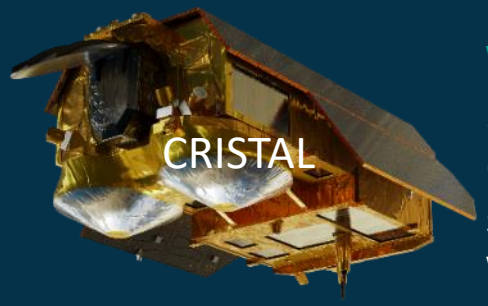
Sentinel User Preparation Activity – Atmosphere Science Foundational Experiment

EOP-SG

03-07-2024

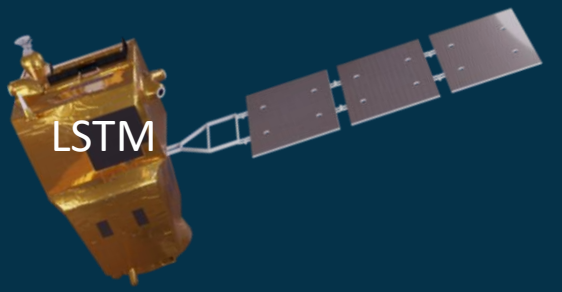
Sentinel Users Preparation (SUP) ESA EOP Initiative

Activity in collaborative synergy with the EC



WHAT

SUP is a preparatory initiative for the use of Copernicus Expansion/NG data. Strong support by MS and EARSC.
With a multi-mission approach.

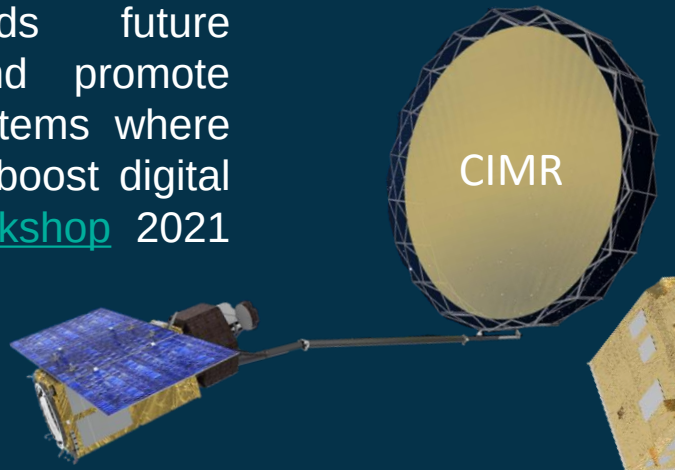


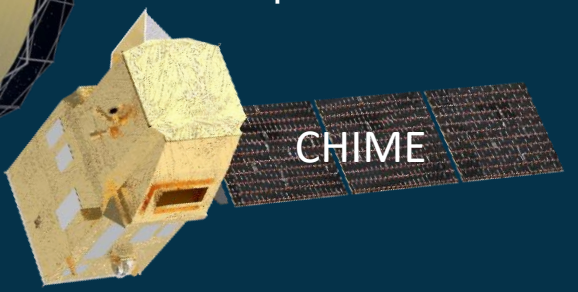
WHY

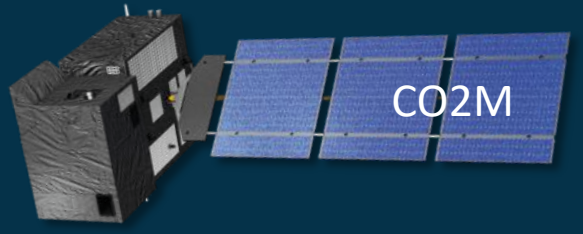
Supporting the integration of new Copernicus Expansion/NG datasets towards future operational working practices and promote European leadership for space systems where competitors are already active and boost digital commercialisation (ref. EARSC workshop 2021 with D-EOP).

HOW

- Build the necessary expertise in the various science and application domains and sectors (academia, value adding companies) to prepare future downstream services.
- Ensure readiness for rapid uptake by users and stakeholders of derived information products.







EFFECTS

- Readiness of science and downstream analytics to address societal/environmental challenges.
- Act as ‘de-risking’ factor and incentive for growth to maximise return-on-investment.

Enabling actions

➔ **Multi-mission** approach.

➔ **Enabling actions** on:

1) **[SUP-1] Applications preparedness with stakeholder and end-users**
2) **[SUP-2] SUP Sharing and Collaboration Environment**
3) **[SUP-3] Fundamental research and algorithm/products developments/validation**
4) **[SUP-4/5] New processing methods for Sentinel Expansion class datasets**
5) **[SUP-6] Training, toolboxes and education**

➔ **Representative dataset consolidation** (e.g., in terms of revisit time, resolution, and spectrally/technique) over specific areas of interest, with stakeholder engagement as necessary, through: proxy-data from non-ESA missions (national, international partners, commercial), simulated/ synthetic data from models, and in-situ/validation/campaign data. Leveraging and complementing existing infrastructure/datasets and planned campaign data.

SENTINEL USERS PREPARATION

chime

cimr

co2m

cristal

lstm

rose-l

s1 ng

s2 ng

s3 ngt

s3 ngo

[SUP-3] - Fundamental research and algorithm, products, development and validation

- **ITT (~500KEuro) - S5 and synergistic S5/CO2M CO2** retrieval community algorithm: Build a prototype CO2 retrieval algorithm for the Sentinel-5 mission and synergistic retrievals with CO2M in an open-source framework and develop plan for scientific use (further development). Perform algorithm performance assessment and generation of synthetic data for testing.

