## Richard Teague

## Curriculum Vitae

CONTACT Center for Astrophysics
INFORMATION 60 Garden Street MS 78
Cambridge, MA, 02138

E-mail: rteague@cfa.harvard.edu Web: https://richteague.github.io

Phone: (+1) 617-495-7259

CITIZENSHIP United Kingdom

RESEARCH Smithsonian Astrophysical Observatory
EXPERIENCE Submillimeter Array Fellow

Sep. 2019 – Apr. 2020

• Unveiling the Kinematics of the Planet Formation Process

University of Michigan

May 2017 – Jul. 2019

Postdoctoral Researcher

- Molecular probes of the physical structure of protoplanetary disks.
- Advisor: Prof. Ted Bergin

Max-Planck-Institute for Astronomy

Jan. 2017 – Apr. 2017

Postdoctoral Researcher

- Sub-mm observations of planet forming disks.
- Advisor: Prof. Thomas Henning

EDUCATION Max-Planck-Institute for Astronomy, Heidelberg, Germany

Ph.D. in Astronomy (Magna Cum Laude) Oct. 2013 – Jan. 2017

- Thesis title: Tracing the Earliest Stages of Planet Formation through Modelling and Sub-Millimeter Observations
- Advisors: Prof. Thomas Henning and Dr. Dmitry Semenov
- Fellow of the International Max Planck Research School (IMPRS).

University of Edinburgh, Edinburgh, United Kingdom

MPhys Astrophysics (First Class Honours) Sept. 2008 – May 2013

- Thesis title: Cosmology in Modified Gravity Models
- Advisor: Prof. Andy Taylor

Honours & Ernst Patzer Award

Nov. 2016

AWARDS Awarded for the best refereed publication by a young scientist.

Pre-Honours Certificate of Merit May 2011

Awarded for top 5% performance in pre-honours exams.

Pre-Honours Certificate of Merit May 2010

Professional Services	Postdoc and Research Scientist DEI Representative Department Diversity, Equity and Inclusion Committee Member	2018 - 2019
	Equi-Tea Organizer  Diversity, Equity and Inclusion Journal Club	2018 - 2019
	Stars, Planets and Formation Seminar Organizer  Departmental Seminar Series	2018 - 2019
	Conversations on Equity and Inclusion Co-organizer  Joint Physics / Astronomy / Space Sciences DEI Colloquium Series	2018 - 2019
	NESSF External Reviewer	2018
	Heidelberg MPG Student Workshop Organizer	2016
	PSF Coffee Organizer Departmental Seminar Series	2015 - 2017
	MPIA Student Representative	2015 - 2017
	MPIA Student Workshop Organizer	2015, 2016
	IMPRS Graduate Student Representative	2013 - 2017
	Referee for AAS, A&A and MNRAS journals	
Talks & Seminars	JPL Astrophysics Colloqium  Witnessing the Dynamics of Planetary Assembly	November 2019 (invited)
	Gordon Research Seminar Unveiling the Dynamics of Planet Formation	June 2019
	IAU Symposium 350: Laboratory Astrophysics  Tracing The Physical Conditions of Planet Formation with Molecular Ex	Apr. 2019 ccitation (invited)
	Planet-Forming Disks Unveiling the Dynamics of Planet Formation	Mar. 2019 (invited)
	NAOJ Theoretical Astronomy Seminar Observing the Kinematics of Planet-Disk Interactions with ALMA	Oct. 2018 (invited)
	LMU Munich Astronomy Colloquium Using Kinematics to Search for Embedded Protoplanets	Aug. 2018 (invited)
	University of Tübingen Astronomy Seminar Kinematical Detections of Embedded Protoplanets	Aug. 2018 (invited)
	Astrophysical Frontiers in the Next Decade and Beyo The First Kinematical Detection of Embedded Protoplanets	ond Apr. 2018
	Magnetic Fields or Turbulence A Spatially Resolved Search for Turbulence in TW Hya	Feb. 2018
	MPIA Patzer Awards Colloquium	Nov. 2016

