

Carl Andrew Ziegler

Assistant Professor/Observatory Director

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Research Interests

Characterization of exoplanets; formation and evolution of planetary systems in multiple star systems; large adaptive optics surveys; detection of long-period transiting planets

Positions

September 2020 - current **Stephen F. Austin State University**, Nacogdoches, TX
Assistant Professor of Astronomy
Director of SFA Observatory
August 2018 - July 2020 **University of Toronto**, Toronto, ON
Dunlap Postdoctoral Fellow
PI: SOAR TESS survey (speckle imaging survey)
PI: One Hit Wonders (TESS single-transit planet survey)

Education

May 2018 **University of North Carolina**, Chapel Hill, NC
PhD, Physics and Astronomy
Thesis: "Characterization of Exoplanets and Stellar Systems with New Robots"
Advisor: Prof. Nicholas Law
August 2013 **Southern Illinois University**, Carbondale, IL
M.S., Physics
Thesis: "Adsorption of Neon on Open Carbon Nanohorn Aggregates"
Advisor: Prof. Aldo Migone
May 2009 **William Jewell College**, Liberty, MO
B.A., Physics and Mathematics
Research: variable stars, globular clusters
Advisor: Prof. Maggie Sherer

Significant Contribution Publications

10. *An Adaptive Optics Census of Companions to Northern Stars Within 25 pc with Robo-AO*
M. Salama, C. Ziegler, et al., *The Astronomical Journal*, 2022 **163** 5
9. *Robo-AO and SOAR High-resolution Surveys of Exoplanet Hosting Stars*
C. Ziegler, et al., *Frontiers in Astronomy and Space Sciences*, 2021 **8** 3
8. *SOAR TESS Survey. II: The impact of stellar companions on planetary populations*
C. Ziegler, et al., *The Astronomical Journal*, 2021 **162** 5
7. *SOAR TESS Survey. I: Sculpting of TESS planetary systems by stellar companions*
C. Ziegler, et al., *The Astronomical Journal*, 2020 **159** 19

Significant Contribution Publications – Continued

6. *Measuring the Recoverability of Close Binaries in Gaia DR2 with the Robo-AO Kepler Survey*
C. Ziegler, et al., *The Astronomical Journal*, 2018 **156** 259
5. *Robo-AO Kepler Planetary Candidate Survey V: The effect of physically associated stellar companions on planetary systems*
C. Ziegler, et al., *The Astronomical Journal*, 2018 **156** 83
4. *Robo-AO Kepler Planetary Candidate Survey IV: The effect of nearby stars on 3857 planetary candidate systems*
C. Ziegler, et al., *The Astronomical Journal*, 2018 **155** 161
3. *Robo-AO Kepler Planetary Candidate Survey III: Adaptive Optics Imaging of 1629 Kepler Exoplanet Candidate Host Stars*
C. Ziegler, et al., *The Astronomical Journal*, 2017 **153** 66
2. *Robo-AO Kepler Planetary Candidate Survey II: Adaptive Optics Imaging of 969 Kepler Exoplanet Candidate Host Stars*
C. Baranec, C. Ziegler, et al., *The Astronomical Journal*, 2016 **152** 18
1. *Multiplicity of the Galactic Senior Citizens: A High-resolution Search for Cool Subdwarf Companions*
C. Ziegler, et al., *The Astrophysical Journal*, 2015 **804** 30

SPIE Instrumentation Papers

3. *SRAO: the southern robotic speckle + adaptive optics system*
N. Law, C. Ziegler, A. Tokovinin, *Proc. SPIE 9907, Optical and Infrared Interferometry and Imaging V*, 99070K, 2016
2. *SRAO: optical design and the dual-knife-edge WFS*
C. Ziegler, et al., *Proc. SPIE 9909, Adaptive Optics Systems V*, 99093Z, 2016
1. *The Robo-AO KOI survey: laser adaptive optics imaging of every Kepler exoplanet candidate*
C. Ziegler, et al., *Proc. SPIE 9909, Adaptive Optics Systems V*, 99095U, 2016

