

# Marie Van de Sande

## Curriculum vitae

Institute of Astronomy, KU Leuven  
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<https://marievds.github.io/>

### • Employment

- 01/10/2018 - 30/09/2021 **Postdoctoral fellow** of the Research Foundation - Flanders (FWO),  
Institute of Astronomy, KU Leuven
- 24/05/2018 - 30/09/2018 **Postdoctoral researcher** funded by ERC Consolidator Grant AEROSOL,  
Institute of Astronomy, KU Leuven

### • Education

- 01/09/2014 - 23/05/2018 **Doctor of Science:** Astronomy and Astrophysics  
Institute of Astronomy, KU Leuven, Belgium  
*"The gas-phase chemistry in the circumstellar environments of AGB stars"*  
Supervised by Prof Dr Leen Decin  
<https://fys.kuleuven.be/ster/pub/phd-marie-van-de-sande/phd-thesis-marie-van-de-sande>
- 24/09/2012 - 03/07/2014 **Master of Science:** Astronomy and Astrophysics, *cum laude*  
Institute of Astronomy, KU Leuven, Belgium  
*"Probing flickering variability in cataclysmic variable stars"*  
Supervised by Dr Simone Scaringi and Prof Dr Christian Knigge
- 23/01/2014 - 14/06/2014 **Erasmus exchange**  
School of Physics and Astronomy, University of Southampton, UK  
Master's thesis co-supervisor Prof Dr Christian Knigge

### • Grants and awards

<b>Marie Skłodowska-Curie action IF 2019 ICEDRAGON</b>	<b>Project funding of €213,000</b>
Marie Skłodowska-Curie action IF 2018 ICEDRAGON	Seal of Excellence
IAU Symposium 350: Laboratory Astrophysics	IAU travel grant of €540
ATOMIUM data reduction and preliminary science meeting	MARCUs travel grant of £400
<b>Postdoctoral fellowship Research Foundation - Flanders</b>	<b>Project funding of €180,000</b>
IAU Symposium 332: Astrochemistry VII	IAU travel grant of €500
	<b>Poster prize</b>
Summer school: Astrochemistry from Space to Earth	Financial support of €600
Erasmus funding	Financial support of €1,550

- **List of contributed talks, posters and seminars at international conferences and scientific institutes**

- May 2021 **Planned: contributed talk** European Conference on Laboratory Astrophysics, Capri, Italy: "Molecular line emission as a tracer of the dust-grain size distribution within AGB outflows"
- Mar 2021 **Planned: contributed talk** Faraday joint interest group conference, Sheffield, UK: "Molecular line emission as a tracer of the dust-grain size distribution within AGB outflows"
- Sep 2019 **Contributed talk** The physics and chemistry of the interstellar medium, Avignon, France: *"The effect of circumstellar dust grains on the gas-phase chemistry in AGB outflows"*
- Aug 2019 **Contributed talk** A star has evolved - a conference in the honor of Hans Olofsson, Smogen, Sweden: *"The effect of dust-gas reactions on the gas-phase chemistry"*
- May 2019 **Seminar** Université Libre de Bruxelles, Belgium: *"Stellar winds of AGB stars as astrochemical laboratories"*
- Apr 2019 **Contributed talk** IAU Symposium 350: Laboratory Astrophysics: From observation to interpretation, Cambridge, UK: *"AGB outflows as test of chemical kinetics and radiative transfer models"*
- Feb 2019 **Seminar** University of Leeds, UK: *"The stellar winds of AGB stars as astrochemical laboratories"*
- Feb 2019 **Seminar** University of Manchester, UK: *"The role of stellar photons on the circumstellar envelopes of AGB stars."*
- Oct 2018 **Lunch talk** at Leiden Observatory, the Netherlands
- Aug 2018 **Poster** at IAU Symposium 343: Why Galaxies Care About AGB stars, Vienna, Austria: *"The chemistry in clumpy AGB outflows"*
- Apr 2018 **Contributed talks** European Week of Astronomy and Space Science 2018, Liverpool, UK: *"Understanding the effects of clumping and porosity on the growth of carbon chains in the stellar outflow of the carbon-rich AGB star IRC+10216"* and *"Gaseous metal oxides and hydroxides tracing the formation of extra-terrestrial dust grains"* (first author L. Decin)
- Sep 2017 **Contributed talk** Astrochemical conference KIDA 2017, Bordeaux, France: *"Determining the effect of a non-uniform AGB outflow on its chemistry"*
- Aug 2017 **Seminar** University of Leeds, UK: *"Determining the effect of a non-uniform AGB outflow on its chemistry"*
- Jul 2017 **Contributed talk** The Physics of Evolved Stars: The Role of Binarity, Nice, France: *"Determining the effect of a non-uniform AGB outflow on its chemistry"*
- May 2017 **Contributed plenary talk** Nederlandse Astronomenconferentie 2017, Nijmegen, the Netherlands: *"Determining the effect of a non-uniform AGB outflow on its chemistry"*
- Mar 2017 **Poster** IAU Symposium 332: Astrochemistry VII, Puerto Varas, Chile: *"Determining the effect of a non-uniform AGB outflow on its chemistry"*.  
**Winner of poster prize.**
- Nov 2016 **Contributed talk** European Conference on Laboratory Astrophysics, Madrid, Spain: *"Using forward chemistry to improve the understanding of the stellar winds of O-rich AGB stars"*

