

GABI WENZEL

Research Scientist · Laboratory Astrophysicist
gwenzel@mit.edu · [gbwnzl.github.io](https://github.com/gbwnzl) · [Google Scholar](#) · [ORCID](#)

EDUCATION

University of Toulouse PhD in Laboratory Astrophysics	Jun 2017 – Jul 2020 Toulouse, France
University of Münster Master of Science in Physics	Oct 2014 – Mar 2017 Münster, Germany
University of Münster Bachelor of Science in Physics	Oct 2010 – Sep 2014 Münster, Germany

EXPERIENCE

Massachusetts Institute of Technology <i>Research Scientist, Laboratory Astrochemistry</i> Conducting follow-up laboratory studies on functionalized PAHs to expand on our recent interstellar discoveries . Focusing on measuring previously unknown spectra of functionalized PAHs at MIT. Continuing to supervise graduate students while tailoring my own research profile.	Dec 2024 – Present Cambridge, MA, USA
Center for Astrophysics Harvard & Smithsonian <i>SAO Visiting Scientist Fellowship</i> The origin and fate of PAHs at low temperatures remain poorly understood, and our recent detections in dark molecular clouds challenge our understanding of interstellar PAH chemistry and physics . As an SAO Visiting Scientist in the McCarthy Group , I investigate potential formation and destruction pathways of cosmic PAHs.	Oct 2024 – Present Cambridge, MA, USA
Massachusetts Institute of Technology <i>(Senior) Postdoctoral Associate, Laboratory Astrochemistry</i> Designed, constructed, and leveraged a cavity-enhanced and chirped-pulse Fourier Transform microwave spectrometer to study molecular systems of astrochemical interest while leading the rotational spectroscopy efforts in the McGuire Group , including supervision of graduate students in the laboratory and beyond.	Oct 2022 – Nov 2024 Cambridge, MA, USA
Center for Interstellar Catalysis (InterCat), Aarhus University <i>Postdoctoral Research Fellow, Laboratory Astrophysics</i> Experimentally investigated the catalytic effects of astrophysically relevant, functionalized PAHs and the potential formation of the molecular building blocks of life on different cosmic dust grain surface analogues. Led laboratory experiments, data analysis, and dissemination of results, while supervising Bachelor, Master, and PhD students in the astrophysics / astrochemistry laboratory.	Oct 2020 – Sep 2022 Aarhus C, Denmark
Institut de Recherche en Astrophysique et Planétologie (IRAP) <i>Marie Skłodowska-Curie Early Stage Researcher (ESR)</i> Conducted research and received training in the interdisciplinary field of laboratory astrophysics within the MSCA ITN EUROPAH under the supervision of Dr. Christine Joblin. This included collaborations with theoretician Dr. Aude Simon (LCPQ) and extended stays at research facilities in the Netherlands, working together with Dr. Sandra Brünken at the FELIX Laboratory , and in Italy, collaborating with Dr. Giacomo Mulas at INAF, Cagliari .	Jun 2017 – Jul 2020 Toulouse, France
Hidden Analytical Ltd. <i>Advanced Systems Analyst</i> Carried out an internship and gained experience on quadrupole mass spectrometers. Extended surface analysis skills by performing a project combining temperature programmed desorption (TPD) and secondary ion mass spectrometry (SIMS) experiments on differently coated silicon samples.	Mar 2019 – May 2019 Warrington, United Kingdom
Institute(s) of (Theoretical) Physics, University of Münster <i>Student Assistant</i> Assisted in undergraduate teaching, including exercise classes and laboratory instruction. See ‘Teaching Experience’ for details.	Nov 2013 – Mar 2017 Münster, Germany

Technologieförderung Münster GmbH

Reception Administrative Assistant

Main responsibilities included customer service, tenant support as well as preparation and follow-up processing of business events.

Feb 2013 – Dec 2014

Münster, Germany

SELECTED RESEARCH EXPERIENCE

Green Bank Telescope (GBO), WV, USA

Mar 2024 – present

Active GOTHAM collaboration observer using the 100 m Green Bank Telescope to study aromatic molecules in TMC-1 and trace early-stage star formation chemistry.

LISA@FELIX Laboratory, Nijmegen, The Netherlands

May 2022, Sep 2022, Aug 2023

Led IR beamtime to study PAH:ice chemistry at the LISA end-station with FTIR spectroscopy on ASW, CO, and methanol ices.

