

---

CONTACT INFORMATION	Center for Astrophysics 60 Garden Street MS 78 Cambridge, MA, 02138	(+1) 617-495-7259 <a href="https://richteague.github.io">https://richteague.github.io</a> <a href="mailto:richard.d.teague@cfa.harvard.edu">richard.d.teague@cfa.harvard.edu</a>
RESEARCH EXPERIENCE	<b>Center for Astrophysics   Harvard &amp; Smithsonian</b> <i>Submillimeter Array Fellow</i>	Sep. 2019 –
	<b>University of Michigan</b> <i>Postdoctoral Researcher</i>	May 2017 – Jul. 2019
	<b>Max-Planck-Institute for Astronomy</b> <i>Postdoctoral Researcher</i>	Jan. 2017 – Apr. 2017
EDUCATION	<b>Max-Planck-Institute for Astronomy</b> , Heidelberg, Germany Ph.D. in Astronomy (Magna Cum Laude)	Oct. 2013 – Jan. 2017
	<b>University of Edinburgh</b> , Edinburgh, United Kingdom MPhys Astrophysics (First Class Honours)	Sep. 2008 – May 2013
HONOURS & AWARDS	<b>Harvard Data Science Initiative Research Fund (\$9,700)</b> <i>Regularized Maximum Likelihood Imaging: A New Method for Detecting Planets</i>	Mar. 2020
	<b>Ernst Patzer Award</b> <i>Awarded for the best refereed publication by a young scientist.</i>	Nov. 2016
	<b>Pre-Honours Certificate of Merit</b> <i>Awarded for top 5% performance in pre-honours exams.</i>	May 2011
	<b>Pre-Honours Certificate of Merit</b> <i>Awarded for top 5% performance in pre-honours exams.</i>	May 2010
PUBLICATION SUMMARY	<b>17 lead author papers</b> , including one published in <i>Nature</i> , and 36 co-author papers, totaling <b>517 citations</b> . Data taken from <a href="#">NASA's ADS</a> . A full bibliography can be found at the end of the CV.	
OBSERVATIONAL TIME SUMMARY	I have been awarded over <b>82 hours</b> (200 hours) of time on ALMA as PI (co-I), <b>20 hours</b> (150 hours) on IRAM telescopes as PI (co-I) and <b>10 hours</b> (30 hours) on the SMA as PI (co-I). A break down of proposals can be found below.	
PROFESSIONAL SERVICES	<b>SMA Interferometry School SOC</b> <i>SMA, Hilo, Hawaii, USA</i>	Mar. 2021
	<b>Advanced Data Analysis Techniques for ALMA SOC</b> <i>NRAO, Charlottesville, Virginia, USA</i> <i>[postponed due to Covid-19]</i>	Oct. 2020

<b>SMA Seminar Organizer</b> <i>Departmental Seminar Series</i>	2020 - 2021
<b>Visualizing the Kinematics of Planet Formation SOC</b> <i>Flatiron Institute, New York City, USA</i>	Oct. 2019
<b>Postdoc and Research Scientist DEI Representative</b> <i>Department Diversity, Equity and Inclusion Committee Member</i>	2018 – 2019
<b>Equi-Tea Organizer</b> <i>Diversity, Equity and Inclusion Journal Club</i>	2018 – 2019
<b>Stars, Planets and Formation Seminar Organizer</b> <i>Departmental Seminar Series</i>	2018 – 2019
<b>Conversations on Equity and Inclusion Co-organizer</b> <i>Joint Physics / Astronomy / Space Sciences DEI Colloquium Series</i>	2018 – 2019
<b>NESSF External Reviewer</b>	2018, 2020
<b>Heidelberg MPG Student Workshop Organizer</b>	2016
<b>PSF Coffee Organizer</b> <i>Departmental Seminar Series</i>	2015 – 2017
<b>MPIA Student Representative</b>	2015 – 2017
<b>MPIA Student Workshop Organizer</b>	2015, 2016
<b>IMPRS Graduate Student Representative</b>	2013 – 2017
<b>Referee for AAS, A&amp;A, MNRAS and Nature journals</b>	

