Protecting the dark and quiet sky is our joint responsibility.

But have you ever wondered what’s your connection to the Big Bang?

Piero Benvenuti
Dark and Quiet Sky

• The STSC and COPUOS have been lively in discussing how to reach a fair compromise between operating very large satellite constellations and preserving a dark and quiet sky for science and humanity.

• ... but have you ever considered, at your personal level, why should you care about the sky?

• Isn’t it a matter to be left to the astronomers?
Astronomy and Cosmology

- To answer these questions, we should realize that astronomy’s final objective is not just astrophysics, but the grand task of constructing a rational model of the entire reality.

- Indeed, modern cosmology poses important challenges to philosophy and theology. Therefore, it profoundly probes our consciousness and relationship with the Cosmos. We are all affected...

- …a brief historical detour is in order…
Origin and nature of the cosmos: an ancient quest that continues challenging us...
Our ancestors tried to answer with mythical narratives...

*Enûma Elish*
(II millennium a.C.)

*Bereshît*
(Genesis I, VI-V century a.C.)

*Gilgameš*
(III millennium a.C.)
Greek philosophers attempted a rational answer...
The elusive cosmology...

• Galileo’s *cannocchiale*, in those crucial nights of 1610, opened a new window on the universe...

• ...but at the same time, it destroyed the crystalline spheres of the Aristotelian cosmology.

• Mankind was left bereft of an understandable cosmology.
Man is again dismayed in front of the vastness of the cosmos.

How Nature, wise and frugal, could commit such disproportions, with superflous hand. So many nobler bodies to create?

*John Milton, Paradise Lost*
The Einstein revolution

- The speed of light is a universal constant.
- Space and Time are relative and inseparable between them and from the universe's matter-energy.
- The matter-energy shapes the geometrical structure of space.
- The space (so curved) defines the trajectories that matter and light must follow.
George Lemaître, the father of modern cosmology...

- “Un univers homogène de masse constante et de rayon croissant, rendant compte de la vitesse radiale des nébuleuses extra-galactiques.” (1927)
- Hubble (1929) published his Hubble Law on the recession of galaxies with Slipher and Humason.
- Einstein initially argues with Lemaître, but then he accepts the experimental evidence and eliminates the cosmological constant from his equations: “the biggest blunder in my life” – he will say later...
- In 2018, the “Hubble law” was renamed “Hubble-Lemaître law)
Primordial Nucleosynthesis

- H ~ 75% (3 minutes)
- He ~ 25%
- D, Li, B

Nuclear fusion in stellar cores

- He, C, O, N, ... Fe ... ≈ 10^6 yrs

CMB (≈3x10^5 yrs)

Spread in the Interstellar Medium

Supernovae, stellar wind

Molecules aggregation

Molecular clouds, Protoplanetary disks

Habitable Planets ? Intelligent life?

Quantistic Fluctuation ?

Inflation ? (≈10^{-33} sec)
A Copernican counter-revolution...

- The essential characteristic of reality is its **evolution**.
- The old, sharp Cartesian distinction between matter and spirit (consciousness) is being challenged in the context of a holistic evolution.
- Pause for a moment to reflect on our own existence (material and spiritual): it is not just a part of, but strongly related to all the phases of cosmic evolution.
- Therefore, relationships are more essential than entities.
- A cosmic relational ontology should be developed...
The Big-bang really questions us deeply...

• We discover ourselves as the consciousness of the cosmos, capable of deciphering its mysterious history and relating our earthly existence to the history of the entire universe.

• By cultivating a deep connection with every phase of cosmic evolution, with every marvel that springs forth, and most importantly, with every other earthly consciousness, we may find that this cosmic love has the power to elevate our smallness to the status of co-creator of the universe, liberating us from the confines of space and time...
In conclusion...

• This new comprehension of the cosmos, that has been made known to us by relentless observation of the starry sky, invests all of us with tremendous responsibility in front of the entire universe.

• Hopefully, this vision will foster universal and peaceful collaboration, eliminating all barriers and local quarrels that, seen from the cosmic majesty, lose any *raisons d’être*. 
This is why we all must protect our sky and, most importantly, raise our eyes, observe it, and meditate on our relation to it.
Thank you for your attention