

Academic CV

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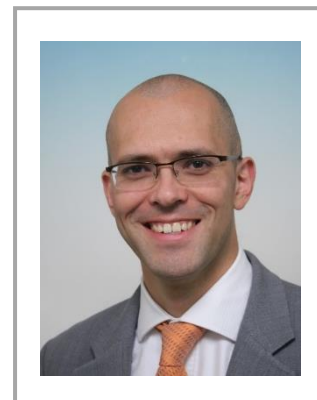
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Education

- Nov. 2022 Umhabilitation and **venia legendi**, Institut für Angewandte Physik, Goethe-University Frankfurt, Germany
- 11.07.2013 **Habilitation** (postdoctoral lecture qualification) and **venia legendi** in Experimental Physics, Cologne University, Germany, Thesis: “*Fortschritte in der numerischen Modellierung von Photo-Dissoziationsregionen*“
- 1997 – 2002 **PhD**, Institut für Theoretische Physik, Goethe-University Frankfurt, Germany, Supervisor: Prof. Dr. W.H. Kegel, **Grade: „very good“ (magna cum laude)**, Thesis: “*Der Einfluss von turbulenten Strömungen auf die Photodissoziation von CO in interstellaren Wolken*“
- 10.07.1997 **Physics Diploma**, Institut für Theoretische Physik, Goethe-University Frankfurt, Germany, Supervisor: Prof. Dr. W.H. Kegel, **Grade: „very good“ (outstanding)** Thesis: “*A-Typ Methanol Maser in interstellaren Molekülwolken unter Berücksichtigung von IR/HII Quellen und Linienüberlapp*“

Academic Employment

- 2023 – Scientific Director, Physikalischer Verein, Frankfurt, Germany
- 2008 – 2022 Senior Researcher, I. Physical Institute, Cologne University, Germany
- 2006 – 2007 Post-Doc, Argelander-Institute for Astronomy, Bonn University, Germany
- 2003 – 2006 Post-Doc, I. Physical Institute, Cologne University, Germany
- 2002 Research Assistant (voluntary), Goethe-University Frankfurt, Germany
- 1998 – 2001 Research Assistant /PhD Student, Goethe- University Frankfurt, Germany

Non-Academic Employment

2015 – present Scientific consultant (freelance) for international Big Data companies

1999 – 2001 IT-Consultant (part time position), USD GmbH, Langen, Germany

Research Expertise and Interests

- Research in observational galactic and extragalactic astrophysics
- Microphysics of the interstellar medium (ISM)
- Chemical and elemental evolution of the ISM
- Formation and evolution of stars and planets
- Data analysis of complex multi-dimensional & multi-wavelength data
- Numerical modelling and scientific programming
- Machine learning and KI in astronomy
- Astronomical observations in the Radio, IR, Far-IR and THz spectral regimes
- Research & Project experience with space-based, airborne and terrestrial astronomical observatories
- Project experience in large-scale, multinational collaborations
- Radiative transfer
- CRC/SFB planning and application (total CRC 956 volume: **33 mil. €**)

Awards and Highlights

2022 – 2026 Co-PI of 2 science cases for the GEco Milky Way survey (>4100 hours in 5 yrs.) on the upcoming **CCAT-prime/FYST observatory** in Chile

2018 Karl Schwarzschild-Lecturer, 195-year anniversary, Physical Club Frankfurt, Germany

2016 Invitation by Nature's editorial board to write a Science News & Views article

2008– 2015 Co-I in 4 Guaranteed Time Key Projects on the Herschel Space Telescope: WADI (Co-PI), Herm33es (Co-I), HexGal (Co-I), HEXOS (Co-I)

2004 – 2007 PI of the seminal PDR model benchmark study (Röllig et al, 2007, A&A, 467, 187 - highlighted paper)

2005 IAU Travel Grant

2003 – present PI and main developer of the numerical PDR model code KOSMA-tau

1996 – 1997 FAZIT PhD Fellow, Frankfurt am Main, Germany

1989 Best student of the year, Abitur: 1.0, Offenbach a. M., Germany

Research Grants

2011 – 2013 DLR, German Aerospace Center, Project: Herschel Open Time Key Project HERMES, 1 PhD positions for 3 yrs., total amount: **217,980 €**, grant ID: 50 OR, awarded to Dr. Christian Glück

2009 – 2011 ASTRONET, Federal Ministry of Education and Research, Project: CATS (Coherent Set of Astrophysical Tools for Spectroscopy) 1 Postdoc Position for 3 years, total amount: **170,996 €** (total project volume: **798,159 €**), grant ID: 05A09EUA

Scientific Journals for which I act as Referee

- Astronomy and Astrophysics
- Astrophysical Journal
- Monthly Notices of the Royal Astronomical Society
- Nature
- New Astronomy Reviews

Publication Record

- 73 peer-reviewed publications, 126 publications in total.
- h-index 35 (Google scholar)
- i10-index 59 (Google scholar)
- total (refereed) citations 3563 (Google scholar)
- **ORCID-ID: 0000-0001-6205-2242**

Full publication list at the end of this document.

