

Andrea Bocchieri

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Telescope Scientist for ESA's *Ariel* mission specialising in exoplanet characterisation through spectroscopic observations, data analysis, optimisation of space instrumentation, especially optical aspects, and control of experimental systematics.

POSITIONS HELD

- **Postdoctoral Fellow**, Sapienza University of Rome 2023 – Present
- **Ph.D. in Astronomy, Astrophysics and Space Science**, Sapienza University of Rome 2020 – 2023

PROFESSIONAL ACTIVITIES

- **Research Associate**, CNR-IFN - Padova 2025 – Present
- **Telescope Scientist**, ESA's *Ariel* Space Mission 2024 – Present
- **Research Associate**, INAF - Arcetri Astrophysical Observatory 2024 – Present

EDUCATION

- **Ph.D. in Astronomy, Astrophysics and Space Science**, Sapienza University of Rome 2020 – 2023
Summa cum Laude – *Characterisation of the Atmospheres of Extrasolar Planets with the Ariel Space Mission*
- **M.Sc. in Astronomy and Astrophysics**, Sapienza University of Rome 2018 – 2020
Summa cum Laude – *Learning from Exoplanetary populations: Data Analysis for the Ariel Space Mission*
- **B.Sc. in Physics**, Sapienza University of Rome 2015 – 2018

LEADERSHIP AND SERVICE

- **Member** – **GAPS** Collaboration 2025 – Present
- **Founder, coordinator** – *Ariel* Stellar Obliquity WG 2025 – Present
- **Chair** – *Ariel* Telescope Assembly Mounting-Correlation Working Group 2025 – Present
- **Member** – *Ariel* Instrument Scientist Team as the Telescope Scientist 2024 – Present
- **Member** – *Ariel* Telescope Assembly Project Office 2024 – Present
- **Chair** – *Ariel* Telescope Assembly Tiger Team 2024 – Present
- **Member** – *Ariel* Data Challenge organising team 2024 – Present
- **Coordinator** – *Ariel*-IT Dry Run simulations and retrievals 2023 – Present
- **National contact** – **Exoclock** Collaboration 2023 – Present
- **Member** – *Ariel* Instrument Operations & Science Data Centre Working Group 2022 – Present
- **Chair** – *Ariel* Simulators Software, Management and Documentation Working Group 2022 – Present
- **Member** – **EXCITE** Team and Data Analysis Working Group 2021 – Present
- **Chair** – *Ariel* Science Brainstorms Working Group 2021 – 2024
- 14 peer-reviewed journal articles as author or co-author; 4 submitted
- 41 conference proceedings, 10+ technical notes, 4 invited talks, 13 observing proposals
- 4 observing nights at TNG with HARPS-N and GIANO-B

LANGUAGES

Italian (Native)	English (C2)	French (C1)	German (C1)	Spanish (B1)
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GRANTS AND AWARDS

- **Organiser** – *Ariel* Data Challenge - NeurIPS, Kaggle [\$100,000] 2024, 2025
- **Co-PI** – INAF USC VIII - *Ariel*-IT Dry Run: simulation and retrieval [3M CPUh] 2023

- **PI** – Avvio alla Ricerca - Sapienza University of Rome [€4,000] 2022, 2024
- **Collaborator** – Progetti di Ricerca - Sapienza University of Rome [€50,000] 2021, 2022, 2023, 2024
- Winner of the *Excellence track* during M.Sc. - Sapienza University of Rome 2020

SELECTED PUBLICATIONS AND PROJECTS

- **Bocchieri et al. (2025)**. *ExoNAMD: Leveraging the spin-orbit angle to gauge multi-planet systems*. Submitted to *A&A*
 - **Bocchieri et al. (2025)**. *Exploring Synergies between Twinkle and Ariel: A Pilot Study*. Accepted by *Exp. Astr.*
 - **Bocchieri et al. (2025)**. *De-jittering Ariel: an optimised algorithm*. *Exp. Astr.*
 - **Mugnai+Bocchieri et al. (2025)**. *ExoSim 2.0: the new Exoplanet Observation Simulator [...]*. *Exp. Astr.*
 - **Changeat et al. (2025)**. *On the synergetic use of Ariel and JWST for exoplanet atmospheric science*. *arXiv*
 - **Bocchieri et al. (2024)**. *PAOS: a fast, modern, and reliable Python package for Physical Optics studies*. *SPIE*
 - **Zak+Bocchieri et al. (2024)**. *Stellar obliquity measurements of six gas giants*. *A&A*
 - **Mugnai+Bocchieri et al. (2024)**. *ExoRad 2.0: The generic point source radiometric model*. *JOSS*
 - **Bocchieri et al. (2023)**. *Detecting molecules in Ariel low resolution transmission spectra*. *Exp. Astr.*
- **Creator, maintainer** – **PAOS**: Generic physical optics model of wavefront propagation through complex space telescopes.
 - **Creator, maintainer** – **ExoNAMD**: Codebase to compute the Normalised Angular Momentum Deficit of planetary systems.
 - **Creator, maintainer** – **STOP-utils**: Utilities for wavefront error analysis using externally simulated error maps.
 - **Creator, maintainer** – **TIGRO**: Tool analysing interferometric surface error measurements with nanometer precision.
 - **Creator, maintainer** – **taurex-emcee**: A plugin for TauREx3.1 that provides the Emcee sampler for the retrieval.
 - **Co-creator** – **ExoRad2.0**: Generic radiometric point source simulator of exoplanet observations.
 - **Co-creator** – **ExoSim2.0**: Generic time-domain point source simulator of exoplanet observations.
- Interferometric testing of Ariel M1 structural model of the 1.1 m aluminium primary mirror (May – August 2024).

