

RAPID: Revolutionary Avalanche Photodiode Infrared Detector

Background

The RAPID project aims to **develop highly-sensitive matrix infrared detectors, initially for very low photon flow applications** (between visible and near infrared wavelengths), and then for new applications. This next generation of detectors will use “HgCdTe avalanche diode” technology, and will target applications that do not currently use these methods such as medical imaging, scientific instrumentation, spectroscopy for gas analysis, and military applications like hyperspectral detection and active imaging.

Innovation

The RAPID project will develop **HgCdTe avalanche diode matrices**, typically 320x256 in size, operating at cryogenic temperatures. These detectors will generate very little noise, have a low dark current, and offer substantial savings. The main objectives of the project concern the development of all the technology elements needed to build the new detectors, including:

- HgCdTe film epitaxies
- Specific detector technology
- Architecture for low-noise analog detection circuits and detection circuits that can operate in photon-counting mode
- Industrial prototypes will be tested in scientific experimentations

Partners

Corporate

Sofradir

SME

Biospacelab

Research laboratories

CEA-Leti - LAOG (Grenoble Astrophysics Laboratory)
- LAM (Marseille Astrophysics Laboratory - Onera)

Key figures

Budget: €13.14 million

Duration: 48 months

Human resources allocated: 79.5 FTE