PERSONAL DETAILS

Family name, First name: CHANGEAT, Quentin
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URL for web site: https://quentchangeat.github.io/
Google scholar profile: https://scholar.google.com/citations?&user=wnonTucAAAAJ

Current position

2024 – Now **Assistant Professor**, Kapteyn Institute, University of Groningen, NL

Previous positions

2022 – 2024 **ESA Research Fellow**, Space Telescope Science Institute, ESA, USA.
2022 – 2024 **Honorary Research Fellow**, Department of Physics and Astronomy, UCL, UK.
2021 – 2022 **Postdoctoral Research Fellow**, Department of Physics and Astronomy, UCL, UK.

Education and key qualifications

28/02/2021 **PhD Astrophysics,** Department of Physics and Astronomy, UCL, UK
Supervisor: Prof. Giovanna Tinetti.
2018 **Master in Mathematics (Part III),** DAMPT, University of Cambridge, UK
2016 **Master Environmental Technology,** CEP, Imperial College London, UK.
2016 **Engineering degree (MEng),** Ecole Nationale Supérieure des Mines, Douai, France.
2013 **CPGE Mathematics and Physics (BSc)**, Lycée Daudet, France.

RESEARCH ACHIEVEMENTS AND PEER RECOGNITION

Achievements summary

My research focuses on the analysis of current and future spectroscopic observations of exoplanets, planets outside our solar system, to understand the physics and the chemistry of their atmospheres. Using data-oriented techniques and models, I am interested in the properties of all planets, ranging from the temperate super-Earth LHS-1140b to the extremely-hot Jupiter KELT-9b, that I observed with the James Webb, Hubble and Spitzer Space Telescopes. Studying the properties of exo-atmospheres provides a unique window into their nature, but also how their formed and interact with their host star. In this context, I have pioneered in the development of tools (TauREx3, ExPLOR, and Alfnoor) to interpret large populations of exo-atmospheres, extracting their properties and chemical composition. My tools and research support the science direction of exoplanet missions such as the ESA-Ariel telescope.

Ten research outputs

In my career to date, I have published 80+ research articles in the field of exoplanets (h-index: 29). Full bibliography: https://ui.adsabs.harvard.edu/public-libraries/Bt4TNyP4RTOi1UoeyWElYg

1. Changeat et al. 2025, Cloud and Haze Parameterization in Atmospheric Retrievals: Insights from Titan's Cassini Data and JWST Observations of Hot Jupiters, *A&A 699 A219.*

2. Changeat et al. 2024b, Toward Atmospheric Retrievals of Panchromatic Light Curves: ExPLOR-ing Generalized Inversion Techniques for Transiting Exoplanets with JWST and Ariel, *AJ 167 195.*

3. Edwards & Changeat 2024, Measuring Tracers of Planet Formation in the Atmosphere of WASP-77A b: Substellar O/H and C/H Ratios, with a Stellar C/O Ratio and a Potentially Superstellar Ti/H Ratio, *ApJL 962 L30.*

4. Changeat et al. 2024a, Is the Atmosphere of the Ultra-hot Jupiter WASP-121 b Variable?, *ApJS 270 34.*

5. Changeat & Yip 2023, ESA-Ariel Data Challenge NeurIPS 2022: Introduction to exo-atmospheric studies and presentation of the Atmospheric Big Challenge (ABC) Database, *RASTI 2 1 45–61.*

6. Edwards, Changeat et al. 2023, Exploring the Ability of HST WFC3 G141 to Uncover Trends in Populations of Exoplanet Atmospheres Through a Homogeneous Transmission Survey of 70 Gaseous Planets, *ApJS 269 31.*

7. Changeat et al. 2022, Five key exoplanet questions answered via the analysis of 25 hot Jupiter atmospheres in eclipse, *ApJS 260 3.*

8. Changeat 2022, On spectroscopic phase-curve retrievals: H2 dissociation and thermal inversion in the atmosphere of the ultra-hot Jupiter WASP-103 b, *AJ 163 106.*

9. Al-Refaie, Changeat, et al. 2021, TauREx 3: A Fast, Dynamic, and Extendable Framework for Retrievals, *ApJ 917 37.*

10. Changeat et al. 2020, Alfnoor: A Retrieval Simulation of the Ariel Target List, *AJ 160 80.*

Prizes/awards

2025 **VENI Talent Grant,** NWO, NL.
2021 **Jon Darius Memorial prize,** UCL, best thesis in Astrophysics 2021.
2018 **E.M. Burnett prize,** University of Cambridge, excellent results.

