

**Department of Space and Climate Physics
Mullard Space Science Laboratory**



**Transformational astrophysics and exoplanets with HWO
Vincent Van Eylen**

Habitable Worlds Observatory

- UKSA-funded feasibility study for a UK-led HWO instrument, focused on the high-resolution imager (HRI)
- UCL/MSSL with partners at Durham, UKATC, RAL Space, CEA



Transformational astrophysics and exoplanet science
with Habitable Worlds Observatory's High Resolution Imager

Primary thematic area: astronomy, astrophysics and fundamental physics (Astro)

Secondary thematic area: the Solar System and Planetary Environments (Planetary)

Lead authors:

Vincent Van Eylen, Mullard Space Science Laboratory (MSSL), UCL, v.vaneylen@ucl.ac.uk,
Richard Massey, Durham University, r.j.massey@durham.ac.uk

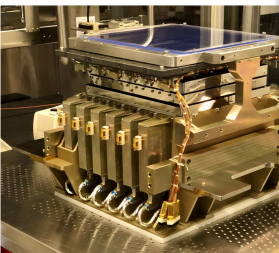
Co-signatories:

UCL: Saeeda Awan, Jo Bartlett, Louisa Bradley, Andrei Bubutanu, Kan Chen, Andrew Coates, Mark Cropper, Ross Dobson, Fabiola Antonietta Gerosa, Emery Grahill-Bland, Leah Grant, Daisuke Kawata, Tom Kennedy, Mirjae Kim, Adriana Adeline Mihalescu, Jan-Peter Muller, Georgios Nicolaiou, Mathew Page, Paola Pinilla, Louisa Preston, Ted Pyne, Hamish Reid, Santiago Velez Salazar, Jason L. Sanders, Giorgio Savini, Ralph Schoenrich, George Seabrooke, Alan Smith, Philip J. Smith, Nicolas Tessore, Marina Ventikos, Esa Vilenius, Francesca Waines, Silvia Zane. **Durham University:** James Betts, Sownak Bose, Cyril Bourgenot, Shaun Cole, Jessica E. Doppel, Vincent Eke, Carlos Frenk, Leo W. H. Fung, Qiuhan He, Mathilde Jauzac, Owen Jessop, Zane Deon Lentz, Gavin Leroy, Simon Morris, Yuan Ren, Jurgen Schmoll, Ray Sharples, Fionagh Thomson, Maximilian von Wietersheim-Kramsta, Kai Wang, Stephane V. Werner. **Cardiff University:** Subhajit Sarkar. **Imperial College London:** Jacob Kegerreis, James Kirk, Subhanjoy Mohanty. **Keele University:** John Southworth. **Lancaster University:** John Philip Stott. **Natural History Museum:** Ashley King. **Newcastle University:** James William Nightingale, David Rosario. **Northumbria University:** Paola Tiranti. **Queen Mary University of London:** Edward Gillen, Cynthia S. K. Ho. **Queens' University Belfast:** Christopher Watson. **RAL Space:** Andrzej Fludra, Chris Pearson. **SPAN Space Engineering and Technology Working Group Member:** Yun-Hang Cho. **Surrey AI Imaging Limited:** Yu Tao. **The Open University:** Joanna Barstow, James Bowen, Chris Castelli, Chiaki Crews, Anagaj Duara, Mark Fox-Powell, David Hall, Carole Haswell, Kit-Hung Mark Lee, Joan Requena, Anabel Romero, Jesper Skottfelt, Konstantin Stefanov. **UK ATC:** Olivia Jones. **University of Birmingham:** Sean McGee, Annelies Mortier, Graham P. Smith, Amalie Stokholm, Amaury Triaud. **University of Bradford:** Becky Alexis-Martin. **University of Bristol:** Malcolm Bremer, Katy L. Chubb, Joshua Ford, Ben Maughan, Daniel Valentine, Hannah Wakeford. **University of Cambridge:** Juan Paolo Lorenzo, Gerardo Barrios, Chandan Bhat, Xander Byrne, Gregory Cooke, Natalie S. Hogg, Nikku Madhusudhan, Maximilian Sommer, Sandro Turchetta, Georgios N. Vassiliadis, Nicholas Walton, Mark Wyatt. **University of East Anglia:** Manoj Joshi. **University of Edinburgh:** Beth Biller, Mariangela Bonavita, Trent Dupuy, Aliza Kenzhebekova, Brian P. Murphy, Vincent Okoth, Cyrielle Optom, Larissa Palethorpe, Paul Palmer, Mia Belle Parkinson, Ken Rice, Sarah Rugeheimer, Colin Snodgrass, Ben J. Suliuff. **University of Hertfordshire:** Souradeep Bhattacharya, Emma Curtis-Lake, Jan Forbrich, Darshan Kakkad, David J. Lagattuta, Brian Omeri Momanyi Bihang'a, Peter Scicluna. **University of Leeds:** Richard Booth. **University of Leicester:** Martin Barstow, Sarah Casewell, Leigh Fletcher, Anushka Sharma. **University of Manchester:** Christopher J. Conselice. **University of Oxford:** Suzanne Algrain, Jayne Birkby, Claire Guimond, Carly Howett, Mei Ting Mak, Richard Palin. **University of Portsmouth:** Chris Pattison, Richard Robinson, Samantha Youles. **University of St Andrews:** Andrew Collier Cameron. **University of Surrey:** Justin Read. **University of Warwick:** David John Armstrong, David J. A. Brown, Heather Cegla. **Aarhus University (Denmark):** Mikkel N. Lund. **Carnegie Observatories (USA):** Andrew Robertson. **CEA Paris-Saclay (France):** Pierre-Olivier Lagage. **Cornell University (USA):** Ligia F. Coelho. **Indian Institute of Astrophysics (India):** Preethi R Karpor. **Instituto de Astrofísica de Canarias (Spain):** Enric Pallé. **KU Leuven (Belgium):** Leen Declin, Denis Dehère, Kaustubh Halik. **NASA Goddard Space Flight Center (USA):** Swara Ravindranath. **NASA JPL (USA):** Jason Rhodes. **Space Telescope Science Institute (USA):** Marc Postman, Iain Neill Reid. **Univ. Grenoble Alpes (France):** Fabien Malbet. **University of Arkansas (USA):** Amirneazam Amiri. **University of Bern (Switzerland):** Marck Braam. **University of Groningen (Netherlands):** Qiuhan He. **University of Oslo (Sweden):** Haakon Dahle. **University of Sydney (Australia):** Angharad Weeks.

