

Curriculum Vitae

Dániel Apai, Ph.D.

Steward Observatory
933 N. Cherry Avenue
Tucson, AZ 85721, USA

apai@arizona.edu

Ph: +1-520-621-6534

Web/Blog: <https://apai.space>

POSITIONS

2022– Interim Associate Dean for Research, College of Science, Univ. of Arizona
2021– Professor of Astronomy and Planetary Science, University of Arizona
2017 Associate Professor of Astronomy and Planetary Science, Univ. of Arizona
2011 Assistant Professor of Astronomy and Planetary Science, Univ. of Arizona
2008 Assistant Astronomer, Science Policies Group, Space Telescope Science
Institute, Baltimore
2004-2008 Postdoctoral Research Associate, Steward Observatory and NASA
Astrobiology Institute, The University of Arizona

EDUCATION

2004 PhD, University of Heidelberg and Max Planck Institute for Astronomy
Heidelberg, Germany, Advisor: Prof. Thomas Henning
2000 MSc in Physics, University of Szeged, Hungary

RESEARCH LEADERSHIP AND SERVICE

Interim Associate Dean for Research, College of Science, 2022–
Lead, College of Science Strategic Plan
Steering Committee of Three UA Research Centers
Co-Lead, Nautilus Space Observatory, Technology and Science Development Team
Founder and Lead, Atmospherica group: Atmospheric CO₂ removal and sequestration
Co-Lead, NASA/NExSS (600+ member research coordination network)
Co-Chair, NExSS Quantitative Habitability Science Working Group
Chair, HST-TESS Advisory Committee, Space Telescope Science Institute
Member, Science Advisory Committee, Giant Magellan Telescope
Executive Committee Member, NASA Exoplanet Program Analysis Group (EXOPAG)
Chair, NASA EXOPAG Study Analysis Group (EXOPAG SAG15)
Science Questions and Data Requirement for Direct Imaging Missions

MAJOR PROJECTS AS PRINCIPAL INVESTIGATOR OR CO-PRINCIPAL INVESTIGATOR

1. **Unlocking the Stellar Treasure Trove:** A Hubble Space Telescope Large Treasury Archival program (together with B. Rackham and J. de Wit).
2. **Atmospherica**, a university-industry consortium to develop and implement a biotechnology-based, scalable CO₂ removal and sequestration technology (co-inventor: Apai), with the goal to offset 1Gt-level annual CO₂ emission.
3. **Alien Earths** (NASA/ICAR) Astrobiology Research Program, \$6.2M. A multidisciplinary team of 50 members, working toward answering the question “Which nearby planetary systems are more likely to harbor habitable planets?” <https://alienearthspace.org> AE already led to more than 40 refereed papers.
4. **Project EDEN:** A global network of 1–2m research telescopes that surveyed all northern late M-dwarf stars (~1,300 nights) to search for transiting Earth-sized planets. Led to multiple discoveries and planet occurrence rate assessments.
5. **Cloud Atlas** (Hubble Space Telescope Large Treasury Program, 112 orbits): A large HST program to understand how do atmospheric structure and cloud properties in exoplanets and brown dwarfs change with temperature and gravity. It led to 11 refereed papers.
6. **Extrasolar Storms** (Spitzer Exploration Science Program, 1,144 Spitzer hours + 28 HST orbits, Cycle-9): One of the largest Spitzer Space Telescope programs ever approved, Extrasolar Storms was monitoring the evolution of giant storms and jets in brown dwarfs over 1.5 years; the first program dedicated to atmospheric dynamics of brown dwarfs.
7. **Earths in Other Solar Systems** (EOS): A \$5.6M NASA award for the multi-disciplinary study of how Earth-like planets form and acquire their volatiles and organics. EOS led to 155 refereed papers and ~5,000 citations.
8. **Scorpion Survey:** 100-star ExAO (VLT/SPHERE) direct imaging survey for long-period giant exoplanets; the survey led to multiple discoveries of a new exoplanet and two planet-forming disks, widely covered in the media.
9. **ACCESS Survey:** As one of three Co-PIs, Apai founded and led ACCESS, the largest systematics transmission spectroscopic survey of exoplanets, utilizing the Magellan telescope in Chile.

