

DARK AND QUIET SKIES AS A COPUOS AGENDA ITEM: SOME REFLECTIONS

Rafael Moro Aguilar, LL.M.

Florida International University,
Miami, USA

Member, Delegation of Spain to the
UNCOPUOS Legal Subcommittee

Laura Jamschon Mac Garry, LL.D.

University of Belgrano, Buenos Aires,
Argentina

Former Acting Chair, UNCOPUOS Legal
Subcommittee



FLORIDA
INTERNATIONAL
UNIVERSITY

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Introduction

- Since the launch of the first large satellite constellations in 2019, there is a growing interference in astronomical research by reflected sunlight and radio emissions from satellites
- **Starting in 2021, the issue of dark and quiet skies for science and society has been discussed as an agenda item at the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS)**
- **This contributed to open in COPUOS an important debate** which was already being carried out by scientific and academic institutions:
 - **how to reach a balance** between the development of space technology and the viability of scientific observation
 - **how to prevent or at least mitigate** further interference

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Introduction (2)

- This is a **technical problem** requiring **technical solutions**
 - **Satcons operators and the astronomical community have engaged in a coordination effort aimed to mitigate the harmful effects of satellite reflections and emissions on astronomical data**
 - **Best practices** are being created for that purpose by stakeholders
- **This channel of collaboration must be maintained**, and for the moment it may be sufficient to at least mitigate this unintended effect
- However, **implementation of mitigation measures by the operators of the constellations is done on a voluntary basis**
- **This may not be enough in the longer term**, particularly if additional constellations are launched, and as a result ground-based astronomy becomes impracticable

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Why COPUOS?

- **The COPUOS mandate** as reflected in UNGA Resolutions 1348(XIII) and 1472(XIV)A states that the **Committee must**:
 - (i) **Examine "the nature of legal problems** which may arise in the carrying out of programmes to explore [and to use] outer space"
 - (ii) **"facilitate international cooperation in this field** within the framework of the United Nations"
- The issue also involves the **application of the UN Outer Space Treaties**
- **In those cases where two lawful activities come into conflict, they should be harmonized**, reconciling the principles of freedom of use and exploration (Art. I OST) with the principles of due regard, non-harmful contamination, and non-interference (Art. IX OST)
- **This requirement also applies to private space operators** (Art. VI OST)

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Why COPUOS? (2)

- All this is further shown by the work of **the two multilateral UN bodies** addressing the different perspectives of dark and quiet skies: **the International Telecommunication Union (ITU) and COPUOS**
- In 2022, **COPUOS already recognized that both optical and radio astronomical observations are an essential aspect of space activities and should be protected from interference** (Doc. A/77/20, para. 182)
- In 2023, **the Group of Friends of Dark and Quiet Skies was created in COPUOS**
 - Initiative of Spain and Chile as co-facilitators; many other COPUOS member States are now participating
 - The aim is to raise awareness and maintain interest about this issue at the Committee in order to find solutions

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Dark and Quiet Skies as a current STSC agenda item

- Since 2024, the topic is again on the STSC agenda, under the title **"Dark and quiet skies, astronomy and large constellations: addressing emerging issues and challenges"**
- **The work program will extend until 2029** > 4 more sessions along with all the preparatory work of each session, technical presentations, side events, and relevant discussions at the annual STSC session
- **What can be expected?**
 - a) **The industry will hear the concerns of the astronomical sector and may offer concrete solutions**
 - b) **Astronomical institutions may also report on current strategies that they are using to counter the negative effects of constellations of satellites**

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Dark and Quiet Skies as a current STSC agenda item (2)

- c. **Space actors may offer examples of best practices already implemented** to mitigate light pollution and radioelectric interference
- d. **Space companies might report on any extra costs** that such measures are causing on the space industry > on the prices of services, investment incentives, and opportunities
- e. **COPUOS offers an appropriate forum for cooperative solutions** by pulling together efforts from different private and public stakeholders worldwide
- f. **COPUOS Member States might decide to work on a voluntary set of guidelines** to promote a responsible launch and operation of satellite constellations
- g. **The STSC might serve as a forum to multilaterally monitor the evolution and effectiveness of measures adopted**

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Dark and Quiet Skies as a current STSC agenda item (3)

- **We are witnessing a growing interest and support for this topic from member States within COPUOS** > from the perspective of responsible use and exploration of outer space
 - **During 2025, 21 States and 6 observers made statements under this agenda item** > an increase of 40% in States' and 200% in observers' participation
 - **Some contributions during 2025 have been particularly noteworthy** > such as the conference room paper prepared by the Group of Friends (CRP.22), and the side events organized by some Member States with the support of UNOOSA on the margins of the STSC and the plenary sessions
- **Another positive effect has been a much more visible presence of the ITU in the COPUOS sessions** > thereby reinforcing the cooperation between these two bodies, which is essential for a full treatment of the issue

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Dark and Quiet Skies as a current STSC agenda item (4)

- **The success of the STSC will depend on several factors:**
 - **An active involvement of a wide range of States, including developing States,** in the discussions and the proposed solutions
 - **The inclusive involvement of different stakeholders:** space industry, space science, space policy, space economy, and space diplomacy
 - **A comprehensive and mutual understanding of the concerns raised by the different stakeholders**
 - **The implementation of potentially agreed upon measures or guidelines**
 - **Public and private investment in more sustainable technological solutions**

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Dark and Quiet Skies as a potential LSC agenda item

- **The issue of D&Q Skies has also been raised by a number of delegations at the LSC in recent sessions** > However, no consensus has been reached so far as to including the topic in the agenda of the LSC
- This may be because:
 - **A preliminary exhaustive examination of the technical aspects is necessary to effectively determine whether regulation is necessary**, and if so, what kind of regulation and which aspects it should address
 - **It might reflect a bottom-up approach**, where self-regulatory, tailor-made solutions are more welcome than regulatory ones, and where voluntary best practices are favored over binding rules
 - The awareness that, while States remain central to meet global challenges and have unique responsibilities in the multilateral system, **solutions increasingly depend on the private sector and non-State actors, who should therefore be part of the deliberations**

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Dark and Quiet Skies as an LSC agenda item (2)

- However, in the future, one can perfectly envision an agenda item at the COPUOS LSC, such as an **"Exchange of views on the regulatory aspects of the preservation of dark and quiet skies"**
- **Indeed, as long as international space law is absent, solutions may also be coming from national space law**
 - **States must assess compliance of private operators with applicable international law so as to avoid any harmful interference** > arguably, this would include the issue of light pollution caused by space objects
 - Initially, the only related national rule was a United States federal law enacted in 2001 prohibiting obtrusive space advertising
 - At present, we also have **the FCC's** recommending coordination plans between constellations and the National Science Foundation; **France's** legal requirement that the brightness of spacecraft must not exceed 7th magnitude; and the draft **EU Space Act** adopting both approaches

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Conclusion

- **Satellite constellations and astronomical research are lawful forms of exploring and using outer space**
- **A coordination in the exercise of these freedoms is needed, and for the moment it is achieved through consultations between industry and astronomers**
- **Best practices are being created, and already some legal rules are also being introduced at the national level**
- **However, we need a set of common, international standards**
- **This topic is now included in the agenda of the STSC of COPUOS**
- **It is possible that one day, it could also be considered at the LSC**
- **As long as there is interference between satellite constellations and astronomy, this topic should remain in the agenda of COPUOS**