ELISA, Aarhus, Denmark

Mar 2022 – Jun 2022

Led ion storage ring experiments using visible photodissociation spectroscopy to study photostability trends of oxygen-functionalized PAHs.

ASTRID-2 Synchrotron, Aarhus, Denmark

Feb 2021

Performed XPS on oxygen-irradiated C₆₀ on HOPG; observed enhanced chemistry under repeated annealing and exposure.

CALMIP HPC Center, Toulouse, France

Dec 2019

Ran DFT calculations of PAHs with Turbomole and Octopus; obtained theoretical IR spectra and photoabsorption cross sections.

SOLEIL Synchrotron, France

Sep 2017, Jul 2019

Used VUV action spectroscopy to study fragmentation and ionization of large PAHs in a linear ion trap.

FELion@FELIX Laboratory, Nijmegen, The Netherlands

Aug 2017, Jun 2019 – Jul 2019

Modified cryogenic ion trap setup; measured IR action spectra of PAH fragments tagged with Ne using FELIX.

DESIREE, Stockholm, Sweden

Nov 2018

Studied radiative cooling of anthracene and phenanthrene cations in an electrostatic storage ring.

FLASH, DESY, Hamburg, Germany

Aug 2015

Participated in XUV-FEL desorption experiments of astrophysical ices; used TOF-MS to analyze desorption dynamics.

TEACHING EXPERIENCE

Co-Organizer of the Star and Planet Formation Course

Apr 2022 – Oct 2022

Mentoring a group of PhD and master level students following the star and planet formation lecture given online by Dr. Melissa McClure at Leiden University. Supervised discussion rounds, seminars, short presentations, and essays.

Tutor for the Undergraduate Modules Physics I – III

Mar 2015 – Mar 2017

Marking of first to second year physics students' exercises and giving class explanations of the solutions. These modules covered mechanics, thermodynamics, electromagnetism, analytical mechanics, electrodynamics, optics, special relativity.

Undergraduate Laboratory and General Physics for Scientists Tutor

Nov 2013 – Feb 2015

General demonstrating duties assisting undergraduate medical students in their first year performing experimental exercises in the physics laboratory. Responsibilities also included the marking of laboratory reports, students' exercises, and discussions of the solutions during the courses.

AWARDS & GRANTS

Women in Chemistry+ Travel Grant

MIT, Cambridge, MA, 2025

Infinite Expansion Award

MIT, Cambridge, MA, 2024

Best Talk Award

PAHRTEA Meeting Nijmegen, 2019

LASERLAB-EUROPE Grant

2-month stay at FELIX Laboratory, 2019

IAU Travel Grant

IAU S350 Laboratory Astrophysics, 2019

PCMI Travel Grant

Société Française d'Exobiologie, 2018

WE-Heraeus Travel Grant

DPG (German Physical Society) Spring Meeting, 2017

DPG (German Physical Society) A-Levels Award

Arndt High School, Krefeld, 2010

PUBLICATIONS

[22] Toru Shay, H.; **Wenzel, G.**; Xue, C.; McGuire, B. A. Bridging Machine Learning and Spectroscopy: A New Analysis for Astrochemical Target Selection. Accepted for publication in *The Astrophysical Journal*.

