Tansu Daylan

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Education

- 2018, Ph.D. in Physics, Harvard University, Cambridge, MA, US
- 2015, MA in Physics, Harvard University, Cambridge, MA, US
- 2013, BS in Physics (double major), Middle East Technical University (METU), Ankara, Turkey
- 2012, BS 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 includes over 80 refereed publications, 3,700 citations, and an h-index of 33 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 and Achievements

- Outstanding Achievement Award, WashU Physics, 2023
- Selected by NASA to participate in the ULTRASAT mission as a US PI, 2023
- Selected to participate in the NASA PI Launchpad at the University of Michigan, 2023
- LSST Discovery Alliance Catalyst Fellowship, John Templeton Foundation, 2022
- Selected into NASA FDL Research Team, 2020
- MIT Kavli Fellowship, Kavli Foundation, 2018
- MIT Translational Fellowship, 2018
- AAS Chambliss Competition Honorable Mention, 2015
- 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 10^{th} 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 ULTRASAT's 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

First 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**
   AJ, 166:98, September 2023, doi:10.3847/1538-3881/ace69b, 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**

AJ, 159:163, April 2020, doi:10.3847/1538-3881/ab74cf, arXiv:1907.04929

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. Reynolds et al., **Overview of the Advanced X-ray Imaging Satellite (AXIS)**
SPIE OEA, 126781E, October 2023, doi:10.1117/12.2677468, arXiv.org:2311.00780

18. Esparza-Borges et al., **Detection of Carbon Monoxide in the Atmosphere of WASP-39b Applying Standard Cross-correlation Techniques to JWST NIRSpec G395H Data**
ApJL, 955:L19, September 2023, doi:10.3847/2041-8213/acf27b, arXiv:2309.00036

19. Hord et al., **Identification of the Top TESS Objects of Interest for Atmospheric Characterization of Transiting Exoplanets with JWST**
Submitted to AJ, arXiv:2308.09617

20. 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

21. Fausnaugh et al., **Four years of Type Ia Supernovae Observed by TESS: Early Time Light Curve Shapes and Constraints on Companion Interaction Models**
ApJ, 956:108, October 2023, arXiv:2307.11815

22. 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

23. 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

24. Grant et al., **Detection of Carbon Monoxide's 4.6 Micron Fundamental Band Structure in WASP-39 b's Atmosphere with JWST NIRSpec G395H**
ApJL, 949:L15, May 2023, doi:10.3847/2041-8213/acd544 arXiv:2304.11994

25. 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

26. 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

27. 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

28. 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

29. 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

30. Ahrer et al., **Early Release Science of the exoplanet WASP-39b with JWST NIRCam**
Nature, 614:653-658, February 2023, doi:10.1038/s41586-022-05590-4 arXiv:2211.10489

31. 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

32. Saydjari et al., **The Dark Energy Camera Plane Survey 2 (DECaPS2): More Sky, Less Bias, and Better Uncertainties**
ApJS, 264:28, February 2023, doi:10.3847/1538-4365/aca594 arXiv:2206.11909

33. 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

34. Kaye et al., **Transit timings variations in the three-planet system: TOI-270**
MNRAS 510:5464-5485, March 2022, doi:10.1093/mnras/stab3483

35. 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

36. 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

37. 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

38. 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

39. 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

40. 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

41. 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

42. 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

43. 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

44. 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

45. 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

46. 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

47. 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

48. 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

49. 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

50. 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

51. 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

52. 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

53. Corrales et al., **The life cycle of stars and their planets from the high energy perspective**
AXIS Probe Concept Mission White Paper, November 2023, arXiv:2311.07674

54. de Wit et al., **A roadmap to the efficient and robust characterization of temperate terrestrial planet atmospheres with JWST**
October 2023, arXiv:2310.15895

55. 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

56. Han et al., **NANCY: Next-generation All-sky Near-infrared Community surveY**
Roman Core Community Survey White Paper, June 2023, arXiv:2306.11784

57. Collett et al., **The 4MOST Strong Lensing Spectroscopic Legacy Survey (4SLSLS)**
The Messenger, 190:49-52, March 2023, 10.18727/0722-6691/5313