Talks

Conference Talks

- *SOAR TESS Speckle Survey of Exoplanet Candidates*
C. Ziegler, et al., Texas A&M University-Commerce, March 23-25, 2023
- *SOAR TESS survey: The sculpting of planetary systems by stellar companions*
AAS 235, January 5-9, Honolulu, HI (2020)
- *One Hit Wonders: Hunting the longest-period TESS planets*
TESS Sci Con I, July 29-Aug 2, Cambridge, MA (2019)
- *One Hit Wonders: Hunting the longest-period TESS planets*
CASCA 2019, June 17-20, Montreal, QC (2019)
- *Death Stars? Understanding how tight binaries impact TESS planets with SOAR speckle imaging*
AAS 233, January 6-10, Seattle, WA (2019)
- *Robo-AO KOI Survey: LGS-AO imaging of every Kepler planetary candidate host star*
AAS 231, January 9-12, National Harbor, MD (2018)
- *High resolution imaging of 4000 Kepler planetary candidate host stars*
Know Thy Star, Know Thy Planet, October 11, Pasadena, CA (2017)

Talks - Continued

- *Robo-AO KOI Survey: LGS-AO imaging of every Kepler planetary candidate host star*
Transiting Exoplanets, July 17, Keele, UK (2017)
- *Adaptive Optics Imaging of Kepler Planetary Candidates*
North Carolina Astronomers Meeting, September 24, Jamestown, NC (2016)
- *The Robo-AO KOI Survey: Laser Adaptive Optics Imaging of Every Kepler Exoplanet Candidate*
AAS 227, January 4-8, Kissimmee, FL (2016)
- *Study of Carbon Dioxide adsorption on Purified HiPco Nanotubes*
American Physical Society Meeting, March 18–22, Baltimore, MD (2013)

Invited Talks

- *The Robo-AO KOI survey and the development of a Southern robotic AO system*
Institute for Astronomy, September 14, Hilo, Hawaii (2016)

Conference Posters

- *One Hit Wonders: recovering the longest period TESS planets*
C. Ziegler, et al., Extreme Solar Systems IV, Reykjavik, Iceland (2019)
- *Sculpting of TESS Planetary Systems by Binary Stars*
C. Ziegler, et al., Tess SciCon I, Cambridge, MA (2019)
- *Robo-AO KOI Survey: Robotic LGS-AO Imaging of Every Kepler Planetary Candidate*
C. Ziegler, et al., Kepler SciCon IV, NASA Ames (2017)
- *SRAO: the first southern robotic AO system*
C. Ziegler, et al., SPIE Astronomical Telescopes + Instrumentation, Edinburgh, UK (2016)
- *The Robo-AO KOI survey: laser adaptive optics imaging of every Kepler exoplanet candidate*
C. Ziegler, et al., SPIE Astronomical Telescopes + Instrumentation, Edinburgh, UK (2016)
- *Multiplicity of the Galactic Senior Citizens: A high-resolution search for cool subdwarf companions*
C. Ziegler & N. Law, AAS 225, Seattle, WA (2015)

Grants and Telescope Time

- *Robo-AO-2 Observations of TESS Planet Candidates*
C. Ziegler & C. Baranec, TESS Guest Investigator, \$250,000, *In submission*
- *SOAR TESS Survey of Exoplanet Candidate Hosts*
C. Ziegler et al., NOAO Proposal, Award 3 Nights on SOAR telescope, 2022A
- *Characterization of TESS planets in multiple star systems*
C. Ziegler et al., NOAO Proposal, Award 4 Nights on SOAR telescope, 2021A
- *SOAR TESS Survey: Characterization of TESS planets in multiple star systems*
C. Ziegler et al., NOAO Proposal, Award 3 Nights on SOAR telescope, 2020B