SUPERVISION	<b>Haochuan Yu</b> Beijing Normal University <i>Undergraduate student.</i>	2020
	<b>Alessandra Canta</b> Harvard University <i>Undergraduate student. Co-supervised with Karin Öberg, Harvard</i>	2020
	<b>Felipe Alcaron</b> University of Michigan <i>Graduate student. Co-supervised with Ted Bergin and Ke Zhang, UMich.</i>	2019 – 2020
	<b>Jenny Calahan</b> University of Michigan <i>Graduate student. Co-supervised with Ted Bergin and Ke Zhang, UMich.</i>	2019 – 2020
	<b>Deryl Long</b> University of Michigan <i>Undergraduate student. Co-supervised with Ted Bergin and Ke Zhang, UMich.</i>	2019
	<b>Case Hazewinkel</b> University of Michigan <i>Undergraduate student. Co-supervised with Ted Bergin, UMich.</i>	2019
	<b>Jeanne Kwon</b> University of Michigan <i>Undergraduate Research Opportunity Program</i>	2018 – 2019
	<b>Julian Penzinger</b> Ludwig Maximilian University <i>Summer student. Co-supervised with Dmitry Semenov, MPIA.</i>	2016, 2018

TALKS & SEMINARS	<b>Caltech Dix Planetary Science Department Seminar</b>	November 2020
	<i>Planet Formation in 6D</i>	(invited)
	<b>Research Unit Transition Disks (RUTD) Conference</b>	October 2020
	<i>Observing the Dynamics of Planet Disk Interactions</i>	(invited)
	<b>From Clouds to Planets II: The Astrochemical Link</b>	October 2020
	<i>ALMA's 3D View of Planet Formation [postponed due to Covid-19]</i>	(invited)
	<b>Exoplanets III</b>	July 2020
	<i>Kinematical Detection and Characterizing of Protoplanets with ALMA</i>	
	<b>MPIA Königstuhl Colloquium</b>	July 2020
	<i>Visualizing the Assembly of Planetary Systems</i>	(invited)
	<b>JPL Astrophysics Colloquium</b>	November 2019
	<i>Witnessing the Dynamics of Planetary Assembly</i>	(invited)
	<b>Gordon Research Seminar</b>	June 2019
	<i>Unveiling the Dynamics of Planet Formation</i>	
	<b>IAU Symposium 350: Laboratory Astrophysics</b>	Apr. 2019
	<i>Tracing The Physical Conditions of Planet Formation with Molecular Excitation</i>	(invited)
	<b>Planet-Forming Disks</b>	Mar. 2019
	<i>Unveiling the Dynamics of Planet Formation</i>	(invited)
	<b>NAOJ Theoretical Astronomy Seminar</b>	Oct. 2018
	<i>Observing the Kinematics of Planet-Disk Interactions with ALMA</i>	(invited)
	<b>LMU Munich Astronomy Colloquium</b>	Aug. 2018
	<i>Using Kinematics to Search for Embedded Protoplanets</i>	(invited)
	<b>University of Tübingen Astronomy Seminar</b>	Aug. 2018
	<i>Kinematical Detections of Embedded Protoplanets</i>	(invited)
	<b>Astrophysical Frontiers in the Next Decade and Beyond</b>	Apr. 2018
	<i>The First Kinematical Detection of Embedded Protoplanets</i>	
	<b>Magnetic Fields or Turbulence</b>	Feb. 2018
	<i>A Spatially Resolved Search for Turbulence in TW Hya</i>	
	<b>MPIA Patzer Awards Colloquium</b>	Nov. 2016
	<i>Measuring Turbulence in TW Hya with ALMA: Methods and Limitations</i>	(invited)
	<b>MPIA Königstuhl Colloquium</b>	Nov. 2016
	<i>Observing the Earliest Stages of Planet Formation</i>	(invited)
	<b>Astrochemistry with ALMA Cycle 4</b>	Jun. 2016
	<i>Detecting Turbulence in Protoplanetary Disks</i>	(invited)
	<b>Sant-Cugat Forum on Astrophysics</b>	Apr. 2016
	<i>Turbulence in Protoplanetary Disks: Methods and Limitations</i>	
	<b>Protoplanetary Discussions</b>	Mar. 2016
	<i>Turbulence in TW Hya</i>	

