

David R. Ciardi, Ph.D.

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Education

Ph.D. Physics, University of Wyoming, Laramie, WY, USA 1997

Star Formation in the Filamentary Dark Cloud GF-9: A Multi-Wavelength Intra-Cloud Comparative Study,
Advisor Charles E. Woodward

B.A. Astronomy & Physics (*cum laude*), Boston University, Boston, MA, USA 1991

Vision

It is my strongest desire to make a positive and influential impact on our community and the world by empowering and conducting innovative scientific and educational research – and enabling that connection to the world. The wonder of the universe belongs to all of us.

Skills

Strong team and institutional leadership experience; project and institutional management for software and hardware programs; community building and organizational experience; significant strategic planning and leadership experience; scientific cross-disciplinary experience

Professional Experience

2002 – Present: Deputy Director and Senior Research Scientist, NASA Exoplanet Institute/IPAC/Caltech

Deputy Director of the NASA Exoplanet Science Institute, which is responsible for the NASA Exoplanet Archive, the Exoplanet Follow-Up Observation Program, the NN-Explore Program, the Keck Observatory Archive, NASA Keck Operations, and the Sagan Program. Project lead for the NASA Ariel Science Center. Previous leadership duties at NExScI/IPAC include Project Scientist for the NASA Exoplanet Archive, the Large Synoptic Survey Telescope, the Kepler Science Analysis System, and the Keck Observatory Archive. Duties include management and scientific direction of a team of software engineers and scientists during design, development, implementation, and operation. Other duties include liaison to NASA and the exoplanet community for NExScI with an emphasis on new projects and coordination of the scientific community activities for exoplanet research. Scientific research focused on exoplanet detection, characterization, and formation, and stellar astrophysics and formation. Techniques include high precision optical and near-infrared time-series photometry and spectroscopy, optical and infrared imaging and spectroscopy, and near-infrared interferometry. **Deputy Director: 2024 – current; Senior Research Scientist 2017-current; Member of the Professional Staff 2009-current; Chief Scientist 2017 – 2024; Associate Research Scientist 2008 – 2017; Assistant Research Scientist 2006 – 2008; Assistant Staff Scientist 2002 – 2006**

2000 – 2002: Assistant Scientist, University of Florida

Instrument scientist and optical designer for the Florida infrared instrumentation group. Lead optical designer and engineer for the spectroscopy components for T-ReCS, a mid-infrared imager and spectrograph for the Gemini 8-m Telescope, and CanariCam, a mid-infrared imager and spectrograph with polarimetric and coronagraphic modes for the Spanish GTC 10-m Telescope. Team leader for the integration and testing of T-ReCS; team leader for the scattering analysis for CanariCam.

1998 – 2000: Postdoctoral Research Scientist, University of Florida (Dr. Elizabeth Lada)

Responsible for the University of Florida in-orbit observational plan to be performed with NASA's Wide-Field Infrared Explorer (WIRE) to map and take a complete census of the nearest star formation regions. Developed a suite of GUI-based planning tools that utilized the satellite coordinate system and orbital parameters to optimize data acquisition. Primary point of contact between the University of Florida team and the NASA team.

1996 – 1998: Postdoctoral Research Scientist, University of Wyoming (Dr. Steve Howell)

Developed and lead an optical-infrared imaging and spectroscopic scientific program to study low-mass stellar objects in interacting binary systems. Team leader for the preparation, setup, operation, and support of the cryogenic near-infrared camera systems at the Wyoming Infrared Observatory (WIRO). Developed a suite of software tools for data collection and analysis to be used with the near-infrared imaging systems at WIRO.