CONFERENCES AND WORKSHOPS

INVITED TALKS

1. **Notti d'Estate** (Arcetri, ITA) 22 Jul 2025
Characterisation of exoplanet atmospheres with Ariel: scientific and technological challenges
2. First **PLATOSpec** science workshop (Ondřejov, CZ) 22 May 2025
Know Thy Star, Know Thy Planet: PLATOSpec's Crucial Context for the Ariel Survey
3. **ESO: Stellar Coffee** (Garching, GER) 10 Jun 2024
Summoning the Science Simulators Applied to the Ariel Space Mission
4. **MIAPbP: Habitability: the astrophysical, atmospheric, and geophysical implications** (Garching, GER) 4 Jun 2024
An overview of the Ariel simulators framework and the Ariel Data Challenge 2024

ORGANISATION

1. Convener and Chair at **Europlanet Science Congress** (Helsinki, FIN) 7–12 Sep 2025
Future and current instruments to detect and characterise extrasolar planets and their environment
2. Convener and Chair at **Europlanet Science Congress** (Berlin, GER) 8–13 Sep 2024
Future and current instruments to detect and characterise extrasolar planets and their environment
3. **SOC** member at **Ariel-IT Science** (Palermo, ITA) 20–22 May 2024
4th Meeting of the Italian community dedicated to Ariel's scientific preparation
4. Convener at **NeurIPS – Ariel Data Challenge** (San Diego, USA) 2–7 Dec 2025
Extracting exoplanetary signals from the Ariel Space Telescope
5. Convener at **NeurIPS – Ariel Data Challenge** (Vancouver, CAN) 10–15 Dec 2024
Extracting exoplanetary signals from the Ariel Space Telescope

SELECTED TALKS

1. **Ariel Consortium Meeting** (Madrid, SP) 29 Sep–3 Oct 2025
 - *Ariel S2MD: working group update (plenary)*
 - *ExoNAMD: Leveraging the spin-orbit angle to constrain the dynamics of multiplanetary systems*

2. Congresso Nazionale di Fisica (Palermo, ITA)	22–26 Sep 2025
<i>Ariel-IT end-to-end exercise from the astrophysical scene to planetary spectra: simulations and retrieval</i>	
3. Europlanet Science Congress (FIN)	7–12 Sep 2025
<ul style="list-style-type: none"> • <i>The Atmospheric Remote-sensing Infrared Exoplanet Large-survey (Ariel) sensitivity and performance</i> • <i>EzoNAMMD: a community tool to gauge multi-planetary systems</i> 	
4. Detection and Dynamics of Exoplanets (Coimbra, PO)	7–11 Jul 2025
<i>EzoNAMMD: a community tool to gauge multi-planetary systems</i>	
5. Chianti Topics (Florence, ITA)	3–6 Jun 2025
<ul style="list-style-type: none"> • <i>Ariel-IT end-to-end exercise from the astrophysical scene to planetary spectra: simulations and retrieval</i> • <i>EzoNAMMD: a community tool to gauge multi-planetary systems</i> 	
6. Ariel Consortium Meeting (Leiden, NL)	8–11 Apr 2025
<ul style="list-style-type: none"> • <i>Ariel S2MD: working group update (plenary)</i> • <i>An end-to end experiment on a small sample of targets: simulations and retrieval</i> 	
7. Ariel Consortium Meeting (Lisbon, PO)	28–30 Oct 2024
<i>Ariel S2MD: working group update (plenary)</i>	
8. Europlanet Science Congress (Berlin, GER)	8–13 Sep 2024
<i>The Atmospheric Remote-sensing Infrared Exoplanet Large-survey sensitivity and performance</i>	
9. SPIE Astronomical Telescopes & Instrumentation (Yokohama, JP)	16–21 Jun 2024
<i>The atmospheric remote-sensing infrared exoplanet large-survey (Ariel) sensitivity and performance</i>	
10. Ariel-IT Science (Palermo, ITA)	22 May 2024
<i>Updates on Ariel simulations and detrending</i>	
11. Ariel Consortium Meeting (Tartu, EST)	23–26 Apr 2024
<ul style="list-style-type: none"> • <i>Ariel S2MD: working group update (plenary)</i> • <i>Updates on Ariel performance analyses</i> • <i>Ariel long-term detrending</i> 	
12. Ariel Consortium Meeting (Budapest, HUN)	24–27 Oct 2023
<i>Breakthrough in Ariel jitter detrending</i>	
13. ExoClock Annual Meeting (Thessaloniki, GR)	21–22 Oct 2023
<ul style="list-style-type: none"> • <i>The Ariel mission and population studies</i> • <i>A vanilla introduction to jitter detrending for Ariel</i> 	
14. Ariel Science Ground Segment Workshop at ESAC (Madrid, ES)	12–14 Sep 2023
<i>Ariel Exposure Time Calculator (ETC) Status and Plans</i>	
15. Ariel Consortium Meeting (Tenerife, ES)	6–9 Jun 2023
<i>Ariel Reconnaissance Survey Targets: Detection of Molecules and Promotion to Higher Tiers</i>	
16. Ariel-IT Meeting (Palermo, ITA)	16–18 May 2023
<ul style="list-style-type: none"> • <i>Ariel Reconnaissance Survey Targets: Detection of Molecules and Promotion to Higher Tiers</i> • <i>The ExoClock Project: an open platform for maintaining the Ariel target ephemerides</i> 	
17. Disks and Planets across ESO Facilities (Garching, GER)	28 Nov–2 Dec 2022
<i>Detecting molecules in Ariel low resolution transmission spectra</i>	
18. Ariel Consortium Meeting (Bologna, ITA)	10–12 Oct 2022
<i>Ariel PSF sampling analysis with PAOS</i>	
19. Ariel Consortium Meeting (Paris, FR)	14–17 Jun 2022
<i>Ariel Tier 1 population analysis</i>	