Academic Service

- Local Organizing Committee, 7th Chile-Cologne-Bonn-Symposium, 2022, 200+ participants, Puerto Varas, Chile
- Member: Bonn-Cologne Graduate School, H2-Grant review panel, 2016, Cologne, Germany
- Local Organizing Committee, 6-th Zermatt ISM-Symposium 2015, 250+ participants, Zermatt, Switzerland
- Member: Bonn-Cologne Graduate School, H2-Grant review panel, 2014, Bonn, Germany
- Local Organizing Committee, SOFIA Winter School 2014, 70 participants
- Referee for ANR: Agence Nationale de la Recherche (French national funding agency), France (2013) project volume: 4 yrs., 446035 €
- Editor: EAS Conference proceedings, 5th Zermatt ISM-Symposium 2010
- Local Organizing Committee, 5th Zermatt ISM-Symposium 2010, 250+ participants, Zermatt, Switzerland

Telescope Time Awards

Galactic Ecology (Co-PI for 2 science cases)	>4100h	CCAT-prime/FYST	2022-26
Balloon mission to observe [NII] 122 μ m emission (Co-I)	21d	ASTHROS/NASA	2023
Radiative Feedback from Massive Stars (Core-team)	27.8h	JWST/ERS	2022
Highly Ionized regions in Carina and G333.6-0.2 (Co-I)	3.9h	SOFIA/FIFI-LS	2021-22
Extreme Stellar Feedback in the Carina SF Region (Co-I)	19.3h	SOFIA/upGREAT	2021-22
FEEDBACK – SOFIA Legacy program (Co-I)	91h	SOFIA/upGREAT	2019-22
Origin of the CII emission in diffuse clouds (Co-I)	11h	IRAM-30m/Emir	2019
A Multi-Wavelength View of the Sgr A Complex (Co-I)	24h	IRAM-30m/Emir	2019
Accretion flows in S106 (Co-I)	16h	NOEMA	2018-19
A Multi-Wavelength View of the Sgr A Complex (Co-I)	22.7h	IRAM-30m	2018
[OI] 145 μ m emission in the pillars of creation (Co-I)	1h	SOFIA/upGREAT	2017-18
The pillars of creation in M16 revisited (Co-I)	27.8h	IRAM-30m/Emir	2017
[OI] and [CI] in IC1396A (Co-I)	100m	SOFIA/upGREAT	2017
[CII] in IC10 (PI)	144m	SOFIA/upGREAT	2017

[OI] and [CII] in S106 (Co-I)	4h	SOFIA/upGREAT	2017
Gas Components Towards the Arched-Filaments (Co-I)	7.5h	IRAM-30m/Emir	2016-17
Velocity resolved [CII] and [NII] observations in M33 (Co-I)	2h	SOFIA/upGREAT	2016-17
CO and [CI] mapping observations in NGC 2074 (Co-I)	6.3h	APEX	2016-17
OI and high-J CO in the IC 10 (PI)	3h	SOFIA/upGREAT	2016
[CII] and [NII] in IC342 (PI)	96m	SOFIA/upGREAT	2016
[O I] emission from the DR21 outflow (Co-I)	1.5h	SOFIA/upGREAT	2016
Feedback of a massive star: a case study of S106 (Co-I)	18.1h	IRAM-30m/Emir	2016
[CII] in the LMC clouds N160 and N158 (Co-I)	2h	SOFIA/upGREAT	2016
Shocks or PDRs in S106? [OI] and high-J CO obs. (Co-I)	1h	SOFIA/GREAT	2015
The LMC star-forming region N44 (Co-I)	1h	SOFIA/GREAT	2015
Velocity resolved [CII] and [NII] observations in M33 (Co-I)	2h	SOFIA/GREAT	2015
Strong [CII] self-absorption towards NGC 2024 (Co-I)	1.5h	SOFIA/GREAT	2014
Mapping hot CO in DR21-C (PI)	1h	SOFIA/GREAT	2014
[OI] and [CI] in IC1396A (Co-I)	1h	SOFIA/GREAT	2014
[CI] in M33 (Co-I)	14.2h	APEX	2013-14
Hot CO in the Massive Star Forming Region DR21 (PI)	10.7h	HSO/HIFI	2012-13
Pillars of Creation (Co-I)	31h	HSO	2012
[CII] emission from ISM clouds in formation (Co-I)	2h	SOFIA/GREAT	2012
Mapping the nucleus of IC342 (PI)	3.5h	SOFIA/GREAT	2012
[CII] mapping of LMC cloud cores (Co-I)	5h	SOFIA/GREAT	2012
WADI – the cluster NGC 3603 (Co-PI)	12.9h	HSO/ HIFI+PACS	2010-13
GT Key Project Warm and Dense ISM (Co-I)	140h	HSO/ HIFI+PACS	2010-13
GT Key Project HexGal (Co-I)	420h	HSO/ HIFI+PACS	2010-13
GT Key Project HEXOS (Co-I)	400h	HSO/ HIFI+PACS	2010-13
OT Key Project Herm33es – M33 (Co-I)	7.3h	HSO/PACS+SPIRE	2010
[CII] emission in the nucleus of IC342 (PI)	30m	SOFIA/GREAT	2011
Atomic carbon in M33 (PI)	33h	APEX/CHAMP+	2009
The dusty PDR NGC3603 (PI)	2h	APEX/Laboca	2007
The PDR interface in the Rosette Molecular Cloud (Co-I)	24	JCMT	2007
Mid-J CO and [CI] mapping at 150 pc distance (Co-I)	1.7h	NANTEN2	2007
The clumpy distribution of warm gas in NGC3603 (PI)	47h	NANTEN2	2006-07
Atomic carbon and warm CO in the RCW106 (Co-I)	13h	NANTEN2	2006-07
Large nearby Galaxies (Co-I)	7h	NANTEN2	2006-07
The Carina star forming region (Co-I)	14h	NANTEN2	2006-07
A Chemical study of the Cepheus-B PDR (Co-I)	45h	IRAM-30m	2006
CI, HCN, HCO ⁺ , CN in NGC278 (Co-I)	31h	JCMT	2005