	<b>Chemical Diagnostics of Star and Planet Formation</b>	Jan. 2015
	<i>Deuterium Fraction in Protoplanetary Disks</i>	(invited)
	<b>ZAG - IPAG - MPIA Workshop on Planet Formation</b>	Jan. 2015
	<i>Deuterium Fraction in DM Tau</i>	(invited)
SCHOOL PARTICIPATION	<b>45th Saas-Fee Course</b>	2015
	<i>From Protoplanetary Disks to Planet Formation</i>	
	<b>Heidelberg Graduate School on Fundamental Physics</b>	2015
	<b>DIANA Protoplanetary Disk School</b>	2014
OBSERVING EXPERIENCE	<b>Sub-Millimeter Array</b>	2019 –
	<i>Monthly rota.</i>	
	<b>MPG/ESO 2.2m</b>	2016
	<i>14 nights</i>	
TEACHING	<b>Wavefront Analysis Laboratory Instructor</b>	2014
SUCCESSFUL TELESCOPE PROPOSALS (AS PI)	<b>SMA PI: Teague, R.</b> , 10 hours, 2020A-S033, A ranked	2020
	<i>A 3D Exploration of an Edge-On Self-Gravitating Disk</i>	
	<b>ALMA PI: Teague, R.</b> , 13.8 hours, 2019.1.01357.S, A ranked	2019
	<i>Constraining the H2 Surface Density Profile in IM Lup</i>	
	<b>ALMA PI: Teague, R.</b> , 3.0 hours, 2019.1.00794.S, B ranked	2019
	<i>Detecting the Photoevaporative Wind in IM Lup</i>	
	<b>ALMA PI: Teague, R.</b> , 33.2 hours, 2019.1.00419.S, B ranked	2019
	<i>Mapping the 3D Kinematic Structure of Planet Formation</i>	
	<b>ALMA PI: Teague, R.</b> , 20.2 hours, 2018.A.00021.S, DDT	2019
	<i>Confirmation of an Embedded Planet in the Disk of TW Hya</i>	
	<b>Magellan/MagAO PI: Teague, R.</b> , 6 hours	2018
	<i>Searching for Wide Separation Planets in AS 209</i>	
	<b>ALMA PI: Teague, R.</b> , 6.7 hours, 2018.1.00980.S, A ranked	2018
	<i>An Unambiguous Detection of a Magnetic Field in a Protoplanetary Disk</i>	
	<b>ALMA PI: Teague, R.</b> , 5.3 hours, 2016.1.00440.S, A ranked	2016
	<i>Model Independent Study of Turbulence and Temperature in TW Hya</i>	
	<b>IRAM PdBI PI: Teague, R.</b> , 19.9 hours, W14BI, C ranked	2014
	<i>Disk Diagnostics with Deuteration</i>	
(AS CO-I)	Including over 200 hours with <b>ALMA</b> , 150 hours with <b>IRAM</b> telescopes, 30 hours with the <b>SMA</b> , 50 hours with the <b>VLA</b> , 25 hours with <b>VLT</b> (X-shooter and SPHERE), and 2 nights	

with **Magellan** (MagAO/MagAOx).

