

CV Date	17/01/2025
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Part A. PERSONAL INFORMATION

First Name	Nicholas Oliver		
Family Name	Attree		
Sex	Male	Date of Birth	
ID number Social Security, Passport			
URL Web	https://sites.google.com/view/nickattree		
Email Address	attree@iaa.csic.es		
Open Researcher and Contributor ID (ORCID)	0000-0003-3344-6693		

A.1. Current position

Job Title	Doctor Contratado		
Starting date	2023		
Institution	Consejo Superior de Investigaciones Científicas		
Department / Centre	Departamento de Sistema Solar / Instituto de Astrofísica de Andalucía		
Country	Spain	Phone Number	
Keywords	Orbit; Comet; Solar system		

A.2. Previous positions (Research Career breaks included)

Period	Job Title / Name of Employer / Country
2021 - 2023	Postdoctoral Researcher / Technische Universitaet Braunschweig / Germany
2018 - 2021	Postdoctoral Research Fellow / University of Stirling / United Kingdom
2016 - 2018	Postdoctoral Research Assistant / Laboratoire d'Astrophysique de Marseille / France
2015 - 2015	Postdoctoral Research Assistant / Queen Mary University of London / United Kingdom

A.3. Education

Degree/Master/PhD	University / Country	Year
PhD	Queen Mary University of London / UK	2015
MPhys Masters in Physics with Planetary Science	University of Leicester / UK	2011

Part B. CV SUMMARY

Scientific-Technical Contributions

Planetary scientist working on thermophysical properties and dynamics of comets, planetary-rings, and Mars, with expertise in numerical modelling and spacecraft data analysis. I have published 24 peer-reviewed papers on these subjects, 46% as first author, and 92% in Q1 publications. I have also given 33 talks at international conferences, invited seminars and workshops, including a prize-winning talk at the US DDA meeting (see sections C1 and C2 below for more details). I have given public outreach talks in Spain ('Bajo El Mismo Cielo', 2024) and the UK (National Student Space Conference, 2019; National Astronomy Week, 2020), and have been interviewed for a number of public dissemination articles (e.g. Test a los cometas, 2024), ESA and NASA press releases (Rosetta's comet sculpted by stress, 2019; Cassini Sees Objects Blazing Trails in Saturn's F Ring, 2012), as well a UK national astronomy magazine (Saturn's Jet Set Ring, Astronomy Now, 2012), local newspaper (Braunschweiger Zeitung, 2022), and UCL's Global Lab Podcast (2016). I have helped write several large research-grant

and observing-time proposals, including ongoing calls for the James Webb Space Telescope, and have contributed to software tools such as a thermophysical model that is available to the community.

Mobility and Internationalisation

I have experience working on international projects (C3 below) and space missions. I am a member of the ESA Comet Interceptor Comet Environment Working Group (selected by competitive call) as well as an associate scientist on the CoCa instrument team, and previously the ESA Rosetta/OSRIS and NASA Cassini/ISS and InSight/HP3 instrument teams. I am a member of the International Astronomical Union and fellow of the UK Royal Astronomy Society. I have experience leading undergraduate maths and physics seminars, giving a number of lectures in a Planetary Science Masters program, and helped organise the Planetary Environments in the Laboratory workshop (Stirling, 2019).

Independence and Leadership

I successfully proposed an International Team on the subject of cometary activity and dynamics to the International Space Science Institute (Bern, Switzerland) competitive call. I assembled the team (consisting of 14 scientists from 5 different European countries, plus external collaborators from the USA), and led the two-year-long project, including organising two week-long workshops in Bern as well as a number of online meetings, with the outputs listed in C1 and C2. Additionally, I have supervised two Masters student 'Astropraktikum' projects (Christian Schuckart/Kevin Müller, TU Braunschweig, 2022/23) and assisted the supervision of a PhD student (Narissa Patel, University of Stirling/Open University, thesis completed 2022).

