ESA Planetary Protection Updates

COSPAR Planetary Protection Panel
London, 24th April 2024

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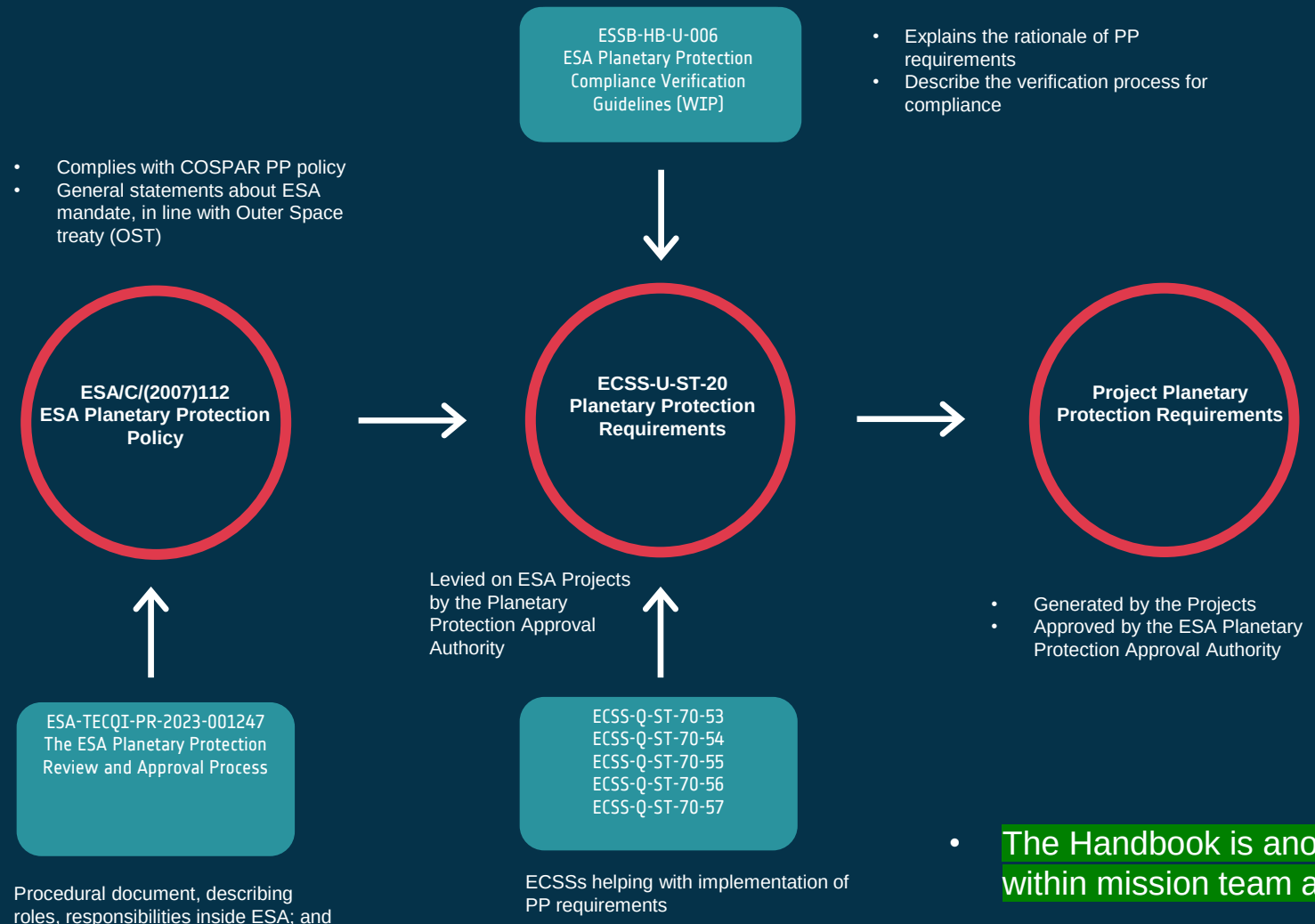
Documentation updates



ESSB-HB-U-006 – Handbook for planetary protection

Independent safety office (PPO) convener of the working group

ESA experts from Human Robotic Explorations, Science, Technology Engineering and Quality, Space Transportation and Operations