- **ITT (~2x500KEuro) - SWOT Data analysis and synergistic study for S3NG preparation**: **ITT (~500KEuro) CHIME/S2NG for water quality and coastal biology**.
- **ITT (~500KEuro) Multi-mission (S1, ROSE-L, CMIR, CRISTAL) sea ice integrated study**

SUP Fundamental research and algorithm/products development/validation

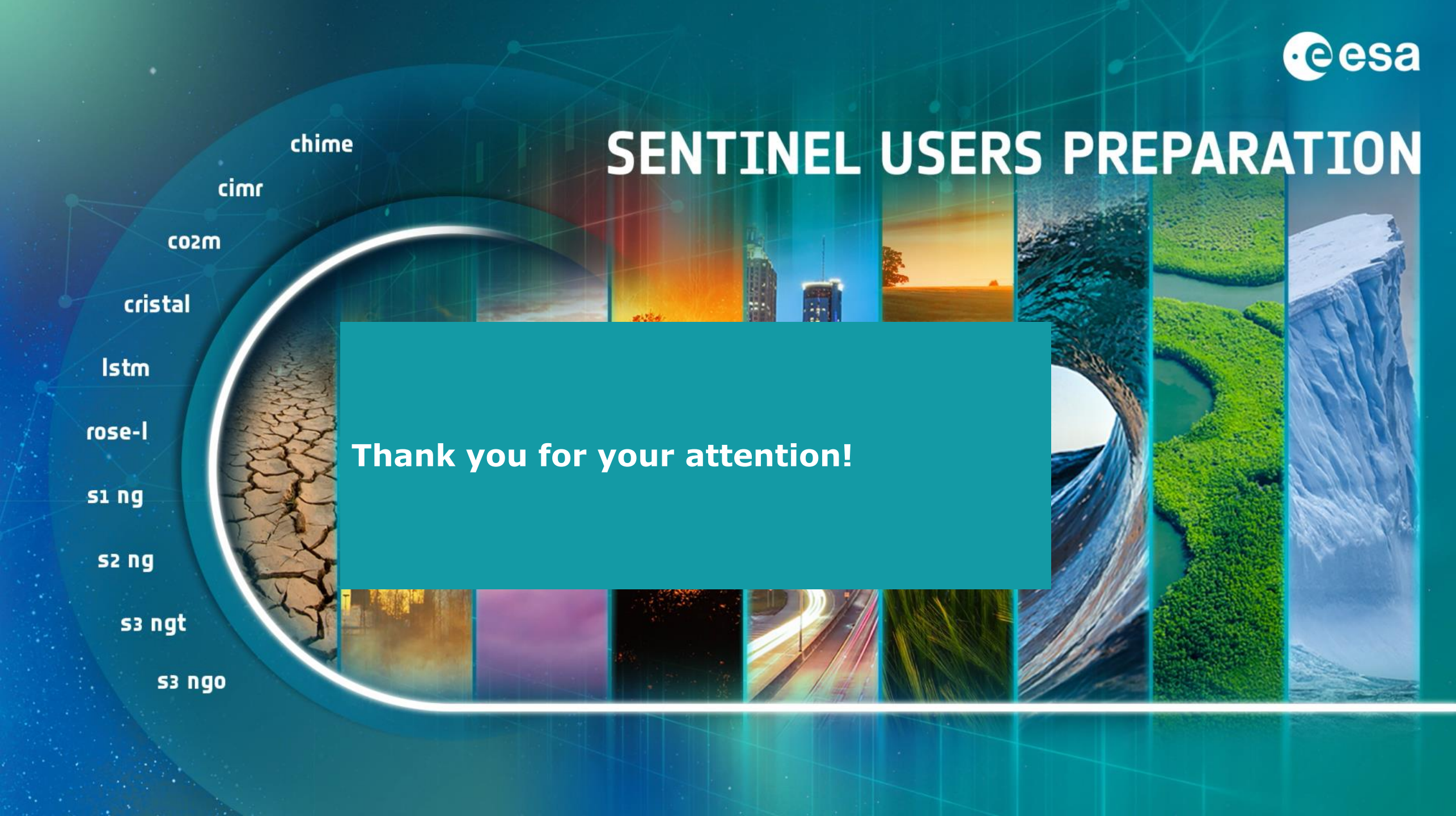
- **SUP Terrestrial Biosphere Foundational Experiment (1500K): Multi-mission campaigns and studies (CHIME/LSTM/S2NG/S1/ROSE-L/CMIR/…) to** advance in the exploration of synergistic aspects to better characterise the terrestrial biosphere. Q4 2024

- **SUP Soils, Water and Agriculture Foundational Experiment (800K): HR Multi-mission (S1/ROSE-L/S2NG/CHIME/LSTM) advanced soil, water and agriculture synergistic multi-scale multi-mission experiment, Q4 2024**

- **SUP Atmosphere Science Foundational Experiment (800K): Multi-mission atmosphere retrieval opportunities;** Generate a community reference benchmarking dataset to simulate combinations of Sentinel-5, Sentinel-4, CO2M and HR missions (CHIME, S2, S3); Modelling TOA radiances over a representative set over areas and exploring novel opportunities for new products and science results. Q4 2024

What elements should this SUP include?

- ML/AI elements for fast synthetic spectrum generation?
- What challenges remain with synthetic spectrum generation to overcome?
- What new products could be assessed and considered?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Thank you for your attention!