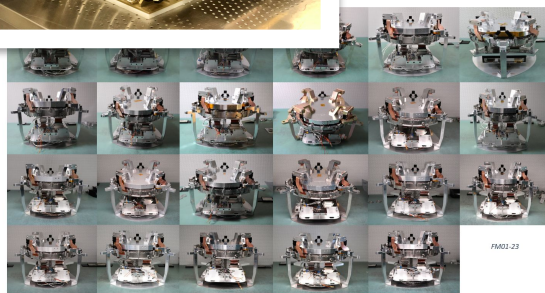
arXiv:2512.16416v1 [astro-ph.IM] 18 Dec 2025

Extensive instrument track record, many with US contributions

JWST NIRSpec calibration unit



Euclid VIS leadership



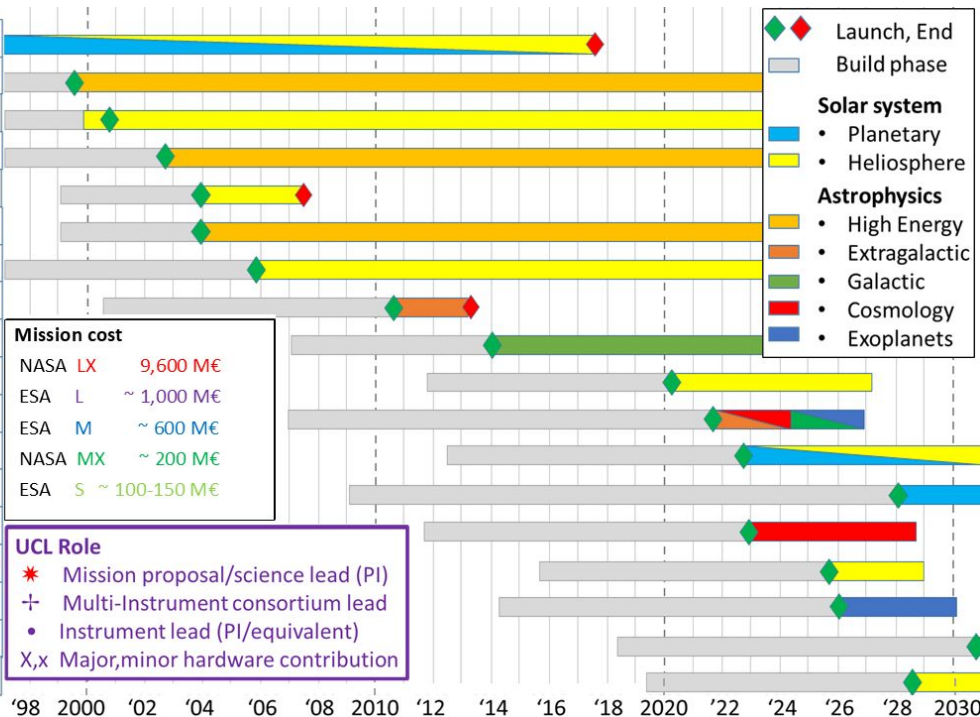
| | |
|-------------------|-------|
| Cassini (M) | X • |
| XMM-Newton (L) | X • |
| Cluster (M) | X • |
| Integral (M) | x |
| Double Star (S) | X • |
| Swift (MX) | X • |
| Hinode (M) | X • |
| Herschel (L) | X |
| Gaia (M) | X |
| Solar Orbiter (M) | X • + |
| James Webb (LX) | x |
| JUICE (L) | x |
| ExoMars (L) | X • + |
| Euclid (M) | X • |
| SMILE (S) | x * |
| PLATO (M) | X |
| Vigil (M-like) | X • |
| EUVST (M-like) | X • |

Mission cost

| | |
|---------|--------------|
| NASA LX | 9,600 M€ |
| ESA L | ~ 1,000 M€ |
| ESA M | ~ 600 M€ |
| NASA MX | ~ 200 M€ |
| ESA S | ~ 100-150 M€ |

UCL Role

- * Mission proposal/science lead (PI)
- + Multi-Instrument consortium lead
- Instrument lead (PI/equivalent)
- X,x Major, minor hardware contribution



26 PLATO CCDs