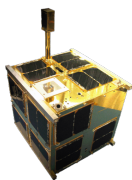


Master Thesis Topic 1: Pulsating A and F stars observed with the BRITE-Constellation and TESS space telescopes

Supervision: Konstanze Zwintz (Room 08/06)

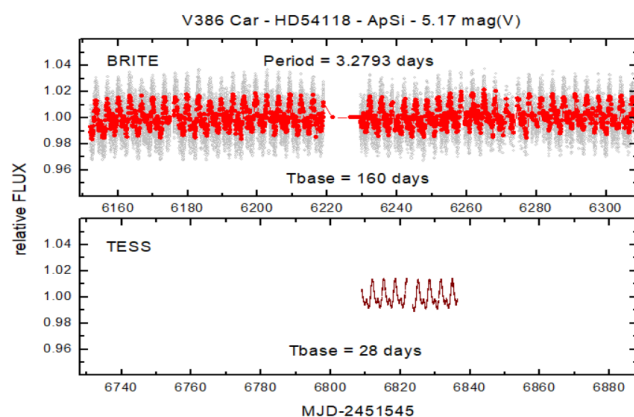
Work focus: In your master thesis you will work on selected stars with spectral types A and F that were observed with the BRITE-Constellation and TESS satellites and show *p*- and *g*-mode pulsations. The goal of this work is a pulsational analysis and asteroseismic interpretation of these stars based on a combination of both data sets. Your work will also be the basis of a scientific publication addressing the A and F stars observed by BRITE-Constellation.

The NASA space telescope TESS (<https://tess.mit.edu>) is currently conducting an all-sky survey to discover transiting exoplanets. A separate science goal is the study of stellar pulsations based on the TESS data. All measurements obtained by TESS immediately become public and are available in an online archive.



The Austrian-Canadian-Polish mission BRITE-Constellation (<https://brite-constellation.at>) consists of five nano-satellites which observe the brightest stars in the sky for up to half a year continuously with the aim to study stellar variability. BRITE-Constellation data are available through Konstanze Zwintz.

As the magnitudes of the TESS and BRITE-Constellation targets overlap, a large fraction of stars observed by BRITE-Constellation has also been observed by TESS with typically higher accuracy but shorter time bases. The figure on the right shows a star with rotational modulation caused by spots on the surface as an example.



In your master thesis you will investigate the BRITE-Constellation and TESS data of the pre-selected sample of pulsating A and F type stars for a first asteroseismic interpretation: you will find out in which frequencies the stars oscillate, if they show *p*- modes or *g*-modes or both, if they are multi- or mono-periodic, if regular spacings in frequency or period can be identified etc. By placing your stars into a Hertzsprung-Russell Diagram based on spectroscopic information (i.e., $\log g$ and effective temperature) retrieved from archives (e.g., the ESO archive) you will then be able to investigate the evolutionary stages of the stars. Finally, a statistical and comparative analyses of all stars should be carried out including a comparison with the information previously known from the literature.

Your work will be the basis of a peer-reviewed publication for which you will become one of the authors.

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