

Tansu Daylan

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Education

- 2018, Ph.D. in Physics, Harvard University, Cambridge, MA, US
- 2015, M.A. in Physics, Harvard University, Cambridge, MA, US
- 2013, B.S. in Physics (double major), Middle East Technical University (METU), Ankara, Turkey
- 2012, B.S. in Electrical and Electronics Engineering, METU, Ankara, Turkey
- 2008, Robert College, Istanbul, Turkey

Positions

- Since August 2023, Assistant Professor of Physics, Washington University, St. Louis, MO, US
- June 2022 - July 2023, Postdoctoral Research Associate, Princeton University, Princeton, NJ, US
- June 2021 - May 2022, Visiting Postdoctoral Associate, Princeton University, Princeton, NJ, US
- June 2021 - May 2022, TESS Postdoctoral Associate, MIT, Cambridge, MA, US
- June 2018 - May 2021, Kavli Fellow, MIT, Cambridge, MA, US
- 2013-2018, Research/Teaching Fellow, Harvard University, Cambridge, MA, US
- 2011-2013, Teaching Assistant, METU, Ankara, Turkey

Research Statement

I have had the exciting opportunity to make contributions in the fields of exoplanets and cosmology. My research footprint covers over 80 refereed publications and 3,000 citations, an h-index of 31, and can be accessed via [NASA ADS](#), [Google Scholar](#), or [my ORCID](#). My Ph.D. thesis was A Transdimensional Perspective on Dark Matter (2018) advised by Douglas P. Finkbeiner.

Select Research Achievements

- Led the discovery of four small exoplanets transiting a bright, Sun-like star, HD 108236 (Daylan et al. 2021a),
- Significantly contributed to the characterization of over 50 exoplanets (e.g., Daylan et al. 2021b),
- Co-developed the inference framework to model stars and exoplanets (Günther&Daylan2021),
- Led the group vetting of the NASA TESS mission, enabling the discovery of over 6,000 exoplanet candidates,
- Developed transdimensional gravitational imaging to probe the small-scale structure of dark matter (Daylan et al. 2018),
- Constructed a novel statistical method to perform transdimensional inference (Daylan et al. 2017),
- Revealed the consistency between the GeV excess in the inner Galaxy and WIMP annihilation (Daylan et al. 2016).

Select Awards, Honors and Achievements

- LSSTC Catalyst Fellowship, John Templeton Foundation, 2022
- Selected into the the NASA FDL research team, 2020
- MIT Kavli Fellowship, Kavli Foundation, 2018
- WorldQuant Fellowship, 2014
- Harvard Purcell Fellowship, 2013
- Undergraduate Physics Research Award, Bilkent University, 2013
- Selected among the young researchers to attend the Lindau Nobel Laureates Meeting, 2012
- Featured by the Scientific American in the “30 under 30” list, 2012
- Bulent Kerim Altay Award, METU, 2008 and 2009
- Great Achievement Fellowship, Prime Ministry of the Turkish Republic, 2008
- Superior Success Fellowship, Turkish Education Foundation, 2008
- Higher Education Examination Achievement Award, Fen Bilimleri, 2008
- Ranked 10th among 1.5 million participants (99.999th percentile) in the Higher Education Examination, 2008

Select awarded grants as PI

- \$299,966, **Preparing for a leap: Precursor Strong Lensing Science with Roman Towards Precision Cosmology**, 2023, 22-ROMAN22-0072, NASA Roman Research and Support Program
- \$93,544, **ExoCore: An open science curriculum for enhanced reproducibility and equity in exoplanet research**, 2023, NASA Transform to OPen Science Training (TOPST)
- \$69,970.71, **Hunting For Black Holes With TESS**, 2021, TESS Guest Investigator (GI) Program, Cycle 4, ID G04190.
- \$5K, **Robust Census of Long-Period Solar System and Interstellar Objects with LSST**, 2021, LSSTC ES
- \$5K, **A Cloud-accelerated hunt for black holes with TESS**, 2021, Azure cloud computing, Princeton University

Select awarded observational resources as PI

- ULTRASAT US PI program. **Empowering ULTRASATs Legacy on Planetary Habitability: a survey of stellar flares and space weather beyond the Solar System**, 22-UTASPS22-0033
- 2-minute cadence targets. **Mapping Star Spots Using TESS**, TESS GI Program, Cycle 4, ID G04206.
- 2-minute cadence targets. **Searching For Compact Objects With Stellar Companions Using TESS**, TESS GI, Cycle 3, ID G03254.
- 1.5 nights. **Revealing the dynamical history of an exceptional multiplanetary system with small transiting planets and a bright host**, Magellan Clay/PFS, 2021A.
- 1 night. **Probing the spin-orbit alignment of a rich and compact multiplanetary system TOI-1233**, Magellan Clay/PFS, 2022A.