- Jun 2016 **Poster** Cool Stars 19, Uppsala, Sweden: *"Probing the abundance of SiO and HCN throughout the stellar wind of R Dor"*
- May 2016 **Contributed talk** at RAS Astrophysical Chemistry Group Meeting, Manchester, UK: *"SiO and HCN throughout the stellar wind of R Doradus"*
- Jul 2015 **Poster** Stellar End Products: The Low Mass - High Mass Connection, Garching, Germany: *"Unravelling the dust formation process in R Doradus"*
- Jun 2015 **Poster** The Physics of Evolved Stars: a conference dedicated to the memory of Olivier Chesneau, Nice, France: *"Unravelling the dust formation process in R Doradus"*
- Jun 2014 **Poster** National Astronomy Meeting 2014, Portsmouth, UK: *"The universal nature of accretion-induced variability: rms-flux relation in two more accreting white dwarfs"*

- **Awarded observing time as co-investigator**

- 2020 ALMA, *"Initial mass estimates for AGB stars from oxygen isotopes"*, PI T. Danilovich, KU Leuven (Belgium). ID 2019.1.00187.S, 10.5 h awarded
- 2019 VLT/SPHERE + VLT/MATISSE, *"Tracing the origins of dust species in O-rich M-type stars through an ambitious multi-wavelength approach"*, PI M. Montarges, KU Leuven (Belgium). ID 0103.D- 0772, 21.5 h + 7.3 h awarded
- 2019 ALMA, **Large Programme "ATOMIUM: ALMA Tracing the Origins of Molecules In dUst-forming oxygen-rich M-type stars"**, PI L. Decin, KU Leuven (Belgium). ID2018.1.00659.L, 113.2 h awarded
- 2019 ALMA, *"Resolving the inner wind and exposing a potential companion of the AGB star EP Aquarii"*, PI W. Homan, KU Leuven (Belgium). ID 2018.1.00750.S, 2 h awarded
- 2018 APEX, *"H<sub>2</sub>S towards extreme OH/IR stars"*, PI T. Danilovich, KU Leuven (Belgium). ID 102.F- 9301, 15.1 h awarded
- 2017 APEX, *"A spectral survey of low and intermediate mass-loss rate carbon stars"*, PI T. Danilovich, KU Leuven (Belgium). ID 099.D-0750, 36 h awarded
- 2017 VLT/SPHERE, *"Constraining the dust properties of the winds of red supergiants as a means to solve the mass-loss problem"*, PI L. Decin, KU Leuven (Belgium). ID 099.D-0600, 5.3 h awarded
- 2016 ALMA, *"The quest for the building blocks of the warm dust species in the inner wind of R Dor"*, PI L. Decin, KU Leuven (Belgium). ID 2017.1.00824.S, 6 h awarded
- 2016 APEX, *"The effect of wind density on the chemistry around AGB stars"*, PI E. De Beck, Onsala Space Observatory (Sweden). ID 099.F-9306, 41 h awarded
- 2016 VLT/SPHERE, *"The puzzle of the origin of non-homogeneous mass loss in evolved stars"*, PI L. Decin, KU Leuven (Belgium). ID 2019.1.00187.S, 6.7 h awarded
- 2016 ALMA, *"Observing the inner wind of the circumstellar environment of EP Aqr"*, PI W. Homan, KU Leuven (Belgium). ID 2016.1.00057.S, 2.2 h awarded
- 2016 ALMA, *"The evolutionary conundrum of the superwind phase of oxygen-rich asymptotic giant branch stars"*, PI R. Lombaert, Onsala (Sweden). ID 2016.1.00005.S, 2.4 h awarded

