

# CURRICULUM VITAE FOR PROFESSOR DÁNIEL APAI

**Research Interests:** Extrasolar planets; Planet formation; Planetary and brown dwarf atmospheres; Cool stars; Astrobiology; Space telescope architectures

## Professional Appointments

2022 – Interim Associate Dean for Research, College of Science, University of Arizona  
2021 – Professor, Departments of Astronomy and Planetary Sciences, University of Arizona  
2017 – 2021 Associate Professor, Depts. of Astronomy and Planetary Sciences, Univ. Arizona  
2011 – 2017 Assistant Professor, Depts. of Astronomy and Planetary Sciences, Univ. Arizona  
2008 – 2011 Assistant Astronomer, Space Telescope Science Institute

## Education

2004 PhD, University of Heidelberg and Max Planck Institute of Astronomy, Germany  
2000 MSc in Physics, University of Szeged, Hungary

## International Leadership Roles:

- Co-Lead, NASA *Nexus for Exoplanet System Science*, network of ~600 researchers
- Senior Facilitator, *Scialog: Signatures of Life in the Universe*, Research Corporation
- Lead, *Quantitative Habitability Science Working Group*, NASA NExSS
- Chair, *HST–TESS Advisory Committee*, Space Telescope Science Institute
- Science Advisory Committee member, *Giant Magellan Telescope*
- Executive Committee member, *NASA Exoplanet Program Analysis Group (EXOPAG)*
- Steering Committee member, *NASA Nexus for Exoplanet System Science (NExSS)*
- Chair, *Exoplanet Science Questions for Direct Imaging Missions*, SAG15/EXOPAG
- Member, *Hubble Space Telescope Financial Review Committee*

## Major Programs as Principal Investigator

- *Alien Earths*: NASA/Nexus for Exoplanet System Science, \$6.2M grant, 50 members
- *Earths in Other Solar Systems*: NASA/Nexus for Exoplanet System Science, \$5.7M grant, 45-member team, 150+ refereed papers with >2K citations/year
- 9 Hubble Space Telescope + 4 Spitzer Space Telescope programs, including:
  - *Extrasolar Storms*: Spitzer Exploration Science Program (1,144 Spitzer hours, 24 HST orbits)
  - *Cloud Atlas*: Hubble Space Telescope (Large Treasury Program, 112 orbits), 12 refereed papers
- *Nautilus*: *A large-aperture space telescope for a biosignature survey based on diffractive optics*, Co-PI of \$1.2M Gordon & Betty Moore Foundation grant

## Advising/Mentoring:

**Postdoc. Researchers (15):** Brittany Miles, Martin Schlecker, Megan Mansfield, Kevin Hardegree-Ullman, Alex Bixel, Kevin Wagner, Sebastiaan Krijt, Benjamin Rackham, Jonathan Rees, Elena Manjavacas, Michael McGauley, Hao Yang, Theodora Karalidi, Esther Buenzli

**Graduate Students (14):** Rachael Amaro, Matthew Murphy (UA), Arin Avsar (UA), Fuda Nguyen (UA), Quentin Jay Socia (UA), Jeremy Dietrich (UA), Alex Bixel (UA), Kevin Wagner (UA), Yifan Zhou (UA), Ben Wei Peng Lew (UA), Benjamin Rackham (UA), Davin Flateau (UA), Veselin Kostov (JHU), Justin Rogers (JHU)

## **Books: Protoplanetary Dust: The Astrophysical and Cosmochemical Perspectives**

Eds: D. Apai and D. Lauretta, Planetary Sci. Series, Cambridge Univ. Press, 2010, 370 pp.

## **Recent Major Reports and White Papers led by Apai**

- 1) **Apai** (Chair) et al. 2019, Report to Space Telescope Science Institute: *Optimal Strategies for Hubble Space Telescope Follow up of TESS-discovered Exoplanets*
- 2) **Apai**, Bixel\*, Rackham et al. 2020, Bull. Am. Astr. Soc. and Astro2020 White Paper: *Nautilus: A Very Large-Aperture, Ultralight Space Telescope for Exoplanet Exploration, Time-domain Astrophysics, and Faint Objects*
- 3) **Apai**, Ciesla, Mulders et al. 2018, White Paper submitted to the NAS Committee on Exoplanet Science Strategy, *A comprehensive understanding of planet formation is required for assessing planetary habitability and for the search for life*
- 4) **Apai** and SAG15 team, NASA EXOPAG Study Assessment Group 15 (<http://tiny.cc/sag15>) *Science Questions for Future High-Contrast Imaging Exoplanet Missions*
- 5) **Apai**, Rackham\*, Giampapa et al. 2018, White Paper submitted to the NAS Committee on Exoplanet Science Strategy, *Understanding Stellar Contamination in Exoplanet Transmission Spectra as an Essential Step in Small Planet Characterization*

\* - students/postdocs advised by Apai

## **Selected Publications (195+ refereed publications; 11,000+ citations, h~60)**

- 1) **Apai**, Nardiello, Bedin 2021 *Astrophysical Journal* 906, 64  
*TESS Observations of the Luhman 16 AB Brown Dwarf System: Rotational Periods, Lightcurve Evolution, and Zonal Circulation*
- 2) Dietrich\*, **Apai** 2020 *Astronomical Journal* 161, 17  
*An Integrated Analysis with Predictions on the Architecture of the Tau Ceti Planetary System, Including a Habitable Zone Planet*
- 3) Dietrich\*, **Apai** 2020 *Astronomical Journal* 160, 107  
*Hidden Worlds: Dynamical Architecture Predictions of Undetected Planets in Multi-planet Systems and Applications to TESS Systems*
- 4) Bixel\*, **Apai** 2021 *Astronomical Journal*, in press  
*Bioverse: A simulation framework to assess the statistical power of biosignature surveys*
- 5) Bixel\*, **Apai** 2020 *Astrophysical Journal* 896, 131  
*Testing Earth-like Atmospheric Evolution on Exo-Earths through Oxygen Absorption: Required Sample Sizes and the Advantage of Age-based Target Selection*
- 6) **Apai**, Milster, Kim, Bixel\*, Schneider, Liang, Arenberg 2019 *Astron. J.*, 158, 83  
*A Thousand Earths: A Very Large Aperture, Ultralight Space Telescope Array for Atmospheric Biosignature Survey*
- 7) Rackham\*, **Apai**, Giampapa, 2018 *Astrophysical Journal* 853, 122  
*The Transit Light Source Effect: False Spectral Features and Incorrect Densities for M-dwarf Transiting Planets*
- 8) **Apai**, Karalidi\*, Marley et al. 2017 *Science* 357, 683  
*Zones, Spots, and Planetary-Scale Waves Beating in Brown Dwarf Atmospheres*

**Patents: US+International:** 2 (Ultralight Large-Aperture Hybrid Lenses for Space Telescopes)

**Outreach:** Blog: <http://apai.space> Twitter: @danielapai