Previous Teaching Experience

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| Fall 2019 | University of Toronto , Toronto, ON
<i>Exoplanet mini-course, AST 221</i>
Taught 8-week course on detection of exoplanets and exoplanet demographics to Astronomy majors. Mix of lectures and in-class group projects. |
| Summer 2019 | University of Toronto , Toronto, ON
<i>AO Lab Lead, Dunlap Summer School</i>
Led both undergraduates and graduate students in a lecture introducing adaptive optics and a lab to build a Shack-Hartmann wavefront sensor. |
| Summer 2019 | University of Toronto , Toronto, ON
<i>Summer Undergraduate Mentor</i>
Advised summer undergraduate student in testing and implementing robotic telescope control and on-the-fly data reduction pipeline. |
| Spring 2017 | University of North Carolina , Chapel Hill, NC
<i>Undergraduate Research Mentor</i>
Advised capstone course for UNC undergraduate to build novel methods to reduce adaptive optics images of bright stars |
| Summer 2015 | University of North Carolina , Chapel Hill, NC
<i>Summer Research Mentor</i>
Advised high school student with <i>Kepler</i> host star multiplicity research |
| Fall 2013-
Spring 2014 | University of North Carolina , Chapel Hill, NC
<i>Astronomy 101L Lab Teaching Assistant</i>
Led five lab sections using robotic "Skynet" telescopes |
| Fall 2010-
Spring 2013 | Southern Illinois University , Carbondale, IL
<i>Astronomy 101 Lab Teaching Assistant</i>
Taught twenty lab sections in astronomy |
| Spring 2012-
Fall 2012 | Southern Illinois University , Carbondale, IL
<i>Physics Lab Instructor</i>
Taught three calculus-based physics lab courses |

Professional Service and Public Outreach

- Referee for MNRAS, ApJ, AJ, PASP, and A&A
- Assisted monthly public observing nights for Chapel Hill Astronomical and Observational Society
- Two public talks for Raleigh Astronomy Club

Software Skills

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| Computer Programming: | <ul style="list-style-type: none"> - Python (primary language for astronomical data analysis) - C++ (control software for Andor EMCCD camera, WFS reconstruction) - TheSkyX (automated telescope and observatory control) - MaximDL (camera control and reduction) - Mathematica (hydrodynamical simulations for graduate ISM class) - HTML (designed project sites, roboaokepler.org and onehitwonders.space) - LabVIEW (wrote control GUI for gas adsorption instrumentation) - Mathematica (hydrodynamical simulations for graduate ISM class) |
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Instrumentation

- Instrumentation - Zemax (optical design for Robo-SOAR)
- Design: - SolidWorks (modeling for fabrication of custom mounts and packaging used in Robo-SOAR)
- Robo-SOAR - built optical testbed of NGS-AO system
- construction: - designed and constructed prototype of reflective pyramid WFS

Professional References

Professor Suresh Sivanandam
 Assistant Professor, Dunlap Institute for Astronomy, University of Toronto
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Professor Nicholas Law
 Assistant Professor, Department of Astronomy, University of North Carolina
 nlaw@unc.edu / 919-962-3019

Professor Christoph Baranec
 Assistant Astronomer, Institute for Astronomy, University of Hawaii, Manoa
 baranec@hawaii.edu / 808-932-2318

Professor Adam Kraus
 Assistant Professor, Department of Astronomy, University of Texas, Austin
 alk@astro.as.utexas.edu / 617-956-7740

