ULTRAVIOLET ASTRONOMY IN THE XXI CENTURY

e-Workshop 2020 – October 27-29



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Laboratoire d'Études Spatiales et d'Instrumentation en Astrophysique



CASSTOR

a technological and scientific demonstrator for UV high-resolution spectropolarimetry

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CASSTOR

- Nanosat 12U (20x20x30 cm) with 12-cm telescope
- Spectrograph with R=12500 in the UV domain: 135-291 nm
- Polarimeter with MgF2 birefringent plates in molecular adhesion





 \rightarrow demontrate that this technology resists in space and increase its technological readiness level (TRL)

 \rightarrow demontrate that science will be feasible by producing the very first stellar UV spectropolarimetric results

CASSTOR: a technological demonstrator

Polarimeter is a rotating stack of 4 very thin (0.3 mm) birefringent plates (MgF2) in molecular adhesion to perform temporal modulation, followed by a Wollaston prism (MgF2) to separate the orthogonally polarized beams



 \rightarrow This is the baseline for all UV spectropolarimetric missions in preparation (Arago, LUVOIR, PolStar) \rightarrow CASSTOR will **demonstrate that such a device can stand space conditions**

CASSTOR: a scientific demonstrator

CASSTOR will concentrate on UV spectropolarimetry of bright stars:

- magnetic field in the circumstellar environment of Ap/Bp stars
- environment of Wolf Rayet stars
- circumstellar disks of Be stars, including gamma Cas
- inhomogeneity of the wind in blue supergiants

 \rightarrow no spectropolarimetric data of these objects exist in the UV as of today \rightarrow CASSTOR will provide the very first stellar UV spectropolarimetric measurements



CASSTOR: timeline

- Opto-mechanical study: 2019-2020
- Ongoing Phase 0 study with CNES (French space agency): 2020-2021
- Engineering model tested in vaccum chamber: 2022 → TRL=6
- Launch: end of 2025