TEACHING EXPERIENCE

1. Co-Advisor – Syty, A. (Paris-Saclay University)	2024
Research project: <i>Detrending techniques for the Ariel space mission</i>	
2. Co-Advisor – Polci, A. (Sapienza University of Rome)	2023–2024
M.Sc. thesis: <i>Exoplanet observations through the lens of the Fisher information formalism</i>	
3. Co-Advisor – Syty, A. (Paris-Saclay University)	2023
Research project: <i>Line of sight jitter detrending techniques for the Ariel space mission</i>	
4. Co-Advisor – Carrarini, T. (Sapienza University of Rome)	2023
M.Sc. thesis: <i>Transit spectroscopy with the James Webb Space Telescope: the impact of noise and saturation</i>	
5. Tutor – Hall, H. (ESA Mission Performance Engineering YGT)	2022–2023

Research project: *Linear drift creation and detrending in presence of pointing jitter*

6. **Co-Advisor** – Altamura, L. (Sapienza University of Rome) 2022
M.Sc. thesis: *Pointing jitter noise reduction in HD209458 out-of-transit observation*
7. **Co-Advisor** – D’Alessandro, A. (Sapienza University of Rome) 2021
M.Sc. thesis: *Phase-resolved spectroscopy with EXCITE for exoplanet atmospheric characterization*
8. **Co-Advisor** – Masciulli, C. (Sapienza University of Rome) 2021
M.Sc. thesis: *Synergies and complementarities between JWST and EXCITE*

OBSERVING PROPOSALS

1. **LBT** (PI) 2025
The evolutionary history of the ~60 Myr multiplanetary system TIC 434398831
Instrument: PEPSSI, Telescope time: **6.1h**
2. **ESO/VLT** (Cycle P116, dPI) 2025
Cliff Hanger system TOI-942: aligned or misaligned orbit? Escaping or stable atmosphere?
Instrument: ESPRESSO, Telescope time: **6h 42m**
3. **TNG** (PI) 2025
GIARPS characterization of the super-puff transiting planet TOI-1420 b
Instrument: HARPS-N/GIANO-B, Telescope time: **12.1h**
4. **ESO/VLT** (Cycle P115, dPI) 2024
Breaking the chains of near-resonant systems
Instrument: ESPRESSO, Telescope time: **6h 18m**
5. **HST** (Cycle 32 & 33, CoI) 2024
FUV flux of nearby exoplanet host stars in the Ariel target list
Instrument: COS/G140L, 137 Snapshot Targets
6. **ESO/VLT** (Cycle P114, PI) 2024
Unruly mini-Neptunes: constraining the evolution of the very young transiting system TOI-1097
Instrument: ESPRESSO, Telescope time: **4h 38m**
7. **ESO/VLT** (Cycle P114, CoI) 2024
Planet evolution in- and around the desert: measuring masses of the young Neptunes orbiting TOI-942
Instrument: ESPRESSO, Telescope time: **28h 23m**
8. **ESO/VLT** (Cycle P114, dPI) 2024
Vanishing Worlds: Comparative Study of Atmospheric Mass Loss of Two Very Young Neptunes
Instrument: CRIRES, Telescope time: **6h 50m**
9. **Gemini-North** (Semester 2024A, CoI) 2024
How do resonant planetary chains form and survive?
Instrument: MAROON-X, Telescope time: **7h 30m**
10. **JWST** (Cycle 3, CoI) 2024
Contextualising our solar-system: Atmospheric characterization of the Jupiter-analogue Kepler-167e
Instrument: NIRISS, Telescope time: **39h 16m** [ADS]
11. **ESO/VLT** (DDT P112, dPI) 2024
How do resonant planetary chains form and survive?
Instrument: ESPRESSO, Telescope time: **5h 12m**
12. **ESO/VLT** (Cycle P112, PI) 2023
Unruly Neptunes: constraining the evolution of the very young transiting system TOI-942
Instrument: ESPRESSO, Telescope time: **7h 15m**
13. **ESO/VLT** (Cycle P112, dPI) 2023
Vanishing Worlds: Comparative Study of Atmospheric Mass Loss of Two Very Young Neptunes
Instrument: CRIRES, Telescope time: **12h 45m**

