# Exoplanets: Understanding New Worlds with Signal Processing

*Overview:*

More than 5,600 exoplanets have been discovered, and new ones are found every few days. Detecting and analyzing these exoplanets requires highly advanced (space-borne) telescopes and sophisticated signal-processing techniques. With very few exceptions, the light reflected and emitted by a planet cannot be measured separately from the light of its host star. Instead, we have to resort to indirect measurement methods. These methods help constrain an exoplanet's size, mass, and orbital characteristics. They can be used to determine whether the planet has an atmosphere and even retrieve information about the surface or atmospheric composition. The information obtained in this way is used to group exoplanets according to their characteristics and perform statistical studies. The ultimate goals are to further our understanding of the universe and explore the question of habitability outside of the solar system.

The aim of the seminar is to understand the current and future instruments and measurement methods used to detect and analyze extrasolar planets. We will develop an overview of the state of research and dive deep into current scientific questions. Each student will be assigned a specific topic, which should ultimately be presented in a concise and engaging fashion.

*Organizational Structure:*

- The number of participants is limited to 6 students.
- Please register by sending an E-Mail to the contact listed below until 12$^{th}$ of May 2024.
- A kick-off meeting will be scheduled after the registration has passed.
- The presentations should be given in English.
- After halftime a brief (5 minute) “pitch” presentation will be given by each participant, where the other participants can also give feedback on the general presentation style.

*Contact:*

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