TELESCOPE TIME ALLOCATION AS PI INCLUDE:

9 HST Programs (~280 orbits), 4 Spitzer Space Telescope Programs (~1,300 hours), 18 ESO Programs, 2 LBT Programs, ~1,300 nights on small telescopes, etc.

KEY RECENT GRANTS AS PI AND CO-PI:

Pandora NASA SmallSat (Apai Co-I, UArizona PI and lead of Exoplanet Working Group)
Stellar Contamination in Exoplanets \$1.3M 2023-2026

Stellar Treasure Troves (Apai Co-PI)
Hubble Space Telescope Large Treasury Prog. \$1.8M (expected) 2024-2026

Alien Earths
NASA Astrobiology \$6.20M 2021-2026

Nautilus Space Observatory / MODE Technology
Gordon and Betty Moore Foundation (Apai Co-PI) \$1.50M 2018-2022

Earths in Other Solar Systems
NASA Nexus for Exoplanet System Science \$5.70M 2015-2020

Cloud Atlas
Hubble Space Telescope Large Treasury Program \$0.86M 2016-2019

Extrasolar Storms
Spitzer Exploration Science Program + Hubble \$0.75M 2012-2016

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

PUBLICATIONS

200+ refereed publications; ~150 non-refereed publications; 12,000+ citations, h~56

* - students/postdocs advised by Apai

Select Publications

- 1) **Apai**, Barnes, Lichtenberg et al. 2024, Planetary Science Journal, in prep.
The NExSS Quantitative Habitability Framework
- 2) **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
- 3) **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
- 4) Rackham*, **Apai**, Giampapa, 2018 Astrophysical Journal 853, 122
The Transit Light Source Effect: False Spectral Features and Incorrect Densities for M-dwarf Transiting Planets
- 5) **Apai**, Karalidi*, Marley et al. 2017 Science 357, 683
Zones, Spots, and Planetary-Scale Waves Beating in Brown Dwarf Atmospheres
- 6) **Apai** et al. 2013 Astrophysical Journal 768, 121
HST Spectral Mapping of L/T Transition Brown Dwarfs Reveals Cloud Thickness Variations
- 7) Lagrange, Bonnefoy, Chauvin, **Apai** et al. 2010 Science
A Giant Planet Imaged in the Disk of the Young Star β Pictoris
- 8) **Apai**, Pascucci et al. 2005 Science 310, 834
The Onset of Planet Formation in Brown Dwarfs

Books Edited include:

Protoplanetary Dust: The Astrochemical and Cosmochemical Perspectives

Editors: D. Apai and D. Lauretta

Planetary Science Series, Cambridge University Press, 390 pp. (2011)

PHD DISSERTATIONS DIRECTED

2023 Jeremy Dietrich (UA Astronomy)

[Revealing Unseen Planets in Exoplanetary Systems](#)

2021 Alex Bixel (UA Astronomy)

[Statistical Strategies for Characterizing Habitable Exoplanets](#)

2021 Ben Wei Peng Lew (UArizona Planetary Science)

[Self-Luminous Worlds with Exotic Clouds: Characterizing Clouds in Brown Dwarf Atmospheres](#)

2020 Kevin Wagner (UA Astronomy)

[Imaging Forming Planetary Systems Towards Imaging Exo-Earths](#)

2019 Yifan Zhou (UA Astronomy)

[Time-Resolved Observations of Directly-Imaged Planetary-Mass Companions and Exoplanets](#)

2018 Benjamin Rackham (UA Astronomy): [The Transit Light Source Effect](#)

HONORS AND AWARDS

- 2022 Crotts Radical Hypothesis Lecture, Columbia University
2016 NASA Commendation as Member of the Hubble Space Telescope Science Team
2012 Tinsley Visiting Scholar, Astronomy Department, University of Texas
2004 Max Planck Institute's Patzer Price for Outstanding PhD Dissertation of the Year
2000 PhD Fellowship of the German Academic Exchange Service (DAAD)
1998 Erasmus Scholarship of the European Union to Univ. Jena, Germany
1999 Scholarship of the Hungarian Republic, awarded by the Minister of Education

SERVICE AS REVIEWER:**Journal Referee:**

Science, Astrophysical Journal, Monthly Notices of the Royal Astronomical Society, Astronomy & Astrophysics, Publications of the Astronomical Society of the Pacific, Elements special issue, etc.