TECHNICAL SKILLS

- **Programming:** Python, C, Git, Bash, LaTeX
- **Software:** Office Suite, Adobe Suite
- **Optical design:** Zemax OpticStudio; PAOS
- **Codes:** ExoRad2.0; ExoSim2.x; Alfnoor; TauREx3.x
- **OS:** Linux (Ubuntu, Debian), Windows, macOS
- **Linux server administration:** *melodie* and *flounder*

PUBLICATIONS

JOURNAL ARTICLES

1. Changeat, Q., & al. (2025). On the synergetic use of Ariel and JWST for exoplanet atmospheric science. *White paper authored by the Ariel-JWST synergy working group*. DOI: [10.48550/arXiv.2509.02657](https://doi.org/10.48550/arXiv.2509.02657)
* I wrote the Ariel payload description and observing strategy; I provided detailed insights into potential synergies.
2. Mugnai L. V., Yip K. H., **Bocchieri, A.**, et al. (2025). A public dataset of Ariel simulated observations for developing exoplanetary atmosphere data reduction pipelines. *Submitted to RAS Techniques and Instruments (RASTI)*.
* I co-organised the Ariel Data Challenge; I validated the dataset ensuring its reliability and scientific value.
3. **Bocchieri, A.**, Zak, J., Turrini, D. (2025). ExoNAMD: Leveraging the spin-orbit angle to constrain the dynamics of multiplanetary systems. *Submitted to the Astronomy & Astrophysics journal*.
4. Zak, J., & al. (2025). PLATOSpec's first results: planets WASP-35b and TOI-622b are on aligned orbits, and K2-237b is on a polar orbit. *Accepted by the Astronomy & Astrophysics journal*. DOI: [10.48550/arXiv.2508.10145](https://doi.org/10.48550/arXiv.2508.10145)
* I provided comments on the measurements and established the connection with future atmospheric studies.
5. Zak, J., Boffin, H., **Bocchieri, A.** & al. (2025). Ten Aligned Orbits: Planet Migration in the Era of JWST and Ariel. *Accepted by the Astronomical journal*. DOI: [10.48550/arXiv.2505.20516](https://doi.org/10.48550/arXiv.2505.20516)
* I assessed the completeness of spin-orbit angle measurements in the Ariel candidate sample.
6. Kokori, A., & al. (2025). ExoClock Project IV: A Homogeneous Catalogue of 620 Exoplanet Ephemerides for the Ariel Space Mission. *Submitted to the Astronomical journal*.
* I am the Italian national contact for ExoClock and I provided key comments on the early draft of the paper.
7. Thuraiirethinam, V., **Bocchieri, A.**, Savini, G., Mugnai, L. V., and Pascale, E. (2025). Modelling Phase Variations introduced by Extreme Broadband Dichroics for Astronomical Photometry. *The Journal of Astronomical Telescopes, Instruments, and Systems (JATIS)*. DOI: [10.1117/1.JATIS.11.1.014003](https://doi.org/10.1117/1.JATIS.11.1.014003).
* I used my code (PAOS) to analyse the PSF degradation in Ariel FGS-2 with the simulated wavefront maps.
8. Zak, J., Boffin, H., Sedaghati, E., **Bocchieri, A.**, & al. (2025). Stellar obliquities of eight close-in gas giant exoplanets. *The Astronomy & Astrophysics journal*. DOI: [10.1051/0004-6361/202452171](https://doi.org/10.1051/0004-6361/202452171)
* I provided key comments on the early draft and provided the code to plot the results.
9. **Bocchieri, A.**, Lorenzo V. Mugnai, Pascale, E., & al. (2025). De-jittering Ariel: an optimized algorithm. *The Experimental Astronomy journal*. DOI: [10.1007/s10686-025-09999-3](https://doi.org/10.1007/s10686-025-09999-3)
10. Mugnai, L. V., **Bocchieri, A.**, Pascale, E., & al. (2025). ExoSim 2.0: the new Exoplanet Observation Simulator applied to the Ariel space mission. *The Experimental Astronomy journal*. DOI: [10.1007/s10686-024-09976-2](https://doi.org/10.1007/s10686-024-09976-2)
* I co-created the code, stress-tested it, interfaced it with PAOS, and helped in all phases of paper preparation.
11. **Bocchieri, A.**, Booth, L., and Lorenzo V. Mugnai (2025). Exploring Synergies between Twinkle and Ariel: a Pilot Study. *Accepted by the Experimental Astronomy journal*.
12. Zak, J., Boffin, H., Sedaghati, E., **Bocchieri, A.**, & al. (2024). HD 110067 c has an aligned orbit. Measuring the Rossiter-McLaughlin effect inside a resonant multiplanetary system with ESPRESSO. *The Astronomy & Astrophysics journal*. DOI: [10.1051/0004-6361/202450570](https://doi.org/10.1051/0004-6361/202450570)

