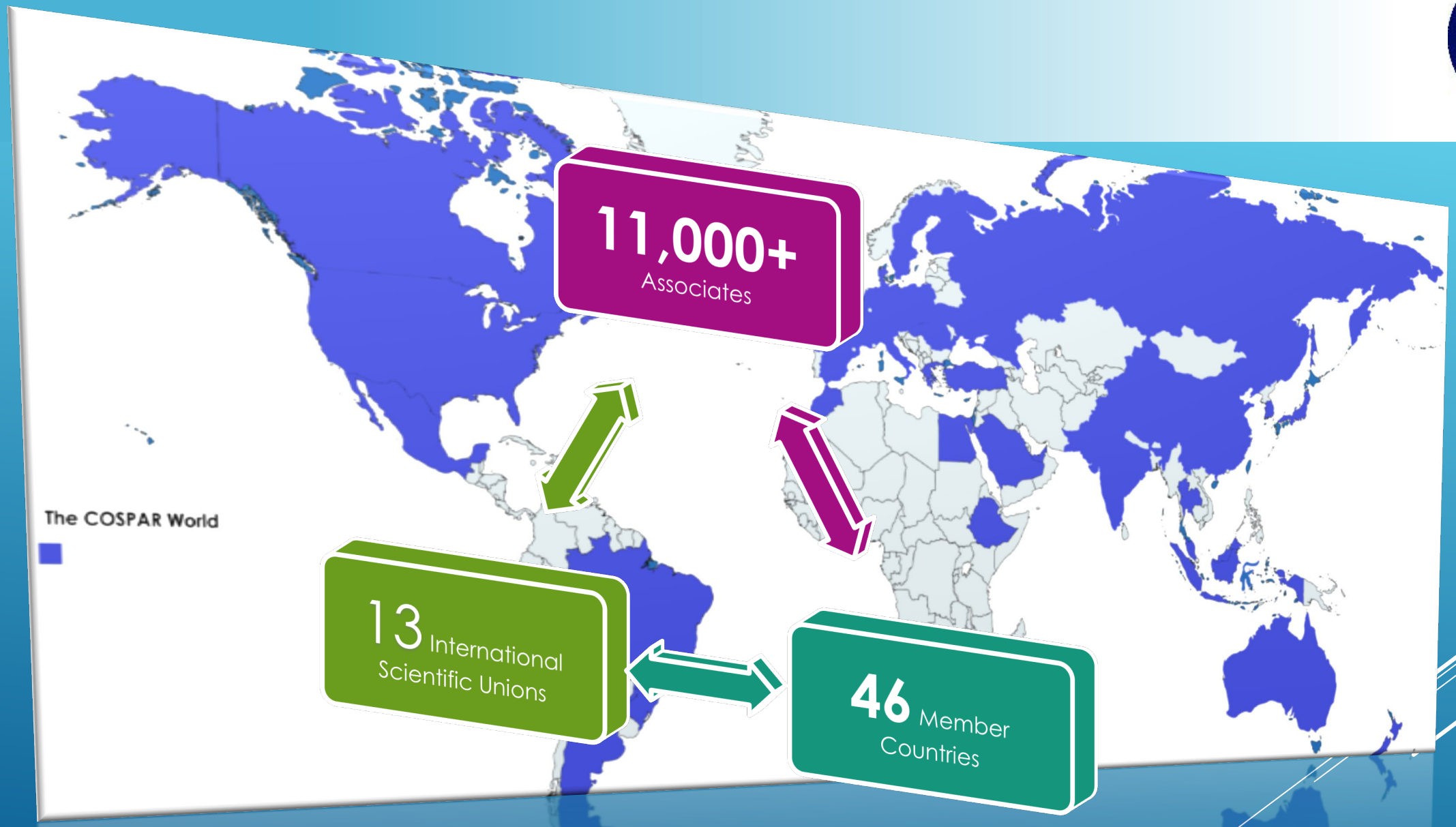
COSPAR BRIEFING TO ESSC-62

Jean-Claude WORMS

Executive Director

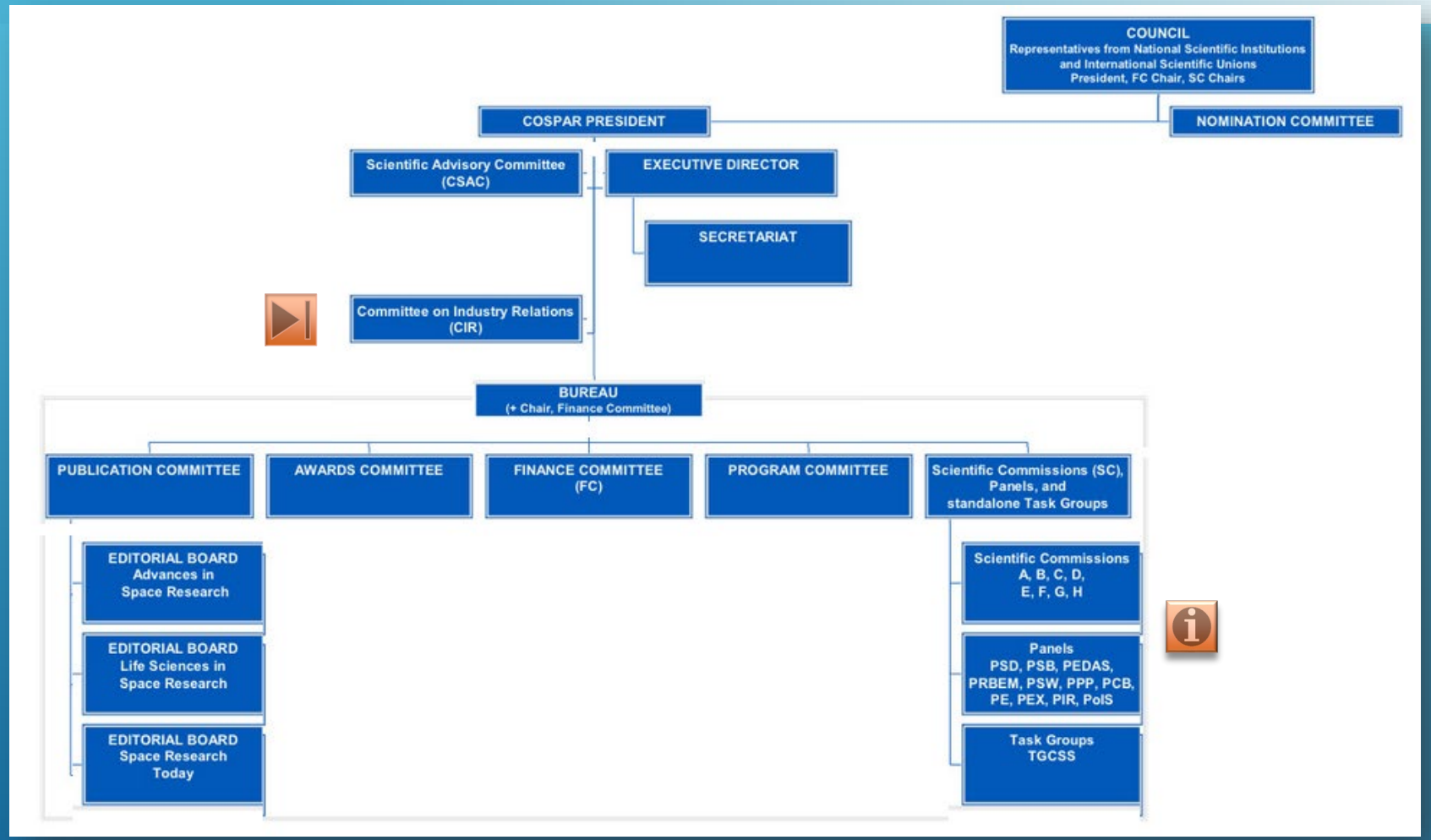
CREATED AT THE DAWN OF THE SPACE AGE TO OFFER A NEUTRAL FORUM FOR SPACE SCIENTISTS WORLD-WIDE


11,000+
Associates
13 International Scientific Unions
46 Member Countries
The COSPAR World

BUREAU MEMBERS

- The Bureau is composed of eight members, elected for 4 years (renewable once)
  - Len Fisk (USA), President (second and final term)
  - Karl Heinz Glassmeier (Germany) VP (first term)
  - Catherine Césarsky (France) (second term)
  - Masaki Fujimoto (Japan)
  - Manuel Grande (UK)
  - Charles Kennel (USA)
  - Pietro Ubertini (Italy)
  - Chi Wang (China)

