



NATIONAL APPROACHES FOR PROTECTING DARK & QUIET SKIES

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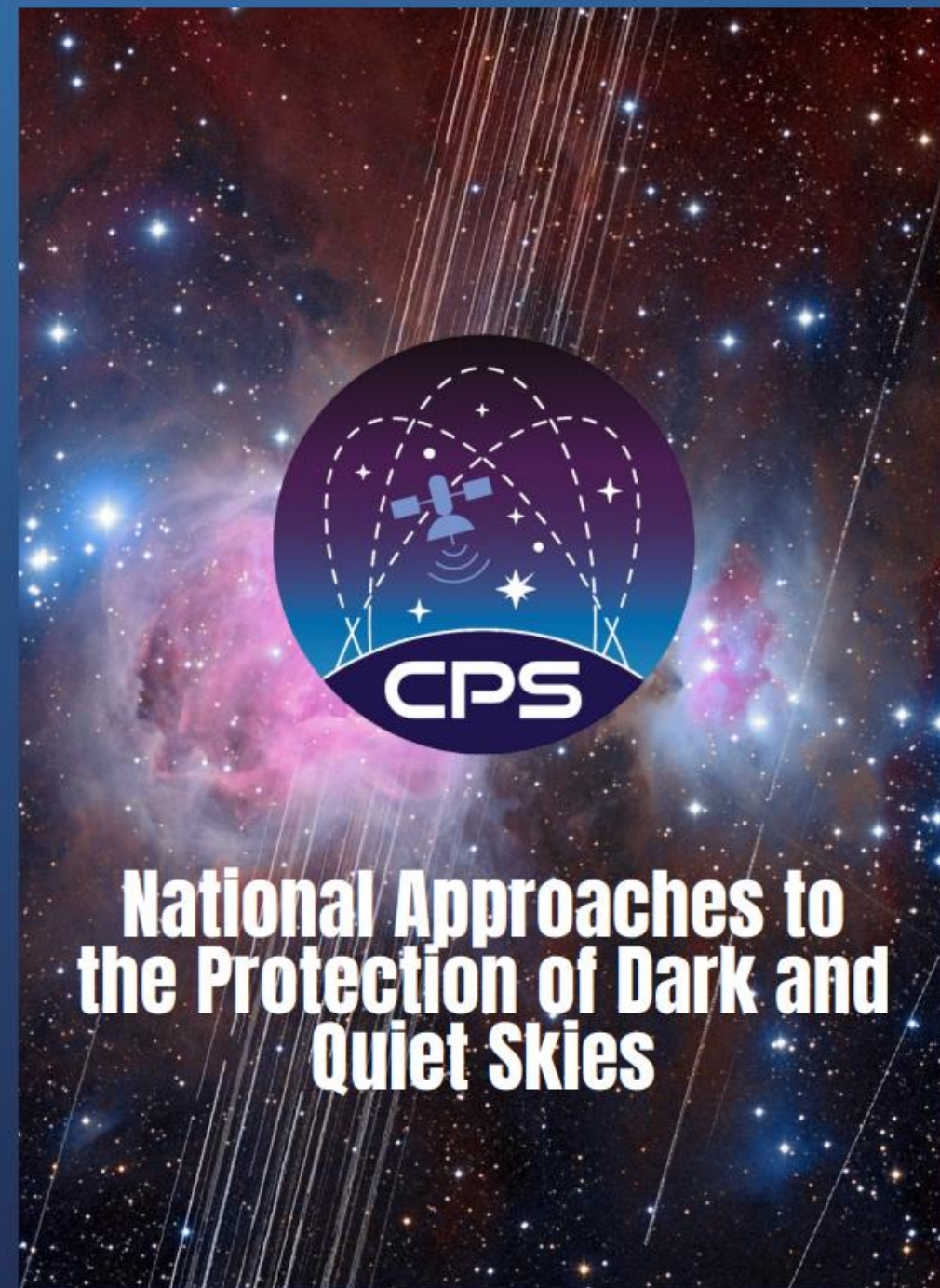
REPORT

