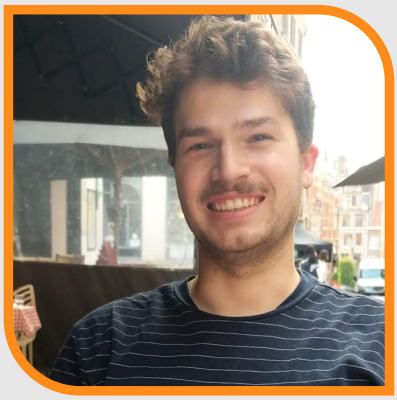

Siemen Burssens

PhD student at the Institute of Astronomy, KU Leuven

Date of Birth: Jan. 9, 1995

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Interests

- Asteroseismology
- Massive stars
- β Cephei stars
- Photometry
- Seismic modelling

Personal

My research focuses primarily on asteroseismic modelling of massive stars in order to constrain their interior physics. Besides my research I am interested in many other things such as science outreach, teaching, learning new languages, active travel and old novels.

Profiles

Education

Postgraduate Studies

2018 – 2022 **PhD in Astronomy and Astrophysics** **KU Leuven, Belgium**
Thesis title: Variability of blue supergiants with the K2 and TESS space mission.
Supervisors: Prof. Dr. Conny Aerts, Dr. Dominic M. Bowman.
Photometry | Spectroscopy | Asteroseismic modelling

2017 – 2018 **M.Sc. in Medical Radiation Physics** **KU Leuven, Belgium**
Thesis title: Knowledge-based treatment planning: a RapidPlan approach.
Supervisors: Ir. Msc. Tom Depuydt
Grade: Cum Laude
Radiotherapy | Treatment planning | PCA analysis

2015 – 2017 **M.Sc. in Astronomy and Astrophysics** **KU Leuven, Belgium**
Thesis title: Molecular analysis of oxygen-rich AGB-star V1300 Aql.
Supervisors: Prof. Dr. Leen Decin, Dr. Taissa Danilovich.
Grade: Cum Laude
AGB stars | Molecular spectroscopy | Stellar winds

Undergraduate Study

2012 – 2015 **Bachelors degree in Physics** **KU Leuven, Belgium**
with a minor in Biochemical Sciences

Publications

Submitting author

- **Burssens, S.**; Bowman, D. M.; Aerts, C. et al., 2019.
New β Cep pulsators discovered with K2 space photometry.
Monthly Notices of the Royal Astronomical Society (Impact factor 5.231, in 2018), Volume 489, Issue 1, p.1304-1320. doi:10.1093/mnras/stz2165.

- **Burssens, S.**; Simón-Díaz, S.; Bowman D. M.; et al. 2020.
Variability of OB stars from TESS southern Sectors 1-13 and high-resolution IACOB and OWN spectroscopy.
Astronomy & Astrophysics (Impact factor 6.209, in 2018), Volume 639, A81.
doi:10.1051/0004-6361/202037700

Co-author

- Bowman, D. M.; **Burssens, S.**; Pedersen, M. G.; et al. 2019.
Low-frequency gravity waves in blue supergiants revealed by high-precision space photometry.
Nature Astronomy (Impact factor 10.500, in 2018), Volume 3, p. 760-765.
doi:10.1038/s41550-019-0768-1.

- Bowman D. M.; **Burssens, S.**; Simón-Díaz, S.; et al. 2020.
Photometric detection of internal gravity waves in upper main-sequence stars: II. Combined TESS photometry and high-resolution spectroscopy.
Astronomy & Astrophysics (Impact factor 6.209, in 2018). Volume 640, A36.
doi:10.1051/0004-6361/202038224

- Pedersen M. G.; Aerts C.; Pápics P.I.; Michielsen M.; Gebruers S.; Rogers T.M.; Molenberghs G.; **Burssens S.**; Garcia S. & Bowman D. M. 2021.
Internal mixing of rotating stars inferred from dipole gravity modes.
Nature Astronomy (Impact factor 10.500, in 2018), Volume 5, p.715-722.
doi:10.1038/s41550-021-01351-x

Skills

Programming:

- Python ●●●●●
- Bash scripting ●●●●○
- Git/Github ●●●○○
- Fortran ●●●○○
- MATLAB ●●●○○
- Java ●●○○○
- Latex ●●○○○

Data analysis:

- Period04 ●●●●●
- GSSP ●●○○○

Modelling:

- MESA ●●●●○
- GYRE ●●●●○

Languages

Dutch (Mother Tongue)

English (IELTS Band score 7.5)

French (10 year at Sec. school)

German (2 years at Sec. school)

Italian (Resident for 10 years)

Spanish (Intro classes A1)

Other research experience

Nov 2017 - May 2018 — **Research student** — **KU Leuven, Belgium**

20% a week extracting and reducing light curve data from the K2 space mission, focusing on OB stars. Developed familiarity with asteroseismology, and data extraction and reduction techniques.

Teaching Experience

Teaching assistant

KU Leuven — **L02C1a: Natuurkunde** — Fall semester '18

Organising exercise sessions on basic concepts of math (differentiation/integration) and physics (mechanics, thermodynamics) for first year physiotherapy students.

KU Leuven — **G0U45a: Inleiding tot de sterrenkunde** — Spring semester '19

Organising exercise sessions on basic concepts of astronomy for first year physics students.

KU Leuven — **E0F05a: Natuurkunde met inbegrip van wiskundige basis**

Fall semester '19, '20, '21

Organising exercise sessions on basic concepts of math (differentiation/integration) and physics (mechanics, thermodynamics) for first year speech therapy students.

KU Leuven — **L08A1a: Natuurkunde en biomechanica** — Spring semester '20

Organising exercise sessions on basic concepts of physics (mechanics, thermodynamics, biomechanics) for first year physical education students.

KU Leuven — **G0P26A: Statistische thermodynamica** — Spring semester '21

Organising exercise sessions on thermodynamics and statistical mechanics for first year physics students.

Outreach

KU Leuven — **Ladies@Science** — Spring '20

Interactive lecture on exoplanets and stellar evolution for students aged 15-16.

KU Leuven — **KinderUniversiteit** — Fall' 19, '20, '21

Setting up experiments and interactive lectures for students aged 8-12.

KU Leuven — **Astronomy lecture** — Spring '21

Online lectures about astronomy and space travel for students aged 13-14.

Conferences

August 2019 — **Stars and their Variability observed from space** — Univ. of Vienna

A zoology of high-mass pulsators with the TESS and K2 space missions (15 minute contributed talk).

July 2020 — **MOBSTER-1 Virtual Astronomy Conference** — Online

Modelling of OB stars with TESS, the construction of an asteroseismic sample (15 minute contributed talk).

June 2021 — **The European Astronomical Society Annual Meeting** — Online

Exploitation of a TESS OB asteroseismic sample: constraints on rotation and interior mixing in the high-mass pulsator HD192575 (15 minute contributed talk).

August 2021 — **TESS Science Conference II** — Online

Exploitation of a TESS OB asteroseismic sample: constraints on rotation and interior mixing in the high-mass pulsator HD192575 (poster contribution).

Observing experience

Fall ’16 **Observations at the Mercator telescope**
Roque de los Muchachos Observatory, La Palma, Spain
Ten day educational observing run as part of a student ‘Observational school’ course at the KU Leuven. Primarily with the HERMES spectrograph.

Spring ’20 **Observations at the Mercator telescope**
Roque de los Muchachos Observatory, La Palma, Spain
Ten day solitary observing run. Primarily with the HERMES spectrograph.