8+ weeks hands-on experience as observer and operator at the NANTEN2 observatory, Chile.

Research Visits

Feb-Mar 2019	Tel Aviv University, Israel, Collaborator: Amiel Sternberg
Dez 2014	Tel Aviv University, Israel, Collaborator: Amiel Sternberg
Sep 2010	Sydney, Australia, Collaborator: Maria Cunningham
Apr 2008	Torun, Poland, Collaborator: Ryszard Szczerba
Dez 2006	CEA/Saclay, Collaborator: Suzanne Madden
Apr 2006	Torun, Poland, Collaborator: Ryszard Szczerba

Scientific Projects and Collaborations

Large Research Projects

CRC/SFB1601 Habitats of Massive Stars across Cosmic Times

(2023-2027), DFG, Germany, PI: Stefanie Walch, **Total grant: 15,802,000€**

CRC/SFB956 Conditions and Impact of Star Formation

(2019-2022), DFG, Germany, PI: Stephan Schlemmer, **Total grant: 12,756,000€**

(2015-2018), DFG, Germany, PI: Jürgen Stutzki, **Total grant: 11,778,700 €**

(2011-2014), DFG, Germany, PI: Jürgen Stutzki, **Total grant: 8.352.000 €**

CRC/SFB 494: Die Entwicklung der interstellaren Materie

(2003-2007), DFG, Germany, PI: Jürgen Stutzki

Space Based Observing Projects

JWST Mission (James Webb Space Telescope) Launch planned October 2021

ERS Project (Early Release Science Program) ID 1288: “Radiative Feedback from Massive Stars as Traced by Multiband Imaging and Spectroscopic Mosaics“, core-team member, 20+ scientists, 27.8 hrs. observing time, goal: provide “template data” and science-enabling products for PDRs

JWST Cycle 1 observations of Orion & Trifid (proposal)

Herschel Satellite-Mission (2009-2013)

HEXOS (*Herschel/HIFI Observations of EXtraOrdinary Sources: The Orion and Sagittarius B2 Star forming Regions*), Co-I, 60+ scientists, 400+ hrs. observing time – result: a near-complete census of the most abundant species in best template objects in space

HEXGAL (*Hifi EXtraGALactic: Physical and Chemical Conditions of the ISM in Galactic Nuclei*), Co-I, 20+ scientists, 420 hrs. observing time – result: detailed chemical inventory of galactic nuclei showing surprising large amounts of H₂O

WADI (*Warm and Dense ISM*), Co-PI, 30+ scientists, 140 hrs. observing time (13 hrs. as source PI) – result: light hydride inventory across 13 template PDRs, detailed energy balance disentangled

HerM33es (*Herschel M33 Extended Survey*), 40+ scientists, 7.3 hrs. observing time, result: detailed heating and cooling across the nearby spiral M33

HotCO (*Hot CO in the Massive Star Forming Region DR21C*) (PI), 10.7 hrs. observing time

