

Royal
Astronomical
Society

The Lord Vallance of Balham KCB
Minister of State for Science, Research and Innovation

CC: Prof. Michele Dougherty, Executive Chair, Science and Technology Facilities
Council

6 February 2025

Dear Lord Vallance,

Light Pollution Threat to European Southern Observatory

I am writing to you as President of the Royal Astronomical Society, the UK organisation which represents more than 4,000 astronomers and geophysicists, to ask for your help in safeguarding a facility of vital importance to our science.

The European Southern Observatory (ESO), the world-leading astronomical observatory in northern Chile, is at great risk from the proposed construction of a nearby industrial complex by the company AES Andes¹. The associated light pollution, atmospheric turbulence and dust from this development is set to badly compromise the scientific operations of the telescopes, to the extent that it represents an existential threat to the Observatory in its present form.

ESO was established in 1962, the UK joined in 2002, and it now includes 16 member states. The Observatory is situated in one of the very best sites for astronomy globally, and is as a result home to a large number of optical telescopes.

These include facilities like the Very Large Telescope (VLT) and the European Extremely Large Telescope (E-ELT), which on completion in 2028, will be the largest visible light telescope in the world. This will be able to directly image Earth-sized planets around the nearest stars, for example, a key part of the search for life elsewhere in the Universe.

The 2023 Royal Astronomical Society Survey of Demographics and Research Interests noted that 28% of UK astronomers and solar system scientists had used data from its telescopes in the previous two years². This makes it the most popular astronomical facility cited by respondents, and is a testament to its importance.

¹ <https://www.eso.org/public/news/eso2501/>

² Article in A&G by R. Massey and S. McWhinnie, in press

ESO itself notes the many UK scientific and technical contributions to the facility in the 23 years since we joined³. Our scientists use its facilities for key discoveries in areas such as exoplanet detection, and in finding phosphine in the atmosphere of Venus, and our engineers play a seminal role in constructing its optics and instruments.

The UK national contribution makes up 16% of the ESO budget, amounting to around €31 million (£26 million) in 2021, the most recent year for which information is publicly available⁴. In 2022 UKRI estimated that UK organisations had received £117 million since accession, and that the overall economic benefits were typically £45.5 million each year, or around twice the investment made by the Government. Companies such as Teledyne e2V and Optic Glyndwr are direct beneficiaries, supplying components for the telescopes and their instruments⁵.

The proposal by AES Andes, a subsidiary of the US energy company AES Corporation, is to build an industrial complex covering 3,000 hectares, between 5 and 11 kilometres from the ESO Paranal site. The project is related to the large scale production of hydrogen and green ammonia, and the development of solar and wind energy, and battery storage.

At such close proximity to the site, it is hard to see how mitigation measures will protect the telescopes from the resulting increases in light pollution, dust and turbulence (the outline plans include no details of this in any case). A far more preferable option would be for the facility to be moved further away, as at a distance of 50 km or more its impact would be greatly reduced.

It is difficult to overstate how serious the threat is to UK, European and global astronomy. Our science depends on access to pristine dark sky sites, of which there are precious few. If this site is compromised then there is simply nowhere else as good for astronomy in the southern hemisphere, and the view through a key window into a large fraction of the universe will have been compromised.

As you know, astronomy and space science ask some of the biggest questions about our origins and whether we are alone in the universe. They are disciplines with an extraordinary power to inspire the population as a whole, and are seen as a key

³ <https://www.eso.org/public/about-eso/memberstates/britishinvolvement/>

⁴ <https://www.eso.org/public/about-eso/memberstates/>

⁵ <https://www.ukri.org/news/uk-reaps-rewards-from-european-astronomy-organisation-membership/>

“STEM attractor” to encourage young people to pursue studies and careers in science in general.

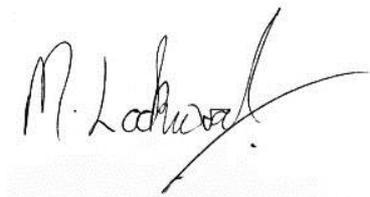
Given the importance of the ESO site, can you please assure us that the UK Government will do its utmost to protect it for future generations?

With that in mind, we would like to suggest that you take the following actions on behalf of the UK astronomy community:

1. To contact Aisén Etcheverry Escudero, the Science, Technology, Knowledge and Innovation Minister in the Chilean government and ask her to call for a halt to the new development, and if it does go ahead, for it to be relocated to a safe distance from the ESO sites.
2. To work with your counterparts in the other 15 ESO member states and urge them to do the same.

We would of course be very happy to meet with you to discuss this further, and to arrange this, please contact Dr Robert Massey, the Deputy Executive Director of the Royal Astronomical Society, via rmassey@ras.ac.uk.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'M. Lockwood', with a long, sweeping flourish extending to the right.

Prof. Mike Lockwood FRS
President, Royal Astronomical Society