Part C. RELEVANT ACCOMPLISHMENTS

C.1. Most important publications in national or international peer-reviewed journals, books and conferences

AC: corresponding author. (n° x / n° y): position / total authors. If applicable, indicate the number of citations

- 1 Scientific paper.** Groussin, O.; Jorda, L.; (3/13) Attree, N.; et al; Schuckart, C.2024. Thermal environment and erosion of comet 67P/Churyumov-Gerasimenko. \aap. Forthcoming article.
- 2 Scientific paper.** (1/5) Attree, N. (AC); Schuckart, C.; Bischoff, D.; Gundlach, B.; Blum, J.2024. Localised ejection of dust and chunks on comet 67P/Churyumov-Gerasimenko: testing how comets work. Monthly Notices of the Royal Astronomical Society. pp.stae2315-stae2315. ISSN 0035-8711.
- 3 Scientific paper.** (1/12) Attree, N. (AC); Gutierrez, P.; Groussin, O.; et al; Schuckart, C.2024. Varying water activity and momentum transfer on comet 67P/Churyumov-Gerasimenko from its non-gravitational forces and torques. \aap. 690, pp.A82-A82.
- 4 Scientific paper.** Lasagni Manghi, R.; Zannoni, M.; Tortora, P.; Budnik, F.; Godard, B.; (6/6) Attree, N.2024. Ephemeris Reconstruction for Comet 67P/Churyumov-Gerasimenko During Rosetta Proximity Phase from Radiometric Data Analysis. Conference proceeding for the 2024 AAS/AIAA Astrodynamics Specialist Conference. EAAS24–331.
- 5 Scientific paper.** Jones, Geraint H.; Snodgrass, Colin; Tubiana, Cecilia; et al; Ji, Hantao; (9/234) Attree, Nicholas. 2024. The Comet Interceptor Mission. Space Science Reviews. 220-1, pp.9-9.
- 6 Scientific paper.** Bischoff, D.; Schuckart, C.; (3/5) Attree, N.; Gundlach, B.; Blum, J.2023. A quantitative description of comet 67P's dust and gas production remains enigmatic. MNRAS. 523-4, pp.5171-5186.
- 7 Scientific paper.** (1/8) Attree, N. (AC); Jorda, L.; Groussin, O.; Agarwal, J.; Lasagni Manghi, R.; {Tortora, P.; Zannoni, M.; Marschall, R.2023. Activity distribution of comet 67P/Churyumov-Gerasimenko from combined measurements of non-gravitational forces and torques. A&A. 670, pp.A170-A170.