Select awarded grants as non-PI

- \$492,467 **Planet Formation Revealed by a Uniform Analysis of all Giant Planets**, 2021, NASA XRP, 21-XRP21-0135, PI: Quinn
- \$67,000, **Disintegrating Rocky Bodies Transiting White Dwarfs: The Key To Understanding Exoplanet Compositions**, 2021, TESS GI Program, Cycle 4, ID G04200, PI: Vanderburg.
- \$50,000, **A Systematic Study To Characterize Rapid Optical Variability Of Agn And Search For Quasi-Periodic Oscillations**, 2021, TESS GI Program, Cycle 4, ID G04215, PI: Pasham.
- \$50,000, **A Systematic Study Of Tess Orbital Phase Curves**, 2021, TESS GI Program, Cycle 4, ID G04096, PI: Shporer.
- **Thermal Emission from the First Planet Transiting a White Dwarf**, 2021, JWST Proposal, Cycle 1, ID 2507, PI: Vanderburg.
- **Leveraging The Synergy Between TESS And Speculoos: Hunting For Exoplanets Around The Nearest Late M Dwarfs**, 2020, TESS GI Program, Cycle 3, ID G03279, PI: Guenther.
- \$44,999.55, **Disintegrating Rocky Bodies Transiting White Dwarfs: The Key To Understanding Exoplanet Compositions**, 2020, TESS GI Program, Cycle 3, ID G03207, PI: Vanderburg.
- \$50,000, **A Systematic Study Of TESS Orbital Phase Curves**, 2020, TESS GI Program, Cycle 3, ID G03232, PI: Shporer.
- \$43,000, **Disintegrating Rocky Bodies Transiting White Dwarfs: The Key To Understanding Exoplanet Compositions**, 2019, TESS GI Program, Cycle 2, ID G022077, PI: Vanderburg.
- \$89,000, **Atmospheric characterization of two temperate mini-Neptunes formed in the same protoplanetary nebula**, 2019, HST Proposal, Cycle 27, ID 15814, PI: Mikal-Evans.

Publications

Lead author

Peer-reviewed

1. Daylan, **TESS'in Mirası: Gökada Muhitimizde Geçiş Yapan Ötegezegen Sayımı [The legacy of TESS: a census of transiting exoplanets in our galactic neighborhood]**
TJAA, 4:79-82, 2023, doi:10.55064/tjaa.1203862
2. Daylan et al., **TESS discovery of a super-Earth and three sub-Neptunes hosted by the bright, Sun-like star HD 108236**
AJ, 161:85, February 2021, doi:10.3847/1538-3881/abd73e, arXiv:2004.11314
3. Daylan et al., **TESS observations of the WASP-121 b phase curve**
AJ, 161:131, March 2021, doi:10.3847/1538-3881/abd8d2, arXiv:1909.03000
4. Daylan et al., **The Small-scale Structure in Strongly Lensed Systems via Transdimensional Inference**
ApJ, 854:141, February 2018, doi:10.3847/1538-4357/aaaa1e, arXiv:1706.06111
5. Daylan et al., **Inference of Unresolved Point Sources at High Galactic Latitudes Using Probabilistic Catalogs**
ApJ, 839:4, April 2017, doi:10.3847/1538-4357/aa679e, arXiv:1607.04637
6. Daylan et al., **The characterization of the gamma-ray signal from the central Milky Way: A case for annihilating dark matter**
Physics of the Dark Universe, 12:1-23, June 2016, doi:10.1016/j.dark.2015.12.005, arXiv:1402.6703

Non-peer-reviewed

7. Daylan & Birrer, **Searching for dark matter substructure: a deeper wide-area community survey for Roman**
Roman Core Community Survey White Paper, June 2023, arXiv:2306.12864

Second or third author

Peer-reviewed

8. Feder, Butler, Daylan, et al., **PCAT-DE: Reconstructing point-like and diffuse signals in astronomical images using spatial and spectral information**
Accepted for publication in AJ, July 2023 arXiv:2307.10385
9. Butler, Feder, Daylan, et al., **Measurement of the Relativistic Sunyaev-Zeldovich Corrections in RX J1347.5-1145**
ApJ 932:55, June 2022, doi:10.3847/1538-4357/ac6c04 arXiv:2110.13932
10. Kunimoto, Daylan, et al., **The TESS Faint Star Search: 1,617 TOIs from the TESS Primary Mission**
ApJS, 259:33, April 2022, doi:10.3847/1538-4365/ac5688 arXiv:2112.02176
11. Günther and Daylan. **Allesfitter: Flexible Star and Exoplanet Inference From Photometry and Radial Velocity**
ApJS, 254:13, May 2021, doi:10.3847/1538-4365/abe70e, arXiv:2003.14371
12. Wong, Shporer, Daylan, et al., **Systematic Phase Curve Study of Known Transiting Systems from Year 1 of the TESS Mission**
AJ, 160:155, October 2020, doi:10.3847/1538-3881/ababad, arXiv:2003.06407
13. Badenas-Agusti, Günther, Daylan, et al., **HD 191939: Three Sub-Neptunes Transiting a Sun-like Star Only 54 pc Away**
AJ, 160 113, September 2020, doi:10.3847/1538-3881/aba0b5, arXiv:2002.03958
14. Feder, Portillo, Daylan, et al., **Multiband Probabilistic Cataloging: A Joint Fitting Approach to Point Source Detection and Deblending**

