Siemen Burssens

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Key Skills

Data analysis & visualisation
Statistical inference & modelling
Technical & professional writing
Presentation & communication
Project management
Python
numpy/scipy/pandas/plotly/seaborn
Jupyter Notebook
SQL
Git/Github

Personal

I'm interested in the extraction of knowledge from data sets and the delivery of insights for stakeholders of varied backgrounds or to inform policy design. With my experience as a researcher and a data scientist I know how to work efficiently and autonomously in order to meet deadlines and complete project goals in a timely manner. As a result, I have the ability to learn new concepts and methods quickly, and possess strong interpersonal and presentation skills.

Interests

- Problem solving
- Data visualisation
- Machine learning
- Sustainability and SMART cities
- Astronomy and geophysics

Profiles

Education

2018 – 2022 **PhD in Astronomy and Astrophysics** — **KU Leuven, Belgium**
Thesis title: Massive star asteroseismology with TESS and K2.
Supervisors: Dr. Dominic M. Bowman, Prof. Dr. Conny Aerts
Degree obtained: 4 July 2022.
Link to thesis: `https://tinyurl.com/3dbysvrv`

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: 2:1

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: 1st

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

Professional experience

Key projects

- **H2OforAll: Increasing citizens' awareness and engagement regarding disinfection by-products and drinking water quality (2023-2024, University of Leeds).**
  My role in this EU Horizon project includes using data-driven evidence to increase public awareness about disinfection by-products and engage citizens to take actions that protect water quality now and in the future. To achieve this I'm taking a two-way approach: developing a model that allows citizens to calculate their exposure and pollution profiles, and conducting a social study to determine which actions are most readily adopted and lead to overall behavioural change.

  Project management | Systematic literature reviews | Social study design | Survey data analysis | Scientific modelling | Software: Python, R, QGIS

- **MAMSIE/PARADISE: Statistical data modelling of neutron star progenitors (2020-2022, KU Leuven).**
  Here, I developed up a Python-based statistical modelling framework to derive physical properties of neutron star progenitors. This included extracting data from large astronomy databases and the analyses of multiple data sets of different sources. I also performed simulations of stellar structure and evolution using high performance computing, and conducted an in-depth statistical analysis using a variety of computational methods and algorithms.

  The results of this research were published as a research article in the peer-reviewed scientific journal Nature Astronomy (doi:10.1038/s41550-023-01978-y) .

  Time-series data | Multiphysics simulations | High performance computing | Statistical inference | Bayesian analyses | Software: Python, SQL, Fortran

- **MAMSIE/PARADISE: First scientific results of the novel TESS space mission telescope (2019-2020, KU Leuven).**
  In this project I set up a Python-based data processing framework to combine data sets of 98 stars from different telescopes, including data sets from the recently launched TESS space telescope. I then used the framework to deliver new evidence-backed insights into the evolution of stars more massive than our Sun.

  Resulted in the publication of a research article in the peer-reviewed scientific journal *Astronomy and Astrophysics* (doi:10.1051/0004-6361/202037700).

  Data extraction | Time-series data | Scientific computing | Data visualisation | High performance computing | Software: Python, SQL

Languages

Dutch (Native language)

English (IELTS Band score 7.5)

French (10 years at Sec. school)

Italian (Resident for 10 years)

German (2 years at Sec. school)

Spanish (Intro classes A1)

Other relevant experience

- **Four years of teaching experience in undergraduate university programs (2018-2022).**
  Assistant lecturer on courses in mechanics, electrodynamics, thermodynamics, and astronomy. My duties included the development of lesson plans, hands-on exercise sessions, mentoring students, and the design, supervision and correction of exams.

- **Speaker and participant at several international conferences and seminars (2019-2022)**.
  This included conferences organised by the European Astronomical Society (EAS, link), and the International Astronomical Union (IAU361, link). Here, I obtained hands-on experience with proper data visualisation, presentation skills, and public speaking in front of large audiences.

- **Scientific outreach through a variety of channels (2019-2022)**
  This included organising and participating in open science days at the university for young students aged 6 through 16, dedicated visits to local high schools, and writing online blogs and articles. Here, I advanced my communication and presentation skills by presenting complex topics to non-expert audiences in a comprehensive way.

- **Experimental design and on-site observations with the Mercator telescope situated on the island of La Palma, Spain (2018-2022).**
  Principal investigator of HERMES observing programme 99, focused on the gathering of high-resolution spectroscopic data with the HERMES spectrograph mounted on the Mercator telescope (`http://www.mercator.iac.es`). Included two on-site solo observing runs of two weeks where I operated the telescope autonomously.

- **Member of the international IACOB project (2019-2022).**
  International collaborative project focused on the analysis and gathering of high-resolution spectroscopic data sets of massive stars in the Milky way.
  (`http://research.iac.es/proyecto/iacob/`).

- **Member of the local organising committee of the TASC6/KASC13 Astronomy conference, Leuven, Belgium, 11-15 July 2022 (300 participants).**
  In this role I developed both organisational and managerial skills as part of a team.