

Dries Van De Putte

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POSITIONS AND RESEARCH EXPERIENCE

JUN 2024 — CURRENT

The University of Western Ontario

Postdoctoral Associate

- ▶ Led multiple research projects involving the analysis of JWST integral-field spectroscopy data of nearby interstellar nebulae.
- ▶ Documented new applications of PAHFIT (see below) in a research paper.
- ▶ Set up a Python package gathering data analysis tools developed by our astrochemistry group. Tasks included setting up automated testing, CI, documentation, and performing code review.
- ▶ Mentored students in JWST data analysis and Python programming.
- ▶ Led the data reduction team for the PDRs4All collaboration (see below). Set up a packaging and versioning system for the reduced data.

JUN 2021 — MAY 2024

Space Telescope Science Institute (STScI)

Postdoctoral Researcher

- ▶ Contributed to JWST spectroscopic data reduction in two large international collaborations (“PDRs4All” JWST-ERS-1288 and JWST-GTO-1192). Identified issues and developed workarounds for the pipeline, and delivered high-level data products to research collaborators.
- ▶ Set up and maintained the PDRs4All package containing Python and Bash scripts to run the JWST pipeline and custom postprocessing.
- ▶ Led PDRs4All paper V, a high-impact (23 citations), collaboration-wide (100 members) paper summarizing the mid-IR emission lines.
- ▶ Contributed to the open-source spectral decomposition tool PAHFIT by leading the redesign of the user-facing API and fitting backend, and contributing to enabling compatibility of PAHFIT with JWST data, and writing a user guide and demo notebook. Acted as a contact to help users apply PAHFIT to their research.
- ▶ Designed the Hubble Space Telescope observing program “Linking Gas-Phase Element Depletions and Extinction Curves in the Small Magellanic Cloud”, awarded in 2024.
- ▶ Led a research project analyzing UV spectroscopy data from space telescopes (HST, FUSE, IUE) to reveal the link between far-UV optical properties of interstellar dust and H₂ in the Milky Way.

AUG 2016 — DEC 2020

Ghent University + STScI

Doctoral Student

- ▶ *Ph.D. thesis*: Developed RADAGAST; wrote around 10 000 lines of C++ to model the interactions of interstellar gas with a radiation field and dust grains, using linear algebra (Eigen) differential equation (GSL) solvers. Coupled RADAGAST to the open-source C++ code SKIRT, to enable 3D radiative transfer simulations that include both interstellar gas and dust, in the context of photodissociation region modeling.
- ▶ Led a research project at STScI, where I applied a Bayesian star+dust model (BEAST) to HST stellar photometry data, revealing dust evolution in the IC 63 nebula. Contributed to the open-source BEAST code by implementing a new model parameter (stellar distance) and domain splitting tools to reduce the memory impact.

Continued.

SKILLS

PROFILE

As a researcher working observational data, models, and simulations, I have acquired a broad range of experiences related to programming, tool development, data processing/analysis/modeling, as well as visualizing and presenting results.

TECHNICAL

Programming languages Python (10 years) — C++ (5 years) — Bash scripts

Software development Python packages / numpy / scipy / pytest / dependency management — git / automated testing (CI) / GitHub actions — linux command line / scripting — C/C++ compilers / CMake / OOP — high-performance computing / MPI multiprocessing

Data reduction / pipelines — analysis / images / spectra — statistics / Bayesian — interactive visualization tools / publication-quality figures

Numerical methods — libraries and equation solvers — optimization — Monte Carlo — radiative transfer

COMMUNICATION

Collaborative development / open source — working in large and small international research collaborations.

Writing scientific papers — research proposals — technical documentation.

Presenting conferences — seminars — accessible presentations of technical topics.

AWARDS

2024 Principal investigator of Hubble Space Telescope program GO-17823 (55 orbits, \$157k research funding).

2016 “**Special research fund**” four-year doctoral fellowship — *Ghent University*

EDUCATION

2016-2020 **Ph.D. in Astronomy**
Ghent University

2017-2018 Visiting student
Space Telescope Science Institute
The Johns Hopkins University

2014-2016 **M.Sc. in Physics & Astronomy**
2011-2016 **B.Sc. in Physics & Astronomy**
Ghent University

RESEARCH EXPERIENCE (CONTINUED)

SEP 2014 — JUL 2016

Ghent University

Master Student

- ▶ *Master's thesis*: Set up distributed-data multi-processing in the SKIRT C++ code, splitting up the computational domain to reduce memory usage across compute nodes. This enabled simulations with that would normally exceed the memory capacity of a single node. Implemented efficient inter-process communications using the industry-standard Message Passing Interface (MPI), to switch between two memory distribution schemes and to process the final results. Co-authored a research article by Verstocken et al. (2017) by including a description of this method.
- ▶ *Internship at the Royal Observatory of Belgium*: Developed a new pipeline step for the HERMES spectrograph of the Mercator Telescope, to remove biases introduced by the spectral properties of the flat-field calibration lamps.
- ▶ *Notable elective courses*: “Software Development I: C and C++” — “Simulations and modeling on the nano-scale”.

TEACHING

FALL 2018 & 2019: TA for the 2nd year bachelor course “Statistics and data processing” at *Ghent University*. Led the exercise sessions, and set up Python programming challenges to introduce students to essential packages (*numpy*, *scipy*), and numerical statistical approaches.

PUBLISHING AND PRESENTING

Since 2020, I have published my research across five first-author **peer-reviewed journal articles** (Van De Putte et al. 2020, 2023, 2024, 2025), and was involved with 20+ publications as a co-author. I presented my research across two **invited seminar talks** and five **contributed conference talks**, and several posters. Cf. academic CV at `drvdputt.github.io` for a full list.