15. Portillo, Lee, Daylan, et al., **Improved Point-source Detection in Crowded Fields Using Probabilistic Cataloging**

AJ, 154:132, October 2017, doi:10.3847/1538-3881/aa8565, arXiv:1703.01303

Non-peer-reviewed

16. Kunimoto, Bryson, Daylan, et al., **False Alarms Revealed in a Planet Search of TESS Light Curves**
RNAAS, 7:7, January 2023, doi:10.3847/2515-5172/acb149 arXiv:2301.01900

Contributing author

Peer-reviewed

17. Rojas et al., **The impact of human expert visual inspection on the discovery of strong gravitational lenses**

MNRAS, 523, 4413-4430, August 2023, doi:10.1093/mnras/stad1680 arXiv:2301.03670

18. Fausnaugh et al., **Four years of Type Ia Supernovae Observed by TESS: Early Time Light Curve Shapes and Constraints on Companion Interaction Models**

Accepted for publication in ApJ, July 2023, arXiv:2307.11815

19. Schwamb et al., **Tuning the Legacy Survey of Space and Time (LSST) Observing Strategy for Solar System Science**

ApJS, 266:22, June 2023, doi:10.3847/1538-4365/acc173 arXiv:2303.02355

20. Tsai et al., **Photochemically produced SO₂ in the atmosphere of WASP-39b**

Nature, 617:483-487, May 2023, doi:10.1038/s41586-023-05902-2 arXiv:2211.10490

21. Grant et al., **Detection of Carbon Monoxide's 4.6 Micron Fundamental Band Structure in WASP-39b's Atmosphere with JWST NIRSpec G395H**

ApJL, 949:L15, May 2023, doi:10.3847/2041-8213/acd544 arXiv:2304.11994

22. Yee et al., **The TESS Grand Unified Hot Jupiter Survey. II. Twenty New Giant Planets**

ApJS, 265:1, March 2023, doi:10.3847/1538-4365/aca286 arXiv:2210.15473

23. Tey et al., **Identifying Exoplanets with Deep Learning. V. Improved Light-curve Classification for TESS Full-frame Image Observations**

AJ, 165:95, March 2023, doi:10.3847/1538-3881/acad85 arXiv:2301.01371

24. Mikal-Evans et al., **Hubble Space Telescope Transmission Spectroscopy for the Temperate Sub-Neptune TOI-270 d: A Possible Hydrogen-rich Atmosphere Containing Water Vapor**

AJ, 165:84, March 2023, doi:10.3847/1538-3881/aca90b arXiv:2211.15576

25. Anderson et al., **Early Release Science of the exoplanet WASP-39b with JWST NIRSpec G395H**

Nature, 614:664-669, February 2023, doi:10.1038/s41586-022-05591-3 arXiv:2211.10488

26. Rustamkulov et al., **Early Release Science of the exoplanet WASP-39b with JWST NIRSpec PRISM**

Nature, 614:659-663, February 2023, doi:10.1038/s41586-022-05677-y arXiv:2211.10487

27. Ahrer et al., **Early Release Science of the exoplanet WASP-39b with JWST NIRCам**

Nature, 614:653-658, February 2023, doi:10.1038/s41586-022-05590-4 arXiv:2211.10489

28. JTEC ERS Team, **Identification of carbon dioxide in an exoplanet atmosphere**

Nature, 614:649-652, February 2023, doi:10.1038/s41586-022-05269-w arXiv:2208.11692

