

LUKAS NEUMANN

European Southern Observatory
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EDUCATION

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| PhD in Astrophysics , Bonn University, Advisor: Frank Bigiel Thesis: Connecting probes of molecular gas physics from the Milky Way to nearby galaxies | 11/2021 — 12/2024 |
| Master in Astrophysics , Bonn University, Advisor: Frank Bigiel Thesis: Dense molecular gas, molecular cloud properties and star formation efficiencies across local spiral galaxies | 04/2019 — 09/2021 Grade: 1.5 |
| Master in Physics , Bielefeld University, Advisor: Markus Meinert Thesis: Influence of the device geometry on spin-orbit torque experiments | 04/2017 — 12/2018 Grade: 1.0 |
| Bachelor in Physics , Bielefeld University, Advisor: Markus Meinert Thesis: Strominduziertes Schalten einer senkrecht magnetisierten Schicht durch den Spin-Hall-Effekt ERASMUS exchange student at Lund University, Sweden (Winter Semester 2016/17) | 10/2013 — 01/2017 Grade: 2.0 |

COLLABORATIONS

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| PHANGS , Physics at High Angular Resolution in Nearby Galaxies | 10/2020 — today |
| LEGO , Line Emission as a tool for Galaxy Observations | 10/2021 — today |
| SFB 1601 , Habits of massive stars across cosmic time | 10/2023 — today |

EMPLOYMENT

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| ESO postdoctoral fellow , European Southern Observatory, Garching bei München, Germany | 12/2024 — 11/2027 |
| PhD researcher , Argelander-Institute for Astronomy, Bonn University | 11/2021 — 11/2024 |
| Research assistant , Center for Spinelectronic Materials and Devices, Bielefeld University | 11/2018 — 02/2019 |

PUBLICATION STATISTICS (FULL LIST ATTACHED AT THE END)

Peer-reviewed papers: **21** total, **379** citations (**3** as 1st author + **3** as 1st/2nd author outside of astronomy; ADS library)

MENTORING EXPERIENCE

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| Minou Greve , Master thesis project, Bonn University | 08/2024 — 07/2025 |
| Sabrina Stelter , Master thesis project, Bonn University | 04/2024 — 04/2025 |
| Niklas Schüller , Master thesis project, Bonn University | 03/2024 — 03/2025 |
| Minou Greve , Internship, Bonn University | 05/2024 — 06/2025 |
| Selina Ortner , Bachelor thesis project, Bonn University | 10/2023 — 01/2024 |
| Patrick Lenz , Bachelor thesis project, Bonn University | 06/2023 — 10/2023 |
| Wajdee Chayeb , Internship, Bonn University | 04/2023 — 05/2023 |
| Lars van Engelshofen , Bachelor thesis project, Bonn University | 10/2022 — 02/2023 |
| Malena Held , Bachelor thesis project, Bonn University | 09/2022 — 01/2023 |
| Marius Schuchmann , Bachelor thesis project, Bonn University | 06/2022 — 10/2022 |
| Michèle Steinrötter , Bachelor thesis project, Bonn University | 04/2022 — 08/2022 |

TEACHING EXPERIENCE

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| Teaching assistant , Einführung in die Astronomie, Bachelor Course, Bonn University | 10/2023 — 03/2024 |
| Teaching assistant , Einführung in die Astronomie, Bachelor Course, Bonn University | 10/2022 — 03/2023 |
| Teaching assistant , Physics of the Interstellar Medium, Master Course, Bonn University | 04/2022 — 09/2022 |
| Teaching assistant , Theoretical Astrophysics, Master Course, Bonn University | 10/2021 — 03/2022 |
| Teaching assistant , Proseminar Präsentationstechnik, Bachelor Course, Bonn University | 04/2021 — 09/2021 |
| Teaching assistant , Einführung in die Astronomie, Bachelor Course, Bonn University | 10/2020 — 03/2021 |
| Teaching assistant , Einf. in die extragalakt. Astronomie, Bachelor Course, Bonn University | 04/2020 — 09/2020 |
| Teaching assistant , Einführung in die Physik 4, Bachelor Course, Bielefeld University | 04/2018 — 10/2018 |
| Teaching assistant , Physik für Nicht-Physiker, Bachelor Course, Bielefeld University | 10/2017 — 03/2018 |
| Teaching assistant , Einführung in die Physik 2, Bachelor Course, Bielefeld University | 04/2017 — 09/2017 |