All Peer-reviewed Articles

- [135] Benjamin K. Capistrant et al. *TESS Hunt for Young and Maturing Exoplanets (THYME). XI. An Earth-sized Planet Orbiting a Nearby, Solar-like Host in the 400 Myr Ursa Major Moving Group*. In: *The Astronomical Journal* **167.2**, 54 (2024), p. 54. arXiv: [2401.04785 \[astro-ph.EP\]](#).
- [134] Matias I. Jones et al. *A long-period transiting substellar companion in the super-Jupiters to brown dwarfs mass regime and a prototypical warm-Jupiter detected by TESS*. In: arXiv e-prints, arXiv:2401.09657 (2024), arXiv:2401.09657. arXiv: [2401.09657 \[astro-ph.EP\]](#).
- [133] Jack Schulte et al. *Migration and Evolution of giant ExoPlanets (MEEP) I: Nine Newly Confirmed Hot Jupiters from the TESS Mission*. In: arXiv e-prints, arXiv:2401.05923 (2024), arXiv:2401.05923. arXiv: [2401.05923 \[astro-ph.EP\]](#).
- [132] S. C. C. Barros et al. *The young mini-Neptune HD 207496b that is either a naked core or on the verge of becoming one*. In: **673**, A4 (2023), A4. arXiv: [2303.03775 \[astro-ph.EP\]](#).
- [131] Rafael Brahm et al. *Three Long-period Transiting Giant Planets from TESS*. In: *The Astronomical Journal* **165.6**, 227 (2023), p. 227. arXiv: [2304.02139 \[astro-ph.EP\]](#).
- [130] I. Carleo et al. *The GAPS Programme at TNG L – TOI-4515 b: An eccentric warm Jupiter orbiting a 1.2 Gyr-old G-star*. In: arXiv e-prints, arXiv:2311.11903 (2023), arXiv:2311.11903. arXiv: [2311.11903 \[astro-ph.EP\]](#).
- [129] M. Damasso et al. *A compact multi-planet system transiting HIP 29442 (TOI-469) discovered by TESS and ESPRESSO. Radial velocities lead to the detection of transits with low signal-to-noise ratio*. In: **679**, A33 (2023), A33. arXiv: [2308.13310 \[astro-ph.EP\]](#).
- [128] H. J. Deeg et al. *TOI-1416: A system with a super-Earth planet with a 1.07 d period*. In: **677**, A12 (2023), A12. arXiv: [2305.18542 \[astro-ph.EP\]](#).
- [127] D. del Ser et al. *TFaw survey II: six newly validated planets and 13 planet candidates from K2*. In: *Monthly Newsletter of the Royal Astronomical Society* **518.1** (2023), pp. 669–690. arXiv: [2210.10805 \[astro-ph.EP\]](#).
- [126] Jan Eberhardt et al. *Three Warm Jupiters around Solar-analog Stars Detected with TESS*. In: *The Astronomical Journal* **166.6**, 271 (2023), p. 271.
- [125] Mohammed El Mufti et al. *TOI 560: Two Transiting Planets Orbiting a K Dwarf Validated with iSHELL, PFS, and HIRES RVs*. In: *The Astronomical Journal* **165.1**, 10 (2023), p. 10.
- [124] Ginger Frame et al. *TOI-2498 b: a hot bloated super-Neptune within the Neptune desert*. In: *Monthly Newsletter of the Royal Astronomical Society* **523.1** (2023), pp. 1163–1174. arXiv: [2305.06950 \[astro-ph.EP\]](#).
- [123] J. Hagelberg et al. *TOI-858 B b: A hot Jupiter on a polar orbit in a loose binary*. In: **679**, A70 (2023), A70. arXiv: [2309.11390 \[astro-ph.EP\]](#).
- [122] Mallory Harris et al. *Separated Twins or Just Siblings? A Multiplanet System around an M Dwarf Including a Cool Sub-Neptune*. In: *The Astrophysical Journal* **959.1**, L1 (2023), p. L1. arXiv: [2310.15118 \[astro-ph.EP\]](#).
- [121] Faith Hawthorn et al. *TOI-908: a planet at the edge of the Neptune desert transiting a G-type star*. In: *Monthly Newsletter of the Royal Astronomical Society* **524.3** (2023), pp. 3877–3893. arXiv: [2306.09758 \[astro-ph.EP\]](#).

