Modulbezeichnung:	**Seminar: Modern Optics - Recent advances in nonlinear photonics and communications (PS-MO-Comm)** (Seminar: Modern Optics - Recent advances in nonlinear photonics and communications)	**5 ECTS**
Modulverantwortliche/r:	Birgit Stiller	
Lehrende:	Birgit Stiller	

Startsemester: WS 2020/2021	Dauer: 1 Semester	Turnus: unregelmäßig
Präsenzzeit: 30 Std.	Eigenstudium: 120 Std.	Sprache: Englisch

Lehrveranstaltungen:

Physics Seminar: "Modern Optics - Recent advances in nonlinear photonics and communications" (WS 2020/2021, Hauptseminar, 2 SWS, Birgit Stiller et al.)

Inhalt:

In this seminar we will cover the following topics:

- Supercontinuum generation: sculpturing of broadband light
- Light storage, slow light and electro-magnetic induced transparency - manipulating the speed of information transmission
- Attoscience: light-matter interaction with attosecond temporal resolution
- Experimental cavity optomechanics - interaction of light and vibration
- New waveguides for nonlinear optics, from PCFs to nano waveguide arrays
- Secure communications - hacking the (theoretically) 100%-secure communication channels
- Frequency combs: development & applications
- Silicon photonics - optical chips replacing electronic wires
- Optical waveform generation
- Optical fiber sensing - fast, green, efficient, high-precision sensing of the environment
- Frog and spider, crab and rabbit: techniques to characterize duration and phase of the shortest light pulses
- Nonlinear optical signal processing - harnessing nonlinear effects for advanced communications

Lernziele und Kompetenzen:

Students

- comprehend an interesting physical topic in a short time frame
- identify and interpret the appropriate literature
- select and organize the relevant information for the presentation
- compose a presentation on the topic at the appropriate level for the audience
- use the appropriate presentation techniques and tools
- criticize and defend the topic in a scientific discussion

Literatur:

Will be provided individually for each talk.

Verwendbarkeit des Moduls / Einpassung in den Musterstudienplan:

Das Modul ist im Kontext der folgenden Studienfächer/Vertiefungsrichtungen verwendbar:

[1] **Physics (Master of Science)**

(Po-Vers. 2018w | NatFak | Physics (Master of Science) | Gesamtkonto | Physics seminar(s) | Modern Optics - Recent advances in nonlinear photonics and communications)

Dieses Modul ist daneben auch in den Studienfächern "Materials Physics (Master of Science)", "Physik (Master of Science)", "Physik mit integriertem Doktorandenkolleg (Master of Science)" verwendbar.

Studien-/Prüfungsleistungen:

Modern Optics - Recent advances in nonlinear photonics and communications (Prüfungsnummer: 71921)

Prüfungsleistung, mündliche Prüfung, Dauer (in Minuten): 45
Anteil an der Berechnung der Modulnote: 100%

Erstablegung: WS 2020/2021, 1. Wdh.: WS 2020/2021 (nur für Wiederholer)
1. Prüfer: Birgit Stiller

Organisatorisches:

Please register using StudOn (StudOn-ID: 3246206) www: https://www.studon.fau.de/crs3246206_join.html