- 8 **Scientific paper.** Mueller, N.; Piqueux, S.; Lemmon, M.; et al; Banerdt, W.~B.; (16/18) Attree, N.2021. Near Surface Properties of Martian Regolith Derived From InSight HP3-RAD Temperature Observations During Phobos Transits. GRL. 48-15, pp.e93542-e93542.
- 9 **Scientific paper.** (1/3) Attree, Nicholas (AC); Kaufmann, Erika; Hagermann, Axel. 2021. Gas flow in Martian spider formation. Icarus. 359, pp.114355-114355.
- 10 **Scientific paper.** Kaufmann, E.; (2/4) Attree, N.; Bradwell, T.; Hagermann, A.2020. Hardness and Yield Strength of CO₂ Ice Under Martian Temperature Conditions. Journal of Geophysical Research (Planets). 125-3, pp.e06217-e06217.
- 11 **Scientific paper.** Mottola, Stefano; (2/7) Attree, Nicholas; Jorda, Laurent; Keller, Horst Uwe; Kokotanekova, Rosita; Marshall, David; Skorov, Yuri. 2020. Nongravitational Effects of Cometary Activity. SSR. 216-1, pp.2-2.
- 12 **Scientific paper.** (1/6) Attree, N. (AC); Patel, N.; Hagermann, A.; Grott, M.; Spohn, T.; Siegler, M.2020. Potential effects of atmospheric collapse on Martian heat flow and application to the InSight measurements. PSS. 180, pp.104778-104778.
- 13 **Scientific paper.** (1/14) Attree, N. (AC); Jorda, L.; Groussin, O.; et al; {Rodrigo}, R.2019. Constraining models of activity on comet 67P/Churyumov-Gerasimenko with Rosetta trajectory, rotation, and water production measurements. A&A. 630, pp.A18-A18.
- 14 **Scientific paper.** Groussin, O.; (2/19) Attree, N.; Brouet, Y.; et al; {Tosi}, F.2019. Erratum: Correction to: The Thermal, Mechanical, Structural, and Dielectric Properties of Cometary Nuclei After Rosetta. SSR. 215-5, pp.41-41.
- 15 **Scientific paper.** Groussin, O.; (2/19) Attree, N.; Brouet, Y.; et al; {Tosi}, F.2019. The Thermal, Mechanical, Structural, and Dielectric Properties of Cometary Nuclei After Rosetta. SSR. 215-4, pp.29-29.
- 16 **Scientific paper.** Marshall, D.; Rezac, L.; Hartogh, P.; Zhao, Y.; (5/5) Attree, N.2019. Interpretation of heliocentric water production rates of comets. A&A. 623, pp.A120-A120.
- 17 **Scientific paper.** Matonti, C.; (2/48) Attree, N.; Groussin, O.; et al; Vincent, J. -B.2019. Bilobate comet morphology and internal structure controlled by shear deformation. Nature Geoscience. 12-3, pp.157-162.
- 18 **Scientific paper.** (1/55) Attree, N. (AC); Groussin, O.; Jorda, L.; et al; Shi, X.2018. Tensile strength of 67P/Churyumov-Gerasimenko nucleus material from overhangs (Corrigendum). A&A. 614, pp.C2-C2.
- 19 **Scientific paper.** Becker, Tracy M.; Colwell, Joshua E.; Esposito, Larry W.; (4/5) Attree, Nicholas O.; Murray, Carl D.2018. Cassini UVIS solar occultations by Saturn's F ring and the detection of collision-produced micron-sized dust. Icarus. 306, pp.171-199.
- 20 **Scientific paper.** (1/55) Attree, N. (AC); Groussin, O.; Jorda, L.; et al; Shi, X.2018. Tensile strength of 67P/Churyumov-Gerasimenko nucleus material from overhangs. A&A. 611, pp.A33-A33.
- 21 **Scientific paper.** (1/15) Attree, N. (AC); Groussin, O.; Jorda, L.; et al; Hartogh, P.2018. Thermal fracturing on comets. Applications to 67P/Churyumov-Gerasimenko. A&A. 610, pp.A76-A76.
- 22 **Scientific paper.** Murray, Carl D.; Cooper, Nicholas J.; Williams, Gareth A.; (4/5) Attree, Nicholas O.; Boyer, Jeffrey S.2014. The discovery and dynamical evolution of an object at the outer edge of Saturn's A ring. Icarus. 236, pp.165-168.
- 23 **Scientific paper.** (1/4) Attree, Nicholas O. (AC); Murray, Carl D.; Williams, Gareth A.; Cooper, Nicholas J.2014. A survey of low-velocity collisional features in Saturn's F ring. Icarus. 227, pp.56-66.
- 24 **Scientific paper.** (1/4) Attree, N.~O. (AC); Murray, C.~D.; Cooper, N.~J.; Williams, G.~A.2012. Detection of Low-velocity Collisions in Saturn's F Ring. ApJL. 755-2, pp.L27-L27.

C.2. Conferences and meetings

- 1 Nicholas Attree. The Results of ISSI Team #547: Understanding the Activity of Comets Through 67P's Dynamics. EuroPlanet Science Congress. Europlanet. 2024. Germany.