- * I am the dPI of the observing proposal. I provided key comments on the subsequent analysis and interpretation.
13. Chubb, K. L., Robert, S., Sousa-Silva, C., & al. (2024). Data availability and requirements relevant for the Ariel space mission and other exoplanet atmosphere applications. *RAS Techniques and Instruments (RASTI)*. DOI: [10.1093/rasti/rzae039](https://doi.org/10.1093/rasti/rzae039)
 - * I reviewed the early draft and helped address the specific data needs of the Ariel mission.
 14. Zak, J., **Bocchieri, A.**, Sedaghati, E., & al. (2024). Stellar obliquity measurements of six gas giants. Orbital misalignment of WASP-101b and WASP-131b. *The Astronomy & Astrophysics journal*. DOI: [10.1051/0004-6361/202349084](https://doi.org/10.1051/0004-6361/202349084)
 - * I investigated the observability of various atmospheric scenarios with Ariel and their links to dynamical evolution.
 15. Mugnai, L. V., **Bocchieri, A.**, Pascale, E. (2023). ExoRad 2.0: The generic point source radiometric model. *Journal of Open Source Software*. DOI: [10.21105/joss.05348](https://doi.org/10.21105/joss.05348)
 - * I co-created the code, stress-tested it, interfaced it with PAOS, and helped in all phases of paper preparation.
 16. Jaziri, A. Y., Pluriel, W., **Bocchieri, A.**, & al. (2023). ARES VI: Viability of one-dimensional retrieval models for transmission spectroscopy characterization of exo-atmospheres in the era of JWST and Ariel. *The Astronomy & Astrophysics journal*. DOI: [10.1051/0004-6361/202347379](https://doi.org/10.1051/0004-6361/202347379)
 - * I generated and retrieved the simulated atmospheric spectra with Ariel and JWST. I wrote the paper introduction.
 17. **Bocchieri, A.**, Mugnai, L. V., Pascale, E., Changeat, Q., & Tinetti, G. (2022). Detecting molecules in Ariel low resolution transmission spectra. *The Experimental Astronomy journal*. DOI: [10.1007/s10686-023-09911-x](https://doi.org/10.1007/s10686-023-09911-x)
 18. Mugnai, L. V., Al-Refale, **Bocchieri, A.**, & al. (2021). Alfnor: Assessing the information content of Ariel's low-resolution spectra with planetary population studies. *The Astronomical Journal*. DOI: [10.3847/1538-3881/ac2e92](https://doi.org/10.3847/1538-3881/ac2e92)
 - * I introduced new methodologies to analyse Ariel Tier 1 data, originally developed in my M.Sc. thesis.

