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] **Materials Physics (Master of Science)**
(Po-Vers. 2015s | NatFak | Materials Physics (Master of Science) | Gesamtkonto | Seminar in materials physics | Modern Optics - Recent advances in nonlinear photonics and communications)

[2] **Physics (Master of Science)**
(Po-Vers. 2015s | NatFak | Physics (Master of Science) | Gesamtkonto | Physics seminar(s) | Modern Optics - Recent advances in nonlinear photonics and communications)

[3] **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)

[4] **Physik (Master of Science)**
(Po-Vers. 2010 | NatFak | Physik (Master of Science) | Gesamtkonto | Physikalisches Seminar | Modern Optics -

Recent advances in nonlinear photonics and communications)

[5] **Physik mit integriertem Doktorandenkolleg (Master of Science)**
(Po-Vers. 2010 | NatFak | Elitestudiengang Physik mit integriertem Doktorandenkolleg (Master of Science) | Gesamtkonto | Physikalisches Seminar | Modern Optics - Recent advances in nonlinear photonics and communications)

[6] **Physik mit integriertem Doktorandenkolleg (Master of Science)**
(Po-Vers. 2015s | NatFak | Elitestudiengang Physik mit integriertem Doktorandenkolleg (Master of Science) | Gesamtkonto | Physics seminar(s) | Modern Optics - Recent advances in nonlinear photonics and communications)

[7] **Physik mit integriertem Doktorandenkolleg (Master of Science)**
(Po-Vers. 2018w | NatFak | Elitestudiengang Physik mit integriertem Doktorandenkolleg (Master of Science) | Gesamtkonto | Physics seminar(s) | Modern Optics - Recent advances in nonlinear photonics and communications)

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