

# Curriculum Vitae

## Anika Schmiedeke

Max Planck Institute for extraterrestrial Physics  
Gießenbachstraße 1  
85748 Garching

Telephone: +49 89 3000 3314  
eMail schmiedeke@mpe.mpg.de

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## Post-doctoral and research assistant positions

- Since 09.2016 **Postdoctoral Position**, *MAX PLANCK INSTITUTE FOR EXTRATERRESTRIAL PHYSICS (MPE)*, Garching (Germany).  
Member of the Center for Astrochemical Studies (CAS) led by Prof. Dr. Paola Caselli  
*Activities*: Observation and analysis of low-mass star forming regions.
- 10.2010 – 04.2011 **Research Assistant**, *MAX PLANCK INSTITUTE FOR ASTRONOMY (MPIA)*, Heidelberg (Germany).  
Member of the Infrared Space Astronomy group led by Dr. Oliver Krause  
*Activities*: Herschel PACS and SPIRE scan-map data reduction.
- 09.2009 – 07.2010 **Student Research Assistant**, *MPIA*, Heidelberg (Germany).  
Member of the Infrared Space Astronomy group led by Dr. Oliver Krause  
*Activities*: Reduction of Herschel/PACS data for the GT Projects Kingfish and EPoS.
- 11.2007 – 03.2010 **Student Research Assistant**, *INSTITUTE FOR ENVIRONMENTAL PHYSICS (IUP)*, Heidelberg (Germany).  
Member of the carbon cycle research group led by Prof. Dr. I. Levin  
*Activities*: Laboratory work; measurement of long-lived greenhouse gases in air samples collected world-wide using gas chromatography; extraction of CO<sub>2</sub> out of air samples.

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## Education

- 05.2011 – 08.2016 **Ph.D. in Physics**, *UNIVERSITY OF COLOGNE (UOC)*, Köln (Germany).  
Thesis title: *Radiative transfer modeling of Sagittarius B2*  
Advisors: Prof. Dr. Peter Schilke & Prof. Dr. S. Walch-Gassner; Graduation date: 04.07.2016
- 09.2013 – 12.2013 **Visiting graduate student**, *CALIFORNIA INSTITUTE OF TECHNOLOGY*, Pasadena (USA), Collaboration with Dr. Dariusz Lis.
- 10.2004 – 09.2010 **Diploma in Physics**, *UNIVERSITY OF HEIDELBERG*, Heidelberg (Germany).  
ELECTIVE COURSES: Chemistry, Astronomy, Computational Physics  
Diploma thesis advisors: Prof. Dr. Th. Henning & Dr. H. Beuther  
Thesis Title: *CO J=3-2 mapping of high-mass star-forming regions*; Graduation date: 17.08.2010
- 08.2007 – 09.2007 **Internship**, *MAX PLANCK INSTITUTE FOR ASTRONOMY*, Heidelberg (Germany).  
Supervisor: Dr. Martin Hennemann, Title: *A S[II] and H $\alpha$  imaging survey of star forming regions*  
*Activities*: Observation with the 70 cm MPIA optical telescope, development of an automated data reduction pipeline within IRAF

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## Funding, Reviewing & Student Supervision

- 2020 Supervision of Master student T. Carl.
- Since 2018 Reviewer for Astrophysical Journal (ApJ).
- 09.2013 – 12.2013 Scholarship for research project abroad from SFB956 student exchange programme.

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## Professional Experience

### Computer Skills

Operating Systems	Linux ((K)Ubuntu, LinuxMint, Gentoo), macOS, iOS, Windows, Android
Languages	fluent in python (2 and 3) and bash; working knowledge of Fortran90, C and IDL; basic knowledge of PHP
Software (selected)	alma-ot, casa, casaviewer, cassis, ds9, gildas, git, hipe, hyper-fit, iraf, lime, magix, miriad, mollie, pandora, paraview, radmc-3d, scanamorphos, statcont, xclass
python packages (selected)	aplpy, astrodendro, astropy, fil-finder, lmfit, matplotlib, numpy, lmfit, pandas, pyspeckit, radfil, spectral-cube