CONFERENCE PROCEEDINGS

1. Guerriero, E., et al. (2025). Development of a Cryogenic Vacuum Facility for Structural and Thermal Testing of ARIEL's Primary Mirror (M1 SM) at INAF Palermo. In *European planetary science congress (2025, Vol. 18)*. DOI: [EPSC-DPS2025-567](https://doi.org/10.1007/978-3-031-66667-7_567).
 - * I am involved in all performance-related aspects of the cryogenic test of the Ariel M1 SM in Palermo.
2. Syty, A., Beaulieu, J. P., **Bocchieri, A.**, et al. (2025). Assessing the impact of instrumental systematics on Ariel spectrometer performance using simulated observations. In *European planetary science congress (2025, Vol. 18)*. DOI: [EPSC-DPS2025-742](https://doi.org/10.1007/978-3-031-66667-7_742).
 - * I helped create and validate the datasets and methodologies used in this study to address jitter-coupled effects.
3. Zak, J., **Bocchieri, A.**, and Boffin, H. (2025). Planet migration in the era of JWST and Ariel. In *European planetary science congress (2025, Vol. 18)*. DOI: [EPSC-DPS2025-577](https://doi.org/10.1007/978-3-031-66667-7_577).
 - * I assessed the completeness of spin-orbit angle measurements in the Ariel candidate sample.
4. Yip, K. H., Mugnai, L. V., Papageorgiou, A., **Bocchieri, A.**, et al. (2025). Ariel Data Challenge 2025: Advancing Exoplanetary Signal Extraction for the Ariel Space Telescope. In *European planetary science congress (2025, Vol. 18)*. DOI: [EPSC-DPS2025-1675](https://doi.org/10.1007/978-3-031-66667-7_1675).
 - * I co-organised the Ariel Data Challenge; I validated the dataset ensuring its reliability and scientific value.
5. Pascale, E., **Bocchieri, A.**, et al. (2025). The Atmospheric Remote-sensing Infrared Exoplanet Large-survey sensitivity and performance. In *European planetary science congress (2025, Vol. 18)*. DOI: [EPSC-DPS2025-1626](https://doi.org/10.1007/978-3-031-66667-7_1626).
 - * I am involved in all aspects related to the scientific performance of the Ariel telescope. I gave the talk.

6. **Bocchieri, A.**, Zak, J., and Turrini, D. (2025). ExoNAMD: a community tool to gauge multi-planetary systems. In *European planetary science congress* (2025, Vol. 18). DOI: [EPSC-DPS2025-223](https://doi.org/10.5194/epsc2025-223).
7. **Bocchieri, A.**, Lorenzani, A., Petralia, A., Pascale, E., and Micela, G. (2025). Ariel-IT end-to-end exercise from the astrophysical scene to planetary spectra: simulations and retrieval. In *European planetary science congress* (2025, Vol. 18). DOI: [EPSC-DPS2025-384](https://doi.org/10.5194/epsc2025-384).
8. **Bocchieri, A.** and Mugnai, L. V. (2025). Leveraging advanced simulators to optimize the Ariel space mission preparation. In *European planetary science congress* (2025, Vol. 18). DOI: [EPSC-DPS2025-224](https://doi.org/10.5194/epsc2025-224).
9. Gaiotto, C., & al. (2025). Simulation of the effects of alignment tolerances and as-built mirror surface errors on the optical performance of the Ariel space telescope. In *SPIE Optical Engineering + Applications (OP25O) 2025*. DOI: [10.1117/12.3064016](https://doi.org/10.1117/12.3064016).
 - * I am involved in all performance-related aspects of the Ariel telescope, including its alignment at LDO.
10. Vernani, D., & al. (2025). Manufacturing of the 1.1 meters aluminium primary mirror for the Ariel mission. In *SPIE Astronomical Applications (OP25A) 2025*.
 - * I assessed the quality of the manufactured M1 mirrors from the interferometric measurements by MDL.
11. Cardinale, V. D., & al. (2025). Modal analysis of Ni-P coated cryogenic mirrors for the Ariel mission. In *SPIE Astronomical Applications (OP25A) 2025*.
 - * I reviewed the methodology implemented to obtain the Young's modulus of the Ni-P samples.
12. Guerriero, E., & al. (2025). Cryo-facility project for Ariel M1 tests. In *SPIE Astronomical Applications (OP25A) 2025*.
 - * I am involved in all performance-related aspects of the cryogenic test of the Ariel M1 SM in Palermo.
13. Guerriero, E., & al. (2024). Development of processes and tests for the creation of the primary mirror and the flexure hinges for the Ariel space telescope. In *International Conference on Space Optics - ICSO 2024 (CSO24)*. DOI: [10.1117/12.3075165](https://doi.org/10.1117/12.3075165).
 - * I follow all aspects related to the scientific performance of the M1 and its flexure hinges.
14. Vernani, D., & al. (2024). The manufacturing development of the 1.1 meters aluminium mirror for the Ariel mission. In *International Conference on Space Optics - ICSO 2024 (CSO24)*. DOI: [10.1117/12.3075155](https://doi.org/10.1117/12.3075155).
 - * I followed the manufacturing of the M1 with analyses of the interferometric maps after each polishing run.
15. Chioetto, P., Araiza-Durán, J., A., Barozzi, U., **Bocchieri, A.**, & al. (2024). Analysis and characterization of mid-spatial frequency surface errors on the mirrors of the Ariel space telescope. In *International Conference on Space Optics - ICSO 2024 (CSO24)*. DOI: [10.1117/12.3075158](https://doi.org/10.1117/12.3075158).
 - * I assisted in the analysis of the manufacturing defects of the Ariel M1 at different spatial scales.
16. **Bocchieri, A.**, Mugnai, L. V., Pascale, E., and Syty, A. (2024). Ariel detrending: algorithms to mitigate the jitter disturbance. In *European planetary science congress* (2024, Vol. 17). DOI: [10.5194/epsc2024-240](https://doi.org/10.5194/epsc2024-240).
17. **Bocchieri, A.**, Booth, L., and Mugnai, L. V. (2024). Exploring Synergies between Twinkle and Ariel: a Pilot Study. In *European planetary science congress* (2024, Vol. 17). DOI: [10.5194/epsc2024-272](https://doi.org/10.5194/epsc2024-272).
18. Thurairethinam, V., **Bocchieri, A.**, Savini, G., & al. (2024). Modelling phase errors induced by multilayer optical coating using Monte Carlo transmission line modelling and PAOS for performance sensitivity of the Ariel mission. In *European planetary science congress* (2024, Vol. 17). DOI: [10.5194/epsc2024-1199](https://doi.org/10.5194/epsc2024-1199).
 - * I used my code (PAOS) to analyse the PSF degradation in Ariel FGS-2 with the simulated wavefront maps.

