



Institut für Geographie  
Professur für GIS / Fernerkundung

**Christian Sommer**  
chris.sommer@fau.de  
www.geographie.uni-erlangen.de

Erlangen, den November 12, 2021

*Seminar PG/KG*  
**Vertiefte Methodik:**  
**Active microwave remote sensing**

*Christian Sommer*

**Study programs:** MSc Physical Geography, MA Cultural Geography

**ECTS:** 5 (2 SWS)

**Number of participants:** 20

**Language:** English

**Content:** Optical imagery bears the disadvantage of cloud cover and variable illumination conditions. In contrast, active microwave sensors provide a data source strongly independent of such effects and that enables complementary information retrieval, e.g. deformation monitoring. In the class you will learn the basics and theory as well as practical processing of synthetic aperture radar imagery, its application for different examples from land use land cover, urban areas, snow & ice. You will see how digital elevation models can be derived by SAR interferometry and how the principles of deformation monitoring work.

**Aim of the class:**

- Gain a basic understanding of the sensor technology and analysis steps
- Gain knowledge of different application fields
- Get an idea of potential, limits, difficulties to utilize the technique
- Knowledge and understanding of basic processing steps for SAR data like calibration, automatic co-registration, multi-looking, geocoding and orthorectification, coherence computations, interferometry
- Develop simple shell scripts for automatic processing

**Entry requirements:** Basic GIS knowledge (e.g. generating maps, generating and modifying data, spatial analysis, generating maps), basics of image analysis (e.g. unsupervised and supervised classification, thresholding, filtering), basic scripting (e.g. R, Python) and statistics

**Assessment:** Own small project at the end of the class (includes respective data processing and write-up in paper style), or multiple homework assignments (will be defined before the course starts)

**Start of class / first meeting** see UniVIS