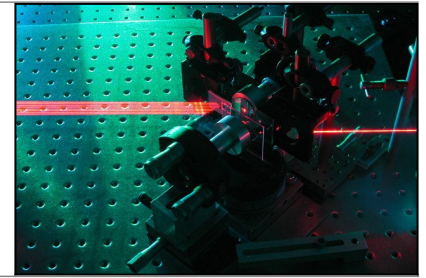


## SC8 | Holography: from measurements to 3D display



NIVEAU : BASIC

**Publics :** Technician, engineer or project manager with basic skills in optics and willing to invest the vast field of holography and its applications

**Prérequis :** Basic knowledge in optics: geometrical optics, light diffraction, light interferences, digital signal processing, notions on Fourier transforms

**Responsable(s) pédagogique(s) :** Pascal Picart - Enseignant-chercheur à l'université du Maine

**Langue de la formation :** French

**Capacité maximum :** 12

**Prix :** 1820€ HT - **Durée :** 4 days - 28 h

### Objectifs

- ▶ Discover holography
- ▶ Acquire knowledge on various fields of application of holography
- ▶ Understand the numerical calculation of holograms
- ▶ Understand the principles of holographic microscopy and know its application areas
- ▶ Realize and process holograms

### Thèmes abordés

Wave optics, diffraction, interferences

Holography: principle, recording, reconstruction

Digital holography, computed generated holograms, holographic measurement and metrology

Holographic microscopy and quantitative phase imaging and tomography

3D display with holographic techniques and other geometric approaches



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## SC8 | Holography: from measurements to 3D display

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### Le programme

#### Holography and Diffractive optics

- ▶ Basics of wave optics
- ▶ Diffraction of light and interferences
- ▶ Principle of holography
- ▶ Materials and components
- ▶ Demodulation and digital processing of holograms

#### Applications of holography

- ▶ Holographic microscopy and quantitative phase imaging - diffractive tomography
- ▶ 3D holographic display and other geometric approaches
- ▶ Measurement and metrology, holography applied to mechanics, acoustics, and fluid mechanics
- ▶ CGH (Computed Generated Holograms) - application for beam shaping, laser phasing, optical tweezers, telecommunication, and information security

#### Practical work

- ▶ Spatial light modulator (SLM)
- ▶ Lens-less imaging and speckle interferometry
- ▶ Reflection holography
- ▶ Digital holography and numerical reconstruction

### Méthodologie et évaluation

Lectures, illustrations and exercises

Applications of holography

Practical work