Review Panels (US):

51 Pegasi b Prize Fellowship Selection Panel • Heising-Simons Foundation • NASA Exoplanet Research Program Panel • US Gemini Large Programs Panel • Hubble Space Telescope Financial Review Panel (3 year appointment committee overseeing allocation of about \$27M/year R&A funds) • Hubble Space Telescope Time Allocation Committee (as Panel Deputy Chair, Panel Member (three times), Mid-Cycle Review member) • Spitzer Space Telescope Time Allocation Committee • National Science Foundation's *Exoplanets* panel • NASA Small Bodies Database • Hubble Space Telescope Director's Discretionary Time Committee • NASA *Origins of Solar Systems* program • NSF *Research Experience for Undergraduates* Program • NASA Astrobiology Institute Director's Discretionary Funds • NASA *Postdoctoral Fellowship* program • Giacconi Postdoctoral Fellowship Committee, etc.

International Review Panels (Examples):

European Research Council *Starting Grant Program*, External reviewer • International Representative to the European Southern Observatory Time Allocation Committee (2 times) • Reviewer, Joint Research Actions program (large-scale university-wide efforts) at the University of Liege, Belgium • Swiss National Science Foundation (SPARK, Ambizione, SNSF Professorship) • Hungarian Science Foundation • FAPESP (Brazil), etc.

PROFESSIONAL SERVICE IN SUPPORT OF THE HUBBLE SPACE TELESCOPE MISSION

- 2010 Editor, Cycle-19 HST Call for Proposals
2010 Organizer, Galactic Astronomy/Solar System/Exoplanets review panels for HST Time Allocation Committee
2009 Editor, Cycle-18 HST Call for Proposals
2009 Analysis of HST's Science Impact, Productivity, and Time Allocation Policy

Departmental and University Committees

Member, Steering Committee, UArizona Center for Semi-Conductor Research 2023-
Member, Vatican Observatory Science Advisory Committee, 2023
Chair of Dean's Innovation Fund, 2022-
UArizona Research Core Facilities Committee, 2022-
Executive Committee, UA Space Institute, 2022-
Chair, Diversity and Inclusiveness Committee, 2019 - 2022
Chair, Faculty Search Committee (Planetary Science), 2021 - 2022
Member, Diversity and Inclusiveness Committee, 2017-2019
Initiative Owner "Astrobiology", UArizona Strategic Planning Committee, 2018-2020
Mentor, MCB Faculty, 2019-2021
Mentor, Steward Observatory Junior Faculty, 2020-
Steward Observatory Annual Performance Evaluation Committee Member, 2019
Steward Observatory Advisory Committee, Elected Member, 2016-2017, 2018-
Member, Bok Fellowship Search Committee, 2018-2019
Organizer, Astronomy Department Faculty Retreat 2017, 2020
Faculty Search Committee for Endowed Chair (Optical Science), Member, 2019-2020
Faculty Search Committee (Molecular & Cellular Biology), Member, 2019-2020
Faculty Search Committee (Astronomy), Member, 2016-2017
Steward Observatory Advisory Committee, Member, 2016
Graduate Admission Committee, Chair, 2016
Graduate Admission Committee, Member, 2012, 2013, 2014, 2015
Multiple Mirror Telescope Strategic Planning Committee: 2014
Committee on Mentoring Committees: 2013/2014
Academic Program Committee: 2012-2015
Astrobiology Program Council: 2011-2015
Small Telescopes Committee: 2012
Molecular and Cellular Biology: Astrobiology Faculty Search Committee: 2016
Academic Advisor for the Undergraduate Astrobiology Minor 2011-2015
Academic Advisor for the Graduate Astrobiology Minor 2011-2015

STUDENTS AND POSTDOCTORAL RESEARCHERS ADVISED**VISITING SCIENTISTS IN APAI'S GROUP:**

Dr. Michael McGauley (2013)
 Dr. Terry-Ann Sue, Rochester Institute of Technology
 Dr. Mark Giampapa (NSF NOIRLab and Raytheon Inc.)

