Thor's Hammer:

ASATS, Cyberspace, and Human Development

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United Nations/United Arab Emirates High Level Forum:
Space as a driver for socio-economic sustainable development
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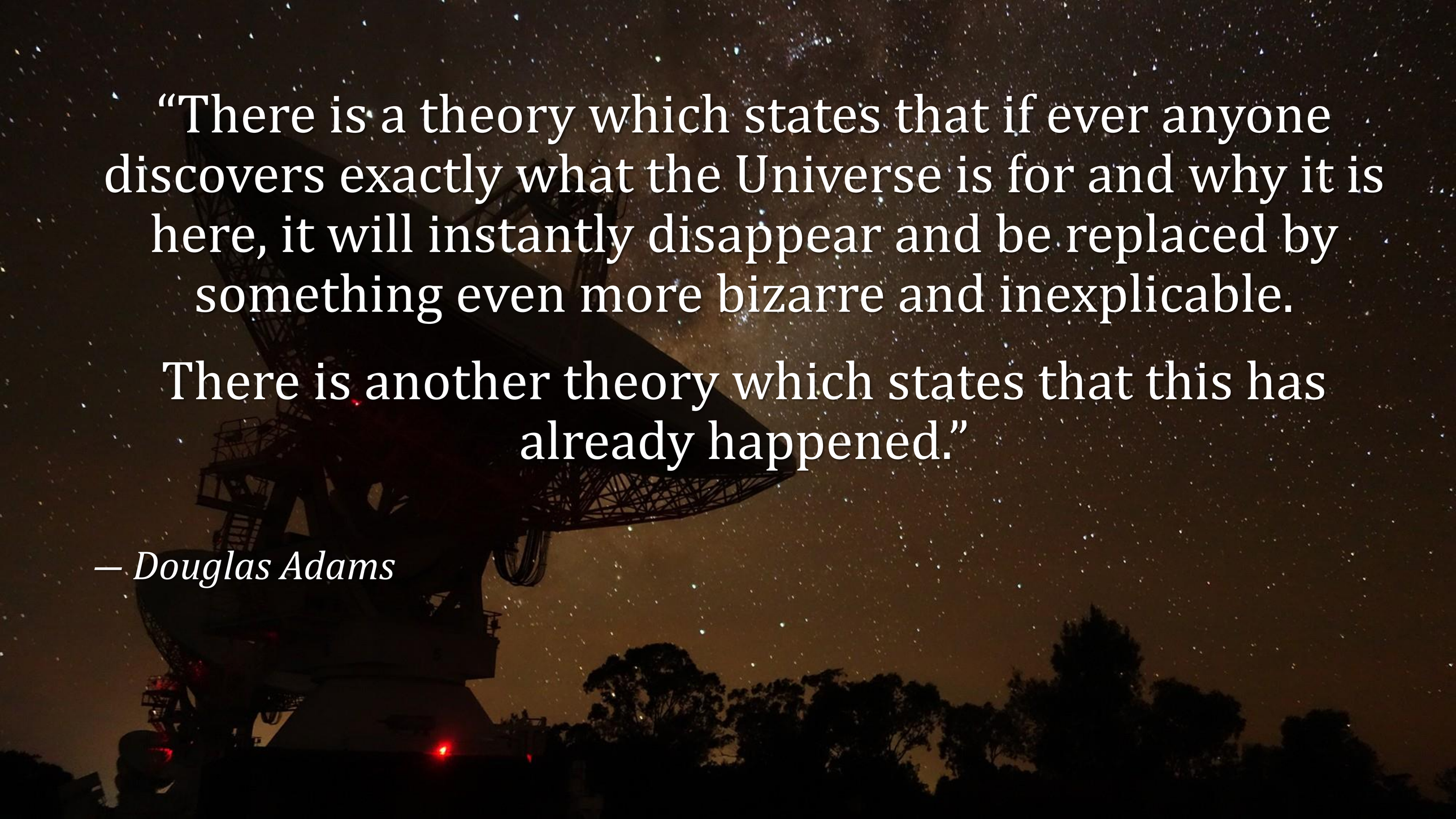
I. A Call to the Stars
II. Interludes of Cyberspace Travel
III. A Red Giant



“There is a theory which states that if ever anyone discovers exactly what the Universe is for and why it is here, it will instantly disappear and be replaced by something even more bizarre and inexplicable.

