

Pr. Denis Defrère

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Contact
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- EMPLOYMENT
- ◇ **Associate Professor** Oct 2020 – present
Instituut voor Sterrenkunde, KU Leuven.
 - ◇ **Research Scientist** Mar 2016 – Sep 2020
STAR Institute (PSILab/FNRS/CSL), University of Liège.
 - ◇ **Research Associate** Sep 2012 – Feb 2016
Steward Observatory, University of Arizona
 - ◇ **Postdoctoral Fellow** Jan 2010 – Aug 2012
Max Planck Institute for Radio Astronomy
 - ◇ **FNRS/FRIA PhD student** Oct 2005 – Dec 2009
STAR Institute (AEOS), University of Liège.
 - ◇ **ESA Trainee** Feb 2005 – May 2005
Advanced Concepts Team at ESTEC (ESA)

- PROFESSIONAL EXPERIENCE
- ◇ **Associate partner** of the [VLTI/GRAVITY+](#) consortium (2020 - present)
 - ◇ **Science Team Member** of [ELT/METIS](#) (2019 - present), the LEECH exoplanet survey (2012-2016), and the HOSTS exozodi survey (2012 – 2020).
 - ◇ **ULiège Project Manager** for ELT/METIS (2019 - 2020).
 - ◇ **Designated Campus Colleague** at Steward Observatory (University of Arizona, 2019 – 2020).
 - ◇ **Principal Investigator** of the [NOTT interferometer project](#) (2017 – present).
 - ◇ **Technical Lead** of the [Large Interferometer For Exoplanets](#) (LIFE, 2018 – 2023)
 - ◇ **Instrument Scientist** of the [Large Binocular Telescope Interferometer](#) (2012 – 2016).
 - ◇ **Night astronomer** for the Large Binocular Telescope Interferometer (100+ observing nights, 2012 – 2016).
 - ◇ **Fizeau visitor** of the European Commission (FP6 and FP7) at the “Institut de Planétologie et d’Astrophysique de Grenoble” (2007, 2010, and 2012) and “ETH Zurich” (Swiss Federal Institute of Technology, 2019).
 - ◇ **External expert** on the DARWIN/TPF project for ESA/ESTEC (2005 – 2006) and NASA/JPL (2007 – 2008).
 - ◇ **Chairman** of a [satellite meeting](#) at the “Pathways to habitable planets” conference on the “Prevalence of exozodiacal dust” (~50 participants, Bern 2015).
 - ◇ Workshop organization ([Hi-5 kickoff meeting](#), [LIFE kickoff meeting](#), [LIFE workshop at Lorentz center](#), [Asgard workshop](#), [Asgard/NOTT exozodi workshop](#)).
 - ◇ 240+ publications including 88 refereed in astronomy journals (including 4 in *Nature*).
 - ◇ 20+ oral presentations at international conferences with a selection committee.

- EDUCATION
- ◇ **Ph.D. in Science**, orientation Astrophysics, University of Liège, December 2009.
Thesis: *Detection of exozodiacal dust: a step toward Earth-like planet characterization with infrared interferometry*. (Supervisors: Pr. Surdej, Dr. Absil)

- ◇ **M.Phil. in Science (highest honors, PGD)**, orientation Astrophysics, University of Liège, September 2007. Thesis: *Performance study of space-based infrared nulling interferometers*. (Supervisors: Pr. Surdej, Dr. Absil)
- ◇ **Civil Engineer in Physics (highest honors, PGD)**, University of Liège, June 2005. Thesis: *Implications of the Pioneer anomaly for the Laser Interferometer Space Antenna (LISA)*. (Supervisors: Pr. Swings, Dr. Rathke)

SKILLS

- ◇ Expert in high-contrast interferometry and exozodiacal disks
- ◇ Astronomical observations/operations: visible to mid-IR imaging, interferometry, integral field and slit spectroscopy
- ◇ High-contrast imaging and interferometry data reduction and analysis
- ◇ Adaptive optics/wavefront sensing and control: operations, laboratory experiments, and simulations
- ◇ End-to-end instrument simulations and optimization
- ◇ French (native), English (proficient), Dutch (level B2), and German/Spanish (basic)
- ◇ Fluent in various scientific (IDL, Python, MATLAB, C/C++, Fortran) and web-oriented (Html5, PHP, MySQL, Javascript) programming languages

AWARDS AND GRANTS

- ◇ NASA Honor Group Achievement Award, together with the HOSTS team (2020)
- ◇ NASA Honor Group Achievement Award, together with the NASA/JPL team (2019).
- ◇ ERC Consolidator grant for the SCIFY project (2019).
- ◇ Marie Skłodowska-Curie Actions Seal of Excellence (2017).
- ◇ FNRS scientific collaborator grant (2017-2018).
- ◇ OPTICON-H2020 Joint Research Network grant (2016).
- ◇ Max Planck Society grant for independent research (2010).
- ◇ Fizeau Exchange Visitors Grant of the European Interferometry Initiative (4 times).
- ◇ FNRS/FRIA Graduate Fellowship (2005-2009).
- ◇ Odissea Award of the Belgian Senate for the diploma thesis (2005).
- ◇ J. Genard Award of the Astrophysics Department at University of Liege (2005).
- ◇ Pisart grant (merit-based scholarship awarded every year to engineering students at the University of Liege, 2005).

