

Status of the ESA Scientific Programme

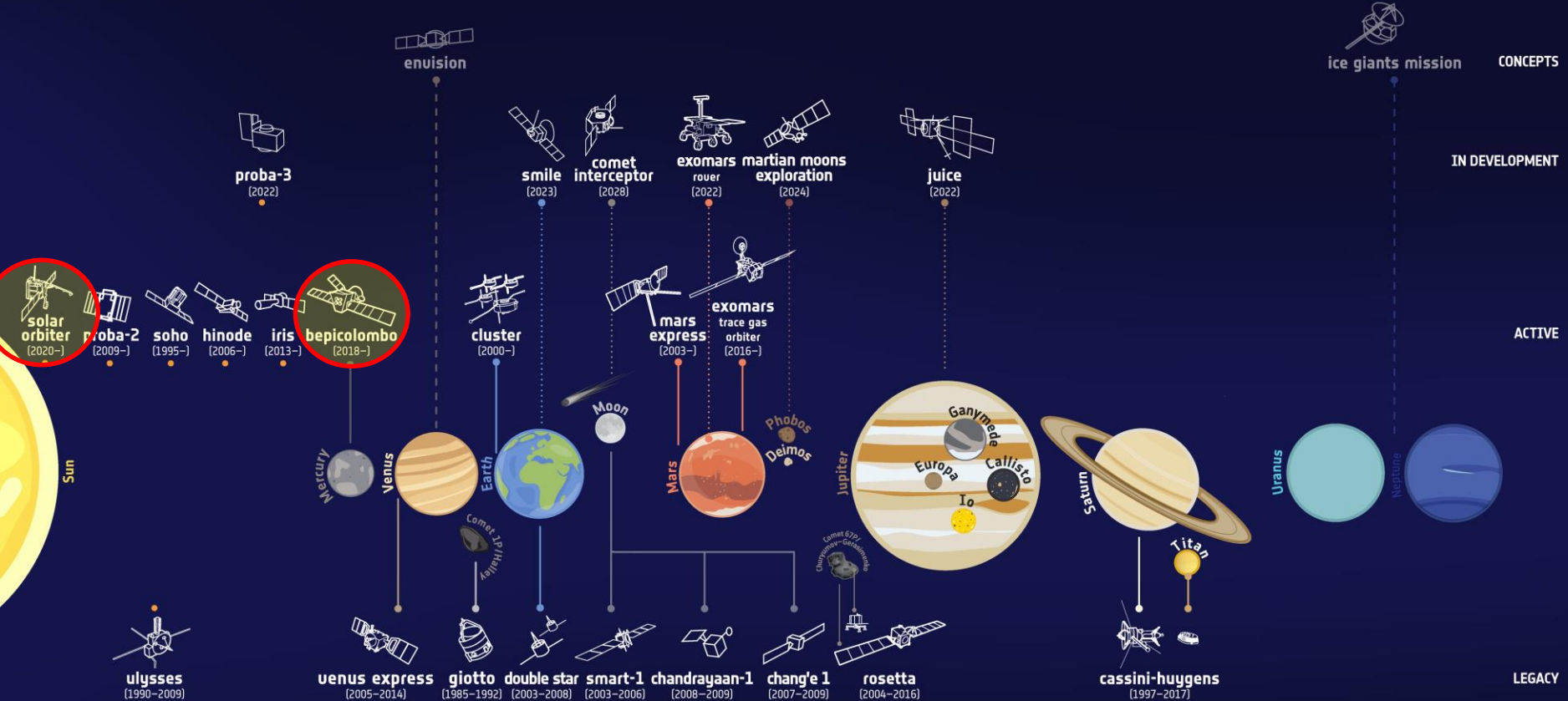
Günther Hasinger, ESA Director of Science
59th European Space Sciences Committee Meeting