Aerial Observing Projects

ASTHROS (Astrophysics Stratospheric Telescope for High-spectral Resolution Observations at Submillimeter-waves), Co-I, launch 2023, NASA/ROSES balloon project, sub-millimeter observations, 21+ days observing time

SOFIA (Stratospheric Observatory for Far Infrared Astronomy)

FEEDBACK, Co-I, 2019-present, 34 scientists, 91 hrs. observing time, goal: Understanding the physical processes that regulate the feedback of massive stars on their environment

(up)GREAT (German REceiver for Astronomy at Terahertz Frequencies) Consortium member

20+ successful observing proposals/projects as PI and Co-I (see Table of awarded observing time)

Ground Based Observing Projects

CCAT-prime/FYST (first light: 2021)

GEco (Galactic Ecology), Co-PI, 2022-2026, unbiased large-scale survey of the Milky Way, **4100+ hrs.** observing time

IRAM 30m

Co-I for 7 observing projects (total time: 156 hrs., see Table of awarded observing time)

IRAM NOEMA Interferometer

“Accretion flows in S106”, Co-I, 16 hrs. observing time

NANTEN2 observatory, hands-on experience in radio/sub-mm astronomy, **JCMT** Spectral Legacy Survey, **Heinrich-Hertz Telescope**

Large Simulation and Data Analysis Projects

KOSMA- τ PDR Model, 2003-present, PI, maintenance and development of the numerical PDR code

PDR Modelling support

Data analysis within SFB 956 (ongoing), Star formation in M17 (ongoing), Modelling PDR emission in the Galactic center (ongoing), Characterizing the local conditions in massive star forming regions – S106 (published 2020, ongoing), Feedback from massive stars – globules and pillars (ongoing)

GENESIS (GENeration and Evolution of Structures in the ISM), 2015-present, Co-I, ANR/DFG Collaborative Project Köln-Bordeaux (ongoing)

PDR Code Comparison Benchmark 2004-2007, PI, 25+ scientists, 17 international institutes

CATS (Coherent Set of Astrophysical Tools for Spectroscopy – Developing a general multi-purpose model fitting tool, 2009-2011, Co-I, successfully secured third-party funding)

Selected International Collaborators

N. Abel, USA • E. Bergin, USA • O. Berne, France • F. Bertoldi, Germany • J. Black, Sweden • S. Bontemps, France • J. Braine, France • M. Burton, Northern Ireland • E. Chambers, USA • G. J. Ferland, USA • A. Fuente, Spain • P. Garcia, Chile • M. Gerin, France • J. Goicoechea, Spain • P. Gratier, France • R. Güsten, Germany • F. Israel, Netherlands • C. Joblin, France • C. Kramer, Spain • M. J. Kaufman, USA • M. Kirsanova, Russia • J. Le Boulrot, France • F. Le Petit, France • B. Mookerjee, India • Z. Nagy, USA • V. Ossenkopf-Okada, Germany • Y. Okada, Germany • J.-P. Perez-Beaupuits, Chile • J. Pineda, USA • R. Szczerba, Poland • A. Sternberg, Israel • W.-F. Thi, Germany • F. F. S. van der Tak, Netherlands • E. F. van Dishoeck, Netherlands • P. A. M. van Hoof, Belgium • S. Viti, UK • P. Woitke, UK • M. G. Wolfire

Teaching Activities at Goethe University Frankfurt

2022 – present Habilitation and venia legendi at Goethe-University

2016 – 2022 an unpaid teaching position at the Goethe-University Frankfurt (“unvergüteter Lehrauftrag”).

Full Courses

All course web-pages are available on the webpage of the [Experimental Astrophysics research group](#) at the Institute for Applied Physics at the Department of Physics (FB 13) of the Goethe-University Frankfurt am Main. My rotating cycle of 3 courses is part of the module VKEXASTM - Special Topics in Experimental Astrophysics for MSc Students.

The summarizing results (“Globalwert”) of course evaluations (“Lehrveranstaltungsevaluation”) is given if available. My **online teaching has been evaluated exceptionally good** with **5.5 of 6** (SS2020) and **5.7 of 6** (WS2020/21) points.

- [Data Analysis for Astronomy and Physics](#), VKEXASTM (VDAPA), 3 CP, SS 2024
- [Data Analysis for Astronomy and Physics](#), VKEXASTM (VDAPA), 3 CP, SS 2023
- [Data Analysis for Astronomy and Physics](#), VKEXASTM (VDAPA), 3 CP, SS 2022
- [Data Analysis for Astronomy and Physics](#), VKEXASTM (VDAPA), 3 CP, SS 2021
- [Physics and Chemistry of the Interstellar Medium](#), VKEXASTM (VISM), 3 CP, WS 2020/21 (evaluation: **5.2 of 6**)
- [Star and Planet Formation](#), VSTAFOR, 3 CP, SS 2020 (evaluation: **5.1 of 6**)
- [Data Analysis for Astronomy and Physics](#), VDAPA, 3 CP, SS 2019 (evaluation: **5.4 of 6**)
- [Physics and Chemistry of the Interstellar Medium](#), VISM, 3 CP, WS 2018/19 (evaluation: **5.3 of 6**)
- [Star and Planet Formation](#), VSTAFOR, 3 CP, SS 2018 (evaluation: **4.6 of 6**)
- [Data Analysis for Astronomy and Physics](#), VDAPA, 3 CP, SS 2017
- [Physics and Chemistry of the Interstellar Medium](#), VISM, 3 CP, WS 2016/17
- [Star and Planet Formation](#), VSTAFOR, 3 CP, SS 2016