There is another theory which states that this has already happened.”

— *Douglas Adams*

I. A Call to the Stars


SUSTAINABLE DEVELOPMENT GOALS
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD

Goal 17: Revitalize the global partnership for sustainable development

ASATS-Space Diplomacy

Space Law Legal instruments

- Outer Space Treaty 1967 (OST)
- Rescue Agreement 1968
- Liability Convention 1972
- Registration Convention 1975
- Moon Agreement 1979
- + UNGA resolutions, sets of principles, guidelines

UNOOSA

Outer Space Treaty: Articles 1 and 2

- The **exploration** and use of outer space shall be carried out for the benefit and in the interests of all nations and **shall be the province of all mankind**;
- Outer space **shall be free for exploration** and use by all States;
- Outer space is **not subject to national appropriation** by claim of sovereignty, by means of use or occupation, or by any other means.

UNOOSA

Outer Space Treaty: Article VI

States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, **whether such activities are carried on by governmental agencies or by non-governmental entities**, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty.

Outer Space Legal Order

A fundamental point about the second space age is that it gives rise to additional challenges of law which are a prerequisite to the realization of

a legal order in outer space.

Outer Space Treaty: Article III

- States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international co-operation and understanding.

War in Space? Or… Space Diplomacy

- **Article 2(4) of UN Charter** (no threat or use of force)
- **Article 51 of UN Charter** (self-defense/attribution)
- **Jus ad bellum** (permissible-just war)
- **Jus in bello** (limitations in conduct)
- Article 45 of the ITU Constitution (harmful interference)

II. Interludes of Cyberspace Travel

Res extra patrimonium

The word Internet is simply a label.

The word Cyberspace embodies a gallery of technologies: a doorway to another universe.

“The greatest victory
is that which requires no battle.”
— Sun Tzu, The Art of War

Space Accessibility…

Maneuver Warfare for ASATS

- Inflicting defeat in a rapid, focused, and unexpected manner while weakening decision-making ability through shock and disruption.

DDOS ATTACKS

The “*weaponization*” of Cyberspace means also the same in OUTER SPACE

Militarization or Self-Defense?

… or, Enhanced Space Accessibility?

What will should defend?

- **People,**
- **Our Future,**
- **Thus, human development.**

Convention on International Liability for Damage Caused by Space Objects (resolution 2777

(1972 Liability Convention, Article VII)

***space debris

Human Security

United Nations…

Human Security means "…to protect the vital core of all human lives in ways that enhance human freedoms and human fulfillment."

A concept that is transnational in character…

similar to cyberspace and outer space.

1. UN Charter, Article 2(4) on the use of force is binding on all nation-states;

2. Satellites disruptions of a cyber or hybrid nature respond to the evolution of technology;

3. What constitute the illegal use of force?

The most haunting elements of ASATs revolve around the ethics of conducting warfare.

Stakeholders must reflect on the reasons behind preemptive strikes and wars of aggression.

Point of Departure: Space Society

Manfred Lachs: State activities in outer space has taken international law into new dimensions.

Wilfred Jenks: It is necessary that international space law evolves quickly to offer solutions. There is a sense of urgency, recognizing that leisure time is a luxury that we cannot not afford in the ambit of technologies that provide threats similar to the explosion of the first atomic bomb.

