

## Tim B. Miller

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Department of Astronomy  
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Citizenship: Canada

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<b>Research Interests</b>	Galaxy Evolution; Galaxy morphology; Bayesian Inference; Machine learning	
<b>Education &amp; Experience</b>	<i>Postdoctoral Fellow</i>	Starting Fall 2023
	Northwestern University, IL, USA	
	Center for Interdisciplinary Exploration and Research in Astrophysics (CIERA)	
	<i>Ph.D, Astronomy</i>	Awarded July 2023
	Yale University, CT, USA	
	Supervisor: Pieter van Dokkum	
	Thesis: A New View of Galaxy Morphology	
	<i>Masters of Science, Physics</i>	Awarded August 2017
	Dalhousie University, Nova Scotia, Canada	
	Supervisor: Scott Chapman	
	Thesis: <i>Star Formation Rate Indicators in the FIRE Simulations &amp; SPT2349-56: A Massive and Active Proto-cluster</i>	
	Visiting Researcher	2015-2016
	California Institute of Technology	
	Supervisors: Phil Hopkins and Chris Hayward	
	<i>Bachelor of Science, First Class Honors in Physics</i>	Awarded May 2015
	Dalhousie University, Nova Scotia, Canada	
<b>Scholarships &amp; Awards</b>	Gruber Science Fellowship	2017 - 2020
	· Award to highly ranked Ph.D applicants	
	Killam Predoctoral Scholarship	2015 - 2017
	· University wide scholarship for M.Sc program	
	NSERC Canada Graduate Scholarship	2016
	· Federal scholarship spanning many areas of study	
	Nova Scotia Graduate Scholarship	2016 - 2017
	· Province wide scholarship for M.Sc program	
	NSERC Undergraduate Summer Research Award	Summers 2013 - 2015
	· Federal award to support summer research projects	
<b>Conferences &amp; Seminars</b>	Tea Talk - Caltech	Oct. 2022
	Galaxies and AGN journal club - John Hopkins U.	Feb. 2022
	Local “Local Group” Group - Flatiron Institute	Nov. 2021
	Thunch - Princeton	Sept. 2021
	EAS Annual Meeting	July 2021
	AAS 235 - Dragonfly Telephoto Array Special Session	Jan 2020

<b>Observational Experience</b>	JWST - NIRCam	
	· Experience with early imaging data	
	HST - ACS & WFC3	
	· Extensive experience working with optical and NIR data	
	Keck I - LRIS	Apr. 2021
	· 2 nights observing	
	Dragonfly Telephoto Array	2020 - 2022
<b>Community &amp; Outreach</b>	· Recurring remote observer	
	Keck I - MOSFIRE	Nov. 2018
	· 3 nights observing	
	Sub-millimetre Array	July 2016
	· Guest observer for 5 nights	
	Journal Referee	2022 - Present
	· AAS Journals, JOSS	
<b>Publications</b>	Astronomy × Data Science Journal Club – Organizer	Fall 2021 - Spring 2023
	· Moderated and organized weekly journal club and speaker series	
	Galaxy Lunch – Organizer	Fall 2019 - Fall 2021
	· Moderated and organized weekly journal club and speaker series	
	Yale Astronomy Student Council – Founding Member	Fall 2018 - Fall 2021
	· Worked with students to communicate concerns to faculty and improve program	
	Astronomy on tap New Haven – Public Talk	July 2019
<b>First Authored</b>	· “The Hubble constant and our expanding universe”	
	Physics Fun and Discovery Days – Presenter	Summers 2013-2016
	· Performed physics demonstrations to elementary and junior high school students	
	<i>10 First Author, 14 Co-Authored, <a href="#">ads library</a></i>	
	Pasha, I. & Miller, T. B. (Co-lead authors), 2023. “pysersic: A Python package for determining galaxy structural properties via Bayesian inference, accelerated with jax”. JOSS, 8(89), 5703	
	Miller, T. B., van Dokkum, P., & Mowla, L. 2023, “Color gradients and half-mass radii of galaxies out to $z = 2$ in the CANDELS/3D-HST fields: further evidence for important differences in the evolution of mass-weighted and light-weighted sizes” , ApJ, 945, 2, 155	
	Miller, T. B., Whitaker, K. E., Nelson, E. J., et al. 2022, “Early JWST imaging reveals strong optical and NIR color gradients in galaxies at $z \sim 2$ driven mostly by dust”, 2023, ApJL, 941, 2, L37	
<b>First Authored</b>	Miller, T. B. & van Dokkum, P., 2021, “Bayesian fitting of multi-Gaussian expansion models to galaxy images”, ApJ, 923, 1, 124	
	Miller, T. B., van Dokkum, P., Danieli, S., et al. 2021, “The Dragonfly Wide Field Survey. II. Accurate Total Luminosities and Colors of Nearby Massive Galaxies and Implications for the Galaxy Stellar Mass Function”, ApJ, 909, 74	
	Miller, T. B., van den Bosch, F. C., Green, S. B., et al. 2020, “Dynamical self-friction: how mass loss slows you down ”, MNRAS , 495, 4496.	
	Miller, T. B., Chapman, S., Hayward, C. C., et al., 2020, “Investigating overdensities around $z > 6$ Galaxies through ALMA observations of [CII]”, ApJ , 889, 2	
	Miller, T. B., van Dokkum, P., Mowla, L. and van der Wel, A. 2019, “A New View of the	