TEACHING ACTIVITIES

- ◇ **Observational techniques** in Master of Astronomy and Astrophysics ([link](#), KU Leuven).
- ◇ **Planetary Systems** in Master of Astronomy and Astrophysics ([link](#), KU Leuven).
- ◇ **Invited Lecturer** in “Space experiment development” ([link](#), University of Liege).
- ◇ **Invited Lecturer** at Caltech’s Sagan Exoplanet Workshop: “Imaging Planets and Disks”.
- ◇ **Substitute Lecturer** in “Astrophysics and space techniques” (Prof. J. Surdej).
- ◇ **Supervisor** of 9 master theses and 4 PhD theses.
- ◇ **Jury member** of 14 PhD theses in Astrophysics.

COMMUNITY SERVICE

- ◇ **Bureau member of the European Interferometry Initiative (EII)** ([link](#), 2020 – present).
- ◇ **Coordinator of the Belgian VLTI expertise center** ([link](#), 2018 – present).
- ◇ **ESO OPC panel member** (2017 – 2018).
- ◇ **Scientific referee** for major astronomy journals (Nature, ApJ, A&A, PASP, JATIS).

- ◇ **ULiège representative** at Belgian National ESO Committee (2016 – 2020).
- ◇ **Participant or Organizer** of outreach activities at the Science Spring Break, a yearly science meeting for school kids.
- ◇ **Invited lecturer** at several general public conferences (Liège, Paris, Lyon, Tucson).

PRESS
RELEASES

- ◇ *Weighing a black hole in the early universe*, [ESO news](#) (2024).
- ◇ *Launch of Europe’s largest astronomy network*, [CNRS news](#) (2021).
- ◇ *Stellar Dust Survey Paves Way for Exoplanet Missions*, [NASA](#) (2nd author, 2018).
- ◇ *Multi-phase volcanic resurfacing at Loki Patera on Io*, [Forbes](#) (2017).
- ◇ *Scientists caught a new planet forming for the first time ever*, [The Washington Post](#) (2015).
- ◇ *An image of a whole planetary system*, [Max Planck Society](#) (2015).
- ◇ *Lava Lake on Moon of Jupiter Revealed in Remarkable Detail*, [National Geographic](#) (2015).
- ◇ *Telescope To Seek Dust Where Other Earths May Lie*, [NASA/JPL](#), [ULg](#) (1st author, 2015).
- ◇ *VLT Detects Exozodiacal Light*, [ESO](#) (3rd author, 2014).
- ◇ *Astronomers Gear Up to Discover Earth-like Planets*, [Astrobiology](#) (2nd author, 2013).
- ◇ *Dust near the habitable zone of stars*, [CNRS](#) (2nd author, 2013).

SELECTED
INVITED
TALKS

- ◇ *Review of high-contrast optical stellar interferometry*, invited talk at the SPIE meeting, San Diego, 2020.
- ◇ *Thermal background calibration with LBTI*, invited talk at the ”thermal infrared observations” workshop, Munich, 2020.
- ◇ *Technological challenge for the Large Interferometer For Exoplanets*, invited talk at ESTEC, Noordwijk, 2019.
- ◇ *Characterizing exoplanetary atmospheres with a mid-infrared nulling spectrograph*, invited talk at Astrobiology meeting, Brussels, 2017.
- ◇ *Proxima Cen b: theoretical spectral signatures for different atmospheric scenarios*, invited talk at EWASS, Prague, 2017.
- ◇ *Theory and early results of the Large Binocular Telescope Interferometer*, invited lecture at the Sagan Exoplanet Summer Workshop, Los Angeles, 2014.
- ◇ *Infrared interferometric detection of exozodiacal dust: status and prospects*, invited seminar at Caltech/IPAC, Los Angeles, 2013.
- ◇ *Infrared interferometric observations with the VLTI*, invited seminar at the University of Chile, Santiago, 2012.
- ◇ *Near-infrared interferometric observations of nearby debris disks*, invited seminar at the “Paris Observatory - LESIA”, Paris, 2011.
- ◇ *Interferometric observations in astronomy*, invited talk at the “grande conférence de l’institut d’astrophysique de Lyon”, Lyon, 2011.
- ◇ *Detection of exozodiacal dust: a step toward Earth-like planet characterization with infrared interferometry*, invited talk at the “grande conférence de l’institut d’astrophysique de Paris”, Paris, 2010.
- ◇ *Observing extrasolar planetary systems with infrared interferometry*, invited seminar at the Astrophysical Institute, Jena University, 2009.
- ◇ *Pioneer anomaly: what can be learned from LISA?*, invited talk at the “Laser, Clocks and Drag-Free: technologies for future exploration in space and tests of gravity”, ZARM, Bremen, 2005.