29. Saydjari et al., **The Dark Energy Camera Plane Survey 2 (DECaPS2): More Sky, Less Bias, and Better Uncertainties**

30. Günther et al., **Complex Modulation of Rapidly Rotating Young M Dwarfs: Adding Pieces to the Puzzle**
AJ, 163:144, April 2022, doi:10.3847/1538-3881/ac503c arXiv:2008.11681
31. Kaye et al., **Transit timings variations in the three-planet system: TOI-270**
MNRAS 510:5464-5485, March 2022, doi:10.1093/mnras/stab3483
32. Mikal-Evans et al., **Diurnal variations in the stratosphere of the ultrahot giant exoplanet WASP-121b**
Nature Astronomy, 6:471-479, February 2022, doi:10.1038/s41550-021-01592-w arXiv:2202.09884
33. Krishnamurthy et al., **Transit Search for Exoplanets around Alpha Centauri A and B with ASTERIA**
AJ, 161:275, June 2021, doi:10.3847/1538-3881/abf2c0
34. Guerrero et al., **The TESS Objects of Interest Catalog from the TESS Prime Mission**
ApJS 254:39, June 2021, doi:10.3847/1538-4365/abefe1, arXiv:2103.12538
35. Smith et al., **GRB 191016A: A Long Gamma-Ray Burst Detected by TESS**
ApJ, 911:1, April 2021, doi:10.3847/1538-4357/abe6a2, arXiv:2102.11295
36. Fausnaugh et al., **Early-time Light Curves of Type Ia Supernovae Observed with TESS**
ApJ, 908:51, February 2021, doi: 10.3847/1538-4357/abcd42, arXiv:1904.02171
37. Crossfield et al., **Phase Curves of Hot Neptune LTT 9779b Suggest a High-Metallicity Atmosphere**
ApJL, 903:L7, November 2020, doi:10.3847/2041-8213/abbc71, arXiv:2010.12745
38. Dragomir et al., **Spitzer Reveals Evidence of Molecular Absorption in the Atmosphere of the Hot Neptune LTT 9779b**
ApJL, 903:L6, November 2020, doi:10.3847/2041-8213/abbc70, arXiv:2010.12744
39. Vanderburg et al., **A giant planet candidate transiting a white dwarf**
Nature, 585, 363-367, September 2020, doi:10.1038/s41586-020-2713-y, arXiv:2009.07282
40. Kane et al., **Transits of Known Planets Orbiting a Naked-Eye Star**
AJ, 160:129, September 2020, doi:10.3847/1538-3881/aba835, arXiv:2007.10995
41. Basturk et al., **A holistic and probabilistic approach to the ground-based and spaceborne data of HAT-P-19 system**
MNRAS, 496:4174, August 2020, doi:10.1093/mnras/staa1758, arXiv:1911.07903
42. Wong et al., **Exploring the atmospheric dynamics of the extreme ultra-hot Jupiter KELT-9b using TESS photometry**
AJ, 160:88, August 2020, doi:10.3847/1538-3881/aba2cb, arXiv:1910.01607
43. Pepper et al., **TESS Reveals HD 118203b to be a Transiting Planet**
AJ, 159:243, June 2020, doi:10.3847/1538-3881/ab84f2, arXiv:1911.05150
44. Günther et al., **Stellar Flares from the First TESS Data Release: Exploring a New Sample of M-dwarfs**
AJ, 159:60, February 2020, doi:10.3847/1538-3881/ab5d3a, arXiv:1901.00443
45. Yu et al., **Identifying Exoplanets with Deep Learning III: Automated Triage and Vetting of TESS Candidates**
AJ, 158:25, July 2019, doi:10.3847/1538-3881/ab21d6, arXiv:1904.02726
46. Günther et al., **A Super-Earth and two sub-Neptunes transiting the bright, nearby, and quiet M-**

dwarf TOI-270

Nature Astronomy, 3:1099-1108, July 2019, doi:10.1038/s41550-019-0845-5, arXiv:1903.06107

47. Bouma et al., **WASP-4b Arrived Early for the TESS Mission.**
AJ, 157:217, June 2019, doi:10.3847/1538-3881/ab189f arXiv:1903.02573
48. Shporer et al., **TESS Full Orbital Phase Curve of the WASP-18b System**
AJ, 157:178, May 2019, doi:10.3847/1538-3881/ab0f96, arXiv:1811.06020
49. Schlafly et al., **The DECam Plane Survey: Optical Photometry of Two Billion Objects in the Southern Galactic Plane**
ApJS, 234:39, February 2018, doi:10.3847/1538-4365/aaa3e2, arXiv:1710.01309

Non-peer-reviewed

50. Street et al., **Maximizing science return by coordinating the survey strategies of Roman with Rubin, and other major facilities**
Roman Core Community Survey White Paper, June 2023, arXiv:2306.13792
51. Han et al., **NANCY: Next-generation All-sky Near-infrared Community surveyY**
Roman Core Community Survey White Paper, June 2023, arXiv:2306.11784
52. Collett et al., **The 4MOST Strong Lensing Spectroscopic Legacy Survey (4SLSLS)**
The Messenger, 190:49-52, March 2023, 10.18727/0722-6691/5313
53. Adhikari et al., **Report of the Topical Group on Cosmic Probes of Fundamental Physics for for Snowmass 2021**
Snowmass 2021 Report, September 2022, arXiv:2209.11726
54. Engel et al., **The Future of Gamma-Ray Experiments in the MeV-EeV Range**
Snowmass 2021 white paper, March 2022, arXiv:2203.07360
55. Mao et al., **Snowmass2021: Vera C. Rubin Observatory as a Flagship Dark Matter Experiment**
Snowmass 2021 white paper, March 2022, arXiv:2203.07252
56. Leane et al., **Snowmass2021 Cosmic Frontier White Paper: Puzzling Excesses in Dark Matter Searches and How to Resolve Them**
Snowmass 2021 white paper, March 2022, arXiv:2203.06859
57. Guy et al., **Rubin-Euclid Derived Data Products: Initial Recommendations**
Rubin-Euclid Derived Data Products Working Group Report, January 2022, arXiv:2201.03862

