

# LUKAS NEUMANN

Argelander-Institut für Astronomie, Universität Bonn  
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## EDUCATION

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**PhD in Astrophysics**, Bonn University, Advisor: Frank Bigiel 11/2021 — Expected: fall 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 GPA: 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 GPA: 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 GPA: 2.0  
ERASMUS exchange student at Lund University, Sweden (Winter Semester 2016/17)

## 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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**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)

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Peer-reviewed papers: **14** total, **152** citations (**2** as 1st author + **3** as 1st/2nd author outside of astronomy; ADS library)

## MENTORING EXPERIENCE

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**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

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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**, ARI Institue Colloquium, Astronomisches Recheninstitut (ARI), Heidelberg, Germany (11/2023)  
**Invited talk**, Galaxy Coffee, European Southern Observatory (ESO), Garching, Germany (11/2023)

<b>Invited talk</b> , Lunch talk, European Southern Observatory (ESO), Garching, Germany	(11/2023)
<b>Invited talk</b> , Lunch talk, Leiden Observatory, Leiden, Netherlands	10/2023
<b>Invited talk</b> , Galaxy Coffee, Max Planck Institute for Astronomy (MPIA), Heidelberg, Germany	10/2023
<b>Invited talk</b> , PSF Coffee, Max Planck Institute for Astronomy (MPIA), Heidelberg, Germany	10/2023
<b>Invited talk</b> , Lunch talk, Lund Observatory, Lund, Sweden ( <i>virtually</i> )	04/2023
<b>Talk</b> , IMPRS Conference, Max Planck Institute for Radio Astronomy (MPIfR), Bonn, Germany	04/2023
<b>Invited talk</b> , Seminar talk, University of Cologne, Cologne, Germany	03/2023
<b>Poster prize talk</b> , From Stars to Galaxies II, Chalmers University, Gothenburg, Sweden	06/2022

## CONFERENCES & WORKSHOPS

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<b>IMPRS Bonn/Cologne retreat</b> , Oostende, Belgium	09/2023
<b>IMPRS Heidelberg summer school</b> , Unraveling Galaxy Evolution with JWST, Heidelberg, Germany	09/2023
<b>PHANGS team meeting</b> , Talk, Pasadena, USA	02/2023
<b>11th IRAM interferometry school</b> , Workshop on millimetre astronomy, Grenoble, France	11/2022
<b>IMPRS Bonn/Cologne retreat</b> , Cochem, Germany	11/2022
<b>From Stars to Galaxies II</b> , Poster & poster prize, Chalmers University, Gothenburg, Sweden	06/2022
<b>Multi-line Diagnostics of the Interstellar Medium</b> , Poster, Nice, France	04/2022
<b>10th IRAM 30m school</b> , Workshop on millimetre astronomy, Granada, Spain ( <i>virtually</i> )	11/2021
<b>ISM 2021</b> , Beirut, Structure, characteristic scales, and star formation ( <i>virtually</i> )	05/2021

## GRANTS & AWARDS

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

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<b>Astroclub Bonn</b> , Organiser & Website	10/2020 — present
<b>Public Talk</b> , Astroclub Bonn, "Die Suche nach dem Längengrad"	(12/2023)
<b>Public Talk</b> , Bonner Sternhimmel, "Sternentstehung in Spiralgalaxien"	(11/2023)
<b>Outreach Event</b> , Universe on tour (national exhibition) with ALMA telescope model, Bonn, Germany	08/2023
<b>Public Talk</b> , AoT Bonn, "JWST - wie man Schweizer Käse und Fleischbällchen in anderen Galaxien findet"	04/2023
<b>Public Talk</b> , Astroclub Bonn, "Die Venus-Transite des 18. Jahrhunderts"	11/2021

## ACADEMIC LEADERSHIP

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

## OVSERVING PROGRAMS

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### *co-PI accepted:*

<b>ALMA</b> , 2023, cycle 10 (2023.1.01493.S)	59 hr/7m
<b>ALMA</b> , 2023, cycle 10 (2023.1.00884.S)	9 hr/12 + 70 hr/7m + 149 hr/TP
<b>ALMA</b> , 2023, cycle 10 (2023.1.00530.S)	10 hr/12m
<b>ALMA</b> , 2022, cycle 9 (2022.1.01654.S)	17 hr/12m + 8 hr/7m + 22 hr/TP
<b>ALMA</b> , 2022, cycle 9 (2022.1.01479.S)	12 hr/12m + 59 hr/7m + 130 hr/TP
<b>ALMA</b> , 2021, cycle 8 (2021.1.00740.S)	24 hr/12m + 51 hr/7m + 109 hr/TP

## TECHNICAL SKILLS

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**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

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Summary: 14 peer-reviewed papers, 152 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<sub>x</sub> 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. Panessa, Seifried, Walch et al., "The evolution of HCO<sub>i</sub>SUP<sub>i</sub>+i/SUP<sub>i</sub> in molecular clouds using a novel chemical post-processing algorithm", MNRAS, 523, 6138 (2023)
2. Jiménez-Donaire, Usero, Bešlić et al. (**incl. Neumann**), "A constant N<sub>2</sub>H<sup>+</sup>(1-0)-to-HCN(1-0) ratio on kiloparsec scales", A&A, 676, L11 (2023)
3. Teng, Sandstrom, Sun et al. (**incl. Neumann**), "The Physical Drivers and Observational Tracers of CO-to-H<sub>2</sub> Conversion Factor Variations in Nearby Barred Galaxy Centers", ApJ, 950, 119 (2023)
4. Belfiore, Leroy, Williams et al. (**incl. Neumann**), "Calibrating mid-infrared emission as a tracer of obscured star formation on HII-region scales in the era of JWST", arXiv, arXiv:2306.11811 (2023)
5. Zakardjian, Pety, Herrera et al. (**incl. Neumann**), "The impact of HII regions on Giant Molecular Cloud properties in nearby galaxies sampled by PHANGS ALMA and MUSE", arXiv, arXiv:2305.03650 (2023)
6. Sun, Leroy, Ostriker et al. (**incl. Neumann**), "Star Formation Laws and Efficiencies across 80 Nearby Galaxies", ApJL, 945, L19 (2023)
7. 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)
8. den Brok, Bigiel, Sliwa et al. (**incl. Neumann**), "A CO isotopologue Line Atlas within the Whirlpool galaxy Survey (CLAWS)", A&A, 662, A89 (2022)
9. den Brok, Chatzigiannakis, Bigiel et al. (**incl. Neumann**), "New constraints on the <sup>12</sup>CO(2-1)/(1-0) line ratio across nearby disc galaxies", MNRAS, 504, 3221 (2021)