	Measuring Turbulence in TW Hya with ALMA: Methods and Limitations	(invited)
	MPIA Königstuhl Colloquium	Nov. 2016
	Observing the Earliest Stages of Planet Formation	(invited)
	Astrochemistry with ALMA Cycle 4	Jun. 2016
	Detecting Turbulence in Protoplanetary Disks	(invited)
	Sant-Cugat Forum on Astrophysics Turbulence in Protoplanetary Disks: Methods and Limitations	Apr. 2016
	Protoplanetary Discussions  Turbulence in TW Hya	Mar. 2016
	Chemical Diagnostics of Star and Planet Formation  Deuterium Fraction in Protoplanetary Disks	Jan. 2015 (invited)
	ZAG - IPAG - MPIA Workshop on Planet Formation  Deuterium Fraction in DM Tau	Jan. 2015 (invited)
Supervision	Deryl Long University of Michigan Undergraduate student. Co-supervised with Ted Bergin and Ke Zhang, UMi	2019 ich.
	Case Hazewinkel University of Michigan Undergraduate student. Co-supervised with Ted Bergin, UMich.	2019
	Jeanne Kwon University of Michigan Undergraduate Research Opportunity Program	2018 - 2019
	Julian Penzinger Ludwig Maximilian University Summer student. Co-supervised with Dmitry Semenov, MPIA.	2016, 2018
School	45th Saas-Fee Course	2015
PARTICIPATION	From Protoplanetary Disks to Planet Formation	
	Heidelberg Graduate School on Fundamental Physics	2015
	DIANA Protoplanetary Disk School	2014
Observing Experience	MPG/ESO 2.2m 14 nights	2016
TEACHING	Wavefront Analysis Laboratory Instructor	2014
Publications (first author)	<b>Teague, R.</b> , Bae, J., Bergin, E. 2019, Nature, in press Meridional Flows in the Disk Around a Young Star	
	<b>Teague, R.</b> , Bae, J., Huang, J., Bergin, E. 2019, ApJL, in press Spiral Structure in the Gas Disk of TW Hya	5
	<b>Teague, R.</b> , 2019, Journal of Open Source Software, 4 Statistical Uncertainties in Moment Maps of Line Emission	

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

A Surface Density Perturbation 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) Bae, J., Zhu, Z., Baruteau, C., et al., 2019, MNRAS, in press.

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 N2H+ Emission Originates above the Midplane in TW Hydrae

Keppler, M., **Teague**, **R.**, Bae, J., et al., 2019, A&A, in press.

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

Successful Telescope Proposals (as pi)	<b>ALMA</b> PI: <b>Teague</b> , <b>R.</b> , 13.8 hours, 2019.1.01357.S, A ranked Constraining the H2 Surface Density Profile in IM Lup	2019
	<b>ALMA</b> PI: <b>Teague</b> , <b>R.</b> , 3.0 hours, 2019.1.00794.S, B ranked Detecting the Photoevaporative Wind in IM Lup	2019
	<b>ALMA</b> PI: <b>Teague</b> , <b>R.</b> , 33.2 hours, 2019.1.00419.S, B ranked Mapping the 3D Kinematic Structure of Planet Formation	2019
	<b>ALMA</b> PI: <b>Teague</b> , <b>R.</b> , 20.2 hours, 2018.A.00021.S, DDT Confirmation of an Embedded Planet in the Disk of TW Hya	2019
	Magellan/MagAO PI: Teague, R., 6 hours Searching for Wide Separation Planets in AS 209	2018
	<b>ALMA</b> PI: <b>Teague</b> , <b>R.</b> , 6.7 hours, 2018.1.00980.S, A ranked An Unambiguous Detection of a Magnetic Field in a Protoplanetary Disk	2018
	<b>ALMA</b> PI: <b>Teague</b> , <b>R.</b> , 5.3 hours, 2016.1.00440.S, A ranked Model Independent Study of Turbulence and Temperature in TW Hya	2016
	IRAM PdBI PI: Teague, R., 19.9 hours, W14BI, C ranked Disk Diagnostics with Deuteration	2014