COLLOQUIUM & SEMINAR TALKS

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| Invited talk , Seminar talk, University of Cologne, Cologne, Germany | 07/2023 |
| Invited talk , OGHRES conference, Max Planck Institute for Radio Astronomy (MPIfR), Bonn, Germany | 06/2024 |
| Invited talk , Radio seminar, Harvard-Smith. Center for Astrophysics (CfA), Cambridge, USA (<i>virtually</i>) | 12/2023 |
| Scheduled talk , ARI Institut Colloquium, Astronomisches Recheninstitut (ARI), Heidelberg, Germany | 11/2023 |
| Scheduled talk , Coffee, Max Planck Institute for Extraterrestrial Physics (MPE), Garching, Germany | 11/2023 |
| Scheduled talk , Galaxy Coffee, European Southern Observatory (ESO), Garching, Germany | 11/2023 |
| Scheduled talk , Lunch talk, European Southern Observatory (ESO), Garching, Germany | 11/2023 |
| Scheduled talk , Lunch talk, Leiden Observatory, Leiden, Netherlands | 10/2023 |
| Scheduled talk , GC Coffee, Max Planck Institute for Astronomy (MPIA), Heidelberg, Germany | 10/2023 |
| Scheduled talk , PSF Coffee, Max Planck Institute for Astronomy (MPIA), Heidelberg, Germany | 10/2023 |
| Invited talk , Lunch talk, Lund Observatory, Lund, Sweden (<i>virtually</i>) | 04/2023 |
| Talk , IMPRS Conference, Max Planck Institute for Radio Astronomy (MPIfR), Bonn, Germany | 04/2023 |
| Invited talk , Seminar talk, University of Cologne, Cologne, Germany | 03/2023 |
| Poster prize talk , From Stars to Galaxies II, Chalmers University, Gothenburg, Sweden | 06/2022 |

CONFERENCES & WORKSHOPS

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| OGHRES conference , Talk, MPIfR, Bonn, Germany | 06/2024 |
| PHANGS team meeting , Talk, ESO, Garching, Germany | 02/2024 |
| SFB 1601 retreat , Kloster Steinfeld, Kall, Germany | 02/2024 |
| IMPRS Bonn/Cologne retreat , Ringberg, Germany | 01/2024 |
| IMPRS Bonn/Cologne retreat , Oostende, Belgium | 09/2023 |
| IMPRS Heidelberg summer school , Unraveling Galaxy Evolution with JWST, Heidelberg, Germany | 09/2023 |
| IMPRS Bonn/Cologne blackboard lecture on turbulence , MPIfR, Bonn, Germany | 07/2023 |
| PHANGS team meeting , Talk, Pasadena, USA | 02/2023 |
| 11th IRAM interferometry school , Workshop on millimetre astronomy, Grenoble, France | 11/2022 |
| IMPRS Bonn/Cologne retreat , Cochem, Germany | 11/2022 |
| From Stars to Galaxies II , Poster & poster prize, Chalmers University, Gothenburg, Sweden | 06/2022 |
| Multi-line Diagnostics of the Interstellar Medium , Poster, Nice, France | 04/2022 |
| 10th IRAM 30m school , Workshop on millimetre astronomy, Granada, Spain (<i>virtually</i>) | 11/2021 |
| ISM 2021 , Beirut, Structure, characteristic scales, and star formation (<i>virtually</i>) | 05/2021 |
| DPG Spring Meeting of the Condensed Matter Section , TU Berlin, Berlin, Germany | 03/2018 |

GRANTS & AWARDS

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| Poster prize , From Stars to Galaxies II, Chalmers University, Gothenburg, Sweden | 06/2022 |
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OUTREACH EXPERIENCE