Other Teaching Activities

- Seminar/Proseminar: [Modern Problems of Astrophysics](#), together with Dr. T. Heftrich & Dr. M. Weigand, WS 2017/18

Teaching Activities at Cologne University

2012 – 2022 Habilitation and venia legendi at Cologne University

2003 – present Regular teaching at Cologne University

Full Courses

- [Data Analysis for Astronomy and Physics](#), 4.5/3 CP, SS 2022
- [Data Analysis for Astronomy and Physics](#), 4.5/3 CP, SS 2021

- **Advanced Seminar on Topical Subjects of Astrophysics**, 3 CP, SS 2021
- Data Analysis for Astronomy and Physics, 4.5/3 CP, SS 2020
- Advanced Seminar on Topical Subjects of Astrophysics, 3 CP, SS2020
- Data Analysis for Astronomy and Physics, 4.5/3 CP, SS 2019
- Data Analysis for Astronomy and Physics, 4.5/3 CP, SS 2018
- Data Analysis for Astronomy and Physics, 4.5/3 CP, SS 2017
- Data Analysis for Astronomy and Physics, 4.5/3 CP, SS 2016
- Data Analysis for Astronomy and Physics, 4.5/3 CP, SS 2015
- Data Analysis for Astronomy and Physics, 4.5/3 CP, SS 2014
- Astrophysik I, Stutzki & Röllig, WS2013/14
- **Mathematica as Tool for Astronomy and Physics**, WS 2009/10
- Astrophysik Oberseminar, SS 2008
- Einführung in die Astronomie, WS 2007/08
- The physics of interstellar photon dominated regions, SS 2007
- The physics of interstellar photon dominated regions, SS 2005

Other Teaching Activities

Substitute instructor for:

- Astronomie und Raumfahrt (PD. Dr. Ossenkopf-Okada), Cologne, WS 2018/19
- Astrophysics II (Prof. Dr. Stutzki), Cologne: WS 2014/15
- Star Formation (Prof. Dr. Schilke), Cologne, SS 2011
- Fourier analysis (Prof. Dr. Stutzki), Cologne, WS 2005

Support & organization of exercise groups and teaching assistance for the following courses:

- Astronomie und Raumfahrt
- Astrophysics I
- Astrophysics II
- Experimental Physics I

Graduate and Undergraduate Referee

2020	Physics Master, MSc. N. Kandpal, Cologne University PhD, Dr. rer. nat. M. Sadaghiani, Cologne University
2018	Physics Bachelor, BSc. B. Dünnebier, Cologne University Physics Master, MSc. A. Aghababaei, Cologne University
2015	PhD, Dr. rer. nat. S. Andree-Labsch, Cologne University
2014	PhD, Dr. rer. nat. Z. Makai, Cologne University
2013	PhD, Dr. C. Buchbender, Universidad de Granada, Spain Physics Bachelor, BSc. P. Klatt, Cologne University

Graduate and Undergraduate Studies Advised

2021	Physics Bachelor, D. Mederos-Leber, Goethe Universität Frankfurt
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2019 – present	PhD project, Msc. A. Baby, Cologne University (Co-supervisor)
2012 – 2016	PhD project, Dr. rer. nat. S. Andree-Labsch, Cologne University (Co-supervisor)
2010 – 2016	PhD project, Dr. rer. nat. C. Glück, Cologne University
2010 – 2014	PhD project, Dr. rer. nat. Z. Makai, Cologne University
2013	Physics Bachelor, BSc., M. Mertens, Cologne University (Co-supervisor)
2004 – 2005	Physics Diploma, Dipl. phys. M. Cubick, Cologne University