- 2016 IRAM 30m, "*Determining the initial mass of Mira by means of the  $^{17}\text{O}/^{18}\text{O}$  isotopic ratio*", PI R. De Nutte (Belgium), KU Leuven. ID 156-16, 30 h awarded
- 2015 JCMT, "*Seeking molecular SiS in the S-type AGB star Chi Cyg*", PI X. Li, Academia Sinica (Taiwan). ID M16AP082, 24 h awarded

- **Awarded computation time as co-investigator**

- 2020 DiRAC, proposal ID ACTP216, 36.32M CPU hours awarded

- **Observing experience**

- 15/06/2017 - 26/06/2017 with HERMES spectrograph and MAIA imager
- 15/06/2015 - 25/06/2015 with HERMES spectrograph and MAIA imager
- 13/10/2014 - 20/10/2014 with HERMES spectrograph

- **Teaching activities**

- Autumn 2019 Supervisor of Bachelor's thesis (4.5 ECTS) for the Bachelor in Physics, "Using chemical modelling of AGB outflows to guide future laboratory experiments"
- June 2019 Teaching assistant to Prof Dr Decin for her lecture on extraterrestrial life in the "Lessen voor de 21ste eeuw" ("Lessons for the 21st century") series
- Autumn 2018 Supervisor of "Research Projects I" (3 ECTS) for the Master in Astronomy & Astrophysics, "Unravelling the sulphur chemistry in oxygen-rich AGB stars".
- Autumn 2014, 2015, 2016, 2017 Teaching assistant of the course "Fysica 3: Elektromagnetisme" ("Physics 3: electromagnetism") for the Bachelor of Science in bioscience engineering. Teaching of tutorial and practical sessions, marking of reports and exams.

- **Organisation of scientific meetings**

- June 29 - July 3, 2020 Member of the SOC of Special Session "The molecular journey from stars to disks" at EAS Annual Meeting, Leiden, The Netherlands
- October 30, 2018 Organisation and planning of the ALMA Large Programme ATOMIUM meeting.  
<https://fys.kuleuven.be/ster/events/conferences/2018/atomium-kick-off-meeting/atomium-kick-off-meeting>
- Autumn 2016 - 2020 Co-organisier of weekly meetings of the evolved stars group at KU Leuven, involving active discussions to increase the collaboration within the group.

- **Collaborative research visits**

14/10/2019 - 18/10/2019 Dr C. Walsh, University of Leeds, UK  
 18/02/2019 - 22/02/2019 Research visit to Dr C. Walsh, University of Leeds, UK  
 12/11/2018 - 16/11/2018 Prof Dr T. J. Millar, Leiden Observatory, The Netherlands  
 08/10/2018 - 12/10/2018 Prof Dr T. J. Millar, Leiden Observatory, The Netherlands  
 30/10/2017 - 03/11/2017 Prof Dr T. J. Millar, Queen's University Belfast, UK  
 14/08/2017 - 18/08/2017 Dr C. Walsh, University of Leeds, UK  
 17/10/2016 - 21/10/2016 Prof Dr T. J. Millar, Queen's University Belfast, UK  
 16/05/2016 - 20/05/2016 Prof Dr T. J. Millar, Queen's University Belfast, UK

- **Public outreach**

Sep 2020 Virtual edition of Pint of Science Belgium, <https://youtu.be/cbAYXZPP3Jo>  
 Jul 2020 Jury member for the Flemish Astronomy Olympiad at the Planetarium of the Royal Observatory, Brussels, Belgium  
 Feb 2020 Scientific speed dating (Pint of Science Valentine's day special, Brussels, Belgium)  
 Feb 2020 Evening lecture at Volkssterrenwacht Beisbroek (public observatory, Belgium)  
 Nov 2019 Afternoon lecture on astrochemistry Neos (seniors club, Keerbergen, Belgium)  
 May 2019 Talk at Pint of Science (Leuven, Belgium), where scientists present their research through informal science talks in bars and pubs  
 May 2019 Jury member for the Flemish Astronomy Olympiad at the Planetarium of the Royal Observatory, Brussels, Belgium  
 Apr 2019 School visits at the Department of Physics and Astronomy (KU Leuven), introducing 16-17 year olds to spectroscopy.  
 Feb 2019 Talk on astrochemistry to the fifth year of general secondary education at Scheppersinstituut Mechelen, Belgium  
 Oct 2018 Participation in round table talks of the cross-over session organised by LUCA School of Arts (Leuven), bringing together artists, designers and scientists  
 Apr 2018 Talk on astrochemistry to the fifth year of general secondary education at Scheppersinstituut Mechelen, Belgium  
 Apr 2016 Co-organiser of the workshop "Photoshopping in the Cosmos" for Ladies@Science, a KU Leuven initiative to encourage female school students to study exact sciences