

Recent optical technologies applications at CNES

Jacques Berthon, CNES, France

Optical technologies continue to rapidly develop in space. We present here a list of a few space missions (supported by CNES) which require the implementation of new optical concepts and technologies.

IASI, the Infrared Atmospheric Sounding Interferometer is a key payload element of the METOP series of European meteorological polar-orbiting satellites. The measurement technique is based on passive IR remote sensing using an accurately calibrated Fourier Transform Spectrometer operating in the 3.7 - 15.5 μm spectral range.

PLEIADES, a very high resolution panchromatic and multispectral Earth observation satellite. The main design requirements for the satellite architecture are the image quality, the pointing agility and the image location accuracy.

PHARAO, will be the first space atomic clock to use optically cooled atoms. We aim for high accuracy (a few 10^{-16}) and stability (better than 10^{-13} . $\tau^{-1/2}$).

PEGASE, is a 2-aperture interferometer for nulling and interferometric imaging. PEGASE is composed of 3 free-flying satellites (2 siderostats and 1 beam combiner) with baselines (going) from 50 to 500 m. PEGASE main goals are: the spectroscopic observation of hot Jupiter sized planets (Pegasides) and brown dwarves, the exploration of the inner area of protoplanetary disks and the validation in real space conditions of nulling interferometry with formation flying.