Talks and Public Outreach

Academic Talks

21.12.2020	(Online) “Modelling the micro-physics and chemistry in PDRs - Theory meets Simulation meets Observation”, SFB 956+ Science Slam
05.10.2020	(Online) “Future perspectives - H ₂ in UV and NIR, XDR, CRRLs, . . .”, SFB 956 Retreat
23.10.2019	(Invited) “PDR Modelling”, -, Germany
17.09.2019	(Invited) “PDR Modelling”, Fall meeting of the German Astronomical Society, Stuttgart, Germany
15.11.2018	(Invited) “PDR energetics - recent applications of the KOSMA-tau PDR code“, Dep. Astronomy and Physics, University College London, United Kingdom
29.09.2017	“PDR Modeling with KOSMA-tau”, Astrochemical Conference KIDA 2017, Bordeaux, France
28.09.2017	“PDR Modeling with KOSMA-tau“, GENESIS/MOBS Kick-off meeting, Bordeaux, France
07.09.2015	“[CII] and [NII] in the nucleus of IC 342“, The 6th Zermatt ISM Symposium, Zermatt, Switzerland
08.07.2015	(Invited) „Sunblock extreme“ Physikalisches Kolloquium, Johann-Wolfgang Goethe Universität, Frankfurt/Main, Germany
30.06.2015	(Invited) “PDR Model Benchmark“, 30 Years of Photodissociation Regions, Asilomar, USA
11.03.2015	(Invited, Online) SOFIA Community Tele Talk: “[CII] and [NII] in the nucleus of IC 342“
03.02.2015	“Photodissociation under varying dust absorption conditions“, Leiden Workshop: Photodissociation in astrochemistry, Leiden, Netherlands
20.06.2014	“Surface Chemistry in the KOSMA-tau PDR Code“, ISMS - International Symposium on Molecular Spectroscopy, Urbana-Champaign, Illinois, USA
10.02.2014	(Invited) “Introduction to PDRs“, SOFIA Winter School 2014, Cologne, Germany

11.03.2013 Public Habilitation Lecture (in german): “Terra 2.0 - Was macht einen Planeten eigentlich bewohnbar?“, Cologne, Germany

05.02.2013 “Isotopic Fractionation of C⁺“, C⁺ as an astronomical tool, Lorentz Center Workshop, Leiden, Netherlands

03.12.2012 Habilitation Presentation: “Sunblock extreme - Astrophysics and Astrochemistry in Photo-Dissociation Regions“, Cologne, Germany

18.10.2012 “Carbon Chemistry - Fractionation in PDRs“
“Chemical Structure in NGC 3603“,
“Combined line and continuum fitting “
Herschel Key Project WADI workshop Bonn, Germany

01.06.2012 “Recent developments of the KOSMA-tau PDR code”

22.11.2012 ”Carbon fractionation in PDRs“, Laboratory Astrophysics 2012, Leiden, Netherlands

01.06.2012 “Recent Developments of the KOSMA- τ PDR Code“, SFB 956 Retreat, Maria von der Aue, Germany

29.02.2012 “CO Excitation Workshop - Benchmark progress“
“Influence of H₂ formation on PDR model results“
Exciting CO in the Local and High-Redshift Universe workshop, Leiden, Netherlands

19.12.2011 “H₂ formation - DR21/Orion Bar models“, Herschel Key Project WADI/HEXOS workshop, Cologne, Germany

14.09.2011 “Chemical modelling crisis in PDR model“, FIR 2011, London, United Kingdom

17.02.2011 “HEXOS - Orion Bar: KOSMA-tau modeling“, ORION Bar modelling workshop, Paris, France

20.01.2011 “HEXOS –Orion Bar, First PDR Modelling Attempts“, Herschel Key Project HEXOS/PRISMAS Joint Team Meeting, Pasadena, USA

16.02.2009 ”MAGIX - Modelling and Analysis Generic Interface to eXternal numerical codes“, MAGIX Project meeting, Cologne, Germany

25.09.2008 “KOSMA- τ PDR Code“, Herschel Key Project WADI Workshop, Paris, France

24.04.2008 **(Invited)** “Low Metallicity PDR Modeling“, Torun, Poland

07.11.2007 **(Invited)** ”Metallicity effects in PDRs“, FIR Workshop 2007, Bad Honnef, Germany

24.01.2007 “PDR modeling of dwarf galaxies“, Astro-Kolloquium, Bonn, Germany

01.03.2006 “Carbon chemistry in giant molecular clouds“, SFB Colloquium, Bonn, Germany

14.12.2005 “Carbon in low Metallicity PDRs“, Astro-Colloquium, Bonn, Germany

11.10.2005 “Carbon in low Metallicity PDRs“, ALMA ISM Workshop, Gothenburg, Sweden

14.12.2004 “PDR Benchmarking“, Herschel Preparatory Science meeting, Cologne, Germany

30.09.2004 “Recent progress in modelling photon dominated regions“, SFB Colloquium, Bonn, Germany

- 29.09.2004 “Recent progress in modelling photon dominated regions”, SFB Colloquium, Bonn, Germany
- 30.10.2003 “Cologne Spherical PDR Model”, NANTEN2 Project Meeting, Cologne, Germany

