

Dr. Melissa K. McClure

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PROFESSIONAL HISTORY

- 2019 — Assistant professor, Veni laureate, *Leiden University*, NL
- 2017 — 2019 Marie Skłodowska-Curie Fellow, *Universiteit van Amsterdam*, NL
- 2014 — 2017 ESO Fellow, *European Southern Observatory*, DE
- 2010 — 2014 NSF Graduate Research Fellow, *University of Michigan*, USA
- 2008 — 2009 Graduate student research assistant, *University of Michigan*, USA
- 2006 — 2008 Lab Tech III, *Spitzer IRS GTO Team*, *University of Rochester*, USA
- 2003 — 2006 Undergraduate Research Assistant, *University of Rochester*, USA
- 2003 — 2005 Summer research programs: **1)** NSF Research Experience for Undergraduates (REU), *Cornell University*, USA; **2)** DOE Summer Undergraduate Laboratory Internship (SULI), *Lawrence Berkeley National Laboratory*, USA; **3)** NSF REU, *University of Rochester*, USA

EDUCATION

- 2014 **Ph.D. in Astronomy & Astrophysics**, University of Michigan, USA
Thesis, *Influence of Dust Grain Evolution on the Structure of Protoplanetary Disks*, supervised by Professor Nuria Calvet
- 2006
 1. **B.Sc. in Physics**, University of Rochester, USA. Thesis, *Spitzer Mid-Infrared Spectroscopy of Taurus Protostars*, supervised by Professor William J. Forrest
 2. **B.A. in Mathematics**
 3. **Minor in French language**

PRIZES, AWARDS, AND PI FUNDING

- 2019 *NWO Veni Fellowship*; **€250.000**
- 2017 *James Web Space Telescope ERS Program, IceAge*; **>\$300.000+**
- 2017 *Marie Skłodowska-Curie Fellowship*; **€177.598**
- 2014 ESO Fellowship, ESO Garching, USA

- 2010 *Herschel Space Observatory Open Time Program, \$142.000*
- 2009 *National Science Foundation Graduate Research Fellowship, ~\$120.000*
- 2006 *Harry W. Fulbright Advanced Laboratory Prize, University of Rochester, USA*
- 2002 — 2006 *National Merit Scholarship, Bausch & Lomb Science Scholarship, and Rush-Rhees Scholarship, \$52.000 total, University of Rochester, USA*

PROFESSIONAL SERVICE

- 2019, Fall Time Allocation Committee for ING telescope
- 2019, Spring/Fall Time Allocation Committee for NASA's IRTF telescope, Mauna Kea
- 2019 Science Organizing Committee member, "ExoComets: Understanding the building blocks of planetary systems", Lorentz Center Workshop
- 2018-2020 Member of ESA's SPICA working group "Formation of Planetary Systems"
- 2018 Organizing Committee member, inaugural edition of University of Amsterdam's Astrophysics Summer International Research Experience (ASPIRE) program for bachelor's and master's students
- 2018 Co-chair of organizing committee for 2019 NOVA postdoc meeting
- 2018 Panel member reviewer for NASA's SOFIA next-generation instrumentation program
- 2017 External reviewer for NASA Exoplanet Research program
- 2016 Member of NASA's Far-Infrared Surveyor (OST) Disks & Planets working group (PI of water ice reservoir science case)
- 2015 External reviewer for NASA Emerging Worlds program
- 2015 Co-chair, Science Organizing Committee, "Frontiers in Star Formation" symposium, Ann Arbor, MI, USA
- 2014 — 2017 Science Data Products Fellow, SPHERE Instrument Operations Team
- 2014 ESO Time Allocation Committee, VLT SPHERE Science Verification
- 2014 Time Allocation Committee for Magellan and MDM (Michigan)
- 2013 — present Referee for the *Astrophysical Journal* and *Astronomy & Astrophysics*

TEACHING/MENTORING

- 2021— Bachelors students, Stef Heijnen & Lieuwe de Regt
- 2020— Masters student, Marissa Vlasblom
- 2020— PhD student, Ardjan Sturm