### Observing Experience

2018 – present	<b>GBT, Green Bank, West Virginia (USA)</b> , > 60 h. radio and sub-mm; on-site & remote observing; instruments: ARGUS, KPFA, MUSTANG2
2009 – present	<b>IRAM-30m, Granada (Spain)</b> , >200 h. sub-mm; on-site & remote observing; instruments: EMIR, HERA, Mambo2, NIKA2
11.2013	<b>CARMA, Big Pine, California (USA)</b> , 1 week. sub-mm; on-site interferometric observing
08.2007 – 09.2007	<b>MPIA 70 cm, Heidelberg (Germany)</b> , ~10 nights. optical; on-site; broad- and narrowband filters

### Technical Experience

CARMA	calibration of interferometric data
GBT	calibration of ARGUS, KPFA & MUSTANG2 data
Herschel	calibration of photometric data obtained with SPIRE and PACS
IRAM-30m	calibration of single dish data; continuum and spectral lines
MPIA-70cm	calibration of optical data
NOEMA	imaging and combining with IRAM 30 m short spacing observations
VLA	K-band observing script setup, data calibration and imaging

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## Observing Projects

### Principal Investigator (>170 h; 5 most recent)

2021	<b>GBT</b> , <i>PRESTELLAR CORES</i> , continuum observations.
2020	<b>IRAM 30M</b> , <i>PRESTELLAR CORES</i> , continuum observations.
2020	<b>GBT</b> , <i>BARNARD 5</i> , continuum observations.
2019	<b>IRAM 30M</b> , <i>BARNARD 5</i> , continuum observations.
2019	<b>VLA</b> , <i>L1544</i> , spectroscopic large-scale mapping.

### Co-Investigator (>600 h, excluding large programmes; 5 most recent)

2021	<b>GBT</b> , <i>BARNARD 5</i> , PI: J. E. Pineda.
2020	<b>NOEMA</b> , <i>IRS63</i> , PI: D. Segura-Cox.
2020	<b>NOEMA</b> , <i>PER-EMB-2</i> , PI: J. E. Pineda.
2020	<b>IRAM 30M</b> , <i>IRS63</i> , PI: D. Segura-Cox.
2020	<b>JCMT</b> , <i>BARNARD 5</i> , PI: G. A. Fuller.

## Large programmes

- 2020–2024 **GBT**, *DiSCo GAS*, 230 h, PI: C.-Y. Chen.  
2013–2015 **CARMA**, *CARMA-ORION*, 650 h, PI: J. Carpenter.  
2009–2013 **Herschel**, *EPoS*, 120 h, PI: O. Krause.

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## Teaching Experience

- Winter 2014 Teaching assistant in '*Experimental Physics I – Classical Mechanics*' at UoC  
Summer 2014 Teaching assistant in '*Experimental Physics II – Electrodynamics*' at UoC  
Summer 2013 Teaching assistant in '*Experimental Physics I – Classical Mechanics*' at UoC  
Winter 2012 Teaching assistant in '*Astrophysics I*' at UoC  
Summer 2012 Teaching assistant in '*Laboratory Course – Thermodynamics*' at UoC  
Winter 2011 Teaching assistant in '*Atomic Physics*' at UoC  
Summer 2011 Teaching assistant in '*Experimental Physics II – Electrodynamics*' at UoC

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## Selected Contributions at Conferences & Seminars

- 05.02.2020 Invited lecture on star formation at the Ludwig-Maximilian University (LMU), Munich  
14.–18.10.2019 Poster presentation at 'ALMA2019: Science results', Cagliari, Italy  
25.10.2018 Speaker at GBT lunch seminar, WV, USA  
13.–17.02.2017 Poster presentation at 'The Physics of the ISM', Cologne, Germany  
25.–29.07.2016 Poster presentations at 'Star formation in different environments', Quy Nhon, Viet Nam  
11.09.2015 Speaker at 6<sup>th</sup> Zermatt ISM Symposium, Zermatt, Switzerland  
28.04.2015 Speaker at Central Molecular Zone (CMZ) workshop, ESO, Garching, Germany  
05.11.2013 Invited speaker at Caltech, CA, USA  
25.01.2012 Speaker at CHESS meeting, UCL, London, UK

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## Organizational Activities

- 01.09.16-31.01.20 Organizer of MPE-CAS group meeting for ~ 30 participants, held every two weeks.  
28.–30.06.2017 Organizer of MPE-CAS retreat at Ringberg Castle, Germany, for ~ 40 participants.