Collaborating author

Peer-reviewed papers based on my work on the TOI process

58. Hawthorn et al., **TOI-908: a planet at the edge of the Neptune desert transiting a G-type star**
MNRAS, 524, 3877-3893, September 2023, doi:10.1093/mnras/stad1840 arXiv:2306.09758
59. Dai et al., **A Mini-Neptune Orbiting the Metal-poor K Dwarf BD+29 2654**
AJ, 166:49, August 2023, doi:10.3847/1538-3881/acdee8 arXiv:2306.08179
60. Psaridi et al., **Three Saturn-mass planets transiting F-type stars revealed with TESS and HARPS. TOI-615b, TOI-622b, and TOI-2641b**
A&A, 675:A39, July 2023, doi:10.1051/0004-6361/202346406 arXiv:2303.15080
61. Brahm et al., **Three Long-period Transiting Giant Planets from TESS**
AJ, 165:227, June 2023, doi:10.3847/1538-3881/accadd arXiv:2304.02139

62. Heitzmann et al., **TOI-4562b: A Highly Eccentric Temperate Jupiter Analog Orbiting a Young Field Star**
AJ, 165:121, March 2023 [doi:10.3847/1538-3881/acb5a2](https://doi.org/10.3847/1538-3881/acb5a2) [arXiv:2208.10854](https://arxiv.org/abs/2208.10854)
63. Delrez et al., **Two temperate super-Earths transiting a nearby late-type M dwarf**
A&A, 667:A59, November 2022, [doi:10.1051/0004-6361/202244041](https://doi.org/10.1051/0004-6361/202244041) [arXiv:2209.02831](https://arxiv.org/abs/2209.02831)
64. Newton et al., **TESS Hunt for Young and Maturing Exoplanets (THYME). VII. Membership, Rotation, and Lithium in the Young Cluster Group-X and a New Young Exoplanet**
AJ, 164:115, September 2022, [doi:10.3847/1538-3881/ac8154](https://doi.org/10.3847/1538-3881/ac8154) [arXiv:2206.06254](https://arxiv.org/abs/2206.06254)
65. Zhou et al., **A Mini-Neptune from TESS and CHEOPS Around the 120 Myr Old AB Dor Member HIP 94235**
AJ, 163:289, June 2022, [doi:10.3847/1538-3881/ac69e3](https://doi.org/10.3847/1538-3881/ac69e3) [arXiv:2204.11975](https://arxiv.org/abs/2204.11975)
66. Silverstein et al., **The LHS 1678 System: Two Earth-Sized Transiting Planets and an Astrometric Companion Orbiting an M Dwarf Near the Convective Boundary at 20 pc**
AJ, 163:151, April 2022, [doi:10.3847/1538-3881/ac32e3](https://doi.org/10.3847/1538-3881/ac32e3) [arXiv:2110.12079](https://arxiv.org/abs/2110.12079)
67. Serrano et al., **A low-eccentricity migration pathway for a 13-h-period Earth analogue in a four-planet system**
Nature Astronomy, 6:736-750, April 2022, [doi:10.1038/s41550-022-01641-y](https://doi.org/10.1038/s41550-022-01641-y) [arXiv:2204.13573](https://arxiv.org/abs/2204.13573)
68. Espinoza et al., **A Transiting, Temperate Mini-Neptune Orbiting the M Dwarf TOI-1759 Unveiled by TESS**
AJ, 163:133, March 2022, [doi:10.3847/1538-3881/ac4af0](https://doi.org/10.3847/1538-3881/ac4af0) [arXiv:2202.01240](https://arxiv.org/abs/2202.01240)
69. Heidari et al., **HD 207897 b: A dense sub-Neptune transiting a nearby and bright K-type star**
A&A, 658:A176, February 2022, [doi:10.1051/0004-6361/202141429](https://doi.org/10.1051/0004-6361/202141429) [arXiv:2110.08597](https://arxiv.org/abs/2110.08597)
70. Huber et al., **A 20-Second Cadence View of Solar-Type Stars and Their Planets with TESS: Asteroseismology of Solar Analogs and a Re-characterization of pi Men c**
AJ, 163:79, February 2022, [doi:10.3847/1538-3881/ac3000](https://doi.org/10.3847/1538-3881/ac3000) [arXiv:2108.09109](https://arxiv.org/abs/2108.09109)
71. Trifonov et al., **A pair of warm giant planets near the 2:1 mean motion resonance around the K-dwarf star TOI-2202**
AJ, 162:283, December 2021, [doi:10.3847/1538-3881/ac1bbe](https://doi.org/10.3847/1538-3881/ac1bbe) [arXiv:2108.05323](https://arxiv.org/abs/2108.05323)
72. Addison et al., **TOI-1431b/MASCARA-5b: A Highly Irradiated Ultra-Hot Jupiter Orbiting One of the Hottest & Brightest Known Exoplanet Host Stars**
AJ, 162:292, December 2021, [doi:10.3847/1538-3881/ac224e](https://doi.org/10.3847/1538-3881/ac224e) [arXiv:2104.12078](https://arxiv.org/abs/2104.12078)
73. Wong et al., **Visible-light Phase Curves from the Second Year of the TESS Primary Mission**
AJ, 162:127, October 2021, [doi:10.3847/1538-3881/ac0c7d](https://doi.org/10.3847/1538-3881/ac0c7d), [arXiv:2106.02610](https://arxiv.org/abs/2106.02610)
74. Wells et al., **A large sub-Neptune transiting the thick-disk M4V TOI-2406**
A&A, 653, A97, September 2021, [doi:10.1051/0004-6361/202141277](https://doi.org/10.1051/0004-6361/202141277), [arXiv:2107.14125](https://arxiv.org/abs/2107.14125)
75. Burt et al., **TOI-1231 b: A Temperate, Neptune-Sized Planet Transiting the Nearby M3 Dwarf NLTT 24399**
AJ, 162:87, September 2021, [doi:10.3847/1538-3881/ac0432](https://doi.org/10.3847/1538-3881/ac0432), [arXiv:2105.08077](https://arxiv.org/abs/2105.08077)
76. Hobson et al., **A transiting warm giant planet around the young active star TOI-201**
AJ, 161:235, May 2021, [doi:10.3847/1538-3881/abeaa1](https://doi.org/10.3847/1538-3881/abeaa1), [arXiv:2103.02685](https://arxiv.org/abs/2103.02685)
77. Osborn et al., **A hot mini-Neptune in the radius valley orbiting solar analogue HD 110113**
MNRAS, 502, 4, 4842-4857, April 2021, [doi:10.1093/mnras/stab182](https://doi.org/10.1093/mnras/stab182), [arXiv:2101.04745](https://arxiv.org/abs/2101.04745)

