Lionel J. Garcia

born in 1994 in France

✉ lionel_garcia@live.fr ⏻ lgrcia

🌐 https://lgrcia.github.io

EDUCATION

2019 - 2023 University of Liège Belgium	**PhD in Astronomy** Towards the detailed atmospheric characterization of temperate rocky exoplanets *Supervisor: Michaël Gillon (SPECULOOS & TRAPPIST teams)*
2016 - 2017 University of Bordeaux France	**MSc in Computer Science** High performance computing and Image processing
2014 - 2017 Institut d'Optique France	**MSc in Optical Instrumentation** Photonics and optical Instrumentation
2012 - 2014 University of Paris-Sud France	**BS in Physics** Applied Physics

POSITIONS

2019 - 2021 University of Liège Belgium	**Teaching assistant** Supervision of tutorial sessions at undergraduate and graduate levels *150h/year – combined with half-time research*
2018 (1 year) ESA-ESTEC Netherlands	**Young Graduate Trainee** Development of novel strategies to build better spacecraft precursor models
2017 (6 months) CERN Switzerland	**Technical Student** Characterization and prototyping of next-generation Beam Wire Scanners for the LHC injectors upgrade
2016 (3 months) ESA-ESTEC Netherlands	**Trainee** Development and validation of a CCD cosmic ray impact simulator against Gaia in-orbit data

SOFTWARE DEVELOPMENTS

Image Processing
Python, LaTeX

prose
A Python package to build image processing pipelines. Developed for Astronomy to enable transparent research and reproducible products.

Signal Processing
Python, JAX

nuance
A Python package to detect exoplanetary transits in the presence of stellar variability and instrumental noises.

Web application
HTML-CSS-JS (VueJS)

SPECULOOS - portal
A web-based portal to monitor the SPECULOOS transit survey nightly observations (interactive schedule, data visualization, comments and flagging system, diagnostics, and more)

Data analysis
Python, snakemake

SPECULOOS - workflows
Developement of data analysis workflows for the automatic analysis and reporting of SPECULOOS observations (Manager of the related working group).

Data analysis
Python, snakemake, prose

TRAPPIST - ESO public release
Reduction and first release of the TRAPPIST telescope photometric products (beginning 2023 with ESO).

Related skills: Python C++ C Julia JS - HTML - CSS LaTeX git

TEACHING

University of Liège
2019 - 2021

Mechanics 101 Tutorials - Undergraduate
From Newtonian mechanics to the study of solids' motion
Professor: Pierre Dauby

Mathematical modeling for the environment Tutorials - Graduate
Dynamical modeling of populations and their environments
Professor: Marilaure Grégoire

Astronomical observations Tutorials and Lectures - Graduate
Telescope observations and applications to Astrophysics (including practical sessions at the Oukaimeden observatory, Morocco)
Professor: Emmanuel Jehin

COMMUNICATIONS

⋆ denotes invited

July 2022   **HST/WFC3 transmission spectroscopy of the cold rocky planet TRAPPIST-1h**
Talk   Garcia L. J., Moran S., Rackham B. V. et al.   *NAM 2022 (Warwick, UK)*

July 2022   **The bright future of PSF photometry using convolutional neural networks**
Poster   Garcia L. J.   *NAM 2022 (Warwick, UK)*

May 2022   **Transmission spectroscopy of the cold rocky planet TRAPPIST-1h**
Poster   Garcia L. J., Moran S., Rackham B. V. et al.   *Exoplanet IV (Las Vegas, USA)*

May 2020   **TRAPPIST-1h transmission spectrum: Knowning the star**
Talk   Garcia L. J., Moran S., Rackham B. V. et al.   *SAG21 symposium (online)*

Jun. 2019 ⋆   **specphot: a suite for SPECULOOS data analysis**
Poster   Garcia L. J. & the SPECULOOS team   *TRAPPIST-1 conference (Liège, Belgium)*

GRANTS

2021   **FRIA Doctoral scholarship**
F.R.S.–FNRS   2 years full-time research funding

PUBLICATIONS

First-authored

2022   **Spectroscopic anatomy of a polar spot on an M4-type star**
Garcia L. J. et al.   *in prep.*

2022   **nuance: Transit detection in the presence of stellar variability and correlated noise**
Garcia L. J., Foreman-Mackey, D.   *in prep. for A&A*