POSTDOCTORAL RESEARCHERS ADVISED AND THEIR NEXT OR CURRENT POSITIONS:

Dr. Esther Buenzli (2011-2013)	(Ambizione Fellow at ETH, now Data Scientist)
Dr. Hao Yang (2013-2016)	(Data Scientist, Carvana)
Dr. Theodora Karalidi (2013-2016)	(Assistant Professor, U. Central Florida)
Dr. Elena Manjavacas (2016-2019)	(Asst. Astronomer, Space Telescope Sci. Inst.)
Dr. Jonathan Rees (2016-2018)	(Support Astronomer, McDonald Observatory)
Dr. Sebastiaan Kriit (2018-2020)	(Lecturer, Exeter University)
Dr. Benjamin Rackham (2019)	(51 Peg. b Fellow, now MIT Research Scientist)
Dr. Alex Bixel (2021)	(Senior Engineer at SpaceX)
Dr. Kevin Hardegree-Ullman (2021-)	(Currently Research Associate in Apai's group)
Dr. Kevin Wagner (2020-)	(Currently Hubble Prize Fellow in Apai's group)
Dr. Megan Mansfield (2021-)	(Currently Hubble Prize Fellow in Apai's group)
Dr. Martin Schlecker (2022-)	(Currently Research Associate in Apai's group)
Dr. Brittany Miles (2022-)	(51 Pegasi b Fellow in Apai's group)

GRADUATE STUDENTS ADVISED:

Chia-Lung Lin (Taiwan National Central Univ, UA visiting) – PhD studies in progress
 Chaucer Langbert (UA Planetary Science) – PhD studies in progress
 Arin Avsar (UA Planetary Science) – PhD studies in progress
 Fuda Nguyen (UA Planetary Science) – PhD studies in progress
 Rachael Amaro (UA Astronomy) - PhD Defense planned in May 2024
 Jeremy Dietrich (UA Astronomy) – now Prize Postdoctoral Fellow at ASU
 Alex Bixel (UA Astronomy) – now Senior Engineer at SpaceX
 Ben Wei Peng Lew (UA Planetary Science) – now Research Associate at NASA Ames
 Kevin Wagner (UA Astronomy) – now Hubble Prize Fellow at Apai's group
 Yifan Zhou (UA Astronomy) – now Assistant Professor at University of Virginia
 Benjamin Rackham (UA Astronomy) – now Research Scientist at MIT
 Justin Rogers (JHU Physics & Astronomy)
 Veselin Kostov (JHU Physics & Astronomy, now Research Scientist at NASA GSFC/Eureka)

MASTER/HONORS THESES DIRECTED:

Aidan Gibbs (U Arizona), now astrophysics PhD student at UCLA
 Davin Fleteau (MSc Thesis, Planetary Sciences), now Astronomy Lecturer at U. Cincinnati
 Laszlo Szucs (now postdoctoral researcher at MPE, Garching)

UNDERGRADUATE STUDENTS ADVISED:

30+ undergraduate research projects advised/co-advised; several resulted in first-author refereed papers for the students and two in Honors College projects. 7 high school student projects.

