

# Mario Damiano

*Ph.D. in Astrophysics*

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## Professional experience

- 2018 - present** **JPL Postdoctoral Fellow**, National Aeronautics and Space Administration (NASA) – Jet Propulsion Laboratory (JPL) – California Institute of Technology, CA, United States.
- 2015 - 2020** **Research Associate**, National Institute for Astrophysics – Observatory of Palermo (INAF–OAPa), Palermo, Italy.

## Education

2019

**Ph.D. in Astrophysics**, *University College London (UCL), London, England, UK*,  
Advisors: Prof. Giovanna Tinetti, Dr. Giuseppina Micela, and Dr. Ingo Waldmann.  
Thesis title: *Data analysis of space and ground observations of exoplanetary atmosphere using Machine Learning algorithms*.

2015

**MSc Physics (Astrophysics)**, *University of Palermo (UNIPA), Palermo, Italy.*,  
Advisors: Prof. Giovanni Peres and Dr. Giuseppina Micela.  
Thesis title: *Exoplanetary atmosphere: high-resolution spectrum with instruments iLocater and HIRES*.

2013

**BSc Physics Science**, *University of Palermo (UNIPA), Palermo, Italy.*,  
Advisors: Prof. Giovanni Peres and Dr. Giuseppina Micela.  
Thesis title: *Exoplanets and stellar activity in the IR-band*.

## Research interests

- Composition and dynamic of exoplanetary atmospheres;
- Spectroscopic data analysis of observations recorded by space and ground facilities;
- Spectral interpretation through Bayesian information retrieval processes;
- Machine and Deep Learning algorithms for data analysis.

## Awards, grants, and fellowships

- JPL Postdoctoral Fellowship, NASA/JPL, 2018
- Ph.D. studentship, European Research Council (ERC) and National Institute for Astrophysics (INAF), 2015

## IT Skills

**Coding** Python, C, Matlab

**OS** MacOS (preferred), Linux, Windows

**Text editing** L<sup>A</sup>T<sub>E</sub>X, Microsoft Office, Apple Softwares

## Invited colloquia and seminar talks

- 2020** 'EXOPLANETARY CHARACTERIZATION THROUGH REFLECTION SPECTROSCOPY', JPL Postdoc Seminar Series, Jet Propulsion Laboratory, CA, US.
- 2019** 'TWO LENSES FOR GLASSES: LOW- AND HIGH-RESOLUTION SPECTROSCOPIC OBSERVATIONS OF EXOPLANETARY ATMOSPHERES', Yuk luncheon seminar, California Institute of Technology, CA, US.

- 2019** 'TWO LENSES FOR GLASSES: LOW- AND HIGH-RESOLUTION SPECTROSCOPIC OBSERVATIONS OF EXOPLANETARY ATMOSPHERES', JPL luncheon seminar, Jet Propulsion Laboratory, CA, US.
- 2017** 'SPECTROSCOPIC OBSERVATIONS OF HOT-JUPITERS WITH THE HUBBLE WFC3 CAMERA', INAF-OAPa seminar series, INAF-Astronomical Observatory of Palermo (INAF-OAPa), Palermo, Italy.

## Conference Presentations

- 2020** 'EXOPLANETARY CHARACTERIZATION THROUGH REFLECTION SPECTROSCOPY', 2<sup>nd</sup> Starshade Science Industry Partnership (SIP) forum, Boulder, CO, United States.
- 2020** 'EXOPLANETARY CHARACTERIZATION THROUGH REFLECTION SPECTROSCOPY', 235<sup>th</sup> American Astronomical Society (AAS) meeting, Honolulu, HI, United States.
- 2019** 'EXOPLANET REFLECTED LIGHT RETRIEVAL: WHAT CAN WE LEARN?', Division Planetary Science (DPS) 51 / European Planetary Science Congress (EPSC) 14, Geneva, Switzerland.
- 2018** 'PLANETARY SIGNAL EXTRACTION VIA HIGH-RESOLUTION SPECTROSCOPY', Centre for Planetary Science (CPS) meeting, Mullard Space Science Laboratory (MSSL), England, UK.
- 2018** 'PLANETARY SIGNAL EXTRACTION VIA HIGH-RESOLUTION SPECTROSCOPY', Workshop for collaboration with Indian science community, University College London, London, England, UK.
- 2017** 'NEAR-IR TRANSMISSION SPECTRUM OF HAT-P-32B USING WFC3 CAMERA ON BOARD HST', European Planetary Science Congress (EPSC) 12, Riga, Latvia.
- 2017** 'PLANETARY SIGNAL EXTRACTION VIA HIGH-RESOLUTION SPECTROSCOPY: WORK IN PROGRESS', 10<sup>th</sup> GAPS2.0 meeting, Palermo, Italy.
- 2016** 'SPECTROSCOPIC OBSERVATIONS OF HOT-JUPITERS WITH THE HUBBLE WFC3 CAMERA', Division for Planetary Sciences (DPS) 48 / European Planetary Science Congress (EPSC) 11, Pasadena, CA, US.