- [21] Slumstrup, L.; Thrower, J. D.; Hopkinson, A. T.; **Wenzel, G.**; Jaganathan, R.; Schrauwen, J. G. M.; Redlich, B.; Ioppolo, S.; Hornekær, L. CO Desorption from Interstellar Icy Grains Induced by IR Excitation of Superhydrogenated PAHs. *arXiv* July 10, 2025.
- [20] Slumstrup, L.; Thrower, J. D.; Schrauwen, J. G. M.; Lamberts, T.; Ingman, E. R.; Laurinavicius, D.; DeVine, J.; Terwisscha van Scheltinga, J.; Santos, J. C.; Noble, J. A.; **Wenzel, G.**; McCoustra, M. R. S.; Brown, W. A.; Linnartz, H.; Hornekær, L.; Cuppen, H. M.; Redlich, B.; Ioppolo, S. IR-Induced CO Photodesorption from Pure CO Ice and CO on Amorphous Solid Water. *ACS Earth and Space Chemistry* 2025, 9, 6, 1607–1621.
- [19] Toru Shay, H.; Scolati, H. N.; **Wenzel, G.**; Lee, K. L. K.; Marimuthu, A. N.; McGuire, B. A. Exploring Effects of Modified Machine Learning Pipelines of Astrochemical Inventories. *The Astrophysical Journal* 2025, 985 (1), 123.
- [18] **Wenzel, G.**; Gong, S.; Xue, C.; Changala, P. B.; Holdren, M. S.; Speak, T. H.; Stewart, D. A.; Fried, Z. T. P.; Willis, R. H. J.; Bergin, E. A.; Burkhardt, A. M.; Byrne, A. N.; Charnley, S. B.; Lipnicky, A.; Loomis, R. A.; Shingledecker, C. N.; Cooke, I. R.; McCarthy, M. C.; Remijan, A. J.; Wendlandt, A. E.; McGuire, B. A. Discovery of the Seven-Ring Polycyclic Aromatic Hydrocarbon Cyanocoronene ($C_{24}H_{11}CN$) in GOTHAM Observations of TMC-1. *The Astrophysical Journal Letters* 2025, 984 (1), L36.
- [17] **Wenzel, G.**; Holdren, M. S.; Stewart, D. A.; Toru Shay, H.; Byrne, A. N.; Xue, C.; McGuire, B. A. Laboratory Rotational Spectra of Cyanocyclohexane and Its Siblings (1- and 4-Cyanocyclohexene) Using a Compact CP-FTMW Spectrometer for Interstellar Detection. *Journal of Physical Chemistry A* 2025, 129 (18), 3986–4001.
- [16] **Wenzel, G.**; Jiménez-Redondo, M.; Ončák, M.; McGuire, B. A.; Brünken, S.; Caselli, P.; Jusko, P. Infrared Spectroscopy of Pentagon-Containing PAHs: Indenyl and Fluorenyl Anions and Indenyl Cation. *Journal of Physical Chemistry Letters* 2025, 16 (16), 3938–3944.
- [15] Remijan, A. J.; Changala, P. B.; Xue, C.; Yuan, E. Q. H.; Duffy, M.; Scolati, H. N.; Shingledecker, C. N.; Speak, T. H.; Cooke, I. R.; Loomis, R.; Burkhardt, A. M.; Fried, Z. T. P.; **Wenzel, G.**; Lipnicky, A.; McCarthy, M. C.; McGuire, B. A. The Missing Link of Sulfur Chemistry in TMC-1: The Detection of $c\text{-C}_3\text{H}_2\text{S}$ from the GOTHAM Survey. *The Astrophysical Journal* 2025, 982 (2), 191.
- [14] **Wenzel, G.**; Speak, T. H.; Changala, P. B.; Willis, R. H. J.; Burkhardt, A. M.; Zhang, S.; Bergin, E. A.; Byrne, A. N.; Charnley, S. B.; Fried, Z. T. P.; Gupta, H.; Herbst, E.; Holdren, M. S.; Lipnicky, A.; Loomis, R. A.; Shingledecker, C. N.; Xue, C.; Remijan, A. J.; Wendlandt, A. E.; McCarthy, M. C.; Cooke, I. R.; McGuire, B. A. Detections of Interstellar Aromatic Nitriles 2-Cyanopyrene and 4-Cyanopyrene in TMC-1. *Nature Astronomy* 2025, 9 (2), 262–270.
- [13] Remijan, A. J.; Fried, Z. T. P.; Cooke, I. R.; **Wenzel, G.**; Loomis, R.; Shingledecker, C. N.; Lipnicky, A.; Xue, C.; McCarthy, M. C.; McGuire, B. A. High Spectral Resolution Observations of Propynal (HCCCHO) toward TMC-1 from the GOTHAM Large Program on the GBT. *The Astrophysical Journal* 2024, 976 (1), 105.
- [12] **Wenzel, G.**; Cooke, I. R.; Changala, P. B.; Bergin, E. A.; Zhang, S.; Burkhardt, A. M.; Byrne, A. N.; Charnley, S. B.; Cordiner, M. A.; Duffy, M.; Fried, Z. T. P.; Gupta, H.; Holdren, M. S.; Lipnicky, A.; Loomis, R. A.; Shay, H. T.; Shingledecker, C. N.; Siebert, M. A.; Stewart, D. A.; Willis, R. H. J.; Xue, C.; Remijan, A. J.; Wendlandt, A. E.; McCarthy, M. C.; McGuire, B. A. Detection of Interstellar 1-Cyanopyrene: A Four-Ring Polycyclic Aromatic Hydrocarbon. *Science* 2024, 386 (6723), 810–813.
- [11] Fried, Z. T. P.; El-Abd, S. J.; Hays, B. M.; **Wenzel, G.**; Byrne, A. N.; Margulès, L.; Motiyenko, R. A.; Shipman, S. T.; Horne, M. P.; Jørgensen, J. K.; Brogan, C. L.; Hunter, T. R.; Remijan, A. J.; Lipnicky, A.; Loomis, R. A.; McGuire, B. A. Rotational Spectrum and First Interstellar Detection of 2-Methoxyethanol Using ALMA Observations of NGC 6334I. *The Astrophysical Journal Letters* 2024, 965 (2), L23.
- [10] Rasmussen, A. P.; **Wenzel, G.**; Hornekær, L.; Andersen, L. H. Gas-Phase Electronic Action Absorption Spectra of Protonated Oxygen-Functionalized Polycyclic Aromatic Hydrocarbons (OPAHs). *Astronomy & Astrophysics* 2023, 674, A103.
- [9] **Wenzel, G.**; Simon, A.; Banhatti, S.; Jusko, P.; Schlemmer, S.; Brünken, S.; Joblin, C. Infrared Spectroscopy of the Benzylium-like (and Tropylium-like) Isomers Formed in the $-\text{H}$ Dissociative Ionization of Methylated PAHs. *Journal of Molecular Spectroscopy* 2022, 385, 111620.
- [8] Banhatti, S.; Rap, D. B.; Simon, A.; **Wenzel, G.**; Leboucher, H.; Joblin, C.; Redlich, B.; Schlemmer, S.; Brünken, S. Formation of the Acenaphthylene Cation as a Common C_2H_2 -Loss Fragment in Dissociative Ionization of the PAH Isomers Anthracene and Phenanthrene. *Physical Chemistry Chemical Physics* 2022, 24, 27343–27354.
- [7] **Wenzel, G.**; Joblin, C.; Giuliani, A.; Castillo, S. R.; Mulas, G.; Ji, M.; Sabbah, H.; Quiroga, S.; Peña, D.; Nahon, L. Astrochemical Relevance of VUV Ionization of Large PAH Cations. *Astronomy & Astrophysics* 2020, 641, A98.
- [6] Joblin, C.; **Wenzel, G.**; Castillo, S. R.; Simon, A.; Sabbah, H.; Bonnamy, A.; Toubanc, D.; Mulas, G.; Ji, M.; Giuliani, A.; Nahon, L. Photo-Processing of Astro-PAHs. *Journal of Physics: Conference Series* 2020, 1412, 062002.
- [5] Bernard, J.; Ji, M. C.; Martin, S.; **Wenzel, G.**; Al-Mogeeth, A.; Stockett, M. H.; Schmidt, H. T.; Zettergren, H.; Joblin, C. Radiative Cooling Dynamics of Anthracene Cations Stored in DESIREE Studied via the Time Evolution of 2-Photon-Absorption Induced Dissociation Rate. *Journal of Physics: Conference Series* 2020, 1412, 232013.