15.May 2020

ESA Solar System Fleet



→ SOLAR SYSTEM EXPLORERS

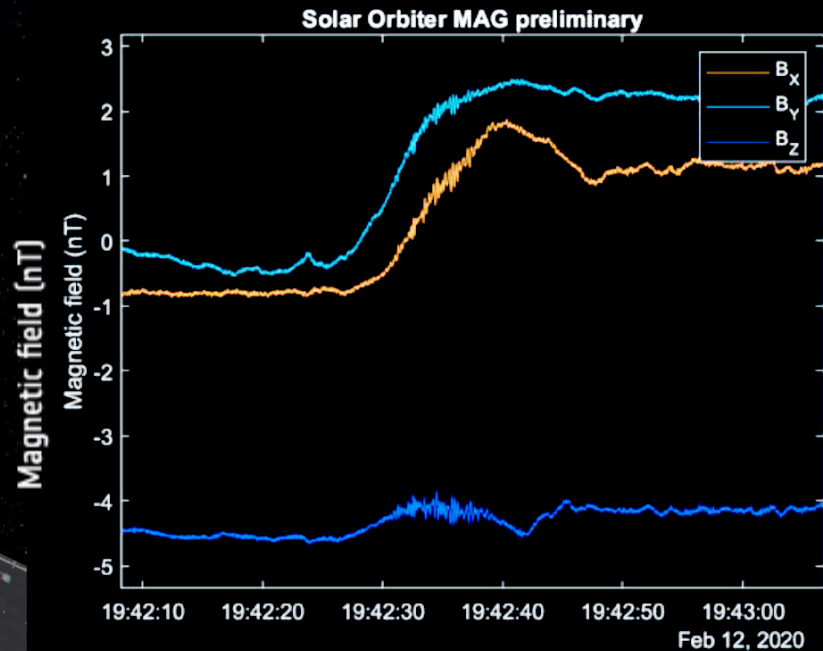




Solar Orbiter Lift-Off



BOOM DEPLOYMENT

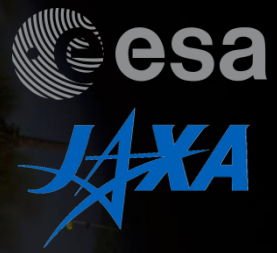


#SolarOrbiter #WeAreAllSolarOrbiters

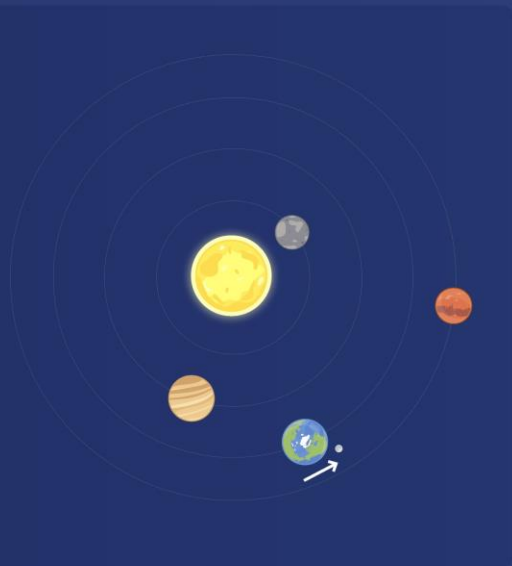
Now ALL instruments switched on!



BepiColombo



BEPICOLOMBO EARTH FLYBY



MPO-MAG
SIXS
MGNS

9 April

- Moon observation
MERTIS
- Mercury Transfer Module
warm-up
- Earth imaging
M-Cam

SERENA
Mio -sensors

10 April

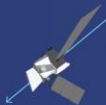
- Earth imaging
M-Cam
- 30 000 km
- 12 700 km
Closest approach
to Earth
- 30 000 km
Eclipse phase



