

# JORDAN VAN BEECK

**POSITION:** PhD student Astronomy & Astrophysics, KU Leuven

## CONTACT INFORMATION

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## RESEARCH INTERESTS

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Much of my work is related to waves propagating inside stars (i.e. asteroseismology), where I focus on coupling theoretical astrophysics to observations. Within this broad research topic, I characterize the influence of stellar magnetic fields, as well as wave interactions and their implications for stellar structure and evolution. I ponder about astrobiological questions on habitability of (exo)planets and (exo)moons, especially when this can be related to stellar activity, and am broadly interested in planetary sciences. Formerly trained as a chemist (and astrophysicist), I am also interested in analytical or theoretical chemistry-related research, for example, investigating the dust formation mechanism in winds of evolved stars.

## SCIENTIFIC EDUCATION

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09/2017–07/2019	ASTRONOMY & ASTROPHYSICS, MSc. KU Leuven Thesis title: The influence of an interior magnetic field on gravity-mode oscillations of intermediate-mass stars <i>Promoters: Prof. Dr. C. Aerts, Dr. T. Van Reeth, Dr. D. M. Bowman</i>
09/2015–09/2017	CHEMIE / CHEMISTRY, MSc. University of Antwerp (Universiteit Antwerpen) Thesis title: Characterization of radioactive particles <i>Promoters: Prof. Dr. K. Janssens, Prof. Dr. B. Salbu, Prof. Dr. O.-C. Lind, MSc. G. Nuyts</i>
09/2012–09/2015	CHEMIE / CHEMISTRY, BSc. University of Antwerp (Universiteit Antwerpen) Thesis title: Atomic scale reactive MD studies of DNA oxidation for plasma oncology: the role of H <sub>2</sub> O <sub>2</sub> and HO <sub>2</sub> <i>Promoters: Prof. Dr. A. Bogaerts, Prof. Dr. E. Neyts, Dr. C. Verlackt</i>

## AWARDS AND HONORS

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2019	Paul Smeyers Prize, KU Leuven Awarded to the annual best master's thesis in Astronomy & Astrophysics at the June examination session.
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## TEACHING EXPERIENCE

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### Courses and modules

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| 09/2019 (ongoing) | Teaching assistant for courses 'Natuurkunde met elementen van wiskunde' I and II (in Dutch, translation: 'Physics with elements of mathematics' I and II) for first year bachelor students in Pharmaceutical sciences, KU Leuven |
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## RESEARCH EXPERIENCE

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| 09/2019 (ongoing) | <p><b>PhD student at Institute of Astronomy / Instituut voor sterrenkunde, Prof. Dr. Conny Aerts, Prof. Dr. Tim Van Hoolst and Dr. Dominic Bowman, KU Leuven</b></p> <p><b>Topic:</b> Application of nonlinear asteroseismology to Kepler and TESS space photometry</p> <p>Main focus: extending current linear asteroseismological tools (that put models of the stellar interior to the test) to the nonlinear domain for intermediate-mass gravity-mode pulsating stars.</p>  |
| 10/2018-6/2019    | <p><b>Master's thesis research project at the Institute of Astronomy / Instituut voor sterrenkunde, Prof. Dr. Conny Aerts, Dr. Dominic Bowman, Dr. Timothy Van Reeth, KU Leuven</b></p> <p><b>Topic:</b> The influence of an interior magnetic field on gravity-mode oscillations of intermediate-mass stars</p> <p><b>Contributions:</b> two publications as a co-author, a first-author publication, and a poster presentation.</p>  |
| 02/2018 (ongoing) | <p><b>Theoretical chemistry research project at Institute of Astronomy / Instituut voor sterrenkunde, Prof. Dr. Leen Decin and Dr. David Gobrecht, KU Leuven</b></p> <p><b>Topic:</b> Dust cluster nucleation in (carbon-rich) winds of asymptotic giant branch stars</p> <p><b>Contribution:</b> a technical report.</p>  |
| 2016-2017         | <p><b>Master's thesis research project at the AXES research group, Prof. Dr. Koen Janssens, MSc. Gert Nuyts, University of Antwerp (Universiteit Antwerpen) and the Centre for Environmental Radioactivity (CERAD), Ole-Christian Lind, Norwegian University of Life Sciences (NMBU)</b></p> <p><b>Topic:</b> Characterization of radioactive particles. (Mainly using X-ray analysis techniques to characterize environmental radionuclides.)</p> <p><b>Research stay:</b> a short research stay in May 2016 at the Deutsches Elektronen-Synchrotron (DESY), providing access to high spatial and spectral resolution X-ray analysis.</p> |