- 2020— Lecturer, Star and Planet Formation, Leiden University
- 2018— Co-supervised a UvA bachelors student (Helena La, BSc), with Prof. Michiel Hogerheijde
- 2018 Guest lecturer, Protoplanetary disk course (Prof. Carsten Dominik)
- 2017— Created a masters project, and was daily supervisor, for a UvA student, Jorrit Bootsma (MSc), official supervisor Prof. Carsten Dominik
- 2016 Fellow Mentor for an ESO student, Anupam Bhardwaj (PhD, currently a postdoc)
- 2011— Worked with students supervised or co-supervised by my PhD advisor: Sierra
2013 Grant (BSc., pursuing a PhD at BU, USA), Alex Blaty (BSc., pursuing an advanced medical degree at UM, USA), Karina Mauco (PhD, UNAM, Mexico, currently a postdoc), and Alice Perez Blanco (MSc., CIDA, Venezuela, currently a PhD candidate)
- 2009 Graduate Student Instructor, University of Michigan
AST 101: introductory astronomy & the search for life (non-majors)
AST 160: introductory to astrophysics (majors)
- 2005 — Undergraduate Teaching Intern, University of Rochester
2006 PHY 121/141: mechanics laboratory (majors), 2 semesters
PHY 122/142: electricity and magnetism (majors)

INVITED TALKS AND COLLOQUIA

- 2021 InterCat Seminar, "Measuring the chemical evolution of ices from molecular clouds to protoplanetary disks.", Aarhus, Denmark (virtually)
- 2020 DAN-II Solid State meeting, "Probing chemical processes in astrophysical ices with the James Webb Space Telescope", Leiden, NL (virtually)
- 2020 Tata Institute of Fundamental Research Colloquium, Mumbai, India (virtually)
- 2020 PCMI conference, "Astrochemistry of ices", Le Havre, France (virtually)
- 2020 **Review:** Far-IR ice detections at NASA SOFIA Instrument Roadmap workshop, STScI, USA (virtually)
- 2020 NASA JWST ERS webinar series, Ice Age ERS program (virtually)
- 2019 CHAINS national chemistry meeting, "Probing volatile ice reservoirs during star and planet formation", Veldhoven, NL
- 2019 Water in the Universe' Symposium, Division of Physical Chemistry, American Chemical Society Fall 2019 National Meeting, San Diego, USA
- 2019 Gordon Research Conference on Origins of Solar Systems, talk on "Volatile Evolution and Transport in Protoplanetary Disks", Mount Holyoke, USA
- 2019 **Review:** "Polarization techniques in the near/mid-IR", Polarization in Protoplanetary Disks and Jets, Sant Cugat, Spain

- 2019 University of Rochester Physics & Astronomy Colloquium, Rochester, USA
- 2018 Center for Space and Habitability (CSH) Seminar, University of Bern, Switzerland
- 2018* **Review:** "Eye to the Telescope: Evolution of the Inner 1 AU of Protoplanetary Disks", Take a closer look: The innermost region of protoplanetary disks and its connection to the origin of planets, Garching bei München, Germany
- 2018* "The IceAge ERS program: Probing the building blocks of life in the JWST era, Denver, USA
- 2018* "Detection of icy, kilometer-size planetesimals at 1-2 Myr through volatile locking", Core2Disk, Orsay, France
- 2018* "Cold as ice: Synergies between observations, the lab, and chemical models in the era of JWST ", DAN-II kickoff meeting, Utrecht, NL
- 2018* "Astrobiology in the JWST era", EWASS 2018, Liverpool, UK
- 2018* "The IceAge ERS program: Community astrochemistry in the era of JWST", RAS annual meeting, Sheffield, UK
- 2017* **Review:** "Proto-planetary Disks and the IRS LowRes Legacy", Science Enabled by Novel Infrared Instrumentation, Ithaca, NY, USA
- 2016 "A Far-IR Determination of Gas Mass and Carbon Depletion in Protoplanetary Disks", The Local Truth: Star-Formation and Feedback in the SOFIA Era, Asilomar, USA
- 2016* "Planetary Building blocks in infrared", Leiden University Colloquium, Leiden, NL
- 2015* "Watering Earth: Identification of ice reservoirs in protoplanetary disks", Frontiers in Star Formation, Ann Arbor, USA
- 2015* "Watering Earth: Identification of ice reservoirs in protoplanetary disks", University of Heidelberg, Germany
- 2015* "Watering Earth: Identification of ice reservoirs in protoplanetary disks", SPF Seminar, ESO Garching, Germany
- 2015* "Detections of trans-Neptunian ice in protoplanetary disks", Revealing the Structure of Protoplanetary Disks, Morelia, Mexico
- 2013* "Spatial Variation of Dust Evolution in Protoplanetary Disks", CfA Radio and Geoastronomy talk, Boston, USA
- 2013* "Spatial Variation of Dust Evolution in Protoplanetary Disks", Boston University, USA
- 2012 "Tracing Planet Formation with Dust Mineralogy", Studies of Star and Planet Forming Regions with Herschel, Leiden, Netherlands