- Moon observation
PHEBUS

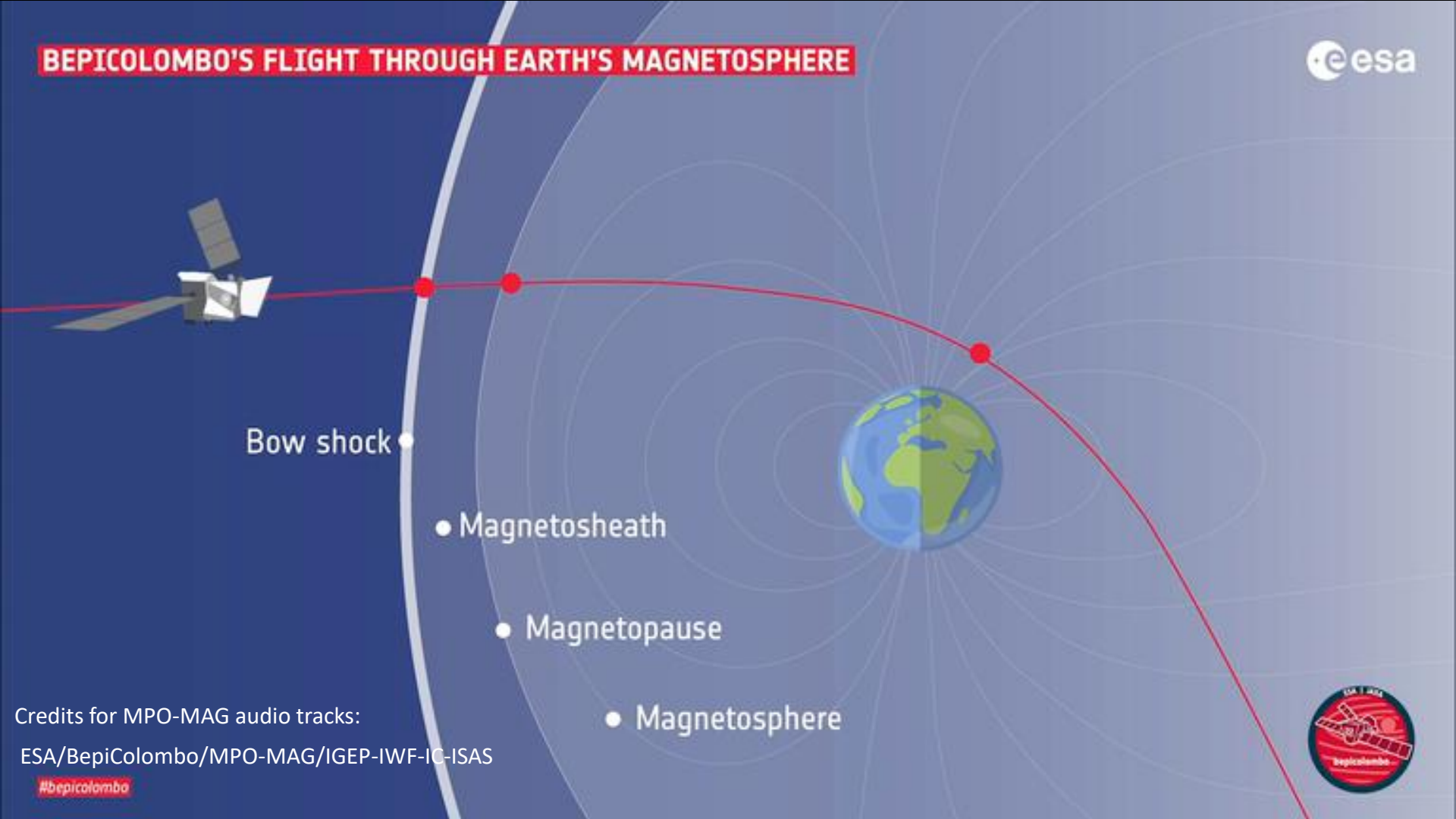
- Earth and Moon
imaging
M-Cam

11 April



Relative sizes and distances are not to scale

BEPICOLOMBO'S FLIGHT THROUGH EARTH'S MAGNETOSPHERE



Bow shock

Magnetosheath

Magnetopause

Magnetosphere

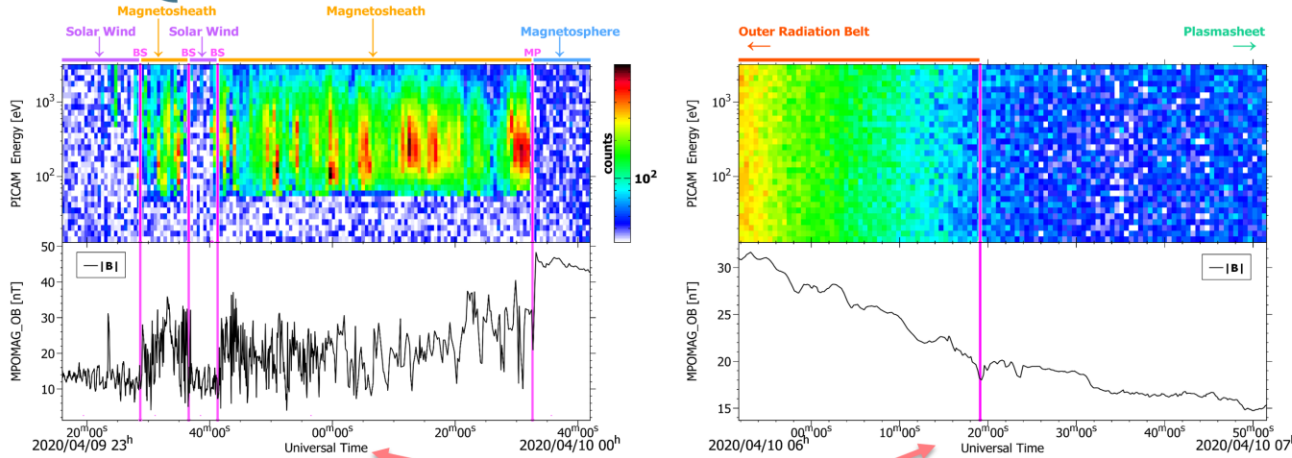
Credits for MPO-MAG audio tracks:

