen years of development, including a final year of testing at the Laboratoire J.-L. Lagrange (Observatoire Côte d'Azur/CNRS/Université de Nice Sophia-Antipolis). The instrument, for which France is responsible under the auspices of the European Southern Observatory (ESO), is international in scope. By observing the protoplanetary disks that surround young stars, the MATISSE project should improve our understanding of the formation of the Earth and of planets in general.

MATISSE is one of the few projects for which France has responsibility under the auspices of the ESO. In early October 2017, the MATISSE (Multi AperTure mid-Infrared SpectroScopic Experiment) instrument will travel to the Atacama desert in Chile to be installed on the ESO's Very Large Telescope (VLT), the world's most powerful astronomical observatory. Eight to ten months' performance validation observing the sky under real conditions will then be required before the instrument is made available to the international astronomical community.

With MATISSE, one of the major goals of researchers is to observe protoplanetary disks in order to understand the formation of our own planet and that of planets in general. To achieve this, the instrument will enable astronomers to observe the sky with unprecedented resolution in the mid-infrared region—at wavelengths of 3 to 13 micrometers—and to combine the light from four of the VLT's eight telescopes at Cerro Paranal, Chile, including the four large eight-meter telescopes. Using the instrument it will be possible to observe the dust and gas surrounding young stars that make up the basic building blocks from which planets form. The environments of stars younger than our own Sun, which have been difficult to observe until now, should shed light on the conditions under which different types of planets form: gas giants like Jupiter, and smaller rocky planets like Earth.

MATISSE will operate in the same range of wavelengths as the James Webb Space Telescope, which will be launched in 2018 by NASA, and to which it is complementary. NASA researchers are already collaborating with the MATISSE consortium in order to step up joint research.

A number of European organizations were involved in developing the project: the Observatoire de la Côte d'Azur (OCA) and the CNRS in France, the MPIA, MPIfR and ESO in Germany, and NOVA-ASTRON in the Netherlands.



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