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| Astroclub Bonn , Organiser & Website | 10/2020 — 11/2024 |
| Public Talk , Astroclub Bonn, “How to produce beautiful RGB images of galaxies” | 10/2024 |
| Highschool Project , Project Andromeda, Assistent | 03/2024 |
| Public Talk , Astroclub Bonn, “Finding Longitude” | 12/2023 |
| Public Talk , Bonner Sternhimmel, “Sternentstehung in Spiralgalaxien” | 11/2023 |
| Outreach Event , Universe on tour (national exhibition) with ALMA telescope model, Bonn, Germany | 08/2023 |
| Public Talk , AoT Bonn, “JWST - wie man Schweizer Käse und Fleischbällchen in anderen Galaxien findet” | 04/2023 |
| Public Talk , Astroclub Bonn, “Die Venus-Transite des 18. Jahrhunderts” | 11/2021 |

ACADEMIC LEADERSHIP

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| SOC member , ESO workshop, Garching bei München, Germany | (07/2025) |
| Colloquium organiser , PHANGS collaboration colloquium organisation team | 10/2022 — today |
| LOC member , IMPRS Bonn/Cologne retreat, Oostende, Belgium | 09/2023 |

OVSERVING PROGRAMS

PI accepted:

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| ALMA , 2024, cycle 11 (2024.1.01512.S) | (25 hr/12 + 50 hr/7m + 81 hr/TP) |
| APEX , 2024 (M9511A-104) | (48 hr) |

co-I accepted:

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| IRAM-30m, 2024, winter (174-24) | (30 hr) |
| ALMA, 2024, cycle 11 (2024.1.01667.S) | (15 hr/12m) |
| ALMA, 2024, cycle 11 (2024.1.01053.S) | (70 hr/7m) |
| ALMA, 2024, cycle 11 (2024.1.00844.S) | (13 hr/12m + 35 hr/7m + 58 hr/TP) |
| ALMA, 2024, cycle 11 (2024.1.00835.S) | (28 hr/12m + 38 hr/7m + 46 hr/TP) |
| IRAM-30m, 2024, summer (075-24) | (62 hr) |
| NOEMA, 2024, summer (S24BE) | (20 hr) |
| ALMA, 2023, cycle 10 (2023.1.01493.S) | 59 hr/7m |
| ALMA, 2023, cycle 10 (2023.1.00884.S) | 9 hr/12 + 70 hr/7m + 149 hr/TP |
| ALMA, 2022, cycle 9 (2022.1.01654.S) | 17 hr/12m + 8 hr/7m + 22 hr/TP |
| ALMA, 2022, cycle 9 (2022.1.01479.S) | 12 hr/12m + 59 hr/7m + 130 hr/TP |
| ALMA, 2021, cycle 8 (2021.1.00740.S) | 24 hr/12m + 51 hr/7m + 109 hr/TP |

TECHNICAL SKILLS

Programming, Python (very good), GitHub (good), C/C++ (fair), HTML (fair), R (fair)
Software, SAOImageDS9 (very good), Carta (good), CASA (good), GIMP (fair)

PEER-REVIEWED PUBLICATIONS

Summary: **21** peer-reviewed papers, **379** citations (see ADS library)

First- and second-author publications

1. **Neumann**, Bigiel, Barnes, et al., “A 260 pc resolution ALMA map of HCN(1-0) in the galaxy NGC 4321”, A&A, 691, A121 (2024)
2. **Neumann**, den Brok, Bigiel et al., “Spectral stacking of radio-interferometric data”, A&A, 675, A104 (2023)
3. **Neumann**, Gallagher, Bigiel et al., “The ALMOND survey: molecular cloud properties and gas density tracers across 25 nearby spiral galaxies with ALMA”, MNRAS, 521, 3348 (2023)