ESA/BepiColombo/MPO-MAG/IGEP-IWF-IC-ISAS

#bepicolombo

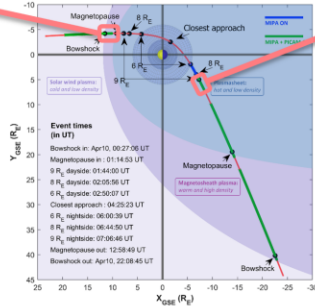


Observations of PICAM (preliminary results)



SERENA PICAM/ MPO MAG comparison

- ✓ **Inbound crossing:**
 - Bowshock
 - Magnetosheath plasma
 - Magnetopause

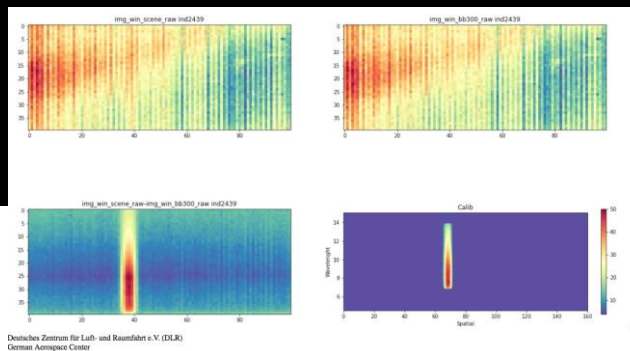


- ✓ **Inner Magnetosphere:**
 - Outer radiation belt, background counts

Magnetic field data: courtesy of MPO-Mag team at University of Braunschweig

Ion data: courtesy of SERENA-PICAM team at Austrian Academy of Sciences

MERTIS: first results of a novel instrument

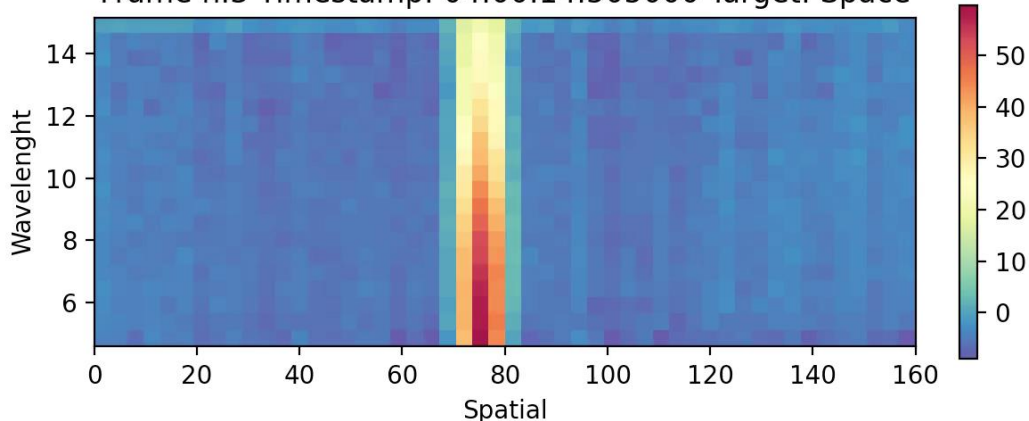


Raw Data from instrument and calibration source

Raw Data merged and additional calibration

Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)
German Aerospace Center

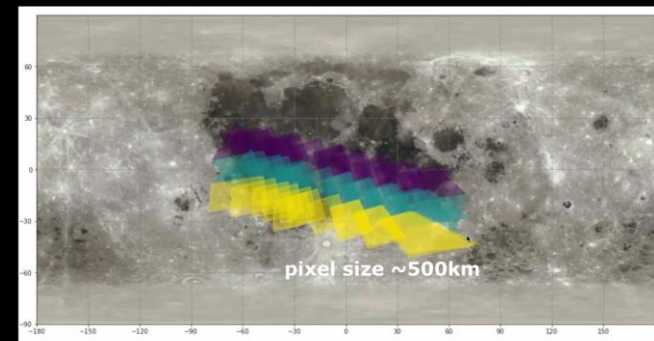
Frame n.3 Timestamp: 04:00:14.505000 Target: Space



Credit: DLR Berlin and Westfälische Wilhelms Universität Münster, Germany

MERTIS : WIP Geometric Data

Pixel 80,81,82 (Color is pixel number)