Public Education & Outreach Talks

- 19.03.2021 „Das interstellare Medium“ (working title), Haus der Astronomie (**Online**)
- 06.03.2020 „Photonentorpedos aus dem All - Strahlungstransport und astrophysikalische Maser“, Physikalischer Verein, Frankfurt/Main, Germany
- 27.09.2019 „Den Gasen auf der Spur - Molekülspektroskopie mit dem SOFIA Observatorium“, Physikalischer Verein, Frankfurt/Main, Germany
26. 10.2018 **Karl-Schwarzschild Lecture, (Invited)**
„SOFIA - das fliegende Teleskop blickt "hinter" die Sterne“
Physikalischer Verein, Frankfurt/Main, Germany
20. 10.2017 „Neugeboren und gewaltig - Junge Sterne im Orionnebel“
Physikalischer Verein, Frankfurt/Main, Germany
10. 07.2015 „Die Planetenküche“
Physikalischer Verein, Frankfurt/Main, Germany
- 11.10.2013 „Der unbekannte sub-Millimeter Himmel – ein neues astronomisches Fenster“
Physikalischer Verein, Frankfurt/Main, Germany
- 28.03.2009 „Der unbekannte sub-Millimeter Himmel – ein neues astronomisches Fenster wird geöffnet“, Physikalischer Verein, Frankfurt/Main, Germany
- 18.05.2007 „Weltraum-Chemie am Limit UV-Schutz extrem – PDRs“
Physikalischer Verein, Frankfurt/Main, Germany
- 27.01.2006 „Chemie im Weltall – Kochen bei minus 200 Grad“
Physikalischer Verein, Frankfurt/Main, Germany
- 11.06.2004 „Kosmische Maser – Laser im Universum“
Physikalischer Verein, Frankfurt/Main, Germany

Colloquia and Conferences

Bad Honnef – 2019, University Grenoble/Avignon – 2019, AG/University Stuttgart – 2019, Paris – 2018, KIDA/ Bordeaux University – 2017, Rome – 2016, AG/ University Bochum – 2016, Leiden Observatory – 2015, Potsdam – 2015, Asilomar – 2015, Zermatt – 2015, Tel Aviv University – 2014, University of Illinois – 2014, ESTEC/Noordwijk – 2013, Leiden Observatory – 2013, Leiden Observatory – 2012, Cologne University – 2011, Paris – 2011, University College London – 2011, ESTEC/Noordwijk – 2010, Paris – 2010, Townsville – 2010, Zermatt – 2010, Madrid – 2009, Rio de Janeiro – 2009, Torun University – 2008, ESTEC/Noordwijk – 2008, ESTEC/Noordwijk – 2007, Bonn/Bad Honnef – 2007, Aarhus – 2006, Copenhagen University – 2006, CEA Paris – 2006, Leiden Observatory – 2006, Onsala Observatory – 2005, AG/Cologne University – 2005,

IAUS 231 Asilomar/Caltech – 2005, Leiden Observatory – 2004, Tel Aviv University – 2004, AG/Univ. Prague – 2004, AG/Univ. Freiburg – 2003, Zermatt – 2003, YERAC IRAM-30m Observatory – 2000

I was awarded travel grants for several colloquia and conferences, e.g. IAU 2005, IRAM/YERAC 2000

References

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Publication List

Citation Metrics

- h-index 35 (Google scholar)
- i10-index 59 (Google scholar)
- total (refereed) citations 3563 (Google scholar)

I have 73 peer-reviewed publication, 126 publications in total.

My publication with the strongest impact has 378 citations so far: Röllig, M., et al. 2007, A photon dominated region code comparison study, *Astronomy & Astrophysics*, 467, 187.

Updated list of publications : [Link to Google Scholar profile](#) [Link to astrophysics data system](#)

The **Impact Factor** (IF) 2019 of the journals I publish in are: *Nature* (42.8), *Science Advances* (13.1), *Astrophysical Journal* (5.8), *Astronomy & Astrophysics* (5.6), *Publications of the Astronomical Society of the Pacific* (3.5)