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## Selected Public Outreach Activities

- 2018 – present ESO Supernova, Planetarium and Visitor Center Volunteer  
2021 Article contribution for german magazine 'Sterne und Weltraum'  
28.03.2019 MPE Girls Day  
21.10.2017 MPE Tag der offenen Tür  
01.10.2015 Schnupperuni for high-school students; Talk: 'What is Astrophysics?'  
07.10.2014 'Holiday and Science: CSI Cologne' 1-day experiment for high-school students  
07.07.2013 Projekttag Köln for high-school students; Talk: 'Star Formation'  
2010-2011 Guided tours of the 70cm optical telescope at the MPIA

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## Language Skills

German	Native
English	Advanced
French	Intermediate, 7 years in high-school
Japanese	Basic, 5 years in high-school
Spanish	Basic, self-taught

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## Publications

I list my papers in reverse-chronological order and indicate my contribution to each paper below. My papers have collected 1500+ refereed citations, 4 papers were cited 100+ times, my lead author publications were cited 58 times in total. My Hirsch index is 20.

### Refereed Publications

1. **Schmiedeke, A.**, J.E. Pineda, P. Caselli, H.G. Arce, and others (Jan. 2021). [Dissecting the super-critical filaments embedded in the 0.5 pc subsonic region of Barnard 5](#). In: *arXiv:2101.00248*. *Contribution*: Lead author.
2. Segura-Cox, D., **A. Schmiedeke**, J.E. Pineda, I. Stephens, and others (Oct. 2020). [Four annular structures in a protostellar disk with an age <500,000 years](#). In: *Nature* 586, pp. 228–231. *Contribution*: Disk radiative transfer modeling, critical revision of the article.
3. Pineda, J.E., D. Segura-Cox, P. Caselli, N. Cunningham, and others incl. **A. Schmiedeke** (July 2020). [A protostellar system fed by a streamer of 10,500 au length](#). In: *Nature Astronomy*. *Contribution*: Critical review of the article.
4. Alves, F. O., P. Caselli, J. M. Girart, D. Segura-Cox, G. A. P. Franco, A. Schmiedeke, and B. Zhao (Oct. 2019). [Gas flow and accretion via spiral streamers and circumstellar disks in a young binary protostar](#). In: *Science* 366.6461, pp. 90–93. *Contribution*: Data visualization and python plotting using matplotlib, critical revision of the article.
5. Meng, F., Á. Sánchez-Monge, P. Schilke, M. Padovani, and others incl **A. Schmiedeke** (Oct. 2019). [The physical and chemical structure of Sagittarius B2. V. Non-thermal emission in the envelope of Sgr B2](#). In: *A&A* 630, A73, A73. *Contribution*: Conception of the initial work, critical review of the article.
6. Pineda, J.E., B. Zhao, **A. Schmiedeke**, D.M. Segura-Cox, and others (Sept. 2019). [The Specific Angular Momentum Radial Profile in Dense Cores: Improved Initial Conditions for Disk Formation](#). In: *ApJ* 882.2, 103, p. 103. *Contribution*: Critical review of the article.
7. Schwörer, A., Á. Sánchez-Monge, P. Schilke, T. Möller, and others incl. **A. Schmiedeke** (Aug. 2019). [The physical and chemical structure of Sagittarius B2. IV. Converging filaments in the high-mass cluster forming region Sgr B2\(N\)](#). In: *A&A* 628, A6, A6. *Contribution*: Critical review of the article.
8. Kruijssen, J.M.D., J.E. Dale, S.N. Longmore, D.L. Walker, and others incl. **A. Schmiedeke** (Apr. 2019). [The dynamical evolution of molecular clouds near the Galactic Centre - II. Spatial structure and kinematics of simulated clouds](#). In: *MNRAS* 484.4, pp. 5734–5754. *Contribution*: Critical review of the article.
9. Mills, E.A.C., A. Ginsburg, A.R. Clements, P. Schilke, and others incl. **A. Schmiedeke** (Dec. 2018). [Discovery of  \$^{14}\text{NH}\_3\$  \(2,2\) Maser Emission in Sgr B2 Main](#). In: *ApJL* 869.1, L14, p. L14. *Contribution*: Critical review of the article.
10. Stéphan, G., P. Schilke, J. Le Bourlot, **A. Schmiedeke**, and others (Sept. 2018). [Chemical modeling of internal photon-dominated regions surrounding deeply embedded HC/UCHII regions](#). In: *A&A* 617, A60, A60. *Contribution*: Assistance with radiative transfer and programming, critical review of the article.
11. Kong, S., H.G. Arce, J.R. Feddersen, J.M. Carpenter, and others incl. **A. Schmiedeke** (June 2018). [The CARMA-NRO Orion Survey](#). In: *ApJS* 236.2, 25, p. 25. *Contribution*: Data calibration, critical revision of the article.