Invited lectures at conferences, workshops (selection)

2025 **Invited colloquium.** *Interpretation of exoplanet data with space observatories,* Univ. Tokyo, Japan.
2025 **Keynote speaker**. *Study of exoplanet atmospheres with next-gen space observatories*, JpGU, Japan.
2025 **Contributed talk.** *Phase-curves with Ariel*, Ariel-Plato community day, NL.
2025 **Invited colloquium.** *Interpretation of exoplanet atmospheres with space observatories*, Univ. of Amsterdam, NL.
2025 **Invited colloquium.** *Interpretation of exoplanet atmospheres with space observatories*, Univ. of Vienna, Austria.
2024 **Invited colloquium.** *Exo-atmospheres in the era of JWST and Ariel*, Brandeis Univ., USA.
2024 **Invited colloquium.** *Modern analysis techniques for exoplanet data*, Univ. of Vienna, Austria.
2023 **Invited colloquium.** *Towards population studies of exoplanet atmospheres*, Univ. of Maryland, USA.
2023 **Invited colloquium.** *Exo-atmospheres in the era of JWST and Ariel*, NAOJ, Japan.
2023 **Keynote speaker.** *Modern analysis techniques for exoplanet data*, ESLAB 2023, NL.
2022 **Contributed talk.** *Towards population studies of exo-atmospheres*, ESA Science Workshop, NL.
2022 **Keynote speaker.** *Atmospheric Retrievals and more*, Flatiron Exoplanet Symposium, USA.
2021 **Invited colloquium.** *Atmospheric studies in the era of next generation telescopes*, Goddard, USA.
2021 **Contributed talk.** *Phase-curve retrievals of exo-atmospheres: WASP-43b*, Exosystèmes II, FR.
2020 **Contributed talk.** *Phase-curve retrievals of exo-atmospheres: WASP-43b*, ARES days, FR.
2020 **Contributed talk.** *The ESA-Ariel mission*, Rocky Worlds I, UK.
2019 **Invited colloquium.** *Degeneracies in atmospheric retrievals for future telescopes*, Univ. Tokyo, Japan.
2019 **Contributed talk.** *Data analysis techniques in the era of next generation telescopes*, EPSC-DPS, FR.

Research grants

2025 **PI.** NWO Veni Grant, *Exoplanet Atmospheres with Next-gen Space Telescopes*, NL, €320,000.
2025 **PI.** NWO Snellius Computing, *Interpreting exoplanet atmospheres with JWST*, NL, 4M CPUh.
2023 **PI.** ESA competitive research funds, *Exoplanet atmospheres in a new era*, NL, €110,000.
2023 **co-I.** ESA competitive research funds, *Ariel Machine Learning Data*, PI. Lueftinger, NL, €100,000.
2023 **PI.** NAOJ Visiting grant, *Towards a unified understanding of the formation of exoplanets and their atmospheres,* Japan, ¥310,000.
2023 **Sci-PI.** STScI discretionary research grant, *Studying the atmospheres of transiting and directly imaged exoplanets via JWST spectroscopy*, USA, $32,000.
2023 **Sci-PI.** STFC DiRAC HPC RAC 15th, *Characterization of exoplanet atmospheres with JWST*, UK, 9.5M CPUh (equiv. £95,000).
2023 **co-I.** STFC DiRAC HPC RAC 15th, *In Search of an Interdisciplinary Solution for Scalable Planetary Characterization*, UK, 5M CPUh + 35k GPUh (equiv. £70,000).

2022 **PI.** ESA Research Fellowship, *Deciphering exoplanetary atmospheres in the era of ESA Ariel and NASA-ESA-CSA JWST,* NL, $300,000.
2021 **PI.** UKSA Postdoctoral Fellowship, *ESA M4 Mission Ariel Implementation Phase*, recipient of the external award led by PI. Tinetti, UK, $200,000.

Observing grants

2024 **PI.** JWST GO 5531 Cycle 3, *Contextualizing our solar-system: Atmospheric characterization of the Jupiter-analogue Kepler-167e*, proposal merged with GO 6491, 39 hours.
2024 **co-I.** JWST GO 6491 Cycle 3, *Revealing the Oblateness and Satellite System of an Extrasolar Jupiter Analog*, proposal merged with GO 5531, 71 hours.
2024 **co-I.** JWST GO 6219 Cycle 3, *MIRI LRS Slit for transiting exoplanet observations*, 15 hours.
2024 **co-I.** VLT/EXPRESSO, *Breaking the chains of near-resonant systems,* 1 night.
2024 **co-I.** Gemini/IGRINS + Keck/KPIC, *Isotope survey towards comprehending the Hot Jupiters formation pathways,* 2 nights.
2023 **co-I.** VLT/CRIRES+, *Vanishing Worlds: Comparative Study of Atmospheric Mass Loss of Two Very Young Neptunes,* 2 nights.
2023 **co-I.** JWST GO 3263 Cycle 2, *The First Atmospheric Study of a Bona Fide Water World*, 23 hours.
2022 **PI.** CHEOPS AO3, *Atmospheric characterization of the hot-Jupiter WASP-79 b*, 28 orbits.
2022 **co-I.** CHEOPS AO3, *Ephemeris Refinement of Key Targets for the ESA-Ariel Mission*, 132 orbits.
2022 **co-I.** CHEOPS AO3, *Rescuing Longer Period TESS Planet Candidates for Future Atmospheric Characterizations*, 130 orbits.
2021 **co-I.** HST GO 16457 Cycle 28, *Atmospheric Characterization of A Disintegrating Planet in the Hot Neptune Desert*, 8 orbits.