Awards

2019: NASA Silver Achievement Medal – TESS Mission

2018: Certificate of Special Congressional Recognition – Kepler Mission

2016: NASA Exceptional Scientific Achievement Medal for work on Kepler and contributions to the confirmation of Kepler's exoplanets which have led to the characterization of planets ranging in size from Jupiters to Earths

Professional Mentoring

2004 – 2006: Dr. Kaspar von Braun, postdoctoral scholar, Caltech

2005 – 2007: Ms. Samantha Lawler, undergraduate, Caltech

2007 – 2009: Dr. Peter Plavchan, postdoctoral scholar, Caltech

2009 – 2011: Dr. Julian van Eyken, postdoctoral scholar, Caltech

2011 – 2012: Mr. Daniel Glomboske, undergraduate student, College of the Canyons

2015 – 2016: Ms. Mindy Saylor, undergraduate student, College of the Canyons

2014 – 2018: Ms. Lea Hirsch, graduate student, University of California, Berkeley

2020 – 2022: Ms. Rachel Fernades, graduate student, University of Arizona

2020 – 2022: Dr. Michael Lund, postdoctoral scholar, Caltech

2022 – 2024: Dr. Catherine Clark, postdoctoral scholar, Caltech

2024 – current: Mr. Galen Bergsten, graduate student, University of Arizona

2022 – current: Ms. Ummee Tania Ahmed, graduate student, University of Southern Queensland

2002 – current: more than a dozen community college and high school summer students

Current Professional Affiliations and Major Collaborations

American Astronomical Society, Full Member

Pandora Science Team

International Astronomical Union, Full Member

Landolt Science Team

TESS Follow-Up Observation Program (Imaging Lead)

Roman WFS Transiting Exoplanets Co-I

CASE/ARIEL Science Team

Ariel Science Consortium

Moonlite Deputy-PI and Science Lead

NASA Community College Network SME

International Programmatic Collaborations

2006 – 2014: Leader of the NASA-CNES/ESA partnership on CoRoT; NASA contributed ground-based follow-up resources for CoRoT science team to confirm CoRoT planetary candidates and provided time series analysis tools for use with the CoRoT data. CNES/ESA provided CoRoT mission to be publicly available through the NASA Exoplanet Archive.

2008 – Current: Leader of the Kepler, K2 and TESS follow-up observation programs which organized the world-wide community into following-up and confirming Kepler and K2 planetary candidates.

2022 – Current: Leader of the NASA/ESA partnership on the NASA Ariel Science Center and the US participation in the Ariel Science Consortium Preparatory Science Program

Professional Publications Highlights ([420+ Papers with 34000+ Citations; H-index=84](#))

2024: "The POKEMON Speckle Survey of Nearby M Dwarfs III The Stellar Multiplicity Rate of M Dwarfs within 15 pc," Clark et al. First paper to show the M-dwarfs that host transiting planets have a different stellar companion distribution than the general M-dwarf population.

2023: "Visual Orbits and Alignments of Planet-hosting Binary Systems," Lester et al. First paper to show that the stellar orbits in close-binaries with transiting exoplanets are primary aligned with the planet orbit.

2022: "A Dearth of Close-in Stellar Companions to M-dwarf TESS Objects of Interest," Clark et al. First paper to show that the stellar companions in M-dwarf planet systems are systematically further out than in field stars.

2021: "Understanding the Impacts of Stellar Companions on Planet Formation and Evolution: A Survey of Stellar and Planetary Companions within 25 pc," Hirsch, L et al. Paper does a full completeness study to show that single star systems have a higher giant planetary occurrence rate than binary stars