Covering variety of disciplines, CC&C, M&P, RAMS, GNC, System, mission trajectory/space debris, life science support, product assurance

First draft being produced

- The Handbook is another milestone to make planetary protection more embedded within mission team and to increase transparency on the verification process

MOON – Contamination aspects

Increasing number of missions targeting the Moon, i.e. ESA Argonauts
Scientific interest mainly focused on volatiles

Study on-going (since 1-March), with main objectives:

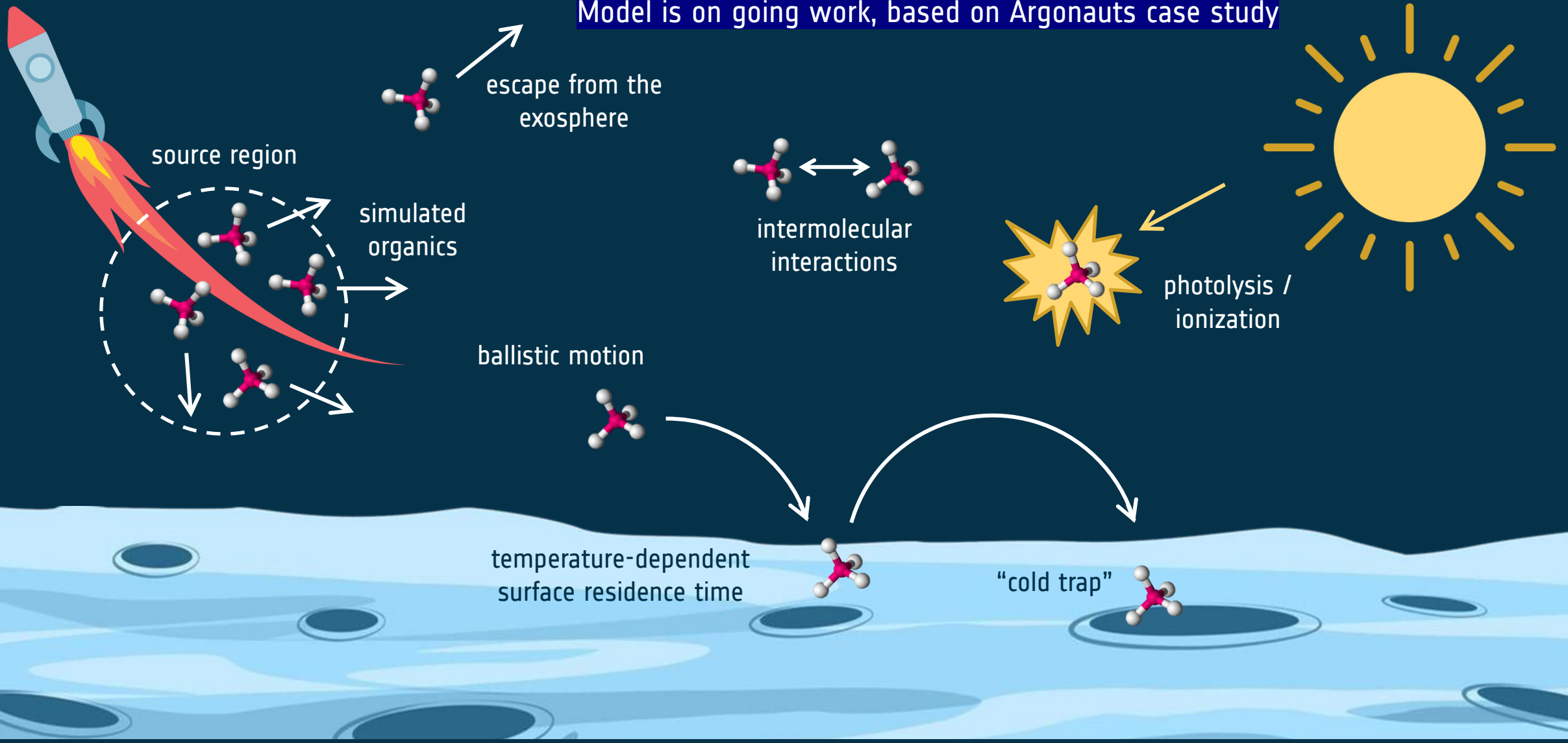
- Assess the organic materials and propulsion products carried by spacecrafts, orbiters and lander (with target the Earth's Moon)
- Determine the risk for scientific experiments or investigations caused by organic materials introductions, through numerical modelling of the transport and distribution of selected materials until they reach the PSRs
- Determine utility of an organic list. What to do with it?
- Assess any other type of contamination (i.e. inorganic, dust, nuclear, etc.) that could have ramifications / cross overs with planetary protection and potentially affect scientific goals

