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PEACEFUL USE OF LASERS IN SPACE

# DECLARATION

BY MEMBERS OF THE SCIENTIFIC COMMUNITY

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Lasers have significantly evolved, enabling a wide range of novel applications, including space debris removal, asteroid deflection, and space exploration. This enormous potential is hindered by the lack of international cooperation. This Declaration presents our vision regarding the peaceful use of laser technology in and towards space. We indicate key steps to achieve this vision and stipulate basic scientific and policy principles. We intend the Declaration to inspire relevant stakeholders and the broader public in the employment of high-energy laser technology for peaceful space-related purposes.

## -- LASER TECHNOLOGY FOR SPACE --

With regard to the increasing trend of satellite mega-constellations deployments, orbital debris will threaten more critical assets in space than ever before. Existing lasers can provide a close-to-perfect solution for orbital debris removal ensuring future deployment and functioning of satellites that are highly critical for our interconnected lives and science-based policymaking. Orbital debris is a matter of urgency for all nations.

Lasers are also potentially useful in the prospecting of celestial bodies, including asteroids, enabling humanity to expand into space. Additionally, high-energy laser technology could provide the means for asteroid deflection in ongoing planetary defense efforts ensuring long-term sustainability for the civilization on Earth.

Lasers can soon prove their utility as a new type of propulsion system to accelerate small-sized interplanetary spacecraft, or even interstellar probes in a more distant future, thus revolutionizing space exploration.

Such radical technology development is an opportunity for a global multi-stakeholder scientific cooperation between state and non-state actors, who can effectively pool resources, knowledge and capabilities.

THIS DECLARATION HAS BEEN ENDORSED BY

GÉRARD MOUROU

A NOBEL PRIZE LAUREATE IN PHYSICS 2018



## -- POLICY --

The utilization of lasers in space, especially high-energy lasers for peaceful purposes, will require **new forms of international cooperation**, based on key principles such as transparency, equitability, inclusivity, and accountability. Therefore, we call upon the international community to commit itself to developing and respecting a **normative framework** implying **confidence building measures** robust enough to establish and maintain trust among all states in a full cycle of development, deployment, and operation of high-energy laser technology.

An internationally recognized **regime** that is in accordance with or expands the *UN COPUOS Guidelines for the Long-term Sustainability of Outer Space Activities* should be agreed upon. The regime should meet the genuine concerns of the international community; simultaneously, it should prevent stigmatization of various high-energy laser technology applications. Such a policy is achievable provided there is sufficient clarity regarding the intentions and interests of involved state and non-state actors (including industry and research institutions).

In this regard, small and medium-sized states and international organizations can serve as mediators and brokers of mutually beneficial international cooperation based on the above-mentioned principles. Thus, laser technology and its applications offer an **unprecedented opportunity** to establish scientific, industrial, and security cooperation on a global scale. The time for seizing this opportunity is now, notwithstanding the current global security environment.

## -- THE WAY AHEAD --

We, the members of the scientific community of laser technology developers, political scientists and other involved experts, call upon the international community to:

- *Establish* an **understanding of lasers** as civilian and scientific instruments for various applications that will help humankind flourish on Earth and expand outward into space.
- *Spread the idea* in relevant communities of people with expert knowledge, both in technical fields and humanities, to plant the seed of a supportive **grassroot movement**.
- *Develop* an **inspirational narrative** framed in cosmopolitan and liberal yet credible and realistic terms.
- *Draft* a **global governance system** following the principles of inclusion, equality, transparency, non-discrimination, mutual trust, and accountability **that will enable to**
  - *establish an international scientific community for laser use in space* preceding possible establishment of a CERN-like organization designed for the scientific and industrial laser technology development, non-discriminatory deployment and benign operation of various laser technologies on Earth and in space, and
  - *introduce an international security regime* ensuring transparent and predictable benign operation of (high-energy) lasers in and towards space that will respect and build upon the mandates of existing international law, organizations, and relevant bodies.
- *Organize* a **critical mass of states** willing to jointly found and fund the CERN-like organization, including through in-kind contributions stemming from **their own hi-tech industries** capable of developing, manufacturing, deploying, and servicing components for high-energy laser installations.

## -- THE CONTEXT --

### **This Declaration was preceded:**

- by **the conference** *Prague Laser SpaceApps Workshop 2019* ([report](#)) on the 25<sup>th</sup> – 27<sup>th</sup> Sep. 2019,
- by **the policy paper** *Kick-Starting Cosmopolitan Governance through Science: The Case of a Giant Laser System* ([link](#)), published by the Institute of International Relations in Prague on the 21<sup>th</sup> December 2019,
- by **the academic paper** *Reaching for the stars: The case for cooperative governance of directed energy technologies* ([link](#)), published in Bulletin of the Atomic Scientists on the 23<sup>rd</sup> April 2020.

### **The Declaration is envisaged to be followed by:**

- a **second conference** in Mikulov, Czechia that will propose policy and institutional building blocks on the subject peaceful use of lasers in space,
- an **establishment** of an international scientific association for laser applications in space.

## -- SIGNATORIES --