

PHYS-607

**Nonlinear fibre optics**

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<b>Cursus</b>	<b>Sem.</b>	<b>Type</b>
Photonics		Opt.

Language of teaching	English
Credits	2
Session	
Semester	
Exam	Oral presentation
Workload	60h
Weeks	
<b>Hours</b>	<b>28 weekly</b>
Lecture	28 weekly
<b>Number of positions</b>	

**Frequency**

Every 2 years

**Remark**

November 28 to December 5, and December 9 2022

**Summary**

Presentation of the different sources of optical nonlinearities in an optical fibre

**Content**

- Presentation of the different sources of optical nonlinearities in an optical fibre.
- 3rd order optical nonlinearity: 4-wave mixing, optical Kerr effect, pulse compression and soliton propagation, parametric amplification, modulation instability.
- Inelastic scatterings: spontaneous Brillouin and Raman scatterings, stimulated scatterings, amplification and lasers, distributed fibre sensors.
- Advanced applications: supercontinuum generation, optical combs, optical clocks, slow and fast light.

**Keywords**

Optical fibres, nonlinear optics, 4-wave mixing, stimulated scattering, fibre optics sensors, slow and fast light.

**Learning Prerequisites****Recommended courses**

Solid knowledge in electromagnetics, in optics and waveguiding

**Resources****Moodle Link**

- <https://go.epfl.ch/PHYS-607>