# ATOC 4500: Class Project Proposal

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## 1 Background

Less than 2 years ago, scientists discovered the exoplanetary system TRAPPIST-1, the first known system consisting of 7 planets. A vast majority of exoplanets are gas giants, but all the planets in the TRAPPIST-1 system are close to an Earth mass, and some of them are in the classical "habitable zone", meaning their solar irradiance is is similar to $1361 \mathrm{W/m^2}$. Needless to say, TRAPPIST-1 was a very exciting discovery for astronomers, particularly the planets TRAPPIST-1 d, e, and f, which are currently our most likely candidates for a habitable exoplanet. According to solar system formation dynamics, we expect planets like TRAPPIST, which orbit very closely to a very dim start, to be tidally locked, meaning there is a substellar point where the sun is always overhead, a terminator, where the sun is constantly setting, and an anti-stellar point, which never sees the sun.

## 2 Research Questions and Motivation

## 3 Coding

### 3.1 Dependencies

## 4 Plan