Top 10 Publications

- [1] (378 citations) **Röllig, M., et al. 2007**, A photon dominated region code comparison study, *A&A*, 467, 187
- [2] (1203 citations) **Röllig, M., et al., 2006**, [CII] 158 μm emission and metallicity in photon dominated regions, *A&A*, 451, 917
- [3] (175 citations) **Gratier, P., et al. 2010**, Molecular and atomic gas in the Local Group galaxy M 33, *A&A*, 522, 3+
- [4] (139 citations) **Goicoechea, J.R. et al. 2015**, Velocity-resolved [CII] Emission and [CII]/FIR Mapping along Orion with Herschel, *ApJ* 812, 75+
- [5] (133 citations) **Gratier, P., et al. 2012**, Giant molecular clouds in the Local Group galaxy M 33, *A&A*, 542, 108+
- [6] (111 citations) **Ossenkopf, V., et al. 2010**, Detection of interstellar oxidaniumyl: Abundant H_2O^+ towards the star-forming regions DR21, Sgr B2, and NGC6334, *A&A*, 518, L111+
- [7] (103 citations) **Nagy, Z. et al. 2013**, The chemistry of ions in the Orion Bar, *A&A*, 550, 96+
- [8] (110 citations) **Ossenkopf, V., Röllig, M., et al. 2013**, Herschel/HIFI observations of [C II] and [13C II] in photon-dominated regions, *A&A*, 550, 570+
- [9] (93 citations) **Kramer, C, et al. 2010**, PACS and SPIRE photometer maps of M 33: First results of the HERschel M 33 Extended Survey (HERM33ES), *A&A*, 518, L67+
- [10] (83 citations) **Combes, F. et al. 2012**, Dust and gas power spectrum in M 33 (HERM33ES), *A&A*, 539, 67+

Theses

- [1] **Röllig, M., 2013, Habilitation** (postdoctoral thesis), *Fortschritte in der numerischen Modellierung von Photo-Dissoziationsregionen*, Cologne University, Germany
- [2] **Röllig, M., 2002, PhD Thesis**, *Der Einfluss von turbulenten Strömungen auf die Photodissoziation von CO in interstellaren Wolken*, Institute for Theoretical Physics, Goethe-University Frankfurt, Germany
- [3] **Röllig, M. 1997, Diploma Thesis**, *A-Typ Methanol Maser in interstellaren Molekülwolken unter Berücksichtigung von IR/HII Quellen und Linienüberlapp*, Institute for Theoretical Physics, Goethe-University Frankfurt, Germany

Books/Conference-Proceedings

- [1] **Röllig, M., Ercolano, B., Roueff, E., Le Boulrot, J.**, Optically thin atomic photochemistry, in *Astrochemical Modeling 2024*, Elsevier
- [2] **Röllig, M., Roueff, E., Le Boulrot, J., Ercolano, B.**, Molecules and radiation shielding, in *Astrochemical Modeling 2024*, Elsevier
- [3] **Röllig, M., Simon, R., Ossenkopf, V., Stutzki, J. M.**, 2011, Conditions and Impact of Star Formation, EAS Publications Series, Vol. 52. EDP Sciences, 2011

Invited Articles

- [1] **Röllig, M.**, 2016, Astrophysics: Violent emissions of newborn stars, *Nature*, 537, 174 (refereed)

Articles in Peer-reviewed Journals

Accepted and Published Articles

- [1] **Elyajouri, M. et al. 2024**, PDRs4All. V. Modelling the dust evolution across the illuminated edge of the Orion Bar, submitted to A&A
- [2] **Zanesse, M. et al. 2023**, OH as a probe of the warm water cycle in planet-forming disks, accepted by A&A
- [3] **Peeters, E. et al 2023**, PDRs4All III: JWST's NIR spectroscopic view of the Orion Bar, accepted by A&A
- [4] **Berné, O. et al. 2023**, Formation of the methyl cation by photochemistry in a protoplanetary disk, *Nature* 621 (7977), 56-59
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- [8] **Röllig, M. & Ossenkopf-Okada, V. 2022**, The KOSMA- τ PDR model-I. Recent updates to the numerical model of photo-dissociated regions, *Astronomy & Astrophysics* 664, A67
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- [10] **Beuther, H. et al. 2022**, FEEDBACK from the NGC 7538 H II region, *Astronomy & Astrophysics* 659, A77
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Acronyms

A&A	Astronomy & Astrophysics
AG	Astronomische Gesellschaft (German society for astronomy)
AN	Astronomische Nachrichten
APEX	Atacama Pathfinder Experiment
ApJ	Astrophysical Journal
CRC/SFB	Collaborative Research Center/Sonderforschungsbereich
FYST	Fred Young Submillimeter Telescope
GREAT	German Receiver for Astronomy at Terahertz Frequencies
HSO	Herschel Space Observatory
IRAM	Institut de radioastronomie millimétrique
JCMT	James Clark Maxwell Telescope (radiotélescope à Hawaïi)
KOSMA	Cologne Observatory for Submm-Astronomy (http://www.astro.uni-koeln.de/kosma)
NOEMA	Northern Extended Millimeter Array
PASP	Publications of the Astronomical Society of the Pacific
PD	“Privatdozent” (habilitiert), private lecturer
PDR	photon-dominated regions or photodissociation regions
PI	principal investigator
SOFIA	Stratospheric Observatory for Far-Infrared Astronomy (NASA/DLR airplane)