12. Pols, S., A. Schwörer, P. Schilke, **A. Schmiedeke**, and others (June 2018). [The physical and chemical structure of Sagittarius B2. III. Radiative transfer simulations of the hot core Sgr B2\(M\) for methyl cyanide](#). In: *A&A* 614, A123, A123. *Contribution*: Assistance with radiative transfer, critical revision of the article.
13. Ginsburg, A., J. Bally, A. Barnes, Nate Bastian, and others incl. **A. Schmiedeke** (Feb. 2018). [Distributed Star Formation throughout the Galactic Center Cloud Sgr B2](#). In: *ApJ* 853.2, 171, p. 171. *Contribution*: Critical revision of the article.
14. Sánchez-Monge, Á., P. Schilke, A. Ginsburg, R. Cesaroni, and **A. Schmiedeke** (Jan. 2018). [STAT-CONT: A statistical continuum level determination method for line-rich sources](#). In: *A&A* 609, A101, A101. *Contribution*: Providing subroutines, critical revision of the article.
15. Kauffmann, J., T. Pillai, Q. Zhang, K.M. Menten, and others incl. **A. Schmiedeke** (July 2017). [The Galactic Center Molecular Cloud Survey. II. A lack of dense gas and cloud evolution along Galactic center orbits](#). In: *A&A* 603, A90, A90. *Contribution*: Providing 3D radiative transfer results of Sgr B2, critical revision of the article.
16. Sánchez-Monge, Á., P. Schilke, **A. Schmiedeke**, A. Ginsburg, and others (July 2017). [The physical and chemical structure of Sagittarius B2. II. Continuum millimeter emission of Sgr B2\(M\) and Sgr B2\(N\) with ALMA](#). In: *A&A* 604, A6, A6. *Contribution*: Critical revision of the article.
17. Neufeld, D.A., P.F. Goldsmith, C. Comito, and **A. Schmiedeke** (Mar. 2017). [Search for Interstellar LiH in the Milky Way](#). In: *ApJ* 837.1, 52, p. 52. *Contribution*: Assistance with line radiative transfer, critical revision of the article.
18. Lippok, N., R. Launhardt, Th. Henning, Z. Balog, and others incl. **A. Schmiedeke** (July 2016). [Earliest phases of star formation \(EPoS\). Dust temperature distributions in isolated starless cores](#). In: *A&A* 592, A61, A61. *Contribution*: Data acquisition and calibration, critical revision of the article.
19. Henshaw, J.D., S.N. Longmore, J.M.D. Kruijssen, B. Davies, and others incl. **A. Schmiedeke** (Apr. 2016). [Molecular gas kinematics within the central 250 pc of the Milky Way](#). In: *MNRAS* 457.3, pp. 2675–2702. *Contribution*: Critical revision of the article.
20. **Schmiedeke, A.**, P. Schilke, Th. Möller, Á. Sánchez-Monge, and others (Apr. 2016). [The physical and chemical structure of Sagittarius B2. I. Three-dimensional thermal dust and free-free continuum modeling on 100 au to 45 pc scales](#). In: *A&A* 588, A143, A143. *Contribution*: Lead author. Highlight figure for the cover of the journal issue.
21. Choudhury, R., P. Schilke, G. Stéphan, E. Bergin, and others incl. **A. Schmiedeke** (Mar. 2015). [Evolution of complex organic molecules in hot molecular cores. Synthetic spectra at \(sub-\)mm wavebands](#). In: *A&A* 575, A68, A68. *Contribution*: Assistance with radiative transfer, critical revision of the article.
22. Schmalzl, M., R. Launhardt, A.M. Stutz, H. Linz, and others incl. **A. Schmiedeke** (Sept. 2014). [The Earliest Phases of Star formation \(EPoS\). Temperature, density, and kinematic structure of the star-forming core CB 17](#). In: *A&A* 569, A7, A7. *Contribution*: Data calibration, critical revision of the article.
23. Johnston, K.G., H. Beuther, H. Linz, **A. Schmiedeke**, and others (Aug. 2014). [The dynamics and star-forming potential of the massive Galactic centre cloud G0.253+0.016](#). In: *A&A* 568, A56, A56. *Contribution*: Data calibration, critical revision of the article.
24. Tackenberg, J., H. Beuther, Th. Henning, H. Linz, and others incl. **A. Schmiedeke** (May 2014). [Kinematic structure of massive star-forming regions. I. Accretion along filaments](#). In: *A&A* 565, A101, A101. *Contribution*: Data calibration, critical revision of the article.

