Lionel J. Garcia

born in 1994 in France

☑ lionel_garcia@live.fr 🕠 lgrcia

Attps://lgrcia.github.io

EDUCATION

2019 - 2023 PhD in Astronomy

University of Liège Towards the detailed atmospheric characterization of temperate rocky

Belgium exoplanets

Supervisor: Michaël Gillon (SPECULOOS & TRAPPIST teams)

2016 - 2017 MSc in Computer Science

University of Bordeaux High performance computing and Image processing

France

2014 - 2017 MSc in Optical Instrumentation

Institut d'Optique Photonics and optical Instrumentation

France

2012 - 2014 BS in Physics

University of Paris-Sud Applied Physics

France

POSITIONS

2019 - 2021 Teaching assistant

University of Liège Supervision of tutorial sessions at undergraduate and graduate levels

Belgium 150h/year – combined with half-time research

2018 (1 year) Young Graduate Trainee

ESA-ESTEC Development of novel strategies to build better spacecraft precursor

Netherlands models

2017 (6 months) Technical Student

CERN Characterization and prototyping of next-generation Beam Wire Scan-

Switzerland ners for the LHC injectors upgrade

2016 (3 months) Trainee

ESA-ESTEC Development and validation of a CCD cosmic ray impact simulator

Netherlands against Gaia in-orbit data

TEACHING

University of Liège Mechanics 101 Tutorials - Undergraduate

2019 - 2021 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

SOFTWARE DEVELOPMENTS

prose 🗭 🖹

Image Processing Python, LaTeX A Python package to build image processing pipelines. Developed for Astronomy to enable transparent research and reproducible products.

nuance 🗇

Python, JAX

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

SPECULOOS - portal

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

SPECULOOS - workflows

Data analysis Python, snakemake Developement of data analysis workflows for the automatic analysis and reporting of SPECULOOS observations (manager of the related working group).

TRAPPIST - ESO public release

Data analysis Python, snakemake, prose 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

COMMUNICATIONS

 \star denotes invited

July 2022 Talk	HST/WFC3 transmission spectroscopy of the cold rocky planet TRAPPIST-1h Garcia L. J., Moran S., Rackham B. V. et al. NAM 2022 (Warwick, UK)
July 2022 Poster	The bright future of PSF photometry using convolutional neural networks Garcia L. J. NAM 2022 (Warwick, UK)
May 2022 Poster	Transmission spectroscopy of the cold rocky planet TRAPPIST-1h Garcia L. J., Moran S., Rackham B. V. et al. Exoplanet IV (Las Vegas, USA)
May 2020 Talk	TRAPPIST-1h transmission spectrum: Knowning the star <u>Garcia L. J.</u> , Moran S., Rackham B. V. et al. <i>SAG21 symposium (online)</i>
Jun. 2019 * Poster	specphot: a suite for SPECULOOS data analysis 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 nois 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 <u>Garcia L. J.</u> , Timmermans, Mathilde, Pozuelos, Francisco J. et al. <i>MNRAS 509 4817-4828</i>
2018	Validation of a CCD cosmic ray event simulator against Gaia in-orbit data Garcia L., Prod'homme T., Lucsanyi D. et al. <i>Proc. SPIE 10709</i>

Other collaborations

2022	Precise near-infrared photometry, accounting for precipitable water vapour at SPECULOOS Southern Observatory Pedersen, P. P., Murray, C. A., Queloz, D., et al. (including Garcia L. J.) MNRAS,
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.) <i>A&A</i> , <i>667</i> , <i>A59</i>
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.) <i>PASP</i> , 134, 105001
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.) <i>MNRAS</i> , <i>514</i> , <i>4120</i>
2022	Observation scheduling and automatic data reduction for the Antarctic Telescope, ASTEP+ Dransfield, G., Mékarnia, D., Triaud, A. H. M. J., et al. (including Garcia L. J.) <i>Proc. SPIE, 12186, 121861F</i>
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.) <i>A&A</i> , <i>657</i> , <i>A45</i>
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.) <i>Proc. SPIE</i> , 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, BO., 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