Sarah M. R. Jeffreson

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Employment/education

2020– **ITC Fellow, Harvard-Smithsonian Center for Astrophysics**, *Harvard University,* Cambridge MA, United States

2016–2020 **PhD student, International Max Planck Research School for Astrophysics**, *University of Heidelberg,* Heidelberg, Germany
Thesis topic: Which physical processes drive the evolution of giant molecular clouds?
Supervisor: J. M. Diederik Kruijssen

2015–2016 **MSc**, *Gonville and Caius College, University of Cambridge,* Cambridge, UK (First-class honours)
Thesis topic: Dynamical models of flattened, rotating globular clusters
Supervisors: Jason L. Sanders and N. Wyn Evans

2012–2015 **BA Hons Physics**, *Gonville and Caius College, University of Cambridge,* Cambridge, UK

Grants, awards and funding

2020– **ITC Fellowship**, *Harvard University,* Awarded an independent research fellowship worth $US 350,000 for the research programme entitled ‘Constraining the molecular cloud lifecycle’

2017 **NEON Observing School scholarship**, *University of Copenhagen and La Palma Observatory* (success rate of 22%, 16/72, value approx. EUR 3500)

2015 **Research funding at Karl Remeis Sternwarte**, *University of Erlangen-Nuernberg*

2014 **Research in Industrial Projects for Students scholarship**, *Institute of Pure and Applied Mathematics, UCLA* (success rate 7%, 32/450, value approx. $US 10,000)

2014 **Research funding in the optics research group**, *Glasgow University*

2013-2016 **Scholarship for continued academic excellence, Gonville and Caius College**, *Cambridge University*

2013 **Amgen Scholars Programme scholarship**, *Karolinska Institutet* (success rate of 7%, 359/5123, value approx. $US 9,000)

Refereed publications

2017– 8 first-author/mentored student, 11 total

Building the molecular cloud population: the role of cloud mergers, Skarbinski, M. Jeffreson, S. M. R., Goodman, A. A., **MNRAS submitted** (2022)

On the scale-height of the molecular gas disc in Milky Way-like galaxies, Jeffreson, S. M. R., Sun, J., Wilson, C. D., **MNRAS, 515**, 1663 (2022)

Introducing EMP-Pathfinder: modelling the simultaneous formation and evolution of stellar clusters in their host galaxies, Reina-Campos, M., Keller, B. W., Kruijssen, J. M. D., Gensior, J., Trujillo-Gomez, S., Jeffreson, S. M. R., Pfeffer, J. L., Sills, A., **MNRAS accepted**

Momentum feedback from marginally-resolved HII regions in isolated disc galaxies, Jeffreson, S. M. R., Krumholz, M. R., Fujimoto, Y., Armillotta, L., Keller, B. W., Chevance, M., Kruijssen, J. M. D., **MNRAS, 505**, 3470 (2021b)

A scaling relation for the molecular cloud lifetime in Milky Way-like galaxies, Jeffreson, S. M. R., Keller, B. W., Winter, A. J., Chevance, M., Kruijssen, J. M. D., Krumholz, M. R., Fujimoto, Y. **MNRAS 505**, 1678 (2021a)

The role of galactic dynamics in shaping the physical properties of giant molecular clouds in Milky Way-like galaxies, Jeffreson, S. M. R., Kruijssen, J. M. D., Keller, B. W., Chevance, M., Glover, S. C. O., **MNRAS, 498**, 385 (2020)

The lifecycle of molecular clouds in nearby star-forming disc galaxies, Chevance, M. et al. (incl. SMRJ), **MNRAS, 493**, 2872 (2020)

The dynamical evolution of molecular clouds near the Galactic Centre - II. Spatial structure and kinematics of simulated clouds, Kruijssen, J. M. D. et al. (incl. SMRJ), **MNRAS, 484**, 5734 (2019)

On the physical mechanisms governing the cloud lifecycle in the Central Molecular Zone of the Milky Way, Jeffreson, S. M. R., Kruijssen, J. M. D., Krumholz, M. R., Longmore, S. N. **MNRAS, 478**, 3380 (2018b)

A general theory for the lifetimes of giant molecular clouds under the influence of galactic dynamics, Jeffreson, S. M. R., Kruijssen, J. M. D., **MNRAS, 476**, 3688 (2018a)

The Gaia-ESO Survey: dynamical models of flattened, rotating globular clusters, Jeffreson, S. M. R., Sanders, J. L., Evans, N. W., Williams, A. A., Gilmore, G. F. et al. **MNRAS, 469**, 4740 (2017)

Mentoring/advising

2021–2022 **Thesis co-advisor**, *(with Prof. Alyssa Goodman) to Maya Skarbinski (Junior),* Harvard College Research Program, Ay98 (Research tutorial in Astrophysics for undergraduates)