First- and second-author publications outside of astronomy

1. Fritz, **Neumann**, and Meinert, “Ultralow Switching-Current Density in All-Amorphous W-Hf/Co-Fe-B/TaO_x Films”, PhRvP, 14, 034047 (2020)
2. **Neumann** and Meinert, “Influence of the Hall-bar geometry on harmonic Hall voltage measurements of spin-orbit torques”, AIPA, 8, 095320 (2018)
3. **Neumann**, Meier, Schmalhorst et al., “Temperature dependence of the spin Hall angle and switching current in the nc-W(O)/CoFeB/MgO system with perpendicular magnetic anisotropy”, ApPhL, 109, 142405 (2016)

Co-authored publications

1. Chown, Leroy, Sandstrom et al. (**incl. Neumann**), “Polycyclic Aromatic Hydrocarbon and CO(2-1) Emission at 50-150 pc Scales in 66 Nearby Galaxies”, arXiv, arXiv:2410.05397 (2024)
2. Laudage, Eibensteiner, Bigiel et al. (**incl. Neumann**), “Neutral atomic and molecular gas dynamics in the nearby spiral galaxies NGC 1512, NGC 4535, and NGC 7496”, A&A, 690, A169 (2024)
3. Bešlić, Barnes, Bigiel et al. (**incl. Neumann**), “The properties and kinematics of HCN emission across the closest starburst galaxy NGC 253 observed with ALMA”, A&A, 689, A122 (2024)
4. Williams, Lee, Larson et al. (**incl. Neumann**), “PHANGS-JWST: Data Processing Pipeline and First Full Public Data Release”, ApJS, 273, 13 (2024)
5. Querejeta, Leroy, Meidt et al. (**incl. Neumann**), “Do spiral arms enhance star formation efficiency?”, A&A, 687, A293 (2024)
6. Stuber, Pety, Schinnerer et al. (**incl. Neumann**), “Surveying the Whirlpool at Arcseconds with NOEMA (SWAN)- I. Mapping the HCN and N₂H⁺ 3mm lines”, A&A, 680, L20 (2023)
7. Zakardjian, Pety, Herrera et al. (**incl. Neumann**), “The impact of H II regions on giant molecular cloud properties in nearby galaxies sampled by PHANGS ALMA and MUSE”, A&A, 678, A171 (2023)
8. Belfiore, Leroy, Williams et al. (**incl. Neumann**), “Calibrating mid-infrared emission as a tracer of obscured star formation on H II-region scales in the era of JWST”, A&A, 678, A129 (2023)
9. Panessa, Seifried, Walch et al. (**incl. Neumann**), “The evolution of HCO⁺ in molecular clouds using a novel chemical post-processing algorithm”, MNRAS, 523, 6138 (2023)
10. Jiménez-Donaire, Usero, Bešlić et al. (**incl. Neumann**), “A constant N₂H⁺(1-0)-to-HCN(1-0) ratio on kiloparsec scales”, A&A, 676, L11 (2023)
11. Teng, Sandstrom, Sun et al. (**incl. Neumann**), “The Physical Drivers and Observational Tracers of CO-to-H₂ Conversion Factor Variations in Nearby Barred Galaxy Centers”, ApJ, 950, 119 (2023)
12. Sun, Leroy, Ostriker et al. (**incl. Neumann**), “Star Formation Laws and Efficiencies across 80 Nearby Galaxies”, ApJL, 945, L19 (2023)

13. Barnes, Watkins, Meidt et al. (**incl. Neumann**), “PHANGS-JWST First Results: Multiwavelength View of Feedback-driven Bubbles (the Phantom Voids) across NGC 628”, *ApJL*, 944, L22 (2023)
14. Belfiore, Leroy, Sun et al., “Calibration of hybrid resolved star formation rate recipes based on PHANGS-MUSE $H\alpha$ and $H\beta$ maps”, *A&A*, 670, A67 (2023)
15. den Brok, Bigiel, Sliwa et al. (**incl. Neumann**), “A CO isotopologue Line Atlas within the Whirlpool galaxy Survey (CLAWS)”, *A&A*, 662, A89 (2022)
16. den Brok, Chatzigiannakis, Bigiel et al. (**incl. Neumann**), “New constraints on the $^{12}\text{CO}(2-1)/(1-0)$ line ratio across nearby disc galaxies”, *MNRAS*, 504, 3221 (2021)