78. Powell et al., **TIC 168789840: A Sextuply-Eclipsing Sextuple Star System**
AJ, 161:162, April 2021, doi:10.3847/1538-3881/abddb5, arXiv:2101.03433
79. Addison et al., **TOI-257b (HD 19916b): A Warm sub-Saturn on a Moderately Eccentric Orbit Around an Evolved F-type Star**
MNRAS, 502, 3, 3704-3722, April 2021, doi:10.1093/mnras/staa3960, arXiv:2001.07345
80. Zhou et al., **Two young planetary systems around field stars with ages between 20-320 Myr from TESS**
AJ, 161:2, January 2021, doi:10.3847/1538-3881/abba22, arXiv:2011.13349
81. Dreizler et al., **The CARMENES search for exoplanets around M dwarfs – LP 714-47b (TOI 442.01): Populating the Neptune desert**
A&A, 644, A127, December 2020 doi:10.1051/0004-6361/202038016, arXiv:2011.01716
82. Ikwut-Ukwa et al., **TheK2&TESS Synergy I:Updated Ephemerides and Parameters for K2-114, K2-167, K2-237, & K2-261**
AJ, 160:209, November 2020, doi:10.3847/1538-3881/aba964, arXiv:2007.00678
83. Dai et al., **The TESS-Keck Survey. III. A Stellar Obliquity Measurement of TOI-1726 c**
AJ 160:193, October 2020, doi:10.3847/1538-3881/abb3bd, arXiv:2008.12397
84. Burt et al., **TOI-824 b: A New Planet on the Lower Edge of the Hot Neptune Desert**
AJ, 160:153, October 2020, doi:10.3847/1538-3881/abac0c, arXiv:2008.11732
85. Gilbert et al., **The First Habitable Zone Earth-sized Planet from TESS. I: Validation of the TOI-700 System**
AJ, 160:116, September 2020, doi:10.3847/1538-3881/aba4b2, arXiv:2001.00952
86. Dalba et al., **The TESS-Keck Survey. I. A Warm Sub-Saturn-mass Planet and a Caution about Stray Light in TESS Cameras**
AJ, 159:241, May 2020, doi:10.3847/1538-3881/ab84e3, arXiv:2003.10451
87. Jordan et al., **TOI-677 b: A Warm Jupiter (P=11.2d) on an eccentric orbit transiting a late F-type star**
AJ, 159:145, April 2020, doi:10.3847/1538-3881/ab6f67, arXiv:1911.05574
88. Shporer et al., **GJ 1252 b: A 1.2 R planet transiting an M3-dwarf at 20.4 pc**
ApJL, 890:L7, February 2020, doi:10.3847/2041-8213/ab7020, arXiv:1912.05556
89. Espinoza et al., **HD 213885b: A transiting 1-day-period super-Earth with an Earth-like composition around a bright ($V = 7.9$) star unveiled by TESS**
MNRAS, 491:2982, January 2020, doi:10.1093/mnras/stz3150, arXiv:1903.07694
90. Quinn et al., **Near-resonance in a system of sub-Neptunes from TESS**
AJ, 158:177, November 2019, doi:10.3847/1538-3881/ab3f2b, arXiv:1901.09092
91. Dawson et al., **TOI-216b and TOI-216c: Two warm, large exoplanets in or slightly wide of the 2:1 orbital resonance**
AJ, 158:65, August 2019, doi:10.3847/1538-3881/ab24ba, arXiv:1904.11852
92. Rodriguez et al., **An Eccentric Massive Jupiter Orbiting a Subgiant on a 9.5-day Period Discovered in the Transiting Exoplanet Survey Satellite Full Frame Images**
AJ, 157:191, May 2019, doi:10.3847/1538-3881/ab11d9, arXiv:1901.09950