Space Society

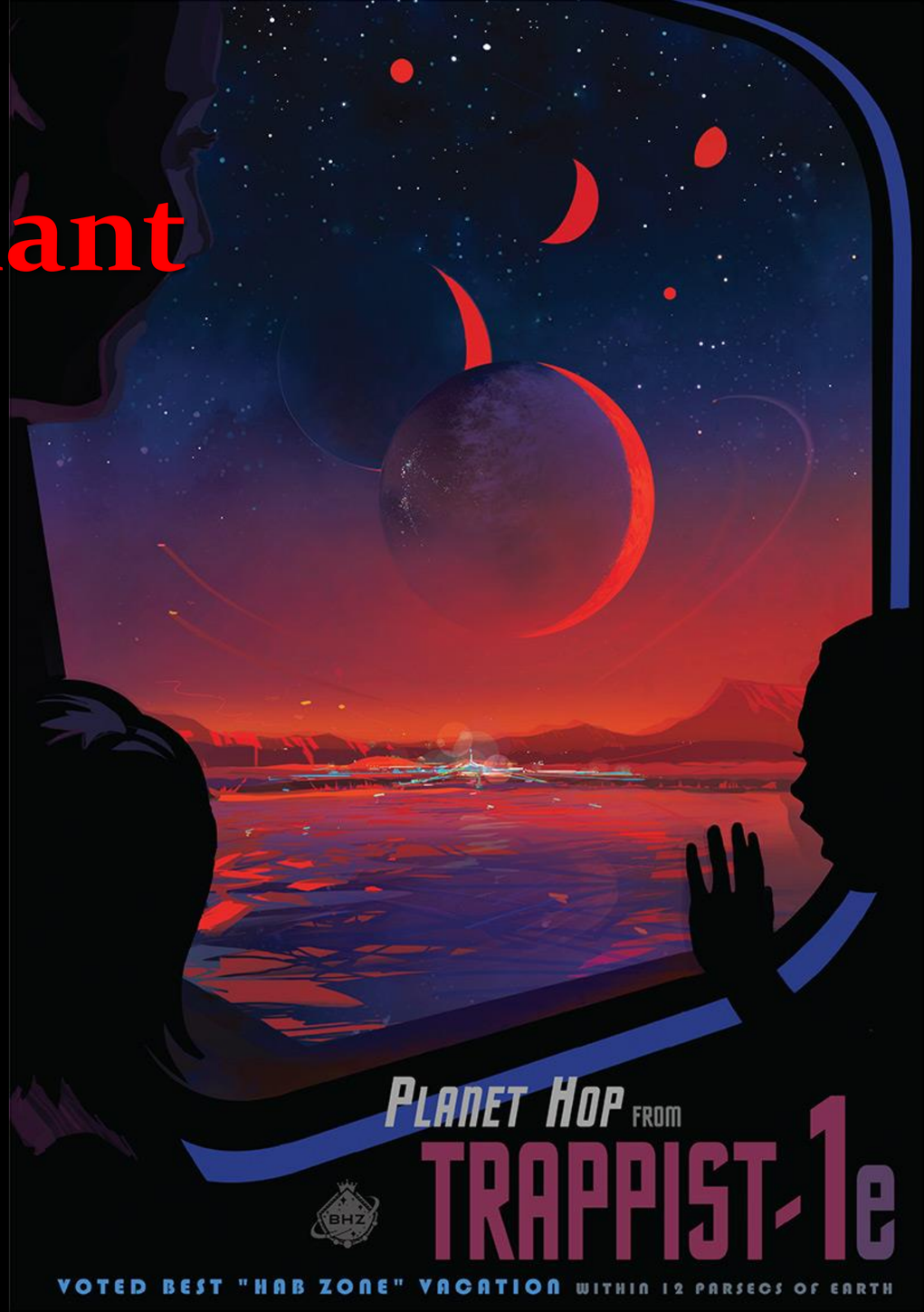
- **THUS,**

"...SDGs cannot be realized without peace and security; and peace and security will be at risk without sustainable development. These twin objectives are mutually reinforcing and inextricably linked."

Mr. KIM Won-soo, High Representative for Disarmament Affairs, UNODA

Dubai, United Arab Emirates, 20 November 2016

III. A Red Giant



Thor’s Hammer

The mythological story of Thor’s hammer:

A weapon

Thor's Hammer (allegory+science)

As the story goes—the hammer was forged in the heart of a dying star.

Physicists have hypothesized that its heavy weight would be attributed to the effects of a **red giant star**.

Red Giant

NASA scientists have noted the possibility of new life on planets within the habitable zone of red giants.

Close to us: more than 150 red giant stars… close enough—for proposed missions of exploration.

Human Reflection (Drake Equation)