## PUBLICATIONS

**Disk Dynamics Collaboration**, et al., PASA, under review

*Vizualizing the Kinematics of Planet Formation [corresponding author]*

**Teague, R.**, Hull, C. L. H., Bergin, E. A., et al., ApJ, under review

*Sub-mm Polarization in the Disk of TW Hya*

**Teague, R.** Loomis, R. A., ApJ, 899

*The Excitation Conditions of CN in TW Hya*

**Teague, R.**, Jankovic, M. R., Haworth, T. J., et al., MNRAS, 495

*A Three Dimensional View of Gomez's Hamburger*

**Teague, R.**, 2019, IAU Proceedings Series, in press.

*Tracing The Physical Conditions of Planet Formation with Molecular Excitation*

**Teague, R.**, Bae, J., Huang, J., Bergin, E. 2019, ApJL, 884

*Spiral Structure in the Gas Disk of TW Hya*

**Teague, R.**, Bae, J., Bergin, E. 2019, Nature, 574

*Meridional Flows in the Disk Around a Young Star*

**Teague, R.**, 2019, Journal of Open Source Software, 4

*GoFish: Fishing for Line Observations in Protoplanetary Disks*

**Teague, R.**, 2019, RNAAS, 3

*Statistical Uncertainties in Moment Maps of Line Emission*

**Teague, R.**, 2019, Journal of Open Source Software, 4

*eddy: Extracting Protoplanetary Disk Dynamics with Python*

**Teague, R.**, Bae, J., Birnstiel, T. & Bergin, E., 2018, ApJ, 868

*Evidence For A Vertical Dependence on the Pressure Structure in AS 209*

**Teague, R.** & Foreman-Mackey, D., 2018, RNAAS, 2

*A Robust Method to Measure Centroids of Spectral Lines*

**Teague, R.**, Henning, T., Guilloteau, S., et al., 2018, ApJ, 864

*Temperature, Mass, and Turbulence: A Spatially Resolved Multiband Non-LTE Analysis of CS in TW Hya*

**Teague, R.**, Bae, J., Bergin, E. A., et al., 2018, ApJL, 860

*A Kinematical Detection of Two Embedded Jupiter-mass Planets in HD 163296*

**Teague, R.**, Semenov, D., Gorti, U., et al., 2017, ApJ, 835

*Surface Density Perturbations in the TW Hydrae Disk at 95 au Traced by Molecular Emission*

**Teague, R.**, Guilloteau, S., Semenov, D., et al., 2016, A&A, 592

*Measuring turbulence in TW Hya with ALMA: methods and limitations*

**Teague, R.**, Semenov, D., Guilloteau, S., et al., 2015, A&A, 574

*Chemistry in disks. IX. Observations and modelling of HCO<sup>+</sup> and DCO<sup>+</sup> in DM Tauri*

- (CO-AUTHOR) Canta, A., **Teague, R.**, le Gal, R., et al., ApJ, submitted  
*The first detection of CH<sub>2</sub>CN in a protoplanetary disk [student paper]*
- Bae, J., **Teague, R.**, Zhu, Z., ApJ, submitted  
*Tightly-Wound Spirals Driven by Buoyancy Resonance in Protoplanetary Disks*
- Garufi, A., Podio, L., Codella, C., et al., A&A, submitted  
*ALMA chemical survey of disk-outflow sources in Taurus (ALMA-DOT V)*
- Öberg, K., Cleeves, L. I., Bergner, J., et al., ApJ, submitted  
*Radial and vertical distributions of DCN and DCO<sup>+</sup> in the TW Hya disk*
- Calahan, J., Zhang, K., **Teague, R.**, et al., ApJ, submitted  
*Uncovering the Thermal Profile of a Typical Gaseous Protoplanetary Disk [student paper]*
- Podio, L., Garufi, A., Codella, C., et al., ApJ, submitted  
*ALMA chemical survey of disk-outflow sources in Taurus (ALMA-DOT II)*
- Pegues, J., Öberg, K. I., Bergner, J. B., et al., ApJ, submitted  
*An ALMA Survey of Chemistry in Disks around Late-Type M-Stars*
- Pegues, J., Czekala, I., Andrews, S. M., ApJ, submitted  
*Dynamical Masses and Stellar Evolutionary Model Predictions of Low-Mass M-Stars*
- Wölfer, L., Facchini, S., Kurtovic, N. T., et al. ApJ, submitted  
*A highly non-Keplerian protoplanetary disc*
- Harrison, R. E., Looney, L. W., Stephens, I. W., et al., ApJ, submitted  
*Low Level Carbon Monoxide Line Polarization in two Protoplanetary Disks: HD 142527 and IM Lup)*
- Alarcón, F., **Teague, R.**, Zhang, K., et al., ApJ, submitted  
*Chemical Evolution in a Protoplanetary Disk with Dust Substructures [student paper]*
- White, J. A., Kóspál, Á, Hughes, A. G. Hughes, et al., ApJ, in press  
*ALMA and VLA Observations of EX Lupi in its Quiescent State*
- Stephens, I. W., Fernández-López, M., Li, Z.-H., et al., ApJ, in press  
*Low Level Carbon Monoxide Line Polarization in two Protoplanetary Disks: HD 142527 and IM Lup)*
- Hall, C., Dong, R., **Teague, R.**, et al., ApJ, in press  
*Kinematic Evidence for Gravitational Instability*
- Long, D. E., Zhang, K., **Teague, R.**, et al., 2020, ApJL, 895  
*Hints of a Population of Solar System Analog Planets from ALMA [student paper]*
- Facchini, S., Benisty, M., Bae, J., et al., 2020, A&A, 639  
*Annular substructures in the transition disks around LkCa 15 and J1610*
- Garufi, A., Codella, C., Rygl, K., et al., 2020, A&A, 636  
*ALMA chemical survey of disk-outflow sources in Taurus (ALMA-DOT I)*
- Rosotti, G., **Teague, R.**, Dullemond, C., et al., 2020, MNRAS, 495  
*The Efficiency of Dust Trapping in Ringed Protoplanetary Discs*