- [4] **Wenzel, G.**; Castillo, S. R.; Mulas, G.; Ji, M.-C.; Bonnamy, A.; Sabbah, H.; Giuliani, A.; Nahon, L.; Joblin, C. Photoprocessing of Large PAH Cations. *Proceedings of the International Astronomical Union* 2019, 15 (S350), 388–389.
- [3] Kleimeier, N. F.; **Wenzel, G.**; Urban, A. J.; Tchalala, M. R.; Oughaddou, H.; Dedkov, Y.; Voloshina, E.; Zacharias, H. Unoccupied Electronic Band Structure of Pentagonal Si Nanoribbons on Ag(110). *Physical Chemistry Chemical Physics* 2019, 21 (32), 17811–17820.
- [2] Jusko, P.; Simon, A.; **Wenzel, G.**; Brünken, S.; Schlemmer, S.; Joblin, C. Identification of the Fragment of the 1-Methylpyrene Cation by Mid-IR Spectroscopy. *Chemical Physics Letters* 2018, 698, 206–210.
- [1] Espeter, P.; Keutner, C.; Roese, P.; Shamout, K.; Berges, U.; **Wenzel, G.**; Bignardi, L.; Kleimeier, N. F.; Zacharias, H.; Westphal, C. Facing the Interaction of Adsorbed Silicon Nano-Ribbons on Silver. *Nanotechnology* 2017, 28 (45), 455701.