- 2 Attree, Nicholas; Argawal, Jessica; Jorda, Laurent; Groussin, Oliver; Marschall, Raphael; Lasagni Manghi, Riccardo; Tortora, Paolo; Zannoni, Marco. Constraints on comet thermal models from Rosetta at 67P/Churyumov-Gerasimenko. European Planetary Science Congress. 2022.
- 3 Attree, Nicholas; Jorda, Laurent; Groussin, Olivier; Marschall, Raphael; Lasagni Manghi, Riccardo; {Tortora}, Paulo; {Zannoni}, Marco. Activity on different terrain types on comet 67P/Churyumov-Gerasimenko. European Planetary Science Congress. 2021.
- 4 {Attree}, Nicholas; {Jorda}, Laurent; {Groussin}, Olivier; et al; {Hartogh}, Paul. Constraining activity models of comet 67P/Churyumov-Gerasimenko with Rosetta data. European Planetary Science Congress. 2018.
- 5 Nicholas Attree. Thermal and mechanical properties in the near-surface of comet 67P/Churyumov-Gerasimenko from Rosetta. Invited seminar at the Max Planck Institute for Solar System Research. 2018.
- 6 Attree, N.; Groussin, O.; Jorda, L.; et al; {Hartogh}, P.. Thermal Fracturing on Comet 67P/Churyumov-Gerasimenko. European Planetary Science Congress. 2017.
- 7 Attree, Nicholas Oliver; Murray, Carl; Cooper, Nicholas; Williams, Gareth. Collisional Features in Saturn's F Ring. AAS/Division for Planetary Sciences Meeting Abstracts \#48. 2016.
- 8 Nicholas Attree. Collisional Features in Saturn's F Ring. Invited seminar for the Institute of Astronomy Exoplanets seminar series, University of Cambridge. 2015.
- 9 Attree, Nicholas; Murray, Carl D; Cooper, Nicholas; Williams, Gareth. Collisional Features in Saturn's F Ring (Ray Duncombe student prize). AAS/Division of Dynamical Astronomy Meeting #45. 2014.
- 10 Murray, C.; Cooper, N.~J.; Attree, N.; Williams, G.~A.; Boyer, J.~S.. The discovery and dynamical evolution of 'Peggy', an object at the outer edge of Saturn's A ring (Invited). AGU Fall Meeting Abstracts. 2013.
- 11 Attree, N.; Murray, C.; Cooper, N.~J.; Williams, G.. F Ring Mini-Jets. AGU Fall Meeting Abstracts. 2012.

C.3. Research projects and contracts

- 1 **Project.** Ciencia y tecnología espaciales para la exploración de cometas y planetas rocosos (PID2021-126365NB-C21). PI Prof. Luisa Lara López. (Instituto de Astrofísica de Andalucía). 01/09/2022-31/08/2026. 1.936.000 €.
- 2 **Project.** International team #547 Understanding the activity of comets through 67P's dynamics. Nicholas Attree. (International Space Science Institute). 24/05/2022-2024.
- 3 **Project.** Comet and Asteroid Re-Shaping through Activity (CAstrA). PI Prof. Jessica Agarwal. (Technische Universitaet Braunschweig). 01/03/2018-31/08/2023. 1.484.688 €.
- 4 **Project.** Comet Physics Laboratory (CoPhyLab). PI Prof. Bastian Gundlach. (Technische Universitaet Braunschweig). 01/01/2018-01/01/2022.
- 5 **Project.** UK Space Agency Aurora funding. PI Prof. Axel Hagermann. (University of Stirling). 01/03/2018-31/08/2021. 422.060 €.
- 6 **Project.** Multi Instrument Analysis of Rosetta Data (MiARD). PI Prof. Nicolas Thomas. (Laboratoire d'Astrophysique de Marseille). 01/03/2016-31/08/2018. 1.659.064,5 €.