- [120] Alexis Heitzmann et al. *TOI-4562b: A Highly Eccentric Temperate Jupiter Analog Orbiting a Young Field Star*. In: *The Astronomical Journal* **165.3**, 121 (2023), p. 121. arXiv: 2208.10854 [astro-ph.EP].
- [119] Benjamin J. Hord et al. *Identification of the Top TESS Objects of Interest for Atmospheric Characterization of Transiting Exoplanets with JWST*. In: arXiv e-prints, arXiv:2308.09617 (2023), arXiv:2308.09617. arXiv: 2308.09617 [astro-ph.EP].
- [118] Xinyan Hua et al. *A Transiting Super-Earth in the Radius Valley and an Outer Planet Candidate Around HD 307842*. In: *The Astronomical Journal* **166.1**, 32 (2023), p. 32. arXiv: 2306.14655 [astro-ph.EP].
- [117] Sz. Kálmán et al. *Discovery of a substellar companion in the TESS light curve of the δ Scuti/ γ Doradus hybrid pulsator HD 31221*. In: **673**, L14 (2023), p. L14. arXiv: 2305.04000 [astro-ph.EP].
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- [115] Christian Magliano et al. *A systematic validation of hot Neptunes in TESS data*. In: *Monthly Newsletter of the Royal Astronomical Society* **519.1** (2023), pp. 1562–1577. arXiv: 2211.08490 [astro-ph.EP].
- [114] Christopher R. Mann et al. *Giant Outer Transiting Exoplanet Mass (GOT 'EM) Survey. III. Recovery and Confirmation of a Temperate, Mildly Eccentric, Single-transit Jupiter Orbiting TOI-2010*. In: *The Astronomical Journal* **166.6**, 239 (2023), p. 239. arXiv: 2311.10232 [astro-ph.EP].
- [113] Christopher Mann et al. *Validation of TOI-1221 b: A Warm Sub-Neptune Exhibiting Transit Timing Variations around a Sun-like Star*. In: *The Astronomical Journal* **165.5**, 217 (2023), p. 217. arXiv: 2209.13651 [astro-ph.EP].
- [112] E. Martioli et al. *TOI-1736 and TOI-2141: Two systems including sub-Neptunes around solar analogs revealed by TESS and SOPHIE*. In: **680**, A84 (2023), A84. arXiv: 2311.07011 [astro-ph.EP].
- [111] Priyashkumar Mistry et al. *VaTEST. II. Statistical Validation of 11 TESS-detected Exoplanets Orbiting K-type Stars*. In: *The Astronomical Journal* **166.1**, 9 (2023), p. 9. arXiv: 2301.09865 [astro-ph.EP].
- [110] Luca Naponiello et al. *A super-massive Neptune-sized planet*. In: **622**.7982 (2023), pp. 255–260. arXiv: 2309.01464 [astro-ph.EP].
- [109] Luca Naponiello et al. *Author Correction: A super-massive Neptune-sized planet*. In: **623**.7986 (2023), E6–E6.
- [108] Dominic Oddo et al. *Characterization of a Set of Small Planets with TESS and CHEOPS and an Analysis of Photometric Performance*. In: *The Astronomical Journal* **165.3**, 134 (2023), p. 134. arXiv: 2301.08162 [astro-ph.EP].
- [107] H. P. Osborn et al. *Two warm Neptunes transiting HIP 9618 revealed by TESS and Cheops*. In: *Monthly Newsletter of the Royal Astronomical Society* **523.2** (2023), pp. 3069–3089. arXiv: 2306.04450 [astro-ph.EP].
- [106] Emma Page et al. *TOI-1994b: A Low Mass Eccentric Brown Dwarf Transiting A Subgiant Star*. In: arXiv e-prints, arXiv:2305.08836 (2023), arXiv:2305.08836. arXiv: 2305.08836 [astro-ph.SR].
- [105] Angelica Psaridi et al. *Three Saturn-mass planets transiting F-type stars revealed with TESS and HARPS. TOI-615b, TOI-622b, and TOI-2641b*. In: **675**, A39 (2023), A39. arXiv: 2303.15080 [astro-ph.EP].