Proceedings based on my work for the AMS-02 collaboration

93. Johnson, Sundaresan, Daylan, et al., **RotNet: Fast and Scalable Estimation of Stellar Rotation Periods Using Convolutional Neural Networks**
NeurIPS 2020, Vancouver, Canada, December 2020, [arXiv:2012.01985](#)
94. S. Schael et al., **Precision measurements of the electron spectrum and the positron spectrum with AMS**
ICRC 2013, Rio De Janeiro, Brazil, 2013
95. J. Casaus et al., **Determination of the positron anisotropy with AMS**
ICRC 2013, Rio De Janeiro, Brazil, 2013
96. V. Choutko et al., **Precision Measurement of the Cosmic Ray Helium Flux with AMS Experiment**
ICRC 2013, Rio De Janeiro, Brazil, 2013
97. S. Haino et al., **Precision measurement of the proton flux with AMS**
ICRC 2013, Rio De Janeiro, Brazil, 2013
98. A. Oliva et al., **Precision Measurement of the Cosmic Ray Boron-to-Carbon Ratio with AMS**
ICRC 2013, Rio De Janeiro, Brazil, 2013
99. B. Bertucci et al., **Precision measurement of the $e^+ + e^-$ spectrum with AMS**
ICRC 2013, Rio De Janeiro, Brazil, 2013

Select Professional activities

- Colloquium Committee Chair and Student Recruitment Committee Chair in the Physics Department at Washington University (since 2023)
- President (2020-2021) and Human Affairs Chair (2019-2020) of the MIT Postdoctoral Association
- TESS Science Office exoplanet vetting co-lead (2018-2023)
- NOIRLab Telescope Allocation Committee member 2020A, 2020B, 2021A, 2021B, and 2022A
- Reviewer for NASA XRP, HST GO, NASA FDL and NASA FINESST proposals
- Referee for the AAS journals AJ, ApJ, and ApJS
- Member of the MAST User Group (MUG) 2022
- Session Chair and/or Organizer in AAS235, AAS237, and TESS Science Conference II
- Organizer for the TESS Science Conference Atmospheric Characterization Splinter Session, 2021
- Editorial board member for the Turkish Journal of Physics (since 2019)
- LOC member for TESS Science Conference I and "Gravitational Waves: New Challenges and Opportunities" (2019)
- Organizer of the MIT Exoplanet Journal Club (2018-2020)
- Member of the science council for the East Anatolian Observatory (since 2019)

Mentoring

Research mentees:

- Graduate student: Mariona Badenas-Agusti (MIT), Emma Chickles (Wellesley→MIT), Lindsey Gordon (Wellesley→UMinnesota)
- Undergraduate student: Richard Feder (Harvard→Caltech), Emily Murray (Princeton), Joshua Zou (Princeton), Siegfried Gawenda (Princeton)
- High school research interns: Ashley Davidson (→ Stanford), Rohan Subramani (→ Columbia), Kartik Pinglé (→ MIT), Jasmine Wright (→ UC Boulder), Rom Fradkin (→ MIT), Deniz Arıkan (→ Stanford)

Other mentorship activities:

- Research mentor for the Harvard-MIT Science Research Mentoring Program (2019-2020)
- Mentor for the MIT Mentor Advocate Partnership (2018-2019)

