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 on 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

Languages

Italian Native *Mother tongue*

English Proficient *Daily practice*

IT Skills

Coding Python, C, Matlab

OS MacOS (preferred), Linux, Windows

Text editing LaTeX, Microsoft Office, Apple Softwares

Other information

Online courses Advanced courses on Machine Learning (ML) and Deep Learning (DL) for Python.

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

Invited Seminars and 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.

2018 'Planetary signal extraction via high-resolution spectroscopy', Workshop for collaboration with Indian science community, University College London, London, England, UK.

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^{nd} Starshade Science Industry Partnership (SIP) forum, Boulder, CO, United States.

2020 'Exoplanetary characterization through reflection spectroscopy', 235^{th} 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.

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^{th} 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.

Publications

First author peer-reviewed manuscripts

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$^{\Re}$: 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

5. *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

4. *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

3. *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

2. *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

1. *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