COURSES TAUGHT

Life, Planets and the Universe, Johns Hopkins University (1 semester)

Astrobiology course co-taught with J. DiRuggiero, C. Norman

23 students, 3 credits, 300-level

Planetary Astrobiology, The University of Arizona (7 semesters)

400/500-level course focusing on exoplanet formation, atmospheres, habitability, and characterization

3 credits, Taught in: 2012, 2014, 2016, 2017, 2019, 2020, 2022

Life in the Universe, The University of Arizona (6 semesters)

General Education course for non-science majors, up to 150 students, 3 credits

Course taught both in regular classroom setting and modified for full dome digital planetarium

3 credits, Taught in: 2012, 2013, 2014, 2016, 2019, 2021

Spring 2013 Astronomy Journal Club

MEETING ORGANIZATION

2023 Senior Facilitator, "Signatures of Life in the Universe", Research Corporation
 2021-23 Chair, Cloud Academy 2, Les Houches Advanced School
 2020/22 Chair/Co-Chair, NExSS Quantitative Habitability Science Working Group
 2020/21 SOC member, HabWorlds 2021
 2021 Senior Facilitator, "Signatures of Life in the Universe", Research Corporation
 2019-21 Organizing Committee Member, Eclipsing Exoplanets Conference, Chile
 2019/2020 Co-organizer, Machina Ex Machina Workshop on Origins of Life, Tucson
 2018 Moderator, NExSS/EXOPAG SAG16 Biosignatures webinar series
 2017/18 SOC Member, Conference: "Astrophysical Frontiers in the Next Decade and Beyond"
 2016/17 Chair, Cloud Academy, Les Houches Advanced Winter School
 2016/17 Faculty, Les Houches Advanced Winter School on Atmospheric Circulation
 2015/16 Co-Chair NExSS Winter School at UA Biosphere 2, 30 grad. students
 2016 SOC member, Disks-Planets workshop at Space Telescope Science Institute
 2016 SOC member, Exoclimates III, international conference
 2016 SOC member, Biosignatures workshop
 2015 Co-organizer, "*Exoplanet Mapping*" session, at Pathways toward Habitable Planets, Bern, Switzerland
 2015 Member of Scientific Organizing Committee, *Astrobio 2015*, Santiago de Chile
 2014 Member, Scientific Organizing Committee, *Beta Pictoris at 30*, Paris
 2014 Co-organizer, *Exoplanets, Biosignatures, & Instruments School, Biosphere 2*
 2014 Co-Chair (SOC & LOC), *Search for Life Beyond the Solar System, Tucson*
 ~250 participant major international meeting on the astronomical search for life in the universe and the instrumentation required for it
 2014 Co-convenor, Session *Clouds in Brown Dwarfs & Exoplanets*, American Astronomical Society Winter 2014 meeting(session proposal pending)
 2013 SOC, Bioastronomy 2013, Santiago, Chile
 2012 Convener, Splinter Session "*Clouds in Brown Dwarfs & Exoplanets*", Cool Stars 17
 2010 Organizing Committee, *STScI May Symposium on Dark Matter*, Baltimore
 2010 Head of Organizing Committee, Workshop, *Volatile Delivery to Habitable Planets* Space Telescope Science Institute, Baltimore
 2010 Co-organizer of workshop *Dust from the ISM to Rocky Planets*, Budapest
 2010 Invited Convener, *Stellar and Cometary Mineralogy*, International Mineralogical Association Meeting, Budapest
 2009- Organizer, STScI-JHU Astrobiology Lecture Series: *Life, Planets, and Universe*
 2009 Organizing Committee, Decadal Survey Townhall Discussion, Baltimore
 2009 SOC, Beyond JWST: Next Steps in UV/OPT/NIR Space Astronomy, Baltimore

OUTREACH (INCOMPLETE LIST)