Size-Mass Distribution of Galaxies: Using  $r_{20}$  and  $r_{80}$  Instead of  $r_{50}$ ", ApJL, 872, L14

**Miller, T. B.**, Chapman, S. C., Aravena, M., et al., 2018, "A massive core for a cluster of galaxies at a redshift of 4.3" , Nature, 556, 469

**Miller, T. B.**, Hayward, C. C., Chapman, S. C., et al. 2015, "The bias of the submillimetre galaxy population: SMGs are poor tracers of the most-massive structures in the  $z \sim 2$  Universe", MNRAS, 452, 878

**Co-authored**

Nelson, E. J., Suess, K. A., ... **Miller, T. B.** ... et al. 2022, "JWST reveals a population of ultra-red, flattened disk galaxies at  $2 < z < 6$  previously missed by HST", ApJ, In Review arXiv:2208.01630

Suess, K. A., Bezanson, R.,... **Miller, T. B.** ..., et al. 2022, "Rest-frame near-infrared sizes of galaxies at cosmic noon: objects in JWST's mirror are smaller than they appeared ", ApJL, 937, L33

Lokhorst, D., Abraham, R.,... **Miller, T. B.** ..., et al. 2022, "A Giant Shell of Ionized Gas Discovered near M82 with the Dragonfly Spectral Line Mapper Pathfinder", ApJ, 927, 136.

Pasha, I., Lokhorst, D.,... **Miller, T. B.** ..., et al. 2021, "A Nascent Tidal Dwarf Galaxy Forming within the Northern H I Streamer of M82", ApJL 923

Liu, Q., Abraham, R., ... **Miller, T. B.** ..., et al. 2021, "A Method To Characterize the Wide-Angle Point Spread Function of Astronomical Images", ApJ, 925, 219

Keim, M. A., van Dokkum, P., ... **Miller, T. B.** ... , et al. 2021, "Tidal Distortions in NGC1052-DF2 and NGC1052-DF4: Independent Evidence for a Lack of Dark Matter ", ApJ, 935, 160

Hill, R., Chapman, S. C., ... **Miller, T. B.** ... , et al. 2021, "A census of the stellar content in the protocluster core SPT2349–56 at  $z = 4.3$ ", submitted to MNRAS, arXiv:2109.04534

Cunningham, D. J. M., Chapman, S. C. .... **Miller, T. B.** ... , et al. 2020, The  $[C\ II]/[N\ II]$  ratio in  $3 < z < 6$  sub-millimetre galaxies from the South Pole Telescope survey MNRAS, 494, 4090

Danieli, S., Lokhorst, D., ... **Miller, T. B.** ... , et al. 2020, "The Dragonfly Wide Field Survey. I. Telescope, Survey Design and Data Characterization", ApJ , 894, 119

Ogiya, G., van den Bosch, F. C., ... **Miller, T. B.** ... et al. 2019, "DASH: a library of dynamical subhalo evolution ", MNRAS, 485, 189.

Mowla, L., van der Wel, A., van Dokkum, P. and **Miller, T. B.**, "A Mass-dependent Slope of the Galaxy Size-Mass Relation out to  $z \sim 3$ : Further Evidence for a Direct Relation between Median Galaxy Size and Median Halo Mass", 2019, ApJL, 872, L13

Marrone, D. P., Spilker, J. S., ... **Miller, T. B.** ... , et al. "Galaxy growth in a massive halo in the first billion years of cosmic history", Nature, 2018, 553, 51

Strandet, M. L., Weiss, A., ... **Miller, T. B.** ... , et al. , "ISM Properties of a Massive Dusty Star-forming Galaxy Discovered at  $z \sim 7$ ", ApJL, 2017, 842, L15

Orr, M. E., Hayward, C. C., ... **Miller, T. B.** ... , et al. "Stacked Star Formation Rate Profiles of Bursty Galaxies Exhibit "Coherent" Star Formation", ApJL , 2017, 849, L2