Multidisciplinary activity, with science in the 'driving sit', with the role 'to inform'. Argonaut mission is giving a very much appreciated support with their scientists and engineers

Workshops planned in the next months to gather international scientific community, stay tuned

TRANSPORT OF VOLATILES ON THE MOON

Model is on going work, based on Argonauts case study



Metagenomic workshop – follow up

https://atpi.eventsair.com/23m40---ppnse2023/programme

October 2023 - ESA workshop: led to the definition of concrete next steps to modernise planetary protection tools

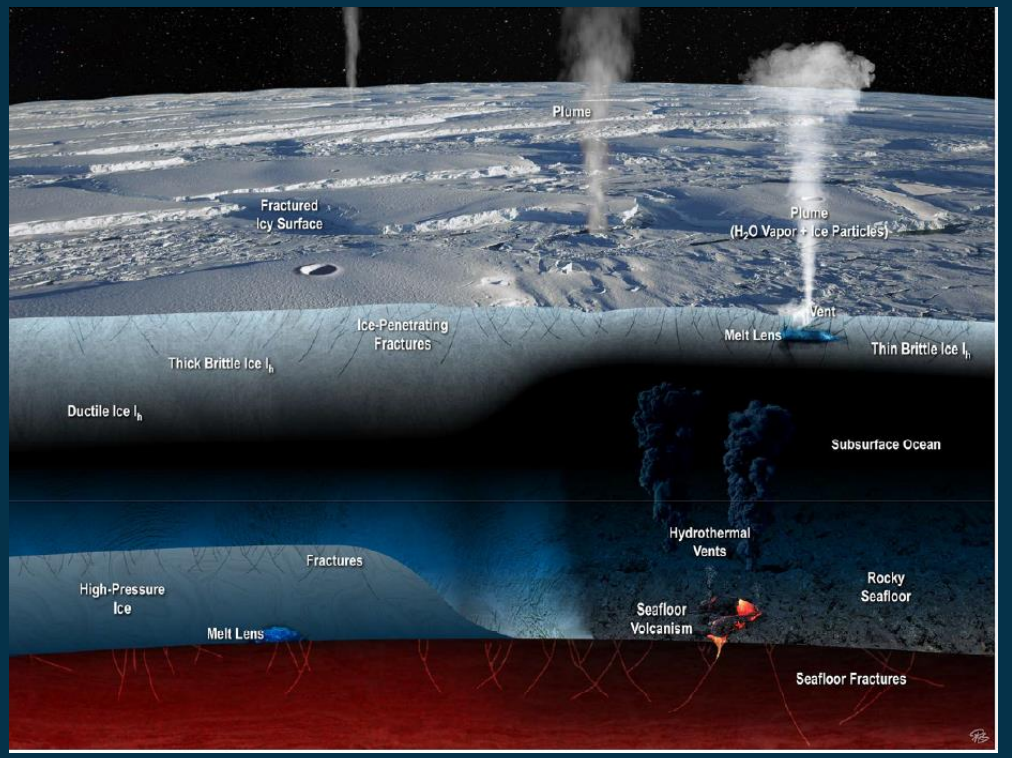
Metagenomics provide information on the "function" of microorganisms, which is considered key to feed probabilistic models of contamination

Part of ESA PP vision to create frameworks for assurance cases

Keep momentum on the topic high: discussions ongoing with NASA PP Office to plan follow up work, including an additional workshop on metagenomic. Tentative dates and scope of the workshop are being discussed

COSPAR PP panel involvement (?)