## GRANTS AND FELLOWSHIPS

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| 2019 - 2023 | 4-year PhD Fellowship, <a href="#">Department of Physics and Astronomy, KU Leuven</a> |
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## MEMBERSHIP OF SCIENTIFIC ORGANIZATIONS

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- Since 2019 | Graduate student member of the International Research Network for Nuclear Astrophysics ([IReNA](#)).
- Since 2020 | Graduate student member of the American Astronomical Society ([AAS](#)).
- Since 2020 | Graduate student member of the Royal Netherlands Astronomical Society/Koninklijke Nederlandse Astronomenclub ([KNA](#)).

## CONFERENCES AND WORKSHOPS

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- October 2018 | STFC/MAMSIE mini-workshop
- April 2019 | STFC/MAMSIE mini-workshop
- June 2019 | 74th Dutch Astronomy Conference/Nederlandse Astronomenconferentie, Groningen/Paterswolde, the Netherlands.
- July 2020 | Let's Talk Science: 8th Summer School for Science Communication and Communicative Competences ([online](#))
- July 2020 | MOBSTER-1 Virtual conference 2020: Stellar variability as a probe of magnetic fields in massive stars ([online](#)).
- August 2021 | 10<sup>th</sup> MESA summer school ([online](#))
- July 2022 | TASC6/KASC13 conference of the asteroseismic community. More information can be found on [this website](#).

## TALKS AND PRESENTATIONS

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- June 2019 | "Constraining magnetic fields in intermediate-mass main-sequence stars with asteroseismology" ([POSTER](#)), 74th Dutch Astronomy Conference/Nederlandse Astronomenconferentie, Groningen/Paterswolde, the Netherlands.
- July 2020 | "Linking detected gravity modes to axisymmetric internal magnetic fields" ([CONTRIBUTED TALK](#)), MOBSTER-1 Virtual conference 2020: Stellar variability as a probe of magnetic fields in massive stars ([online](#), hosted by University of Delaware, USA).

## CONFERENCE ORGANISATION

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- July 2022 | TASC6/KASC13 at Leuven, Belgium: part of the LOC. More information can be found on [this website](#).

## MAIN PEER-REVIEWED SCIENTIFIC PUBLICATIONS

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As of July 2, 2021, my citation metrics are:

- **Google Scholar:** 45 citations, h-index 3
- **NASA ADS:** 37 citations, h-index 3

### Published articles (listed: # of citations from NASA ADS)

1. **J. Van Beeck**, V. Prat, T. Van Reeth, S. Mathis, D. M. Bowman, C. Neiner, and C. Aerts. Detecting axisymmetric magnetic fields using gravity modes in intermediate-mass stars. *Astronomy & Astrophysics*, volume 638, article id. A149, June 2020. (Citations: 10)  
DOI: [10.1051/0004-6361/201937363](https://doi.org/10.1051/0004-6361/201937363)  
Inlists: [Zenodo link](#)
2. V. Prat, S. Mathis, C. Neiner, **J. Van Beeck**, D. M. Bowman, and C. Aerts. Period spacing of gravity modes in rapidly rotating magnetic stars. II. The case of an oblique dipolar fossil magnetic field. *Astronomy & Astrophysics*, volume 636, article id. A100, April 2020. (Citations: 9)  
DOI: [10.1051/0004-6361/201937398](https://doi.org/10.1051/0004-6361/201937398)
3. V. Prat, S. Mathis, B. Buysschaert, **J. Van Beeck**, D. M. Bowman, C. Aerts, and C. Neiner. Period spacings of gravity modes in rapidly rotating magnetic stars I. Axisymmetric fossil field with poloidal and toroidal components. *Astronomy & Astrophysics*, Volume 627, article id. A64, July 2019. (Citations: 18)  
DOI: [10.1051/0004-6361/201935462](https://doi.org/10.1051/0004-6361/201935462)

### Conference proceedings

1. V. Prat, S. Mathis, B. Buysschaert, **J. Van Beeck**, D. M. Bowman, C. Aerts, and C. Neiner. Effect of the magnetic field on period spacings of gravity modes in rapidly rotating stars. *Proceedings of the conference Stars and their Variability Observed from Space*, held in Vienna on August 19-23, 2019. Eds.: C. Neiner, W. W. Weiss, D. Baade, R. E. Griffin, C. C. Lovekin, A. F. J. Moffat. University of Vienna, 2020, pp.105-106  
[NASA ADS link](#)