- [104] Joseph E. Rodriguez et al. *Another shipment of six short-period giant planets from TESS*. In: *Monthly Newsletter of the Royal Astronomical Society* **521.2** (2023), pp. 2765–2785. arXiv: 2205.05709 [astro-ph.EP].
- [103] Lizhou Sha et al. *Correction to: TESS spots a mini-neptune interior to a hot saturn in the TOI-2000 system*. In: *Monthly Newsletter of the Royal Astronomical Society* **526.2** (2023), pp. 2440–2440.
- [102] Lizhou Sha et al. *TESS spots a mini-neptune interior to a hot saturn in the TOI-2000 system*. In: *Monthly Newsletter of the Royal Astronomical Society* **524.1** (2023), pp. 1113–1138. arXiv: 2209.14396 [astro-ph.EP].
- [101] Evan Tey et al. *TESS Discovery of Twin Planets near 2:1 Resonance around Early M Dwarf TOI 4342*. In: *The Astronomical Journal* **165.3**, 93 (2023), p. 93. arXiv: 2301.01370 [astro-ph.EP].
- [100] Benjamin M. Tofflemire et al. *A Low-mass, Pre-main-sequence Eclipsing Binary in the 40 Myr Columba Association-Fundamental Stellar Parameters and Modeling the Effect of Star Spots*. In: *The Astronomical Journal* **165.2**, 46 (2023), p. 46. arXiv: 2210.10789 [astro-ph.SR].
- [99] A. Tuson et al. *TESS and CHEOPS discover two warm sub-Neptunes transiting the bright K-dwarf HD 15906*. In: *Monthly Newsletter of the Royal Astronomical Society* **523.2** (2023), pp. 3090–3118. arXiv: 2306.04511 [astro-ph.EP].
- [98] Noah Vowell et al. *HIP 33609 b: An Eccentric Brown Dwarf Transiting a $V = 7.3$ Rapidly Rotating B Star*. In: *The Astronomical Journal* **165.6**, 268 (2023), p. 268. arXiv: 2301.09663 [astro-ph.EP].
- [97] Mackenna L. Wood et al. *TESS Hunt for Young and Maturing Exoplanets (THYME). IX. A 27 Myr Extended Population of Lower Centaurus Crux with a Transiting Two-planet System*. In: *The Astronomical Journal* **165.3**, 85 (2023), p. 85. arXiv: 2212.03266 [astro-ph.SR].
- [96] Samuel W. Yee et al. *The TESS Grand Unified Hot Jupiter Survey. II. Twenty New Giant Planets*. In: *The Astrophysical Journal* **265.1**, 1 (2023), p. 1. arXiv: 2210.15473 [astro-ph.EP].
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- [94] O. Barragán et al. *The young HD 73583 (TOI-560) planetary system: two $10-M_{\oplus}$ mini-Neptunes transiting a 500-Myr-old, bright, and active K dwarf*. In: *Monthly Newsletter of the Royal Astronomical Society* **514.2** (2022), pp. 1606–1627. arXiv: 2110.13069 [astro-ph.EP].
- [93] Luca Cacciapuoti et al. *TESS discovery of a super-Earth and two sub-Neptunes orbiting the bright, nearby, Sun-like star HD 22946*. In: *Astronomy & Astrophysics* **668**, A85 (2022), A85. arXiv: 2209.09597 [astro-ph.EP].
- [92] Sam Christian et al. *A Possible Alignment Between the Orbits of Planetary Systems and their Visual Binary Companions*. In: *The Astronomical Journal* **163.5**, 207 (2022), p. 207. arXiv: 2202.00042 [astro-ph.EP].
- [91] Jessie L. Christiansen et al. *Scaling K2. V. Statistical Validation of 60 New Exoplanets From K2 Campaigns 2-18*. In: *The Astronomical Journal* **163.6**, 244 (2022), p. 244. arXiv: 2203.02087 [astro-ph.EP].