## Competitively awarded observing time

- 2021-present** 14.4 primary JWST hours awarded in Cycle 1. PI of GO-02334: *"Exploring the nature of a temperate exoplanet in the Fulton gap"*
- 2021-present** 67.9 primary JWST hours awarded in Cycle 1. Co-I of GO-02372: *"Deep Characterization of the Atmosphere of a Temperate Sub-Neptune"*
- 2021-present** 15.4 primary JWST hours awarded in Cycle 1. Co-I of GO-01952: *"Determining the Atmospheric Composition of the Super-Earth 55 Cancri e"*
- 2020-present** 8 primary HST orbits awarded in mid Cycle 28. Co-I of GO-16448: *"Confirming a tentative detection of an atmosphere around a potentially rocky planet"*

## Academic service

- 2021-present** Referee activity for Nature Astronomy (NatAstron), Astronomy and Astrophysics (A&A).

## Student advising

- 2017** Co-advised UNIPA master student for an internship on data analysis of high-resolution spectroscopic observations.  
Palermo, Italy.

## Publications

### First author peer-reviewed manuscripts

5. *Reflected light of small planets I: determining the atmospheric composition of sub-Neptune planets*  
**Damiano, M.** & Hu, R.,  
AJ, 162, 200, Oct 2021 - DOI: 10.3847/1538-3881/ac224d
4. *Multi-orbital-phase and multi-band characterization of exoplanetary atmospheres with reflected light spectra*  
**Damiano, M.**, Hu, R., Hildebrandt, S. R.,  
AJ, 160, 206, Nov 2020 - DOI: 10.3847/1538-3881/abb76a
3. *ExoReL<sup>3</sup>: A Bayesian Inverse Retrieval Framework For Exoplanetary Reflected Light Spectra*  
**Damiano, M.** & Hu, R.,  
AJ, 159, 175, Mar 2020 - DOI: 10.3847/1538-3881/ab79a5
2. *A Principal Component Analysis-based Method to Analyze High-resolution Spectroscopic Data on Exoplanets*  
**Damiano, M.**, Micela, G., Tinetti, G.,  
ApJ, 878, 153, June 2019 - DOI: 10.3847/1538-4357/ab22b2
1. *Near-IR transmission spectrum of HAT-P-32 b using HST/WFC3.*  
**Damiano, M.**, Morello, G., Tsiaras, A., Zingales, T., Tinetti, G.,  
AJ, 154, 39, Jul 2017 - DOI: 10.3847/1538-3881/aa738b

### Co-Author

7. *Unveiling shrouded oceans on temperate sub-Neptunes via transit signatures of solubility equilibria vs. gas thermochemistry,*  
Hu, R., **Damiano, M.**, Scheucher, M., Kite, E., Seager, S., Rauer, H.,  
ApJL 921 L8, Oct 2021 - DOI: 10.3847/2041-8213/ac1f92
6. *Starshade Exoplanet Data Challenge,*  
Hu, R., Hildebrandt, S. R., **Damiano, M.**, Shaklan, S., Martin, S., Lisman, D.,  
JATIS, 7(2), 021216, Mar 2021 - DOI: 10.1117/1.JATIS.7.2.021216
5. *The Transiting Exoplanet Community Early Release Science Program for JWST,*  
Bean, J.L., plus 96 co-authors,  
PASP 130k4402, Nov 2018 - DOI: 10.1088/1538-3873/aadbf3
4. *A chemical survey of exoplanets with ARIEL,*  
Tinetti, G., plus 242 co-authors,  
Exp Astron 46, 135, Sep 2018 - DOI: 10.1007/s10686-018-9598-x
3. *A Population Study of Gaseous Exoplanets,*  
Tsiaras, A., Waldmann, I.P., Zingales, T., Rocchetto, M., Morello, G., **Damiano, M.**, Karpouzas, K., Tinetti, G., McKemmish, L.K., Tennyson, J., and Yurchenko, S.N.,  
AJ, 155, 156, Mar 2018 - DOI: 10.3847/1538-3881/aaaf75
2. *A New Approach to Analyzing HST Spatial Scans: The Transmission Spectrum of HD 209458 b,*  
Tsiaras, A., Waldmann, I.P., Rocchetto, M., Varley, R., Morello, G., **Damiano, M.**, Tinetti, G.,  
ApJ, 832, 202, Dec 2016 - DOI: 10.3847/0004-637X/832/2/202
1. *Detection of an Atmosphere Around the Super-Earth 55 Cancri e,*  
Tsiaras, A., Rocchetto, M., Waldmann, I.P., Venot, O., Varley, R., Morello, G., **Damiano, M.**, Tinetti, G., Barton, E.J., Yurchenko, S.N., Tennyson, J.,  
ApJ, 820, 99, Apr 2016 - DOI: 10.3847/0004-637X/820/2/99