19. Mugnai, L. V., **Bocchieri, A.**, Papageorgiou, A., and Pascale, E. (2024). Performance Simulation Tools for Space Telescopes Applied to the Ariel Space Mission. In *European planetary science congress* (2024, Vol. 17). DOI: [10.5194/epsc2024-892](https://doi.org/10.5194/epsc2024-892).
* I created PAOS and co-created ExoRad2 and ExoSim2, also as Chair of the Ariel Simulators (S2MD) WG.
20. Zak, J. and **Bocchieri, A.** (2024). Rossiter-McLaughlin effect of a sub-Neptune in a resonant chain system. In *European planetary science congress* (2024, Vol. 17). DOI: [10.5194/epsc2024-47](https://doi.org/10.5194/epsc2024-47).
* I am the dPI of the observing proposal. I provided key comments on the subsequent analysis and interpretation.
21. Pascale, E., **Bocchieri, A.**, Eccleston, P., & al. (2024). The Atmospheric Remote-sensing Infrared Exoplanet Large-survey sensitivity and performance. In *European planetary science congress* (2024, Vol. 17). DOI: [10.5194/epsc2024-537](https://doi.org/10.5194/epsc2024-537).
* I am involved in all aspects related to the scientific performance of the Ariel telescope. I gave the talk.
22. **Bocchieri, A.**, Mugnai, L. V., and Pascale, E. (2024). PAOS: a fast, modern, and reliable Python package for Physical Optics studies. In *SPIE Astronomical Telescopes + Instrumentation 2024*. DOI: [10.1117/12.3018333](https://doi.org/10.1117/12.3018333).
23. Kleyheeg, A., & al. (2024). Integration and testing of a cryogenic receiver for the Exoplanet Climate Infrared Telescope. In *SPIE Astronomical Telescopes + Instrumentation 2024*. DOI: [10.1117/12.3020522](https://doi.org/10.1117/12.3020522).
* I followed the related discussions with the EXCITE team and provided key comments on the data analysis.
24. Romualdez, L. J., Bernard, L., **Bocchieri, A.**, & al. (2024). The EXoplanet Climate Infrared Telescope (EXCITE): Gondola Pointing & Stabilization Qualification. In *SPIE Astronomical Telescopes + Instrumentation 2024*. DOI: [10.1117/12.3018442](https://doi.org/10.1117/12.3018442).
* I helped the EXCITE team with comments on the pointing analysis and how to verify the requirements.
25. Chioetto, P., & al. (2024). Planning the integration and test of a space telescope with a 1 m aluminum primary mirror: the Ariel mission case. In *SPIE Astronomical Telescopes + Instrumentation 2024*. DOI: [10.1117/12.3018650](https://doi.org/10.1117/12.3018650).
* I am involved in all aspects related to the scientific performance of the Ariel telescope, starting from M1.
26. D'Anca, F., & al. (2024). Development, manufacturing, and testing of Ariel's structural model prototype flexure hinges. In *SPIE Astronomical Telescopes + Instrumentation 2024*. DOI: [10.1117/12.3021633](https://doi.org/10.1117/12.3021633).
* These flexure hinges connect the Ariel M1 to the Telescope Optics Bench and I closely monitor their performance.
27. Picchi, P., & al. (2024). Aluminum based large telescopes: the ARIEL mission case. In *SPIE Astronomical Telescopes + Instrumentation 2024*. DOI: [10.1117/12.3018855](https://doi.org/10.1117/12.3018855).
* I measured the M1 SM at INAF-Arcetri during a 4-months campaign and analysed the interferometric maps.
28. Mugnai, L. V., **Bocchieri, A.**, & Pascale, E. (2024). ExoSim 2: the new exoplanet observation simulator applied to the Ariel space mission. In *SPIE Astronomical Telescopes + Instrumentation 2024*. DOI: [10.1117/12.3019036](https://doi.org/10.1117/12.3019036).
* I co-created the code, stress-tested it, and interfaced it with PAOS for representative PSFs vs wavelength.
29. Pascale, E., **Bocchieri, A.**, Eccleston, P., & al. (2024). The atmospheric remote-sensing infrared exoplanet large-survey (Ariel) sensitivity and performance. In *SPIE Astronomical Telescopes + Instrumentation 2024*. DOI: [10.1117/12.3017650](https://doi.org/10.1117/12.3017650).
* I am involved in all aspects related to the scientific performance of the Ariel telescope. I gave the talk.
30. Pace, E., & al. (2024). The telescope assembly of the Ariel space mission: an updated overview. In *SPIE Astronomical Telescopes + Instrumentation 2024*. DOI: [10.1117/12.3018735](https://doi.org/10.1117/12.3018735).
* I am involved in all aspects related to the scientific performance of the Ariel telescope.
31. Eccleston, P., & al. (2024). The Ariel payload design post-PDR. In *SPIE Astronomical Telescopes + Instrumentation 2024*. DOI: [10.1117/12.3019713](https://doi.org/10.1117/12.3019713).