Select teaching experience

- Fall 2023, Planets and Life in the Universe, Washington University, St. Louis, MO, US
- Spring 2021, MIT Kaufman Teaching Certificate Program, MIT, Cambridge, MA, US
- Spring 2021, Guest Lecturer, Spec Seminar: Planetary Science, MIT, Cambridge, MA, US
- Fall 2020, Guest Lecturer, Selected Topics in Graduate Physics, 8.398, MIT, Cambridge, MA, US
- Summer 2019, Lecturer, "Quantum to Cosmos: Ideas and Applications", Research summer school, Istanbul, Turkey
- Spring 2019, Guest Lecturer, Artificial Intelligence for TESS Applications, 12.S680, MIT, Cambridge, MA, US
- Spring 2019, Guest Lecturer, Undergraduate Cosmology, Astro 130, Harvard University, Cambridge, MA, US
- Fall 2016, Teaching Fellow, Graduate Cosmology, Physics 212, Harvard University, Cambridge, MA, US
- Spring 2015, Teaching Fellow, The Energetic Universe, SPU 19, Harvard University, Cambridge, MA, US
- Spring 2013, Fall 2012, Spring 2012, Teaching Assistant, Modern Physics, PHYS207, METU, Ankara, Turkey

Select Invited Seminars and Colloquia

- *A deep survey of transiting exoplanets in the TESS Full Frame Images*, Caltech/JPL, Remote, 30 August 2021
- *A Compute-Intensive Exploration and Characterization of Our Celestial Wonders: Dark Matter and Exoplanets*, Washington University, Remote, 27 April 2021
- *A Compute-Intensive Exploration and Characterization of Our Celestial Wonders: Dark Matter and Exoplanets*, University of Florida, Remote, 30 March 2021
- *Discovery of the HD 108236 multiplanetary system with a bright Sun-like star*, Ohio State University, Remote, 26 January 2021
- *Taking a census of dark matter substructure via transdimensional gravitational imaging*, Stanford University, Remote, 15 December 2020

- *Recharacterization of the atmosphere of WASP-121b*, University of Florida, Remote, 9 April 2020
- *Hot Jupiters and the TESS phase curve of WASP-121b*, Yale University, New Haven CT, 19 November 2019
- *TESS phase curve of WASP-121b*, University of Arizona, Tucson AZ, 30 October 2019
- *Probing the small-scale structure in strong lenses with PCAT*, Caltech/JPL, Pasadena CA, 4 March 2019
- *Inner Milky Way Gamma Ray Excess*, Cape Cod Astronomical Society, South Yarmouth MA, 5 January 2017

Select Software Developed

- **Probabilistic Cataloger (PCAT)**, Daylan et al. 2017, Daylan et al. 2018, a transdimensional, hierarchical, and Bayesian framework to sample from the posterior probability distribution of a metamodel, i.e., union of models with different dimensionality,
<https://github.com/daylan/pcat>
- **Allesfitter**, Günther & Daylan, 2019, widely used software to model exoplanets and stars in time-series data,
<https://www.allesfitter.com>

Technical experience

- High-performance computing, data analysis, machine learning, and Bayesian inference using astronomical data collected by space and ground-based missions such as Fermi-LAT, Chandra, JWST, HST, SDSS, TESS, Kepler, and AMS-02.
- Observing with DECam on the 4m Blanco Telescope at CTIO and PFS on the 6.5m Clay (Magellan II) Telescope at LCO.

Select Science Outreach

- Over 40 invited appearances on science outreach podcasts and interviews
- Over 300 science outreach talks to universities and high schools
- Lecturer, The Project Science Voyagers, (2016-2018, addressed ~30,000 high school students)
- Lecturer, Turkish Ministry of Education e-conference series, (2018, addressed ~9,000 high school students)
- Lecturer, Astronomy in Schools (addressed ~1500 high school students)
- Invited author, Science & Utopia and Tree of Evolution
- Contributor, Cambridge Explores the Universe, CfA, Cambridge, April 2016
- Contributor, Ask a Scientist, Sky & Space Day, Cambridge Science Festival, Cambridge, April 2015-2016
- Lecturer, Beacon Hill Seminars, Science In The News Public Science Lectures, Cambridge, MA, (2014-2016)
- Author, Harvard Science In The News, 2014
- Lecturer, "There is a Scientist In My Classroom" Project, Cambridge, MA, 2013
- Organizer, Mobile CERN exhibition, METU, Ankara, Turkey, 2012

Affiliations

- American Physical Society, American Astronomical Society, International Astronomical Union (IAU)
- TESS Atmospheric Characterization, Follow-up, and Objects of Interest Working Groups
- LSST Science Collaborations: Dark Energy (DESC), Transients and Variable Stars (TVS), Solar System (SSSC), and Strong Lensing (SLSC)
- Associate member of CERN and AMS-02 Collaboration, 2011-2013