



# Solar instruments for PROBA2

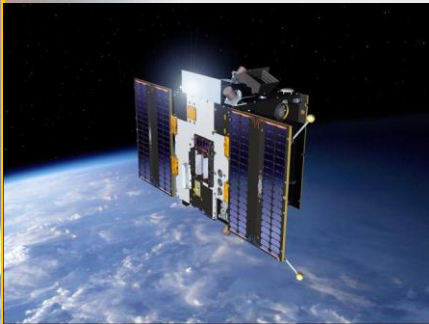
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MAX-PLANCK-GESELLSCHAFT

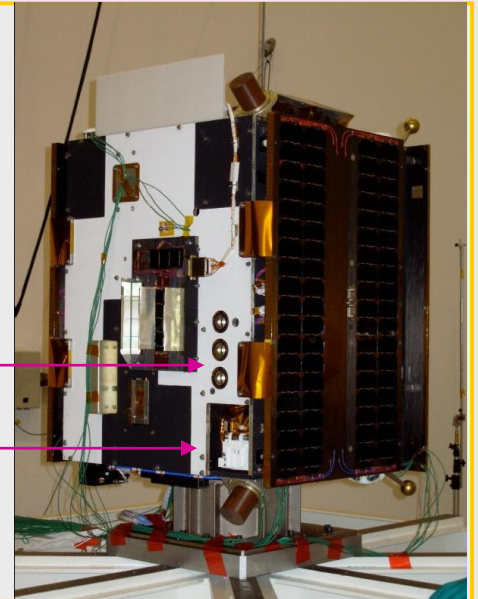
**PROBA 2:** a technology-oriented micro-mission of ESA. It was launched 2 November 2009 in a Sun-synchronous low-Earth orbit!

The satellite has been developed under the lead of the Belgian firm Verhaert Space NV. The scientific lead of the SWAP and LYRA instruments was with the Royal Observatory of Belgium and the Belgian industrial lead with the Centre Spatial de Liège. SWAP and LYRA are both examples of a successful international collaboration. LYRA was developed and built by a Belgian-Swiss-German consortium: ROB - PMOD/WRC, IMOMECA, CSL, MPS and BISA- IASB. Support for SWAP and LYRA calibration was provided by the MPS.



LYRA

SWAP

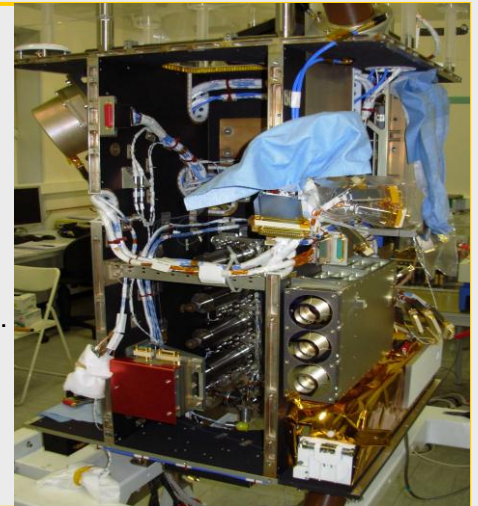


**LYRA** (LYman-alpha RAdiometer) is the **solar VUV radiometer** onboard PROBA 2.

LYRA will be monitoring the solar irradiance in **four carefully selected UV passbands**. They have been chosen for their relevance to Aeronomy, Space Weather and Solar Physics:

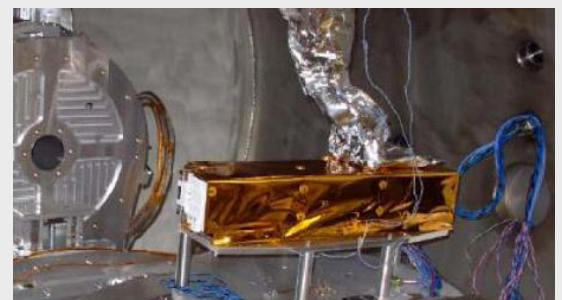
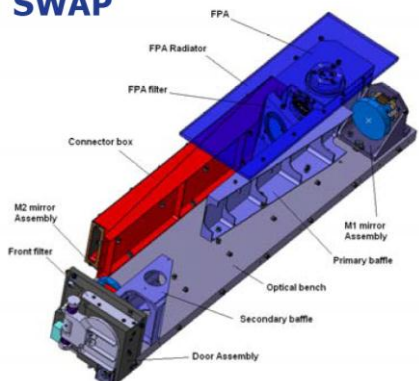
1. the **Lyman-alpha (121.6 nm) channel**,
2. the **200-220 nm Herzberg continuum** range,
3. the **Al-filter channels (17-70 nm)** covering He II-30.4 nm line,
4. the **XUV Zr-filter channel (1-20 nm)**, where solar variability is highest.

All channels require a robust radiometric calibration (accuracy and stability). LYRA will benefit from **diamond detectors**: it will be the first space assessment of this pioneering UV-detector program. This wide bandgap material, makes the sensors **radiation-hard** and **“solar-blind”**.



**SWAP** (Sun Watcher using Active Pixel system detector and image processing) is a telescope in the extreme ultraviolet (EUV), imaging the solar corona at the Fe IX and Fe X lines at 17.4 nm, corresponding to a formation temperature of 1 million K. SWAP will use an off-axis Ritchey Chrétien telescope equipped with Mo/Si multilayer mirrors and an EUV enhanced active pixel sensor detector (phosphor coated APS). As such, the SWAP telescope is a prototype instrument in space, like it is proposed for the Solar Orbiter mission.

## SWAP



in the PTB/BESSY synchrotron beamline for calibration