* I contributed to achieving the payload PDR with performance analyses of the scientific payload of the mission.

32. **Bocchieri, A.**, Mugnai, L. V., & Pascale, E. (2022). Predicting the optical performance of the Ariel Telescope using PAOS. In *European planetary science congress* (2022, Vol. 16). DOI: [10.5194/epsc2022-618](https://doi.org/10.5194/epsc2022-618).
33. Mugnai, L. V., Pascale, E., A. F., Al-Refae, **Bocchieri, A.**, Papageorgiou, A., & Sarkar, S. (2022). ExoSim 2. The new time-domain simulator applied to the Ariel space mission. In *European planetary science congress* (2022, Vol. 16). DOI: [10.5194/epsc2022-370](https://doi.org/10.5194/epsc2022-370).
* I co-created the code, stress-tested it, and interfaced it with PAOS for representative PSFs vs wavelength.
34. **Bocchieri, A.**, Mugnai, L. V., and Pascale, E., Changeat, Q., & Tinetti, G. (2022). Detecting molecules in Ariel Tier 1 transmission spectra. In *European planetary science congress* (2022, Vol. 16). DOI: [10.5194/epsc2022-416](https://doi.org/10.5194/epsc2022-416).
35. Nagler, P. C., Bernard, L., **Bocchieri, A.**, & al. (2022). The EXoplanet Climate Infrared Telescope (EXCITE). In *SPIE Astronomical Telescopes + Instrumentation* (2022, Proceedings Volume 12184). DOI: [10.1117/12.2629373](https://doi.org/10.1117/12.2629373)
* I am a member of the EXCITE team and data analysis working group where we discuss design and performance.
36. Rehm, T., Bernard, L., **Bocchieri, A.**, & al. (2022). The design and development status of the cryogenic receiver for the EXoplanet Climate Infrared TELEscope (EXCITE). In *SPIE Astronomical Telescopes + Instrumentation* (2022, Proceedings Volume 12184). DOI: [10.1117/12.2629588](https://doi.org/10.1117/12.2629588)
* I followed the related discussions with the EXCITE team and provided key comments on the data analysis.
37. Bernard, L., & al. (2022). Design and testing of a low-resolution NIR spectrograph for the EXoplanet Climate Infrared Telescope. In *SPIE Astronomical Telescopes + Instrumentation* (2022, Proceedings Volume 12184). DOI: [10.1117/12.2629717](https://doi.org/10.1117/12.2629717)
* I participated in the working group meetings with the EXCITE team and provided comments on the performance.
38. Pace, E., & al. (2022). The telescope assembly of the Ariel space mission. In *SPIE Astronomical Telescopes + Instrumentation* (2022, Proceedings Volume 12184). DOI: [10.1117/12.2629432](https://doi.org/10.1117/12.2629432)
* I am involved in all aspects related to the scientific performance of the Ariel telescope.
39. Gottini, D., & al. (2022). FEA testing the pre-flight Ariel primary mirror. In *SPIE Astronomical Telescopes + Instrumentation* (2022, Proceedings Volume 12184). DOI: [10.1117/12.2629815](https://doi.org/10.1117/12.2629815)
* I am involved in the FEA correlation of the Ariel M1 measurements. I provided comments for the analysis.
40. **Bocchieri, A.** & Pascale, E. (2021). PAOS, the Physical Optics Propagation model of the Ariel optical system. In *European planetary science congress* (2021, Vol. 15). DOI: [10.5194/epsc2021-241](https://doi.org/10.5194/epsc2021-241).
41. Mugnai, L. V., Pascale, E., **Bocchieri, A.**, Changeat, Q., Al-Refae, A., & Tinetti, G. (2021). Alfnor: a population study on Ariel's low resolution transmission spectra. In *European planetary science congress* (2021, Vol. 15). DOI: [10.5194/epsc2021-185](https://doi.org/10.5194/epsc2021-185).
* I introduced new methodologies to analyse Ariel Tier 1 data, originally developed in my M.Sc. thesis.