SC13 | Low light level vision and photon counting imaging

LEVEL: ADVANCED

Audience: People from private or public companies in the field military, security, microscopy, bioscience and astronomy

Prerequisites: Basic knowledge in optics, notions in radiometry or photometry, notions in imaging or video or photography

Pedagogical manager(s): Thierry Midavaine - Ingénieur expert THALES Optronique

Language of the training: French

Maximum capacity: 12

Price: 1380€ HT - **Duration:** 3 days - 21 h

Objectives

- Tutorial dedicated on Low Light Level imaging technologies in the spectral band from 0,4↔m up to 2↔m
- Be able to design a low light level imaging system with component selections
- Be able to specify low light level components and perform the related acceptance test
- Identify new technologies allowing the enhancement of imaging systems

Next sessions

- 13 december 2021 au 15 december 2021 - Palaiseau

Addressed topics

Needs and Challenges
Night illumination contributors, sensor technologies, Light Intensifiers
LLL digital video imaging, active imaging with laser illumination
Applications and future roadmaps

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The program

The night vision
- Visible Imaging
- Eye sighting
- Night illumination contributors and night levels

Imaging sensors technologies
- Light intensifier tubes
- Intensified digital sensors
- CCD sensors
- CMOS sensors
- SWIR sensors from 1↔m to 2↔m
- Perspective of photon counting enabled imaging technologies
- Read data sheets

Active imaging
- Active imaging principle
- Illumination sources
- Fitted imaging sensors
- Speckle and atmospheric propagation
- Albedos, LCS, cat's eye effect

Applications and challenges
- Demonstrations
- Range modelisation
- Military applications
- Surveillance and security
- Scientific imaging from microscopy to astronomy
- Futur technological challenges

Methodology and assessment

Lectures and exercices
Experiments and live demonstrations
Practical hands-on instruments

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