GOVERNANCE STRUCTURE



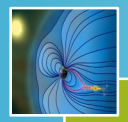
SC	Topics covered	Chair
A	Space Studies of the Earth's Surface, Meteorology and Climate	Ralph Kahn (USA)
B	Space Studies of the Earth-Moon System, Planets, and Small Bodies of the Solar System	Maria-Teresa Capria (Italy)
C	Space Studies of the Upper Atmospheres of the Earth and Planets Including Reference Atmosphere	Andrew Yau (Canada)
D	Space Plasmas in the Solar System, including Planetary Magnetospheres	Nicole Vilmer (France)
E	Research in Astrophysics from Space	Tomaso Bellini (Italy)
F	Life Sciences as Related to Space	Tom K. Hei (USA)
G	Materials Sciences in Space	Marc Avila (Germany)
H	Fundamental Physics in Space	Claus Laemmerzahl (Germany)

SCIENTIFIC COMMISSIONS

PANEL	Chair
Technical Panel on Satellite Dynamics (PSD)	Heike PETER (Germany)
Panel on Technical Problems related to Scientific Ballooning (PSB)	Tetsuya YOSHIDA (Japan)
Panel on Potentially Detrimental Activities in Space (PEDAS)	Carolin FRUEH (USA)
Panel on Radiation Belt Environement Modeling (PRBEM)	Paul O'BRIEN (USA)
Panel on Space Weather (PSW) – hosting ISWAT	Maria KUZNETSOVA (USA)
Panel on Planetary Protection (PPP)	Athena COUSTENIS (France)
Panel on Capacity Building (PCB) sub-panel: Capacity Building Fellowship Program and Alumni (PCB-FA)	Carlos GABRIEL (Spain) Mariano Méndez (Netherlands)
Panel on Education (PE)	Michel BOER (France)
Panel on Exploration (PEX)	Frances WESTALL (France)
Panel on Interstellar Research (PIR)	Ralph McNUTT (USA)
Panel on Space and Social Sciences and Humanities (PSSH)	Isabelle SOURBES-VERGER (France)
Panel on Innovative Solutions (PoIS)	Eric SMITH (USA)
Task Group on establishing a Constellation of Small Satellites (TGCSS) Sub-group on Radiation Belt Sub-group on Atmosphere	Daniel BAKER (USA) Ji WU (China) Mohammed MEFTAH (France)

Small Satellites

- **TGCSS**
  - Developing a constellation of small satellites for science
  - Interest expressed in NASA, Asia, Europe VIDEO
  - COSPAR-INSPIRE partnership LINK
  - Upcoming international call for ideas
  - Support from Chinese launch firm



Space Weather

- **PSW**
  - Panel on SW enables the development of predictive forecasting techniques
  - Active international network coordination (e.g. ISWAT)
  - Update to SW COSPAR Roadmap LINK
  - All SW relevant partners world-wide are contributing

Innovative Solutions

- **PoIS**
  - New panel created in early 2021 LINK
  - Chaired by Eric Smith (Lockheed Martin)
  - Forum for COSPAR Associates to present and discuss new technologies for research
  - 3 sessions in Athens Assembly (07/22)

Planetary Protection

- **PPP**
  - Provides accepted guidelines on planetary protection requirements to guide compliance with the UN OST of 1967
  - Recent evolution of the panel LINK membership (scientists from COSPAR Commissions, and space agencies)

