



President

SOCIETÀ ASTRONOMICA ITALIANA

Largo E. Fermi 5, 50125 Firenze

Ms Anna Rathsmann, Chair of ESA Council
Italian Members of ESA Council

Rome, 4th November 2022

Dear prof. Rathsmann, dear Members of the ESA Council,

I am writing to you on behalf of the Italian Astronomical Society, which represents more than 200 professional astronomers in Italy. Our Society is affiliated to the European Astronomical Society (EAS), with a membership of more than 4,000 across the continent.

The ongoing deployment of the SpaceX Starlink system and of OneWeb is set to be followed by the Amazon Kuiper satellite constellation. These and other planned systems could see the population of satellites in Low-Earth Orbit (LEO) rise from around 2,000 (the 2019 baseline) to more than 300,000 by the end of this decade. One of these constellations is expected to be funded by the European Union, and initial feasibility work on this is underway, with the European Space Agency expected to play a key role in its construction and deployment.

There are a number of concerns associated with this unprecedented change in the use of LEO, such as the management of space traffic and debris, and for our community the direct and potentially very serious effects on astronomical research at both optical and radio wavelengths. The latter is covered in detail in the International Astronomical Union Dark and Quiet Skies Reports¹, to which the EAS contributed, which are under consideration by the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS)².

In short, such a large population of satellites, including the EU constellation, could seriously compromise the work of new and existing astronomical facilities on the ground and in space. These include the Vera Rubin Observatory and the Square Kilometre Array Observatory, where many ESA member states are making substantial investments, both of which are set to begin operations later this decade. Recent work by ESA scientists also documents a similar impact on orbiting observatories like the Hubble Space Telescope.

As an ESA Council member, you will be very much aware of the world-leading capability of the Agency

¹<https://www.iau.org/news/announcements/detail/ann22002/>

²https://www.unoosa.org/res/oosadoc/data/documents/2022/aac_105c_1/aac_105c_1l_394add_7_0_html/AC105_C1_L394Add07E.pdf (p.3-5)



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in space science, including in astronomy, which sits alongside the scientific programmes at observatories on the ground. Through the European Astronomical Society, our Society is already working with the European Commission staff responsible for the new EU constellation on the development of mitigation measures to prevent serious harm to our science.

We urge ESA to make a similar commitment to ensure that any satellite constellations it constructs and / or deploys are put in space without detriment to ground- and space-based astronomy. We would welcome your support for this as a member of ESA Council.

Specific measures could include, inter alia:

- *To ensure that ESA-led projects perform an impact assessment to determine the effects on astronomy and other negative externalities in LEO;*
- *To build sustainability measures into procurement contracts in order to compel companies to perform reflectance analyses and other measures to understand the impacts on astronomy.*
- *In partnership with the European Astronomical Society, to develop a code of best practice to provide to all ESA industry providers to mitigate impacts on astronomy.*

If you need further information, the EAS has a dedicated satellite working group covering optical and radio astronomy that includes experts from the research community and representation from major astronomical facilities, and whose members will be happy to assist you.

Yours sincerely,

Prof. Roberto Buonanno,
President of the Italian Astronomical Society