

Jeppe Sinkbæk Thomsen

Curriculum Vitae, 2025-07-07

Dipartimento di Fisica e Astronomia

Università di Bologna

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Education and academic work

- 2023– **PhD, Astrophysics**, *University of Bologna*, Bologna, Italy.
Supervisor: Andrea Miglio.
- 2022–2023 **Student support astronomer**, *Nordic Optical Telescope (NOT)*, La Palma, Spain.
Project: "FIES velocity stability". Supervisors: John Telting & Frank Grundahl.
- 2022 **Research assistant**, *Aarhus University*, Aarhus, Denmark.
- 2020–2022 **Master of Science, Astronomy**, *Aarhus University*, Aarhus, Denmark.
Thesis: "Comparing Asteroseismic Estimates with Dynamical Mass and Radius for the Red Giant in the Eclipsing Binary KIC8430105", grade (DK7-point) 12. Supervisors: Frank Grundahl & Karsten Brogaard.
- 2016–2020 **Bachelor of Science, Physics**, *Aarhus University*, Aarhus, Denmark.
Dissertation: "Asteroseismology of Stars", grade (DK7-point) 10. Supervisor: Hans Kjeldsen.

Teaching

- 2018-2019 **Physics summer school 18 & 19**, *Youth association of science (UNF)*, Denmark.
Courses: Lagrangian mechanics, the two-body problem, astrophysics, geophysics.

Leadership and service to the community

- 2017–2019 **Regional board**, *UNF, Aarhus, Denmark*.
Accountant (2017), Co-Chair (2018), Board member (2019).
- 2016 **Organizer & Co-coordinator of physics summer camp**, *UNF, Denmark*.
- 2016 **National board**, *UNF, Denmark*.
- 2015 **Grant applications**, *UNF, Denmark*.
Applied for grants to fund UNF physics summer camp 2015. Obtained 180.000 DKK (~20.600 GBP), allowing full funding for the camp and partial funding of Biotech, Chemistry and Nanotech camps.

Competitive telescope time allocations

Principal investigator proposals

- 2024–2025 **Spectroscopic confirmation and study of evolved asteroseismic binaries**, *NOT*.
110 Hours granted, 40H completed.
- 2023-2024 **Anomalous radial velocities in the eclipsing binary KIC10001167**, *NOT*.
26H granted, 22H completed.
- 2023 **Investigating a possible third companion in the eclipsing binary KIC10001167**, *NOT*.
2H granted, 2H completed.

Co-investigator proposals

- 2024-2025 **Exploring asteroseismic binaries**, *NOT*, PI: Mikkel Lund. 118H.
- 2023-2025 **Establishing the accuracy of asteroseismic mass, radius, and age estimates of giant stars using eclipsing binaries**, *NOT*, PI: Karsten Brogaard. 129H.
- 2023 **Improving our understanding of stellar physics with open star clusters**, *NOT*, PI: Karsten Brogaard. 48H.

Talks and seminars

- 2025/07/03 **Contributed talk**, *KIC10001167 – the prototype eclipsing binary for red giant seismology in the old in-situ Milky Way population*, Binary Stars in the Space Era conference, Keele University, UK.
- 2025/03/07 **Seminar**, *KIC10001167 – An eclipsing binary to benchmark asteroseismology of old red giants*, Sun, Stars and Exoplanets group, Birmingham University, UK.
- 2025/02/26 **Seminar**, *KIC10001167 – An eclipsing binary to benchmark asteroseismic ages of old red giants*, Astrophysics Research Centre, Keele University, UK.
- 2025/01/03 **Seminar**, *5 m/s radial velocity precision over 10 months with FIES*, Aarhus University, Denmark.
- 2024/12/11 **Seminar**, *5 m/s radial velocity precision over 10 months with FIES*, Nordic Optical Telescope, La Palma.
- 2024/07/19 **Contributed talk**, *KIC10001167 – The prototype eclipsing binary for the old Milky Way disk*, TASC8/KASC15 Porto, Portugal.
- 2024/07/02 **Online seminar**, *Detection of spectroscopic (SB2) binaries*, GALAH science telecon.

Programming and analysis software experience

Python **Extensive.**

Package experience (among others): scipy, numpy, astropy, lightkurve, dynesty, emcee, multiprocessing, joblib, ellc, phoebe2, PBJam, PSFmachine, scikit-learn, celerite2.

Personal (public) packages and codes.

[sb2sep](#), [FIEStoolReduction](#).

