Tim B. Miller

Department of Astronomy
Yale University, 52 Hillhouse ave
New Haven, CT, 06511

tim.miller@yale.edu
tbmiller-astro.github.io

Research Interests

Galaxy Evolution; Galaxy morphology; Bayesian Inference; Machine learning

Education & Experience

Ph.D Candidate, Astronomy — Expected May 2023
Yale University, CT, USA
Supervisor: Pieter van Dokkum
Thesis: A New View of Galaxy Morphology

Masters of Science, Physics — Awarded August 2017
Dalhousie University, Nova Scotia, Canada
Supervisor: Scott Chapman
Thesis: *Star Formation Rate Indicators in the FIRE Simulations & SPT2349-56: A Massive and Active Proto-cluster*

Visiting Researcher — 2015-2016
California Institute of Technology
Supervisors: Phil Hopkins and Chris Hayward

Bachelor of Science, First Class Honors in Physics — Awarded May 2015
Dalhousie University, Nova Scotia, Canada

Scholarships & Awards

Gruber Science Fellowship	2017 - Present
Killam Predoctoral Scholarship-Master's	2016 - 2017
Nova Scotia Graduate Scholarship	2016 - 2017
NSERC Canada Graduate Scholarship-Master's	2016
NSERC Undergraduate Summer Research Award	Summers 2013 - 2015

Conferences & Seminars

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

Observing Experience

Keck I - LRIS — Apr. 2021
· 2 nights observing

Dragonfly Telephoto Array — 2020 - 2022
· Recurring remote observer

Keck I - MOSFIRE — Nov. 2018
· 3 nights observing

Sub-millimetre Array — July 2016
· Guest observer for 5 nights

Community & Outreach

Astronomy × Data Science Journal Club Organizer — Fall 2021 - Present
· 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
· "The Hubble constant and our expanding universe"

Physics Fun and Discovery Days, Dalhousie University — Summers 2013-2016
· Performed physics demonstrations to elementary and junior high school students

Publications

9 First Author, 14 Co-Authored, ads library

First Authored

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", ApJL, in review, arXiv:2209.12954

Miller, T. B., van Dokkum, P., & Mowla, L. 2022, "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" , in review, ApJ, arXiv:2207.05895

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∼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, ApJLn, 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