CONTRIBUTED TALKS

- 2021 2021 Habitable Worlds open engagement session, "Probing solid compositions in planetary core formation zones", USA (virtually)

- 2017 “Probing physical conditions and carbon abundances in protoplanetary disks”, MIAPP Protoplanetary Disks and Planet Formation and Evolution, Garching bei München, Germany
- 2017 “Measuring gas masses and carbon depletion in young disks”, IAU Astrochemistry VII – Through the Cosmos from Galaxies to Planets, Puerto Varas, Chile
- 2016 “Measuring disk masses”, Star formation 2016, Exeter, UK
- 2015 “Measuring disk gas masses with Hydrogen deuteride”, From clouds to protoplanetary disks: the astrochemical link, Berlin, Germany
- 2015 “Watering Earth: Identification of ice reservoirs in protoplanetary disks”, Zermatt ISM Symposium, Switzerland (cancelled due to medical complications)
- 2013 “Curved walls: Grain growth, settling, and composition patterns in T Tauri dust sublimation fronts”, at Dust growth in star- & planet-forming environments, Heidelberg, Germany
- 2013 “First Herschel Detection of Crystalline Water Ice in a T-Tauri Star”, Star formation Jamboree, Hamilton, Canada
- 2013 “First Herschel Detection of Crystalline Water Ice in a T-Tauri Star”, Transformational Science with ALMA: From Dust to Rocks to Planets Formation and Evolution of Planetary Systems, Kona, USA
- 2010 “Proto-planetary Disks At < 1 Myr: The Evolutionary State Of Ophiuchus”, 215th AAS Conference, Washington D.C., USA
- 2004 “The Universe Adventure, Contemporary Physics Education Project, San Francisco, USA

SUCCESSFUL OBSERVING PROGRAMS

- 2021 **(PI)** — JWST Cycle 1 GO Programs: "MIDAS" #1751 (24.9 hours), "It's COMplicated", #1854 (17.7 hours)
- 2021 Co-I — JWST Cycle 1 GO Programs: #2183 (PI S. Zeegers, 31 hours), #1960 (PI E. van Dishoeck, 21.5 hours), #1644 (PI C. Dougados, 11.1 hours), #1676 (PI C. Espaillat, 7.7 hours)
- 2019 Co-I — iSHELL, IRTF, PI J. Llama, "Studying the atmosphere of one of the youngest exoplanets", 4 half nights
- 2017 **(PI)** — "Volatile locking in protoplanetary disks: linking carbon abundances from 0.1 to ~100 AU", ALMA Cycle 5
- 2017 **(PI)** — "IceAge: Chemical evolution of ices during star formation", JWST, **32 hours**

- 2017 (PI) — “Spectrally resolving neutral carbon and oxygen emission from the inner regions of protoplanetary disks”, iSHELL, IRTF, **3 half-nights**
- (PI) — “Probing the atomic layer inside the dust sublimation rim of protoplanetary disks with neutral carbon and oxygen”, TNG, OPTICON-2020, **2 half nights**
- 2014 (PI) SPHERE Science Verification, “Distribution and abundance of water ice in young extrasolar systems”, **4 hours**
- 2011 — (PI) Magellan “A snapshot of the innermost disk regions around T Tauri stars
2014 (Lupus, Ophiuchus, Serpens, Orion, Chamaleon)” (**2011B**, 4 nights; **2012A**, 5 nights; **2012B**, 3 nights; **2014B**, 3 nights)
- 2010 (PI) *Herschel* Space Observatory Open Time Cycle 1 Program, “Crystal clear: revealing midplane dynamics of protoplanetary disks through the spatial distribution of crystalline dust”, **Priority 1, 28.7 hours, \$142,000 (€101.232)**
- 2009 — (PI) NASA IRTF “Measuring the Inner Rims of Disks Around T Tauri
2013 Stars” (**2009B**, 6 half-nights; **2010B**, 3 nights; **2012B**, 5 half-nights)
- 2009 (PI) NASA IRTF **2009A** Program, “Measuring extinction for solar-mass T-Tauri stars in Lupus and Ophiuchus”, 5 half-nights
(PI) MDM Observatory **2009A** Program, “Optical photometry for Oph YSOs”, 4 nights
- CoI I have also been a Co-I on four *Herschel* programs, three VLT SPHERE programs, one Gemini GPI program, and two ALMA programs.