- 2023 Article on the Nautilus Space Observatory concept, Apai, D., The Conversation, 130,000 reads, followed by TV interviews, articles, and podcast interviews
- 2022 Article on JWST and search for life on exoplanets, Impey, D., Apai, D., The Conversation, 430,000 reads, republished in Science Alert, Space.com, etc.
- 2020 The Conversation article on nearby planetary systems, Apai, D., Dietrich, The Conversation, 12,000 reads, republished in Science Alert, Space.com, etc.
- 2019 "NASA's TESS spacecraft is finding hundreds of exoplanets - and is poised to find thousands more", Apai, D., Rackham, B. V., The Conversation, 113,000+ reads
- 2017-2019 Nearly 1,000 tweets on astronomy: <http://twitter.com/danielapai>
- 2019 Teen Astronomy Cafe, NOAO, Tucson
- 2019 Astronomy on Tap: Tucson
- 2018 Public Talk, Steward Observatory Public Talk Series
- 2018 Public Talk, Phoenix Spirit of Senses Club
- 2018 Public Talk, Sierra Vista Astronomy Club
- 2018 Teen Astronomy Cafe, NOAO, Tucson
- 2018 Project POEM: Interactive astronomy activity for visually impaired students
- 2014-2016 Co-PI of the Hubble Space Telescope EPO grant *Sky Ambassadors*
This program included developing classroom materials for high schools based on Apai's HST programs and presenting a lecture and interacting with high school teachers on the context of the materials to high school teachers. The program also included visits to Tucson-area high schools by Astronomy graduate students, who have been advised by Apai and the other two co-PIs of the program.
- 2016 Organizer: *Other Earths* Public Lecture Series.
Three connected public lectures that attracted a total audience of ~500.
- 2014- Distant Earths and Other Earths Blogs (distantearth.org , otherearth.org)
These WordPress-based websites provide blog articles on exoplanet-related research and on news items on the Earths in Other Solar Systems (EOS) project led by Apai. Apai created the website, wrote most of the content; now students and postdocs are contributing articles and blog posts. The blogs are now also including interviews with scientists. The most read articles have been viewed by more than 2,000 visitors. The content of the blogs is designed in a way to allow it to be used in extra credit activities in some of the GenEd courses.
- 2011-2016 Various Public lectures on Exoplanet Exploration
(e.g., Academic Village, Tucson Steward Observatory Public Lectures Science Cafe Tucson, Hubble Briefings for Educators and NASA Solar System Ambassadors, Space Telescope Science Institute, etc.)
- 2010 Professional Consultant for *Stars*, a non-fiction book for fourth-graders, CapStone Press, 2010

MEDIA COVERAGE:

Results from Apai's group are often covered in electronic and printed media. An incomplete list of recent press releases and articles is provided here (on a variety of topics, all from projects led by Apai or students/postdocs supervised by Apai):

EXAMPLE MEDIA COVERAGE (INCOMPLETE):

- [NASA Selects New Science Teams for Astrobiology Research](#)
- [Life on Ancient Earth and Alien Planets: UArizona to Lead NASA Astrobiology Projects](#)
- [What comes after LUVOR? YouTube documentary by Fraser Cain](#)
- [Sky & Telescope: The Future of Astronomy: 2-page story on Nautilus Space Observatory](#)
- [Visiting the tau Ceti Planetary System \(The Conversation article by Apai and Dietrich\)](#)
- [Science Daily: A new lens for life-searching space telescopes](#)
- [Optics & Photonics News: A Different Kind of Eye on the Cosmos by Stewart Wills](#)
- [Astrobiology News: A Thousand Earths: A Very Large Aperture, Ultralight Space Telescope Array for Atmospheric Biosignature Surveys](#)
- [Hubble fortuitously discovers a new galaxy in the cosmic neighborhood](#)
- [Spiral Arms Discovered in Planet-forming Disk](#) (UA News)
- [UA Astronomers Show Exoplanet Changing Over Time](#) (UA News)
- [Hubble Directly Measures Rotation of Cloudy 'Super-Jupiter'](#) (HST News Release)
- [UA, ASU teams to search for Alien Life](#) (AZ Daily Star)
- [Hubble Gets Best View of a Circumstellar Debris Disk Distorted by a Planet](#) (HST News)
- [Got Planets? Smaller Stars are Best Bet](#) (UA News)
- [Extrasolar Storms: How's the Weather Way Out There?](#) (UA News)
- [Scientists from around the world exchange ideas on space exploration at Oro Valley conference](#) (AZ Daily Star)
- [Stormy Stars? NASA's Spitzer Probes Weather on Brown Dwarfs](#) (JPL News)