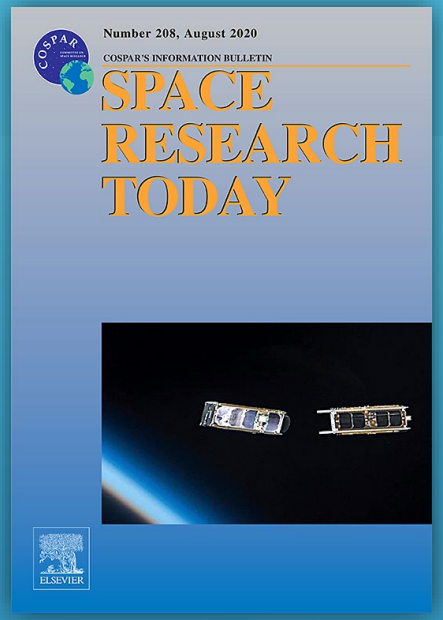
Social Sciences and Humanities

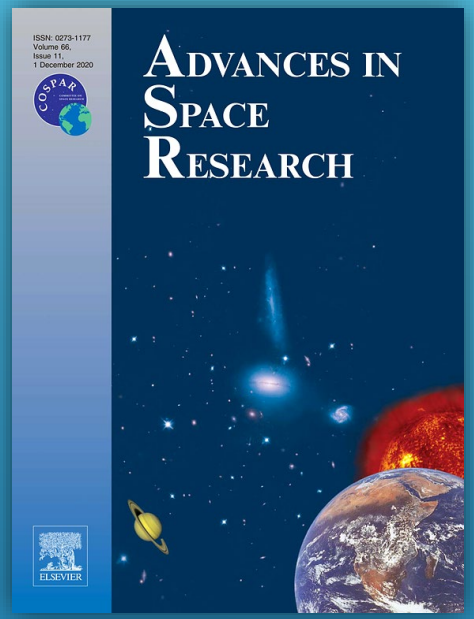
- **PSSH**
  - Establish a dialogue with SSH scholars
  - Chair: Isabelle Sourbès-Verger (CNRS)
  - Give a role to COSPAR in line with current challenges in term of their interaction with society at large
  - New project: sustainability of space exploration

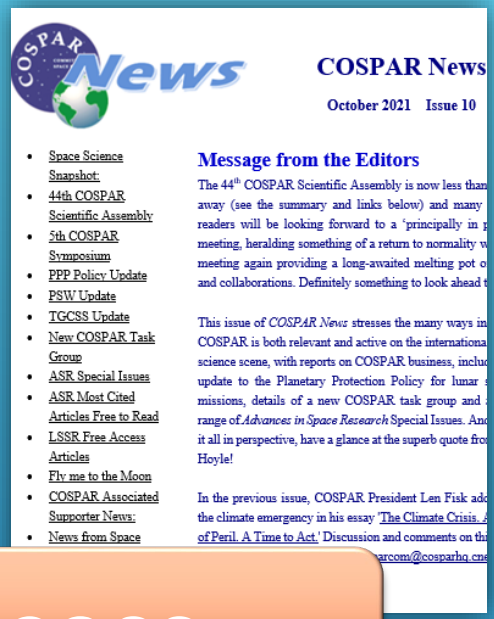
SOME PANEL ACTIVITY EXTRACTS

INDUSTRY CONNECTIONS

- Industry Partners
  - Lockheed Martin (2020)
  - Northrop Grumman (2020)
- New Committee on Industry Relations, directly advising the COSPAR President (Nelson Pedreiro – LM)
  - Airbus, Arianespace, BAE Systems Australia, Ball Aerospace, Blue Origin, Fleet Technologies, Korea Aerospace Industries, Northrup Grumman, Planet Labs, Raytheon/UTC, Rocket Lab, Thales Alenia Space, Virgin Galactic and Lockheed Martin (growing from 8 to 14 since last ESSC plenary)
  - 4 meetings so far and a strategic plan with 22 actions
- Conflict of Interest procedure included in COSPAR Bylaws, to apply to industry relations as well







Open Access…

COSPAR PUBLICATIONS

NEW BOOK SERIES

44TH COSPAR ASSEMBLY (2022)

- Athens will host the 44th COSPAR Assembly in July 2022 for the first time ever
- www.cospar-assembly.org

Local Organizing Committee

Chair : Prof. Amal Chandran, NTU, Singapore,

Prof. Edwin Teo, NTU, Singapore

Prof. Charles Elachi, Caltech/NTU, USA/Singapore

Mr. Lim Wee Seng, NTU, Singapore

Prof. Daniel Hastings, MIT,

Mr. Jonathan Hung, SSTA, Singapore

Ms. Lynette Tan, SSTA, Singapore

Prof. Alexander Ling, NUS, Singapore

Prof. Daniel Baker, UCB, USA

Prof. Loren Chang, NCU, Taiwan

Ms. Li Xin Leo, STB, Singapore

5th COSPAR Symposium 2021

15 – 19 November

Space Science with Small Satellites

POSTPONED TO APRIL 2023

SINGAPORE

singapore
Passion Made Possible

45TH COSPAR ASSEMBLY (2024)

- South Korea will host the 45th Scientific Assembly in Busan

- Increase Assembly value and attractiveness
- Extend partnerships with other organizations (ISC, GEO, UN, IAU, **ESF**, etc.)
- More constraining roadmaps (International Cooperation, **Space Weather, Small Satellites**, etc.) that influence space agencies and challenge them to better use COSPAR
- Strengthening joint activities of COSPAR and UNOOSA (PP, debris, SW, sustainable space exploration)
- Improving COSPAR Support to Developing Space Programs (**Capacity Building Workshops**, support to early-career scientists)
- Associated Supporter program reconstituted to encourage engagement with global space industry
- Improving Communication (COSPAR News, social media, Book series) and Journals
- Diversity, Equality and Inclusion (DEI) policy → COSPAR Compliance Officer