PUBLICATION RECORD SUMMARY

I have published ten first-authored refereed articles, including two single-authored papers and 38 co-authored articles, including one in *Science* (h-index = 27, total citations = 2530). A full list of publications can be found on my website, mkmclure.com

1. **McClure, M. K.**, Dominik, C., & Kama, M., Measuring the atomic composition of planetary building blocks, 2020, *A&A Letters*, 642, 15
2. **McClure, M. K.** Carbon depletion observed inside T Tauri inner rims: Formation of icy, kilometer size planetesimals by 1 Myr, 2019, *A&A*, 632, 32
3. **McClure, M. K.**, Bergin, E. A., Cleeves, L. I., van Dishoeck, E. F., Blake, G. A., Evans, N. J., Green, J. D., Henning, T. K., Oberg, K. I., Pontoppidan, K. M., Salyk, C., Mass measurements in protoplanetary disks from hydrogen deuteride, 2016, *ApJ*, 831, 167
(One of only three measurements of HD in a disk, identification of carbon depletion, 77 citations)
4. **McClure, M. K.**, Manoj, P., Calvet, N., Adame, L., Espaillat, C., Watson, D. M., Sargent, B., Forrest, W. J., D'Alessio, P., Probing Dynamical Processes in the Planet-forming Region with Dust Mineralogy, 2012, *ApJL*, 759, 10

(Paper contains first detections of ice in low-mass protoplanetary disks; results of PI'd Herschel program, 24 citations)

5. McClure, M. K., Observational 5-20 μm Interstellar Extinction Curves Toward Star-Forming Regions Derived From Spitzer IRS Spectra, 2009, *ApJ*, 693, 81

(This was my first project conceived entirely on my own, and resulted in a single author paper; it is also my most cited first-authored paper with 90 citations.)

6. Andrews, S. M., Wilner, D. J., Espaillat, C., Hughes, A. M., Dullemond, C. P., McClure, M. K., Qi, C., & Brown, J. M., Resolved Images of Large Cavities in Protoplanetary Transition Disks, 2011, *ApJ*, 732, 42

(I was the data reductionist for mid-IR spectroscopy, and contributed to the discussion section. It was my first time working with high spatial resolution interferometry and is one of my highest cited papers with 450 citations.)

7. Espaillat, C., D'Alessio, P., Hernández, J., Nagel, E., Luhman, K. L., Watson, D. M., Calvet, N., Muzerolle, J., & McClure, M., Unveiling the Structure of Pre-transitional Disks, 2010, *ApJ*, 717, 441

(I observed one disk in this sample during one of my principle investigator near-IR spectroscopy programs, re-reduced some of the mid-infrared spectra, and commented on the analysis and draft. It is one of my most cited papers, with 193 citations.)

REFERENCES

The following colleagues can attest to my professional experience (chronologically listed):

1. Professor Ewine van Dishoeck / ewine@strw.leidenuniv.nl / +31 715275814 / Leiden Observatory / P. O. Box 9513 / NL-2300 RA Leiden/ Netherlands, *IceAge co-I*
2. Professor Harold Linnartz / linnartz@strw.leidenuniv.nl / +31 715275804 / Leiden Observatory / P. O. Box 9513 / NL-2300 RA Leiden/ Netherlands, *IceAge co-PI*
2. Professor Carsten Dominik / c.dominik@uva.nl / +31 0205257477 / Anton Pannekoek Institute for Astronomy / University of Amsterdam / Science Park 904 / 1098 XH Amsterdam, Netherlands, *Mentor for Marie Curie Fellowship*
3. Dr. Klaus Pontoppidan / pontoppi@stsci.edu / +1 410.338.4744 / Space Telescope Science Institute/ 3700 San Martin Drive / Baltimore, MD 21218 / USA, *IceAge co-I*
4. Dr. Leonardo Testi / ltesti@eso.org / European Southern Observatory / Karl-Schwarzschild-Strasse 2 / D-85748 Garching bei Munchen, *ESO Science Mentor*
5. Professor Ted Bergin / tbergin@umich.edu / +1 734.764.3441 / University of Michigan / Department of Astronomy / 1085 S. University Ave. / Ann Arbor, MI 48109 / USA, *PhD committee member*
6. Professor Nuria Calvet / ncalvet@umich.edu / +1 734.763.6315 / University of Michigan / Department of Astronomy / 1085 S. University Ave. / Ann Arbor, MI 48109 / USA, *PhD supervisor*