INVITED TALKS & SEMINARS

Committee on Space Research (COSPAR) Meeting	Florence, Italy, Aug 2026
Exploring the Aromatic Universe in the JWST Era	London, Canada, Jul 2026
Virtual International Microwave Seminar	Hamburg, Germany, Jul 2025
Press Briefing at the 246th Meeting of the American Astronomical Society	Anchorage, AL, USA, Jun 2025
3rd COST NanoSpace Joint Scientific Meeting	Kaunas, Lithuania, May 2025
Atomic and Molecular Physics Seminar, CfA	Cambridge, MA, USA, Mar 2025
InterCat Seminar, Aarhus University	Aarhus, Denmark, Mar 2025
Green Bank Telescope (GBT) Webinar	Green Bank, WV, USA, Dec 2024
Öberg & Andrews Seminar, CfA	Cambridge, MA, USA, Nov 2024
Annual German LabAstro Meeting	Tegernsee, Germany, Sep 2024
CfA Seminar, Center for Astrophysics Harvard & Smithsonian	Cambridge, MA, USA, Mar 2024
CFEL Molecular and Ultrafast Science Seminars, DESY	Hamburg, Germany, Jan 2023
Colloquium at the Istituto Nazionale di Astrofisica (INAF)	Cagliari, Italy, Dec 2018

CONFERENCE CONTRIBUTIONS

International Symposium on Molecular Spectroscopy (ISMS) (2 Talks)	Champaign, IL, USA, Jun 2025
American Astronomical Society, 246th Meeting (Talk)	Anchorage, AK, USA, Jun 2025
International Symposium on Molecular Spectroscopy (ISMS) (2 Talks)	Champaign, IL, USA, Jun 2024
IAU S383: Astrochemistry VIII (Poster)	Traverse City, MI, USA, Jul 2023
International Symposium on Molecular Spectroscopy (ISMS) (Talk)	Champaign, IL, USA, Jun 2023
Life Cycle of Cosmic PAHs Symposium (Talk & Poster)	Aarhus, Denmark, Sep 2022
739th WE-Heraeus-Seminar (Talk)	Bad Honnef, Germany, Feb 2022
PAHRTEA Meeting (Talk)	Nijmegen, The Netherlands, Sep 2019
Physics and Chemistry of the Interstellar Medium (Poster)	Avignon, France, Sep 2019
IAU S350: Laboratory Astrophysics Symposium (Poster)	Cambridge, UK, Apr 2019
EPoLM-4 Conference (Talk)	Madrid, Spain, Mar 2019
CPMI National Program Symposium (Poster)	Marseille, France, Jun 2018
Cosmic Dust Symposium (Poster)	Copenhagen, Denmark, Jun 2018
DPG Spring Meeting of the Condensed Matter Section (Talk)	Dresden, Germany, Mar 2017

RESEARCH & TECHNICAL SKILLS

Vacuum systems: Ultra-high vacuum (UHV) and high vacuum (HV) equipment use and maintenance
Surface science techniques: AES, LEED, UPS, XPS, IPE, SIMS, STM, TPD, FTIR/RAIRS
Mass spectrometry: Gas-phase ion trap and storage experiments; FT-ICR MS, quadrupole MS (QMS)
Rotational spectroscopy: CP-FTMW, cavity-enhanced FTMW spectroscopy
Photon sources: Use of free electron lasers and synchrotron radiation facilities
Programming and software: Python, LaTeX, C++
Quantum chemistry software: Psi4, Orca, Turbomole, Octopus
Data acquisition and control: LabVIEW, C++/QtCreator
Languages: German (native), English (fluent, C2), French (advanced, B1/B2), Danish (beginner, A2)

LEADERSHIP & OUTREACH

Postdoc Representative – Department of Physics & Astronomy	Aarhus University, 2021 – 2022
Early Stage Researcher Representative	EUROPAH Network, 2018 – 2021
Active Member of UniverSciEl	Science outreach for children, 2017 – 2020
Second PhD Student Representative	IRAP Toulouse, 2017 – 2019

REFEREES upon request.

Gabi Wenzel

September 7, 2025