STRATEGIC PLAN 2019-2023

ISSUES THAT ARE BECOMING CRITICAL WITH 'NEW SPACE'

- Planetary Protection
  - Critical issue today, with involvement of new industrial actors
  - NASA's Gateway initiative and Artemis Accords led us to reconsider Category 2 for the Moon, which was done in June 2021
  - Several policy updates in past few years
  - Ongoing discussion to potentially update guidelines for Venus (done) and Mars
- Space debris and light pollution from constellations
  - Issues bound to increase in magnitude with New Space
  - Science community's reponse (IAU, etc.)
- Sustainability of space exploration (and resource exploitation?)
  - « Mars is a free planet »
  - Can COSPAR do something alongside its PPP activities, what and how?
  - New interdisciplinary discussion between several COSPAR panels (PPP, PEX, PEDAS), led by PSSH

TASK GROUPS

- TGCSS – Establishing a Constellation of Small Satellites
  - stems from COSPAR Strategic Plan
  - is working since 1.5 year
  - Now has 3 sub-groups: ionosphere, radiation belt, and atmospheric remote sensing
- TGIGSP – Establishing an International Geospace Systems Program
  - Has just started its work, chaired by Larry Kepko (USA)
  - Coordinated effort to define science objectives to study the Earth's magnetosphere as a 'System of Systems'
  - Builds on ISTP, feeds into all agencies future programs, and US upcoming Decadal
  - Product will be a COSPAR roadmap

ESSC AND COSPAR

- COSPAR ex officio in ESSC since over 20 years, reciprocated in 2009 by then President Roger Bonnet
- Strong ties and some joint project/proposals, e.g. PPOSS
- ESSC survey: establishing channels with COSPAR is considered by some members a Top-3 success for ESSC, also questioning how to better coordinate and influence each other's strategy and initiatives, reiterated yesterday by Chris in his introduction
- '*Work more with COSPAR*' is one of the 'O' in the SWOT analysis that was conducted by the ESSC Secretariat in 2020
- 2 or 3 volumes in new COSPAR Book Series to be jointly published with ESSC-ESF-LPSP on '20 Years of ISS'

THANK YOU VERY MUCH

https://cosparhq.cnes.fr

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Committee on Space Research

@CosparHQ

COSPAR

BACKUP SLIDES

Planetary protection categories

The different planetary protection categories (I-V) reflect the level of interest and concern that contamination can compromise future investigations or the safety of the Earth; the categories and associated requirements depend on the target body and mission type combinations

Category I: All types of mission to a target body which is not of direct interest for understanding the process of chemical evolution or the origin of life

Category II: All types of missions (gravity assist, orbiter, lander) to a target body where there is significant interest relative to the process of chemical evolution and the origin of life, but where there is only a remote[1] chance that contamination carried by a spacecraft could compromise future investigations

Category III: Flyby (i.e. gravity assist) and orbiter missions to a target body of chemical evolution and/or origin of life interest and for which scientific opinion provides a significant[2] chance of contamination which could compromise future investigations

Category IV: Lander (and potentially orbiter) missions to a target body of chemical evolution and/or origin of life interest and for which scientific opinion provides a significant[2] chance of contamination which could compromise future investigations. 3 subcategories exist (IVa,b,c) depending on instruments, science investigations, special regions etc.

Category V: Two subcategories exist - unrestricted Earth return for solar system bodies deemed by scientific opinion to have no indigenous life forms, and restricted Earth return for all others

[1]Implies the absence of environments where terrestrial organisms could survive and replicate, or a very low likelihood of transfer to environments where terrestrial organisms could survive and replicate

[2]Implies the presence of environments where terrestrial organisms could survive and replicate, and some likelihood of transfer to those places by a plausible mechanism

NEW SUB-CATEGORIES FOR THE MOON SURFACE

- **Category IIa** – all missions to the surface of the Moon whose nominal mission profile does not access areas defined in Category IIb: material inventory limited to organic products that may be released into the lunar environment by the propulsion system
- **Category IIb** – all missions to the surface of the Moon whose nominal mission profile accesses Permanently Shadowed Regions and the lunar poles, in particular latitudes south of 79°S and north of 86°N: full organic inventory (solid and volatiles)

A FEW PPP-RELATED MEDIA LINKS…

- Planetary Protection Policy, Research Outreach, 2020 Link
- Keeping our world pristine, YouTube video, 2021 Link
- To boldly go where no germs… Open Access Government, 2021 Link
- Fly me to the moon, Open Access Government, 2021 Link