Summer 2022 **Primary research advisor**, *to Adriana Medina (Junior),* Harvard Latino Initiative Program, co-advisor Angus Beane

Summer 2022 **Primary research advisor**, *to Gorak Rajesh (PRISE-Emmanuel Fellowship recipient),* co-advisor Eric Koch

Summer 2022 **Research co-advisor (with Dr. Eric Koch)**, *to Courtney Carriera (Junior),* Harvard REU Program

Teaching

2019 **Experimental Physics II, tutor/marker to class of 20**, *University of Heidelberg,* Electrostatics, Electrodynamics, Electromagnetism, Optics, Special Relativity

2018–2019 **Experimental Physics I, tutor/marker to class of 20**, *University of Heidelberg,* Mechanics and Thermodynamics

Selected talks

Feb. 2017– 6 Invited Talks, 5 Colloquia, 12 Contributed Talks, 8 Seminar Talks

Sep. 2022 **Weekly seminar**, CCA, New York (seminar)

Aug. 2022 **IAU Symposium 373: Resolving the Rise and Fall of Star formation in Galaxies**, Busan, Korea (contributed talk)

Jul. 2022 **A holistic view of stellar feedback**, Ascona, Switzerland (contributed talk)

Jun. 2022 **From Stars to Galaxies II - Connecting our understanding of star and galaxy formation**, Gothenburg, Sweden (contributed talk)

May 2022 **Seminar**, McMaster University, Canada (invited seminar)

Apr. 2022 **MSS Seminar**, University of Wisconsin-Madison, USA (invited seminar)

Jan. 2022 **MPA Seminar**, Munich, Germany (invited seminar)

Jan. 2022 **AAS Winter meeting**, (contributed talk)

Dec. 2021 **Weekly Seminar**, ANU, Canberra, Australia (invited seminar)

Jul. 2021 **Ringberg series**, (contributed talk)

Jun. 2021 **AAS Summer meeting**, (contributed talk)

May 2021 **ISM 2021: Structure, characteristic scales, and star formation**, Beirut (contributed talk)

Oct. 2020 **ITC Colloquium**, Harvard, USA (invited colloquium)

Jul. 2020 **ARI Colloquium**, Heidelberg, Germany (colloquium)

Nov. 2019 **Harvard-Heidelberg workshop on the Physics of Star Formation: Linking Observations and Simulations**, Harvard, USA (contributed talk)

Nov. 2019 **Seminar at the ITC**, Harvard, USA (seminar)

Nov. 2019 **SFIR Seminar**, Princeton, USA (seminar)

Sep. 2019 **Through Dark Lanes to New Stars, celebrating the career of Prof. Charles Lada**, Crete, Greece (contributed talk)

Jun. 2019 **Linking the Milky Way and Nearby Galaxies**, Helsinki, Finland (contributed talk)

Jun. 2019 **Institute for Theoretical Astrophysics Blackboard Colloquium**, Heidelberg, Germany (colloquium)

Nov. 2018 **Hendrik van de Hulst Centennial Symposium: The Interstellar Medium of Galaxies, Status and Future Perspectives**, Leiden, The Netherlands (contributed talk)

Jul. 2018 **The Laws of Star Formation: From the Cosmic Dawn to the Present Universe**, Cambridge, UK (contributed talk)

Jun. 2018 **The Multi-Scale Physics of Star Formation and Feedback during Galaxy Formation**, Heidelberg, Germany (invited talk)

Jun. 2017 **Galactic Star Formation with Surveys**, Heidelberg, Germany (contributed talk)

Apr. 2017 **SFB 881 Seminar**, Heidelberg, Germany (seminar)

Scientific responsibilities held

2022 **Submillimeter Array (SMA) Time Allocation Committee**, *Smithsonian Astrophysical Observatory*

2022 **Conference Local Organising Committee**, *Seeing the Future: Of the Universe, Data, Learning & Digital Scholarship,* Harvard University

2022 **ITC Luncheon Organising Committee**, *Harvard University*

2021– **ITC Colloquium Organising Committee**, *Harvard University*

2020 & 2021 **ITC Fellowship Selection Committee**, *Harvard University*

2018 **Conference Local Organising Committee**, *The Multi-Scale Physics of Star Formation and Feedback during Galaxy Formation,* University of Heidelberg

2017–2019 **Co-investigator on ALMA proposals**, *Cycles 5, 6, 7, 9,* Principal Investigators Adam Leroy, Eric Koch, Steven N. Longmore, Mélanie Chevance, Alexander P. S. Hygate

Outreach

2021 **Guest lecturer**, *for Ay98 (Research tutorial in Astrophysics for undergraduates)*

2022 **Interview about 'Cosmic Cliffs' James Webb image**, *Boston Museum of Science (planetarium and social media)*

Refereeing

May 2019– **Referee**, *Monthly Notices of the Royal Astronomical Society*

Programming languages

C/C++, Python, Bash, HTML/CSS