PUBLISHED IN 2024

ANALYSED 77 COUNTRIES ACROSS THE GLOBE

LOOKED INTO NATIONAL ACTION TOWARDS THE
PROTECTION OF D&QS

REGULATORY INSTRUMENTS (POLICY AND LAW) AND
INITIATIVES



[YAKUSHINA, Y., VALDIVIA-LEFORT, M., MARTIN, C., FALLE, A.,
BLAGOJEVIC, T., KIOKO, M., HOOK, C., ANNE-SOPHIE, THIELE,
S., NICHOLS, T., KHAN, M. R., DALAL, R., OSTAPIKO, O., MOT, P.,
JOVANČEVIĆ, V., SALISBURY, L., GUPTA, V., AJ, R., MANOURAS,
G., & BOLEY, A. \(2024\). NATIONAL APPROACHES TO THE
PROTECTION OF DARK AND QUIET SKIES. ZENODO.](#)

THE RESEARCH TOOK THREE MAIN DIRECTIONS:

- PROTECTION OF DARK SKIES
- PROTECTION OF QUIET SKIES
- SATELLITES REGULATIONS



DARK SKIES: GENERAL OVERVIEW

GROUND-BASED LIGHT POLLUTION

Fragmented, but visible global regulatory **trend**: to reduce ground-based impacts

Protection of the dark sky **is done by**:

- Adoption of **LP legislation**
- **Changes** in the **environmental regulations**
- **Combined** approaches

Lack of specific measures to **protect astronomical activities**

ORBITAL LIGHT POLLUTION

New national **space regulations**: **consider** the **need to protect the DS** without indicating specific measures

Lack of provisions for **reducing the impacts of satellites**



DARK SKIES: GROUND-BASED LIGHT POLLUTION

MAIN MEASURES:

- **Lighting curfew:** turning lights off between certain times
- **Limiting Upward Emission**
- **Putting limits on colour temperature:** e.g., $\text{max} \leq 3000 \text{ K}$
- **Special protection of certain sites** (such as astronomical sites)
- **Zoning** (dark sky zones)
- Environmental Impact Assessment (**EIA**)
- **Sanction mechanism**



YAKUSHINA, Y. (2024). LIGHT POLLUTION REGULATIONS AND WHERE TO FIND THEM. JOURNAL OF ENVIRONMENTAL MANAGEMENT, 373, 123757.

DARK SKIES: ORBITAL LIGHT POLLUTION

MAIN ISSUES:

- Mega-constellations of satellites

NEW TECHNOLOGIES:

- Space-based Solar Power Projects
- Space advertising (e.g. Avant Space)
- “Sun on demand” projects
(e.g. Reflect Orbital)



Regulatory gap → strong
need to integrate
environmental
considerations into space
activities (e.g., EIAs)



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ACQUARONE, C., ROTOLA, G., & YAKUSHINA, Y.
(2025). SPACE SOLAR POWER: A SUSTAINABLE
SOLUTION OR AN ENVIRONMENTAL DILEMMA?
CENTRAL EUROPEAN ACADEMY LAW REVIEW, 2(2).
[HTTPS://DOI.ORG/10.62733/2024.2.9-22](https://doi.org/10.62733/2024.2.9-22)

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DARK SKIES: KEY RECOMMENDATIONS

Recognise the value of the night and the need to protect it
(e.g. resolutions)

Recognise light pollution as a form of environmental pollution

Incorporate the **protection of dark sky** and **environmental concerns**
into **space regulations**

Develop **recommendations for reducing impacts from space objects**
and **encourage national states** to adopt them

Improve national regulations on **authorisation and licensing**

QUIET SKIES: GENERAL OVERVIEW

Radio spectrum is **regulated** at the **international level** through the **ITU Radiocommunication Sector (ITU-R)**

ITU member states have their own **analogous national administration**: national policies, ministerial plans, guidelines and regulations, etc.

Countries explicitly **protecting QS** --> the **degree of protection varies**

Radio Quiet Zones (RQZs): geographical areas created by governments through legislation (national law), usually remote and far from sources of terrestrial interference

RQZs: **geographic protection**

Some countries **protect only specific frequency bands**, and **others rely** primarily on international **ITU coordination**

Some **new efforts** – **EU Space Act** (proposal)

QUIET SKIES: PROBLEMS & RECOMMENDATIONS

Awareness raising: Not much knowledge about QS **among national authorities** and interest groups

Having an **international framework does not translate into** having **awareness** at the **national level**

Maximum interference defined by ITU:

- consideration of **aggregated effects**
- not enforcement but **rather negotiation** (national sovereignty)

Guidelines for national administrations: explaining QS and harmful interference (e.g. UEMR)

Collaboration with operators and negotiation are key: guidelines for industry, non-binding agreements



THANK YOU FOR YOUR ATTENTION

LET'S STAY IN TOUCH



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