- 2019: “Detecting Unresolved Binaries in TESS Data with Speckle Imaging,” Matson, R, Howell, S. & Ciardi, D. R. Paper describing how high resolution imaging can be used to determine the stellar companion content of TESS stars.
- 2018: “A Binary System in The Hyades Cluster Hosting A Neptune-Sized Planet,” Ciardi, D. R., Paper describing the first planet found in a binary system within an open cluster.
- 2017: “Assessing the Effect of Stellar Companions from High-resolution Imaging of Kepler Objects of Interest,” Hirsch, L. Ciardi, D. R. et al., Paper describes the probability that stellar companions detected around Kepler planet host stars are bound and how these stars affect the derived planetary sizes and frequency rates of planets
- 2015: “Understanding the Effects of Stellar Multiplicity on the Derived Planet Radii from Transit Surveys: Implications for Kepler, K2, and TESS,” Ciardi et al., Paper describes the effects of undetected binary companions on the derived planetary radii from transit surveys
- 2013: “On the Relative Sizes of Planets within Kepler Multiple-candidate Systems,” Ciardi et al., First paper to show definitely that larger gas and ice giant planets are more commonly in orbits outside of smaller, rocky planets in the Kepler sample indicative of migrational shepherding and/or evaporation.
- 2011: “Characterizing the Variability of Stars with Early-release Kepler Data,” Ciardi et al., First paper to use the Kepler data to determine the variability amplitudes and variability fractions of the stars in the Kepler sample.
- 2001: “On the Near-Infrared Size of Vega,” Ciardi et al., First paper to use infrared interferometry to measure the size of the debris disk and show that Vega’s debris disk harbors dust inside of 1 AU.

Recent Proposals and Grants

Recent Funded Proposals as Primary Investigator

- NASA 2020, “The NASA Exoplanet Archive and ExoFOP: 5 year plan for the 2020 Archive Review,” \$4M
- NASA 2019, “Understanding the Role of Stellar Multiplicity in the Formation and Evolution of Exoplanetary Systems,” \$688,326
- NASA 2018, “Determining the True Kepler Occurrence Rates: Correcting for Stellar Multiplicity,” \$10,000
- NASA 2017, “Understanding the Stellar Multiplicity of Exoplanet Direct Imaging Targets: Preparing NASA for WFIRST,” \$9,000
- NASA 2016, “Validating K2 Planets with Keck Adaptive Optics Imaging,” \$18,000

Recent Funded Proposals as Co-Investigator

- NASA 2023, “Laying the Foundation for a Comprehensive View of Transiting Exoplanets with the Galactic Bulge Survey,” subcontract for \$425,000
- NASA 2015, “Harnessing the Power of the WFIRST Coronagraph: A Coordinated Plan for Exoplanet and Disk Science,” \$3.3M

Selected Recent Talks and Colloquia

- 2024 “The Quest for Other Earths,” invited outreach talk Cerritos College
- 2024 “Exoplanets in Multi-Star Systems,” invited talk ESP2024: PLATO Planetary Systems – formation to observed architectures, Catania, IT
- 2024 “NASA’s Pandora Mission”, contributed talk, Ariel Science Consortium Meeting, Tartu, EE
- 2022 “Stellar Multiplicity in Exoplanet Systems” Invited Colloquium, Georgia State University
- 2021 “Kepler, TESS and Keck Observatory: Driving Our Understanding of Exoplanetary Systems” Cosmic Events Guest Speaker Keck Observatory
- 2020 “Exoplanets From Space and Ground,” Colloquium, Florida Gulf Coast University
- 2020 “A Summary of TESS Discoveries From Year 1+,” Invited Talk 2020 ARIEL Science Meeting, Noordwijk, NL
- 2019 “Characterizing Exoplanets Means Characterizing Stellar Multiplicity,” Colloquium, Australia National University, Canberra, AU
- 2018 “Palomar and Kepler: A Decade of Exoplanet Candidate Confirmation and Characterization,” Invited Talk 2018 Palomar Science Meeting: 70 Years of Palomar
- 2018 “Exoplanets, Stellar Companions, and the Power of High Resolution Imaging”, Colloquium University of Wyoming, Host: Hannah Jang-Condell
- 2017 “Lessons learnt from the Kepler/K2 follow-up observation programs: leading to TESS ... now PLATO”, PLATO Mission Conference 2017: Exoplanetary systems in the PLATO era”, Contributed Talk, Warwick, UK