Richard Teague — Curriculum Vitae

Contact Information

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Citizenship United Kingdom

Research Experience

Smithsonian Astrophysical Observatory Sep. 2019 – Apr. 2020
Submillimeter Array Fellow

University of Michigan May 2017 – Jul. 2019
Postdoctoral Researcher

Max-Planck-Institute for Astronomy Jan. 2017 – Apr. 2017
Postdoctoral Researcher

Education

Max-Planck-Institute for Astronomy, Heidelberg, Germany
Ph.D. in Astronomy (Magna Cum Laude) Oct. 2013 – Jan. 2017

University of Edinburgh, Edinburgh, United Kingdom
MPhys Astrophysics (First Class Honours) Sept. 2008 – May 2013

Honours & Awards

Harvard Data Science Initiative Research Fund ($9,700) Mar. 2020
Regularized Maximum Likelihood Imaging: A New Method for Detecting Planets

Ernst Patzer Award Nov. 2016
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
Awarded for top 5% performance in pre-honours exams.

Publication Summary

13 first author papers, including one published in *Nature*, and 21 co-author papers, totaling **390 citations**. Data taken from NASA's ADS. A full bibliography can be found at the end of the CV.

Observational Time Summary

I have been awarded over **82 hours** (200 hours) of time on ALMA as PI (co-I), **20 hours** (150 hours) on IRAM telescopes as PI (co-I). A break down of proposals can be found at the end of the CV.

Professional Services

Advanced Data Analysis Techniques forALMA SOC Oct. 2020
NRAO, Charlottesville, Virginia, USA

Visualizing the Kinematics of Planet Formation SOC Oct. 2019
Flatiron Institute, New York City, USA

Postdoc and Research Scientist DEI Representative 2018 – 2019
Department Diversity, Equity and Inclusion Committee Member

Equi-Tea Organizer 2018 – 2019
Diversity, Equity and Inclusion Journal Club

Stars, Planets and Formation Seminar Organizer 2018 – 2019
Departmental Seminar Series

Conversations on Equity and Inclusion Co-organizer 2018 – 2019
Joint Physics / Astronomy / Space Sciences DEI Colloquium Series

NESSF External Reviewer 2018 –

Heidelberg MPG Student Workshop Organizer 2016

PSF Coffee Organizer 2015 – 2017
Departmental Seminar Series

MPIA Student Representative 2015 – 2017

MPIA Student Workshop Organizer 2015, 2016

IMPRS Graduate Student Representative 2013 – 2017

Referee for AAS, A&A, MNRAS and Nature journals

Supervision

Felipe Alcaron University of Michigan 2019 –
Graduate student. Co-supervised with Ted Bergin and Ke Zhang, UMich.

Jenny Calahan University of Michigan 2019 –
Graduate student. Co-supervised with Ted Bergin and Ke Zhang, UMich.

Deryl Long University of Michigan 2019
Undergraduate student. Co-supervised with Ted Bergin and Ke Zhang, UMich.

Case Hazewinkel University of Michigan 2019
Undergraduate student. Co-supervised with Ted Bergin, UMich.

Jeanne Kwon University of Michigan 2018 – 2019
Undergraduate Research Opportunity Program

Julian Penzinger Ludwig Maximilian University 2016, 2018
Summer student. Co-supervised with Dmitry Semenov, MPIA.