OTHER CONTRIBUTIONS

Commissions of trust

2023 **External reviewer,** UKRI-EPSRC Research Fellowships, UK.
2023 **External reviewer,** STFC Small Award Grants, UK.
2023 **Expert reviewer,** ESA Research Fellowship, NL.
2023 **Expert reviewer,** ESA competitive research funds, NL.
Reviewer for: Nat. Ast., ApJ, AJ, A&A, MNRAS, JOSS, Exp. Ast., Astrophys. Space Sci.

Large collaborations

2025+ **Member,** HWO Core Team Netherlands.
2024+ **Working group lead,** Ariel Consortium, co-lead of the WG on Synergy Ariel-JWST.
2024+ **Member,** MIRI GTO Program, atmospheric retrieval expert.
2022+ **Member,** JWST ERS Transiting Exoplanet team, atmospheric retrieval expert.
2020+ **Working group lead,** Ariel Consortium, co-lead of the WG on Atmospheric Retrievals.
2018+ **Member,** Ariel Consortium.

Teaching contributions

2025 **Course coordinator,** Numerical Methods, University of Groningen.
2025 **Lecturer,** Ariel Summer School, Fréjus, FR.
2022 **Lecturer,** Space missions for detection and characterization of exoplanets, Rencontre Exobiologique pour Doctorants (RED) School, FR.
2022 **Hands-on lead,** atmospheric retrievals with TauREx, Exosystèmes II conference, FR.
2021 **Organizer/Lecturer,** TauREx code practicals, ARES II Summer School, FR.
2019 **Lecturer,** TauREx code practicals, ARES I Summer School, FR.
2019 **Hands-on lead,** atmospheric retrievals with TauREx, Digital Exoplanet Conference, CZ.
2018 – 2019 **Teaching assistant** Physics of the Exoplanets, UCL, UK.

Supervision contributions

2025 – 2029 **PhD supervisor,** Giacomo Gallina, University of Groningen.
2023 – 2026 **PhD co-supervisor,** Maël Voyer, CEA co-supervision with P-O. Lagage.
2021 – 2022 **PhD external supervisor at UCL,** Fang Wang, UCL visitor from the Chinese Academy of Science.

2024 – 2025 **MSc supervisor,** Rick Bonhof, Groningen Astro.
2024 – 2025 **MSc supervisor,** Jesse Reurink, Groningen Astro.
2024 **MSc supervisor,** Moa Sjöberg, ETHZ Mathemathics.
2022 **MSc supervisor,** Christos Xenofontos, UCL Planetary Science.
2022 **MSc supervisor,** Zofia Hermaszewska, UCL Planetary Science.
2022 **MSc supervisor,** Estelle Janin, UCL Astrophysics.
2021 **BSc thesis supervisor,** Lorenzo Pica Ciamarra, UCL Astrophysics.

Organization of scientific meetings

2026 **Organizer.** Rocky Worlds IV, conference, Groningen, NL.
2025 **Organizer.** Ariel Summer School, Fréjus, FR.
2024 **Co-lead.** Synergy JWST-Ariel, workshop, CEA, France.
2024 **Lead.** Exoplanet workshop STScI-NAOJ, workshop, STScI, USA.
2024 **Organizer.** Ariel Data Challenge 2024, ECML conference.
2023 **Organizer.** Brainstorming on Astrobiology, workshop, ESTEC, NL.
2023 **Organizer.** Ariel Data Challenge 2023, ECML conference.
2022 **Co-lead.** Ariel Data Challenge 2023, NeurIPS conference.
2021 **Organizer.** ARES II, summer school, Biarritz, FR.

Outreach and popularization

2024 **Press Release,** *NASA's Hubble Observes Exoplanet Atmosphere Changing Over 3 Years*, NASA/STScI/ESA/DIRAC.
2023 **Press Release,** *Hubble observations used to answer key exoplanet questions*, ESA/UCL/ CNRS/ DIRAC/NVIDIA**.**
2022 **Panel discussion,** *Your Universe: The James Webb Space Telescope,* Festival of Astronomy, UCL.
2021 **Magazine article,** *AI can reliably spot molecules on exoplanets*, The Conversation**.**
2021 **Magazine article,** *How can some planets be hotter than stars?*, The Conversation
2020 **Magazine article,** *Le mystère des planètes vaporeuses*, Science & Vie**.**
2020 **Magazine article,** *What are hot-Jupiters?* , All about Space**.**
2019 – 2024 **Public lectures,** Pint of Science 2022 (FR), Astronomines 2020 (FR), Semaine de la Science 2019 (FR), Space Café Tokyo 2019 (JP).
2018 – 2019 **Teacher,** ORBYTS program, bimonthly optional courses for high-school students, BSSL, UK.

OTHER PROFESSIONAL EXPERIENCES

2016 – 2017 **Consultant**, Cybersecurity division, Wavestone SA, Paris, FR.
2015 – 2016 **Freelance Consultant**, OutSmart Insights Ltd., London, UK.