C# **Moderate.**

University course "Practical programming and numerical methods". [Course github](#).

C++ **Basic.**

PhD training course "Advanced numerical and computational techniques: Introduction to HPC and ML + Parallel computing".

Software **Non-exhaustive.**

[JKTEBOP](#), [DIAMONDS](#), FIEStool, $\LaTeX$, SLURM (cluster computing), makefile.

Language, interests, and other skills

Language **Danish**, *Mothertongue*.

Language **English**, *IELTS band 8*.

Language **Spanish, Italian, German**, *Limited understanding*.

Driving **Danish (EU) driver's license**.

Interests **Personal interests.**

Badminton, scientific outreach, Linux home media server, hiking, astrophotography, amateur photography, board games.

Publications

Peer-reviewed, first and second author

- 2025 **J. S. Thomsen**, A. Miglio, K. Brogaard, J. Montalbán, M. Tailo, W. E. van Rossem, G. Casali, D. Jones, T. Arentoft, L. Casagrande, D. Sebastian, G. Buldgen, A. H. M. J. Triaud, M. Matteuzzi, A. Stokholm, M. N. Lund, B. Mosser, P. F. L. Maxted, J. Southworth, J. T. Gadeberg, N. Koivisto, Z. Gray, V. Pinter, K. Matilainen, A. A. Djupvik, J. Jessen-Hansen, F. Grundahl, D. Slumstrup, and S. Frandsen. Advancing the accuracy in age determinations of old-disk stars using an oscillating red giant in an eclipsing binary. *Astronomy & Astrophysics*, volume 699, page A152, 2025.
- 2025 A. Mazzi, **J. S. Thomsen**, A. Miglio, K. Brogaard, L. Girardi, D. Bossini, M. Matteuzzi, and W. E. van Rossem. DUETS: Setting expectations for asteroseismic binaries and binary products with synthetic populations. *To be published in Astronomy & Astrophysics*, page arXiv:2504.19866, April 2025.
- 2022 **J. S. Thomsen**, K. Brogaard, T. Arentoft, D. Slumstrup, M. N. Lund, F. Grundahl, A. Miglio, J. Jessen-Hansen, and S. Frandsen. Establishing the accuracy of asteroseismic mass and radius estimates of giant stars - II. Revised stellar masses and radii for KIC 8430105. *Monthly Notices of the Royal Astronomical Society*, volume 517, pages 4187–4201, December 2022.

Peer-reviewed

- 2024 V. Grisoni, C. Chiappini, A. Miglio, K. Brogaard, G. Casali, E. Willett, J. Montalbán, A. Stokholm, **J. S. Thomsen**, M. Tailo, M. Matteuzzi, M. Valentini, Y. Elsworth, and B. Mosser. K2 results for “young” α -rich stars in the Galaxy. *Astronomy & Astrophysics*, volume 683, page A111, March 2024.
- 2024 K. Brogaard, A. Miglio, W. E. van Rossem, E. Willett, and **J. S. Thomsen**. Connecting integrated red giant branch mass loss from asteroseismology and globular clusters. *Astronomy & Astrophysics*, volume 691, page A288, November 2024.
- 2023 J. Geem **et al.** Spectral type and geometric albedo of (98943) 2001 CC₂₁, the Hayabusa2# mission target. *Monthly Notices of the Royal Astronomical Society*, volume 525, pages L17–L21, October 2023.
- 2023 Davide Farnocchia **et al.** The Second International Asteroid Warning Network Timing Campaign: 2005 LW3. *The Planetary Science Journal*, volume 4, page 203, November 2023.
- 2023 K. Brogaard, T. Arentoft, A. Miglio, G. Casali, **J. S. Thomsen**, M. Tailo, J. Montalbán, V. Grisoni, E. Willett, A. Stokholm, F. Grundahl, D. Stello, and E. L. Sandquist. Asteroseismic age estimate of the open cluster NGC 6866 using Kepler and Gaia. *Astronomy & Astrophysics*, volume 679, page A23, November 2023.

In Conference Proceedings

- 2024 Alessandro Mazzi, Andrea Miglio, Léo Girardi, Enrico Corsaro, and **Jeppe Thomsen**. Gaining insights into binary populations by combining photometric and spectroscopic data with asteroseismology. In *EAS2024*, page 2065, July 2024.

Miscellaneous

- 2022 D. B. Malesani, L. Izzo, **J. S. Thomsen**, and R. Clavero. GRB 220623A: NOT optical observations. *GRB Coordinates Network*, volume 32253, page 1, June 2022.