

3D PLUS has developed, in collaboration with CEA (France), gamma rays detectors for STIX instrument on board Solar Orbiter. The mission is scheduled for launch on the 10th February 2020 (5:00 am CET) from Cape Canaveral in Florida (USA).

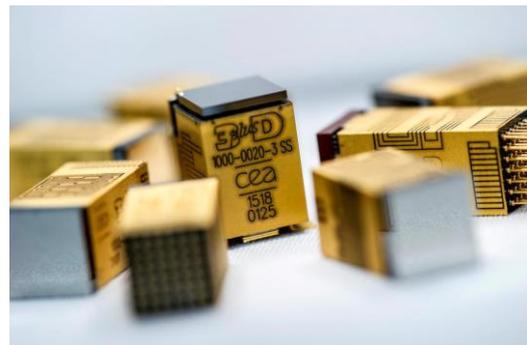
Buc, 7th of February 2020 – Solar Orbiter space mission is the result of an international collaboration between ESA and NASA with the spacecraft being developed by Airbus (France). Solar Orbiter is one of the complementary spacecraft studying the Sun at close proximity, as it will join NASA's Parker Solar Probe launched in 2018 and already engaged in its exploration. Solar Orbiter will operate for years in one of the most hostile regions of the Solar System and study the Sun up close. For the first time, the mission will provide high-resolution images of the uncharted Sun's Polar Regions.



Image credit: Credit: ESA/ATG medialab

Among the ten instruments composing Solar Orbiter, the Spectrometer/Telescope for Imaging X-rays (STIX) performs hard X-ray imaging spectroscopy of solar flares. It consists of 32 collimators with grids and 32 spectrometer units, called Caliste-SO. The set of these two subsystems will allow the spectro-imaging of solar flares in the field of hard X-rays with very high level of precision.

Resulting of a collaboration between 3D PLUS and CEA (France), Caliste-SO units are CdTe hybrid detectors. They integrate 1cm² CdTe multi pixel sensor with a low-noise low-power analog front-end ASIC and circuits for power supply regulation and filtering.



*Caliste-SO detectors.
Image credit: L. Godart/CEA 2017*

Based on 3D PLUS unique technology, the design of Caliste-SO vertically stacked four PCBs, which allow placing ASICs at close distance to the CdTe crystal, therefore increasing the SNR (Signal-to-Noise ratio). The instrument reaches a high resolution thanks to the miniaturization of this sensor, which allowed implementing a matrix of 32 units close together. This design suits STIX spectroscopic requirements allowing both high spectral resolution and high-count rate measurements while perfectly suiting system constraints in terms of volume, mass and power. The STIX instrument also embeds many 3D PLUS volatile and non-volatile memory parts (512 Mbit SRAM, 64 Gbit NAND Flash and 8Mbit EEPROM).



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3D PLUS has also supplied multiple highly reliable memory modules for several instruments. The Polarimetric and Helioseismic Imager (PHI) includes 3D PLUS SRAM, SDRAM and NOR Flash and the Energetic Particle Detector (EPD) embeds our SDRAM and NAND Flash. 3D PLUS memories offers the smallest footprint thanks to the high level of miniaturization, while providing very high densities for electronic designs. The Extreme Ultraviolet Imager (EUI) instrument integrates 3D PLUS high integration and space qualified all-in-one Latch-up Current Limiter (LCL). Our LCL is the best solution for power lines protection for advanced high performance electronics and memory banks in space applications.

3D PLUS is proud to contribute to such challenging mission with ambitious scientific objectives since Solar Orbiter, joined to Parker Solar Probe mission, will allow unprecedented insight into how the parent star works. The mission aims to reveal how the Sun creates and controls the heliosphere that surrounds the whole Solar System and influences the planets.

About 3D PLUS:

3D PLUS is a French SME, world leader in the design and manufacturing of high-performance and high reliability components miniaturized with its unique 3D vertical interconnect technology.

With more than 160,000 modules into space early 2020 and a production of more than 30,000 space qualified modules per year in its facility nearby Paris, 3D PLUS provides all stakeholders of the global space industry for over 20 years for telecommunications applications, Earth observation, navigation, launchers and human spaceflight, science missions, small satellites and constellations.