

LUKAS NEUMANN

Argelander-Institut für Astronomie, Universität Bonn
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EDUCATION

PhD in Astrophysics, Bonn University, Advisor: Frank Bigiel 11/2021 — Expected: 10/2024
Thesis: Connecting probes of molecular gas physics from the Milky Way to nearby galaxies

Master in Astrophysics, Bonn University, Advisor: Frank Bigiel 04/2019 — 09/2021
Thesis: Dense molecular gas, molecular cloud properties and star formation efficiencies across local spiral galaxies Grade: 1.5

Master in Physics, Bielefeld University, Advisor: Markus Meinert 04/2017 — 12/2018
Thesis: Influence of the device geometry on spin-orbit torque experiments Grade: 1.0

Bachelor in Physics, Bielefeld University, Advisor: Markus Meinert 10/2013 — 01/2017
Thesis: Strominduziertes Schalten einer senkrecht magnetisierten Schicht durch den Spin-Hall-Effekt Grade: 2.0
ERASMUS exchange student at Lund University, Sweden (Winter Semester 2016/17)

COLLABORATIONS

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

PhD researcher, Argelander-Institute for Astronomy, Bonn University 11/2021 — fall/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: **18** total, **249** citations (**2** as 1st author + **3** as 1st/2nd author outside of astronomy; ADS library)

MENTORING EXPERIENCE

Sabrina Stelter, Master thesis project, Bonn University 04/2024 — 04/2025
Niklas Schüler, 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 Engelshoven, 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
Michéle Steinrötter, Bachelor thesis project, Bonn University 04/2022 — 08/2022

TEACHING EXPERIENCE

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

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 Institute 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

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 black board 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

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

Astroclub Bonn , Organiser & Website	10/2020 — present
Highschool Project , Project Andromeda, Assistant	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

Colloquium organiser , PHANGS collaboration colloquium organisation team	10/2022 — today
LOC member , IMPRS Bonn/Cologne retreat, Oostende, Belgium	09/2023

OVERSICING PROGRAMS

PI accepted:

APEX , 2024 (M9511A-104)	(48 hr)
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co-PI accepted:

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 , 2023, cycle 10 (2023.1.00530.S)	10 hr/12m
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)
ALMA, 2021, cycle 8 (2021.1.00740.S)

12 hr/12m + 59 hr/7m + 130 hr/TP
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: **18** peer-reviewed papers, **249** citations (see ADS library)

First- and second-author publications

1. **Neumann**, den Brok, Bigiel et al., “Spectral stacking of radio-interferometric data”, A&A, 675, A104 (2023)
2. **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. Querejeta, Leroy, Meidt et al. (**incl. Neumann**), “Do spiral arms enhance star formation efficiency?”, arXiv, arXiv:2405.05364 (2024)
2. Beslic, Barnes, Bigiel et al. (**incl. Neumann**), “The properties and kinematics of HCN emission across the closest starburst galaxy NGC 253 observed with ALMA”, arXiv, arXiv:2403.13751 (2024)
3. Williams, Lee, Larson et al. (**incl. Neumann**), “PHANGS-JWST: Data Processing Pipeline and First Full Public Data Release”, arXiv, arXiv:2401.15142 (2024)
4. 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)
5. 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)
6. 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)
7. 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)
8. 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)
9. 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)
10. Sun, Leroy, Ostriker et al. (**incl. Neumann**), “Star Formation Laws and Efficiencies across 80 Nearby Galaxies”, ApJL, 945, L19 (2023)
11. 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)
12. den Brok, Bigiel, Sliwa et al. (**incl. Neumann**), “A CO isotopologue Line Atlas within the Whirlpool galaxy Survey (CLAWS)”, A&A, 662, A89 (2022)
13. den Brok, Chatzigiannakis, Bigiel et al. (**incl. Neumann**), “New constraints on the ¹²CO(2-1)/(1-0) line ratio across nearby disc galaxies”, MNRAS, 504, 3221 (2021)