Icy Moons



Credit: National Academies of Sciences, Engineering, and Medicine (2023)

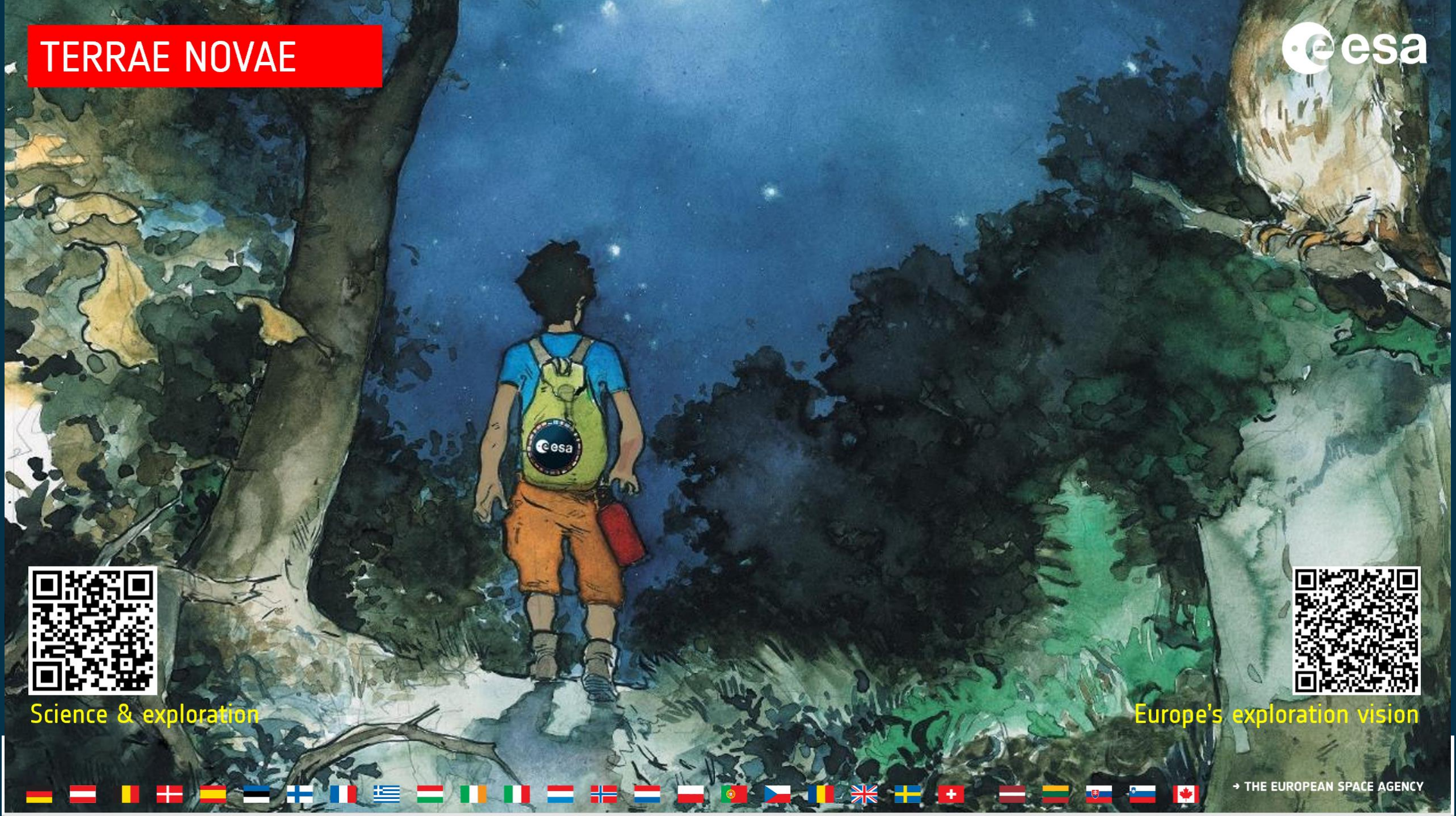
Recent paper from COSPAR PP (P.T. Doran et al, 2024) was a great first step

Additional feedback from community using different channels, i.e. COSPAR inaugural internation week (London) and others

ESA study with ESF in the pipeline (within the next few months) to:

- gather more scientific considerations on the Icy Worlds
- help establishing list of icy bodies
- create an additional venue for exchanging of information and reach consensus, prior to updating of the Policy

TERRAE NOVAE



Science & exploration

Europe's exploration vision

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