- Semenov, D. & **Teague, R.** 2020, Europhysics News, 51  
*Accretion disks around young stars: the cradles of planet formation*
- Huang, J., Andrews, S. M., Dullemond, C. P., et al., 2020, ApJ, 891  
*A multi-frequency ALMA characterization of substructures in the GM Aur protoplanetary disk*
- Rosotti, G., Benisty, M., Juhász, A., et al., 2020, MNRAS, 491.  
*Spiral arms in the proto-planetary disc HD100453 detected with ALMA*
- Bae, J., Zhu, Z., Baruteau, C., et al., 2019, ApJL, 884  
*An Ideal Testbed for Planet-disk Interaction: Two Giant Protoplanets in Resonance Shaping the PDS 70 Protoplanetary Disk*
- Isella, A., Benisty, M., **Teague, R.**, et al., 2019, ApJL, 879  
*Detection of Continuum Submillimeter Emission Associated with Candidate Protoplanets*
- Gallo, E., **Teague, R.**, Plotkin, R. M., et al., 2019, MNRAS, 488  
*ALMA observations of A0620-00: fresh clues on the nature of quiescent black hole X-ray binary jets*
- Schwarz, K., **Teague, R.**, Bergin, E., et al., 2019, ApJL, 876.  
*Line Ratios Reveal N<sub>2</sub>H<sup>+</sup> Emission Originates above the Midplane in TW Hydrae*
- Keppler, M., **Teague, R.**, Bae, J., et al., 2019, A&A, 625  
*Highly structured disk around the planet host PDS 70 revealed by high-angular resolution observations with ALMA*
- Semenov, D., Favre, C., Fedele, D., et al., 2018, A&A, 617  
*Chemistry in disks. XI. Sulfur-bearing species as tracers of protoplanetary disk physics and chemistry: the DM Tau case*
- Flaherty, K. M., Hughes, A. M., **Teague, R.**, et al., 2018, ApJ, 856  
*Turbulence in the TW Hya Disk*
- Fedele, D., Tazzari, M., Booth, R., et al., 2018, A&A, 610  
*ALMA continuum observations of the protoplanetary disk AS 209. Evidence of multiple gaps opened by a single planet*
- Flock, M., Nelson, R. P., Turner, N. J., et al., 2017, ApJ, 850  
*Radiation Hydrodynamical Turbulence in Protoplanetary Disks: Numerical Models and Observational Constraints*
- Dutrey, A., Guilloteau, S., Piétu, V., et al., 2017, A&A, 607  
*The Flying Saucer: Tomography of the thermal and density gas structure of an edge-on protoplanetary disk*
- Beuther, H., Linz, H., Henning, T., et al., 2017, A&A, 605  
*Multiplicity and disks within the high-mass core NGC 7538IRS1. Resolving cm line and continuum emission at  $0.06'' \times 0.05''$  resolution*
- Parfenov, S. Y., Semenov, D. A., Henning, T., et al., 2017, MNRAS, 468  
*On the methanol emission detection in the TW Hya disc: the role of grain surface chemistry and non-LTE excitation*

van Boekel, R., Henning, T., Menu, J., et al., 2017, ApJ, 837

*Three Radial Gaps in the Disk of TW Hydrae Imaged with SPHERE*

Haworth, T. J., Ilee, J. D., Forgan, D. H., et al., 2016, PASA, 33

*Grand Challenges in Protoplanetary Disc Modelling*

Feng, S., Beuther, H., Semenov, D., et al., 2016, A&A, 593

*Inferring the evolutionary stages of the internal structures of NGC 7538 S and IRS1 with chemistry*