25. Draine, B.T., G. Aniano, O. Krause, B. Groves, and others incl. **A. Schmiedeke** (Jan. 2014). [Andromeda's Dust](#). In: *ApJ* 780.2, 172, p. 172. *Contribution*: Data calibration, critical revision of the article.
26. Lippok, N., R. Launhardt, D. Semenov, A. M. Stutz, and others incl. **A. Schmiedeke** (Dec. 2013). [Gas-phase CO depletion and N<sub>2</sub>H<sup>+</sup> abundances in starless cores](#). In: *A&A* 560, A41, A41. *Contribution*: Data acquisition and calibration, critical revision of the article.
27. Sandstrom, K.M., A.K. Leroy, F. Walter, A.D. Bolatto, and others incl. **A. Schmiedeke** (Nov. 2013). [The CO-to-H<sub>2</sub> Conversion Factor and Dust-to-gas Ratio on Kiloparsec Scales in Nearby Galaxies](#). In: *ApJ* 777.1, 5, p. 5. *Contribution*: Data calibration, critical revision of the article.
28. Adams, Joshua J., Joshua D. Simon, Alberto D. Bolatto, G. C. Sloan, Karin M. Sandstrom, Anika Schmiedeke, Jacco Th. van Loon, Joana M. Oliveira, and Luke D. Keller (July 2013). [Dusty OB Stars in the Small Magellanic Cloud. II. Extragalactic Disks or Examples of the Pleiades Phenomenon?](#) In: *ApJ* 771.2, p. 112. *Contribution*: Data calibration, critical revision of the article.
29. Beuther, H., H. Linz, J. Tackenberg, Th. Henning, and others incl. **A. Schmiedeke** (May 2013). [Fragmentation and dynamical collapse of the starless high-mass star-forming region IRDC 18310-4](#). In: *A&A* 553, A115, A115. *Contribution*: Data calibration, critical revision of the article.
30. Pitann, J., H. Linz, S. Ragan, A.M. Stutz, and others incl. **A. Schmiedeke** (Apr. 2013). [G048.66-0.29: Physical State of an Isolated Site of Massive Star Formation](#). In: *ApJ* 766.2, 68, p. 68. *Contribution*: Data calibration, critical revision of the article.
31. Launhardt, R., A.M. Stutz, **A. Schmiedeke**, Th. Henning, and others (Mar. 2013). [The Earliest Phases of Star Formation \(EPoS\): a Herschel key project. The thermal structure of low-mass molecular cloud cores](#). In: *A&A* 551, A98, A98. *Contribution*: Data calibration, critical revision of the article.
32. Tackenberg, J., H. Beuther, R. Plume, T. Henning, and others incl. **A. Schmiedeke** (Feb. 2013). [Triggered/sequential star formation? A multi-phase ISM study around the prominent IRDC G18.93-0.03](#). In: *A&A* 550, A116, A116. *Contribution*: Data calibration, critical revision of the article.
33. Nielbock, M., R. Launhardt, J. Steinacker, A.M. Stutz, and others incl. **A. Schmiedeke** (Nov. 2012). [The Earliest Phases of Star formation \(EPoS\) observed with Herschel: the dust temperature and density distributions of B68](#). In: *A&A* 547, A11, A11. *Contribution*: Data calibration, critical revision of the article.
34. Ragan, S., Th. Henning, O. Krause, J. Pitann, and others incl. **A. Schmiedeke** (Nov. 2012). [The Earliest Phases of Star Formation \(EPoS\): a Herschel key program. The precursors to high-mass stars and clusters](#). In: *A&A* 547, A49, A49. *Contribution*: Data calibration, critical revision of the article.
35. Groves, B., O. Krause, K. Sandstrom, **A. Schmiedeke**, and others (Oct. 2012). [The heating of dust by old stellar populations in the bulge of M31](#). In: *MNRAS* 426.2, pp. 892–902. *Contribution*: Data calibration, critical revision of the article.
36. Zernickel, A., P. Schilke, **A. Schmiedeke**, D.C. Lis, and others (Oct. 2012). [Molecular line survey of the high-mass star-forming region NGC 6334I with Herschel/HIFI and the Submillimeter Array](#). In: *A&A* 546, A87, A87. *Contribution*: Critical revision of the article.
37. Beuther, H., J. Tackenberg, H. Linz, Th. Henning, and others incl. **A. Schmiedeke** (Feb. 2012). [The onset of high-mass star formation in the direct vicinity of the Galactic mini-starburst W43](#). In: *A&A* 538, A11, A11. *Contribution*: Data calibration, critical revision of the article.