58. Adhikari et al., **Report of the Topical Group on Cosmic Probes of Fundamental Physics for Snowmass 2021**
Snowmass 2021 Report, September 2022, arXiv:2209.11726

59. Engel et al., **The Future of Gamma-Ray Experiments in the MeV-EeV Range**
Snowmass 2021 white paper, March 2022, arXiv:2203.07360

60. Mao et al., **Snowmass2021: Vera C. Rubin Observatory as a Flagship Dark Matter Experiment**
Snowmass 2021 white paper, March 2022, arXiv:2203.07252

61. 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

62. Guy et al., **Rubin-Euclid Derived Data Products: Initial Recommendations**

Collaborating author

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

63. 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

64. 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

65. 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

66. 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

67. 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 arXiv:2208.10854

68. 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 arXiv:2209.02831

69. 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 arXiv:2206.06254

70. 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 arXiv:2204.11975

71. 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 arXiv:2110.12079

72. 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 arXiv:2204.13573

73. 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 arXiv:2202.01240

74. 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 arXiv:2110.08597

75. Huber et al., **A 20-Second Cadence View of Solar-Type Stars and Their Planets with TESS: Asteroseismology of Solar Analogs and a Recharacterization of pi Men c**
AJ, 163:79, February 2022, doi:10.3847/1538-3881/ac3000 arXiv:2108.09109

76. 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 arXiv:2108.05323

77. 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 arXiv:2104.12078

78. 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, arXiv:2106.02610

79. 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, arXiv:2107.14125

80. 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, arXiv:2105.08077

81. 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, arXiv:2103.02685

82. 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, arXiv:2101.04745

83. 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

84. 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

85. 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

86. 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

87. 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

88. 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

89. 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

90. 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

91. 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

92. 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

93. 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

94. 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

95. 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

96. 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

97. 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

98. 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

99. S. Schael et al., **Precision measurements of the electron spectrum and the positron spectrum with AMS**
ICRC 2013, Rio De Janeiro, Brazil, 2013

100. J. Casaus et al., **Determination of the positron anisotropy with AMS**
ICRC 2013, Rio De Janeiro, Brazil, 2013

101. V. Choutko et al., **Precision Measurement of the Cosmic Ray Helium Flux with AMS Experiment**
ICRC 2013, Rio De Janeiro, Brazil, 2013

102. S. Haino et al., **Precision measurement of the proton flux with AMS**
ICRC 2013, Rio De Janeiro, Brazil, 2013

103. A. Oliva et al., **Precision Measurement of the Cosmic Ray Boron-to-Carbon Ratio with AMS**
ICRC 2013, Rio De Janeiro, Brazil, 2013

104. 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)
- SOC member for the Workshop on Internal Structure and Evolution of Planets (GIYE), November 28-29, 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

Ph.D. advisor and committee chair for Bryce Wedig (WashU), Nathan Whitsett (WashU),
Ph.D. thesis committee member for Ao Zhang (WashU), Sophia Kay Vlahakis (MIT),
Undergraduate senior thesis committee member for Emily Murray (Princeton), Siegfried Gawenda (Princeton), Emma Chickles (Wellesley→MIT), Lindsey Gordon(Wellesley→ UMinnesota)
Other research mentees:

- Graduate students: Mariona Badenas-Agusti (MIT), Yadira Gaibor (MIT),
- Undergraduates: Richard Feder (Harvard→Caltech), Vikram Bhamre (UC Berkeley), Aman Burman (Caltech), Wolf Cukier (Princeton University)
- High school research interns: Ashley Davidson (→ Stanford), Rohan Subramani (→ Columbia), Kartik Pinglé (→ MIT), Jasmine Wright (→ UC Boulder), Rom Fradkin (→ MIT), Deniz Arıkan (→ Stanford)

I am a Level 1 Trained Facilitator Mentor, having participated in the full-day CIMER workshop on October 27, 2023, at WashU. Other select initiatives to which I committed significant mentoring time have been:

- APS National Mentoring Community Mentorship Program (one mentee during the 2023-2024 AY)
- LSST Dark Energy Science Collaboration Mentorship Program (two mentees during the 2023-2024 AY)
- Princeton University ReMatch Program (four mentees during the 2021-2022 AY)
- Harvard-MIT Science Research Mentoring Program (two mentees during the 2019-2020 AY)
- MIT Mentor Advocate Partnership (one mentee during the 2018-2019 AY)

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 Talks, Seminars, and Colloquia

- *From LSST Light Curves to Transiting Worlds*, **LSST Discovery Alliance Symposium, Tucson, AZ**, In-person meeting, presenting remotely, October 23, 2023
- *The AXIS Perspective on Atmospheric Escape from Exoplanets*, **AXIS Science Talk Series**, Remote meeting, October 13, 2023
- *The Universe is teeming with planets, but where does the Earth stand among them?*, **Astronomy Festival, St. Louis, MO**, September 30, 2023
- *SLSC Status Report*, **Rubin Observatory PCW 2023, Tucson, AZ**, August 09, 2023
- *A multi-wavelength survey of space weather beyond the Solar System*, **ULTRASAT Collaboration Meeting, Rehovot, Israel**, In-person meeting, presenting remotely, July 12, 2023
- *The legacy of TESS: a census of transiting exoplanets in our galactic neighborhood*, **Istanbul University Astrophysics Seminar, Istanbul, Turkey**, May 12, 2023
- *Exoplanetology with allesfitter in the next decade*, **NASA/GSFC EMAC Workshop**, Remote meeting, February 9, 2023
- *Mining faint targets in the TESS Full Frame Images for transiting exoplanets*, **Carnegie Institution of Science Earth and Planetary Laboratory (EPL) Astronomy Seminar**, Remote meeting, December 03, 2021
- *Exoplanets Transiting Faint Stars in the TESS Full Frame Images*, **Amateur Astronomers Association of Princeton (AAAP) Meeting**, Remote meeting, October 12, 2021
- *A Compute-Intensive Exploration and Characterization of Our Celestial Wonders: Dark Matter and Exoplanets*, **Washington University, St. Louis, MO**, Remote meeting, April 27, 2021
- *Discovery of the HD 108236 multiplanetary system with a bright Sun-like star*, **Ohio State University, Columbus, OH**, Remote meeting, January 26, 2021
- *Taking a census of dark matter substructure via transdimensional gravitational imaging*, **Stanford University, Stanford, CA**, Remote meeting, December 15, 2020
- *Recharacterization of the atmosphere of WASP-121b*, **University of Florida, Gainsville, FL**, Remote meeting, April 09, 2020
- *Detection and characterization of worlds beyond our Solar System with TESS*, **Museum of Science, Cambridge, MA**, February 21, 2020
- *Hot Jupiters and the TESS phase curve of WASP-121b*, **Yale University, New Haven CT**, November 19, 2019
- *TESS phase curve of WASP-121b*, **University of Arizona, Tucson, AZ**, October 30, 2019
- *Hunting for exoplanets with TESS*, **Sabancı University, İstanbul, Turkey**, 17 April 2019
- *A transdimensional perspective on dark matter*, **Weekly Physics Seminar, METU, Ankara, Turkey**, 16 April 2019
- Hunting for exoplanets with TESS, **Astronomy Seminar, Ankara University, Ankara, Turkey**, April 15, 2019
- *Probing the small-scale structure in strong lenses with PCAT*, **JPL, Pasadena, CA**, March 04, 2019
- Probing the Small-scale Structure in Strongly Lensed Systems via Transdimensional Inference, **Pheno and vino seminar, Princeton University, Princeton, NJ**, April 24, 2018
- *Probing the small-scale structure in strong lenses with PCAT*, **ITC Seminar, Harvard, Cambridge MA**, April 12, 2018
- *Probing the small-scale structure in strong lenses with PCAT*, **Particle Physics Seminar, MIT, Cambridge MA**, September 28, 2018
- *Inner Milky Way Gamma Ray Excess*, **Cape Cod Astronomical Society Meeting, South Yarmouth MA**, January 05, 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., the union of models with different dimensionality,
  https://github.com/tdaylan/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 50 invited talks and interviews on science outreach platforms on the web with over 2,000,000 views
- 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)
- 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