2022   **HST/WFC3 transmission spectroscopy of the cold rocky planet TRAPPIST-1h**
Garcia L. J., Moran, S. E., Rackham, B. V., et al.   *A&A, 665, A19*

2022   **prose: a Python framework for modular astronomical images processing**
Garcia L. J., Timmermans, Mathilde, Pozuelos, Francisco J. et al.   *MNRAS 509 4817-4828*

2018   **Validation of a CCD cosmic ray event simulator against Gaia in-orbit data**
Garcia L., Prod'homme T., Lucsanyi D. et al.   *Proc. SPIE 10709*

Other collaborations

2022 **SPECULOOS Northern Observatory: searching for red worlds in the northern skies**
Burdanov, A. Y., de Wit, J., Gillon, M., et al. (including Garcia L. J.) *arXiv e-prints, arXiv:2209.09112*

2022 **Two temperate super-Earths transiting a nearby late-type M dwarf**
Delrez, L., Murray, C. A., Pozuelos, F. J., et al. (including Garcia L. J.) *arXiv e-prints, arXiv:2209.02831*

2022 **Observation Scheduling and Automatic Data Reduction for the Antarctic telescope, ASTEP+**
Dransfield, G., Mekarnia, D., Triaud, A. H. M. J., et al. (including Garcia L. J.) *arXiv e-prints, arXiv:2208.04501*

2022 **TESS discovery of a sub-Neptune orbiting a mid-M dwarf TOI-2136**
Gan, T., Soubkiou, A., Wang, S. X., et al. (including Garcia L. J.) *MNRAS, 514, 4120*

2022 **A study of flares in the ultra-cool regime from SPECULOOS-South**
Murray, C. A., Queloz, D., Gillon, M., et al. (including Garcia L. J.) *MNRAS, 513, 2615*

2022 **Complex Modulation of Rapidly Rotating Young M Dwarfs: Adding Pieces to the Puzzle**
Günther, M. N., Berardo, D. A., Ducrot, E., et al. (including Garcia L. J.) *AJ, 163, 144*

2022 **TOI-1442 b and TOI-2445 b: two ultra-short period super-Earths around M dwarfs**
Morello, G., Parviainen, H., Murgas, F., et al. (including Garcia L. J.) *arXiv e-prints, arXiv:2201.13274*

2022 **TOI-2257 b: A highly eccentric long-period sub-Neptune transiting a nearby M dwarf**
Schanche, N., Pozuelos, F. J., Günther, M. N., et al. (including Garcia L. J.) *A&A, 657, A45*

2021 **A large sub-Neptune transiting the thick-disk M4 V TOI-2406**
Wells, R. D., Rackham, B. V., Schanche, N., et al. (including Garcia L. J.) *A&A, 653, A97*

2021 **Six transiting planets and a chain of Laplace resonances in TOI-178**
Leleu, A., Alibert, Y., Hara, N. C., et al. (including Garcia L. J.) *A&A, 649, A26*

2021 **SPECULOOS: Ultracool dwarf transit survey. Target list and strategy**
Sebastian, D., Gillon, M., Ducrot, E., et al. (including Garcia L. J.) *A&A, 645, A100*

2020 **Development of the SPECULOOS exoplanet search project**
Sebastian, D., Pedersen, P. P., Murray, C. A., et al. (including Garcia L. J.) *Proc. SPIE, 11445, 1144521*

2020 **π Earth: A 3.14 day Earth-sized Planet from K2's Kitchen Served Warm by the SPECULOOS Team**
Niraula, P., Wit, J. de ., Rackham, B. V., et al. (including Garcia L. J.) *AJ, 160, 172*

2020 **A super-Earth and a sub-Neptune orbiting the bright, quiet M3 dwarf TOI-1266**
Demory, B.-O., Pozuelos, F. J., Gómez Maqueo Chew, Y., et al. (including Garcia L. J.) *A&A, 642, A49*

2020 **GJ 273: on the formation, dynamical evolution, and habitability of a planetary system hosted by an M dwarf at 3.75 parsec**
Pozuelos, F. J., Suárez, J. C., de Elía, G. C., et al. (including Garcia L. J.) *A&A, 641, A23*

2020 **Photometry and performance of SPECULOOS-South**
Murray, C. A., Delrez, L., Pedersen, P. P., et al. (including Garcia L. J.) *MNRAS, 495, 2446*

MISCELLANEOUS

Ultra running - Illustration