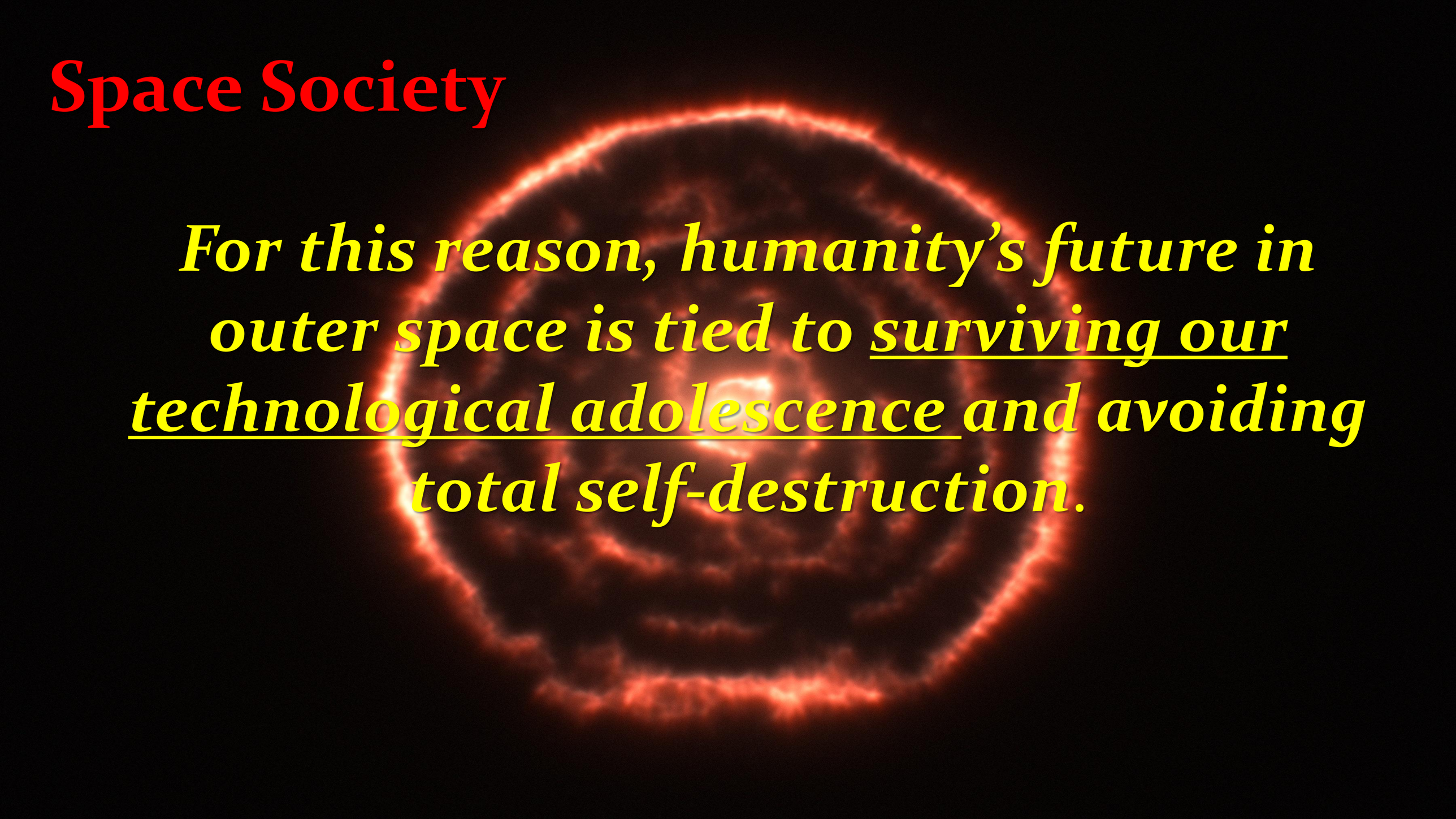
- Carl Sagan.
- The formula is a self-assessment of humanity!!

- $N = R^* \cdot f_p \cdot n_e \cdot f_l \cdot f_i \cdot f_c \cdot L,$
- Where:
- N = The number of civilizations in the Milky Way Galaxy whose electromagnetic emissions are detectable. (The number of advanced technical civilizations.)
- R^* = The rate of formation of stars suitable for the development of intelligent life.
- f_p = The fraction of those stars with planetary systems.
- n_e = The number of planets, per solar system, with an environment suitable for life.
- f_l = The fraction of suitable planets on which life actually appears.
- f_i = The fraction of life bearing planets on which intelligent life emerges.
- f_c = The fraction of civilizations that develop a technology that releases detectable signs of their existence into space.
- L = The length of time such civilizations release detectable signals into space

Space Society

- Sagan noted the positive result of the Drake Equation —only if— the inhabitants of a planet would not destroy themselves shortly after discovering radio astronomy.

Space Society



For this reason, humanity's future in outer space is tied to <u>surviving our technological adolescence</u> and avoiding total self-destruction.

Space Society

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Thank You