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- [89] Georgina Dransfield et al. *HD 28109 hosts a trio of transiting Neptunian planets including a near-resonant pair, confirmed by ASTEP from Antarctica*. In: Monthly Newsletter of the Royal Astronomical Society **515.1** (2022), pp. 1328–1345. arXiv: [2205.09046 \[astro-ph.EP\]](#).
- [88] Steven Giacalone et al. *HD 56414 b: A Warm Neptune Transiting an A-type Star*. In: The Astrophysical Journal **935.1**, L10 (2022), p. L10. arXiv: [2208.06396 \[astro-ph.EP\]](#).
- [87] Steven Giacalone et al. *Validation of 13 Hot and Potentially Terrestrial TESS Planets*. In: The Astronomical Journal **163.2**, 99 (2022), p. 99. arXiv: [2201.12661 \[astro-ph.EP\]](#).
- [86] Alexis Heitzmann et al. *TOI-4562 b: A highly eccentric temperate Jupiter analog orbiting a young field star*. In: arXiv e-prints, arXiv:2208.10854 (2022), arXiv:2208.10854. arXiv: [2208.10854 \[astro-ph.EP\]](#).
- [85] Benjamin J. Hord et al. *The Discovery of a Planetary Companion Interior to Hot Jupiter WASP-132 b*. In: The Astronomical Journal **164.1**, 13 (2022), p. 13. arXiv: [2205.02501 \[astro-ph.EP\]](#).
- [84] F. Murgas et al. *HD 20329b: An ultra-short-period planet around a solar-type star found by TESS*. In: Astronomy & Astrophysics **668**, A158 (2022), A158. arXiv: [2211.02547 \[astro-ph.EP\]](#).
- [83] Carina M. Persson et al. *TOI-2196 b: Rare planet in the hot Neptune desert transiting a G-type star*. In: Astronomy & Astrophysics **666**, A184 (2022), A184. arXiv: [2208.05797 \[astro-ph.EP\]](#).
- [82] Maissa Salama et al. *An Adaptive Optics Census of Companions to Northern Stars Within 25 pc with Robo-AO*. In: The Astronomical Journal **163.5**, 200 (2022), p. 200. arXiv: [2203.11250 \[astro-ph.SR\]](#).
- [81] Luisa Maria Serrano et al. *A low-eccentricity migration pathway for a 13-h-period Earth analogue in a four-planet system*. In: Nature Astronomy **6** (2022), pp. 736–750. arXiv: [2204.13573 \[astro-ph.EP\]](#).
- [80] Sydney Vach et al. *TOI-712: A System of Adolescent Mini-Neptunes Extending to the Habitable Zone*. In: The Astronomical Journal **164.2**, 71 (2022), p. 71. arXiv: [2111.02416 \[astro-ph.EP\]](#).
- [79] Samuel W. Yee et al. *The TESS Grand Unified Hot Jupiter Survey. I. Ten TESS Planets*. In: The Astronomical Journal **164.2**, 70 (2022), p. 70. arXiv: [2205.09728 \[astro-ph.EP\]](#).
- [78] Elisabeth R. Adams et al. *Ultra-short-period Planets in K2. III. Neighbors are Common with 13 New Multiplanet Systems and 10 Newly Validated Planets in Campaigns 0-8 and 10*. In: Planetary Society Journal **2.4**, 152 (2021), p. 152. arXiv: [2011.11698 \[astro-ph.EP\]](#).
- [77] Brett C. Addison et al. *TOI-257b (HD 19916b): a warm sub-saturn orbiting an evolved F-type star*. In: Monthly Newsletter of the Royal Astronomical Society **502.3** (2021), pp. 3704–3722. arXiv: [2001.07345 \[astro-ph.EP\]](#).
- [76] Jennifer A. Burt et al. *TOI-1231 b: A Temperate, Neptune-sized Planet Transiting the Nearby M3 Dwarf NLTT 24399*. In: The Astronomical Journal **162.3**, 87 (2021), p. 87. arXiv: [2105.08077 \[astro-ph.EP\]](#).
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- [74] M. Cointepas et al. *TOI-269 b: an eccentric sub-Neptune transiting a M2 dwarf revisited with ExTrA*. In: Astronomy & Astrophysics **650**, A145 (2021), A145. arXiv: [2104.14782 \[astro-ph.EP\]](#).
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