Talks & Seminars

From Clouds to Planets II: The Astrochemical Link October 2020
ALMA's 3D View of Planet Formation *(invited)*

JPL Astrophysics Colloqium November 2019
Witnessing the Dynamics of Planetary Assembly *(invited)*

Gordon Research Seminar June 2019
Unveiling the Dynamics of Planet Formation

IAU Symposium 350: Laboratory Astrophysics Apr. 2019
Tracing The Physical Conditions of Planet Formation with Molecular Excitation (invited)

Planet-Forming Disks Mar. 2019
Unveiling the Dynamics of Planet Formation (invited)

NAOJ Theoretical Astronomy Seminar Oct. 2018
Observing the Kinematics of Planet-Disk Interactions with ALMA (invited)

LMU Munich Astronomy Colloquium Aug. 2018
Using Kinematics to Search for Embedded Protoplanets (invited)

University of Tübingen Astronomy Seminar Aug. 2018
Kinematical Detections of Embedded Protoplanets (invited)

Astrophysical Frontiers in the Next Decade and Beyond Apr. 2018
The First Kinematical Detection of Embedded Protoplanets

Magnetic Fields or Turbulence Feb. 2018
A Spatially Resolved Search for Turbulence in TW Hya

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 Apr. 2016
Turbulence in Protoplanetary Disks: Methods and Limitations

Protoplanetary Discussions Mar. 2016
Turbulence in TW Hya

Chemical Diagnostics of Star and Planet Formation Jan. 2015
Deuterium Fraction in Protoplanetary Disks (invited)

ZAG - IPAG - MPIA Workshop on Planet Formation Jan. 2015
Deuterium Fraction in DM Tau (invited)

School Participation

45th Saas-Fee Course 2015
From Protoplanetary Disks to Planet Formation

Heidelberg Graduate School on Fundamental Physics 2015

DIANA Protoplanetary Disk School 2014

Observing Experience

Sub-Millimeter Array 2019 –
Monthly rota.

MPG/ESO 2.2m 2016
14 nights

Teaching

Wavefront Analysis Laboratory Instructor 2014

Successful Telescope Proposals (as pi)

ALMA PI: **Teague, R.**, 13.8 hours, 2019.1.01357.S, A ranked 2019
Constraining the H2 Surface Density Profile in IM Lup

ALMA PI: **Teague, R.**, 3.0 hours, 2019.1.00794.S, B ranked 2019
Detecting the Photoevaporative Wind in IM Lup

ALMA PI: **Teague, R.**, 33.2 hours, 2019.1.00419.S, B ranked 2019
Mapping the 3D Kinematic Structure of Planet Formation

ALMA PI: **Teague, R.**, 20.2 hours, 2018.A.00021.S, DDT 2019
Confirmation of an Embedded Planet in the Disk of TW Hya

Magellan/MagAO PI: **Teague, R.**, 6 hours 2018
Searching for Wide Separation Planets in AS 209

ALMA PI: **Teague, R.**, 6.7 hours, 2018.1.00980.S, A ranked 2018
An Unambiguous Detection of a Magnetic Field in a Protoplanetary Disk

ALMA PI: **Teague, R.**, 5.3 hours, 2016.1.00440.S, A ranked 2016
Model Independent Study of Turbulence and Temperature in TW Hya

IRAM PdBI PI: **Teague, R.**, 19.9 hours, W14BI, C ranked 2014
Disk Diagnostics with Deuteration

(as co-i)

Including over 200 hours with **ALMA**, 150 hours with **IRAM** telescopes, two nights with **VLT** (X-shooter and SPHERE), and a night with **Magellan** (MagAO/MagAOx).

Publications (first author)

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
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^+ and DCO^+ in DM Tauri

(CO-AUTHOR) Garufi, A., Codella, C., Rygl, K., et al., A&A, in press.
ALMA chemical survey of disk-outflow sources in Taurus (ALMA-DOT I)

Rosotti, G., **Teague, R.**, Dullemond, C., et al., MNRAS, submitted
The Efficiency of Dust Trapping in Ringed Protoplanetary Discs

Long, D. E., Zhang, K., **Teague, R.**, et al., ApJ, submitted
Hints of a Population of Solar System Analog Planets from ALMA

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., ApJ, in press.
A multi-frequency ALMA characterization of substructures in the GM Aur protoplanetary disk

Rosotti., G., Benisty, M., Juhazs, A., et al., 2019, 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 N2H+ 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 × 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