## In Proceedings

1. **Schmiedeke, A.** (Dec. 2019). [Studying a forming multiple system: From large to small scales.](#) In: *ALMA2019: Science Results and Cross-Facility Synergies.*
2. Schilke, P., Th. Möller, C. Comito, Á. Sánchez-Monge, and others incl. **A. Schmiedeke** (Dec. 2015). [Taming the Dragon: Automatic Line Fitting of ALMA data.](#) In: *Revolution in Astronomy with ALMA: The Third Year.* Ed. by D. Iono, K. Tatematsu, A. Wootten, and L. Testi. Vol. 499. Astronomical Society of the Pacific Conference Series, p. 195.
3. Sánchez-Monge, Á., P. Schilke, A. Zernickel, **A. Schmiedeke**, et al. (May 2015). [Mass accretion flows in the high-mass star forming complex NGC 6334.](#) In: *EAS Publications Series.* Vol. 75-76. EAS Publications Series, pp. 269–272.
4. **Schmiedeke, A.**, P. Schilke, Th. Möller, Á. Sánchez-Monge, et al. (May 2015). [Continuum radiative transfer Modeling of Sagittarius B2.](#) In: *EAS Publications Series.* Vol. 75-76. EAS Publications Series, pp. 171–174.
5. Mills, E.A.C., C.C. Lang, M.R. Morris, J. Ott, and others incl. **A. Schmiedeke** (May 2014). [A radio survey of Galactic center clouds.](#) In: *The Galactic Center: Feeding and Feedback in a Normal Galactic Nucleus.* Ed. by L. O. Sjouwerman, C. C. Lang, and J. Ott. Vol. 303, pp. 139–143.
6. Comito, C., P. Schilke, **A. Schmiedeke**, E. Bergin, and D.C. Lis (July 2013). [Herschel/HIFI observations of water towards Sgr B2\(M\).](#) In: *Protostars and Planets VI Posters.*
7. Launhardt, R., A. Stutz, **A. Schmiedeke**, Th. Henning, et al. (July 2013). [The thermal structure of low-mass cloud cores.](#) In: *Protostars and Planets VI Posters.*
8. Nielbock, M., R. Launhardt, J. Steinacker, A.M. Stutz, and others incl. **A. Schmiedeke** (July 2013). [B68 - The HERSCHEL view: Dust temperatures and densities.](#) In: *Protostars and Planets VI Posters.*
9. Zahorecz, S., H. Beuther, Th. Henning, H. Linz, and others incl. **A. Schmiedeke** (July 2013). [The most massive gas clumps in the Milky Way.](#) In: *Protostars and Planets VI Posters.*

Garching, January 30<sup>th</sup> 2021