G. Hasinger ESSC | 15.5.2020 | Slide 10

Professionals/Amateurs Ground Based Observations

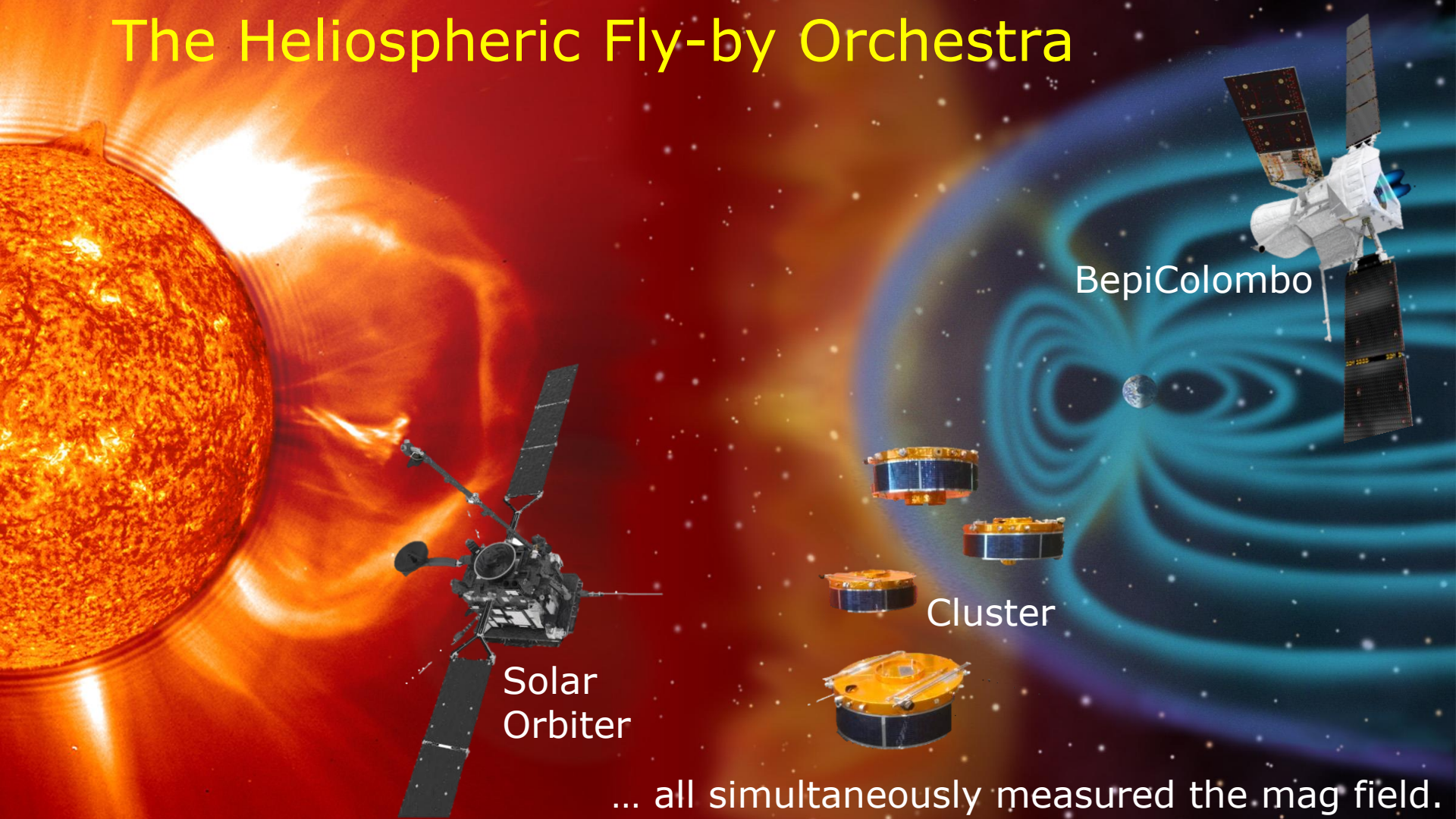


25 cm Telescope - the OCTOPUS telescope in San Pedro de Atacama (Chile) from the 6ROADS network.

Image credit ESA/6ROADS, Marcin Gedek, Rafal Reszelewski, Michal Zolnowski".



The Heliospheric Fly-by Orchestra



BepiColombo

Cluster

Solar
Orbiter

... all simultaneously measured the mag field.

Comet C/2019 Y4 ATLAS

Hubble Space Telescope



Solar Orbiter may
fly through the
comet tail end of
May/early June !

20 April

May 12, 2020

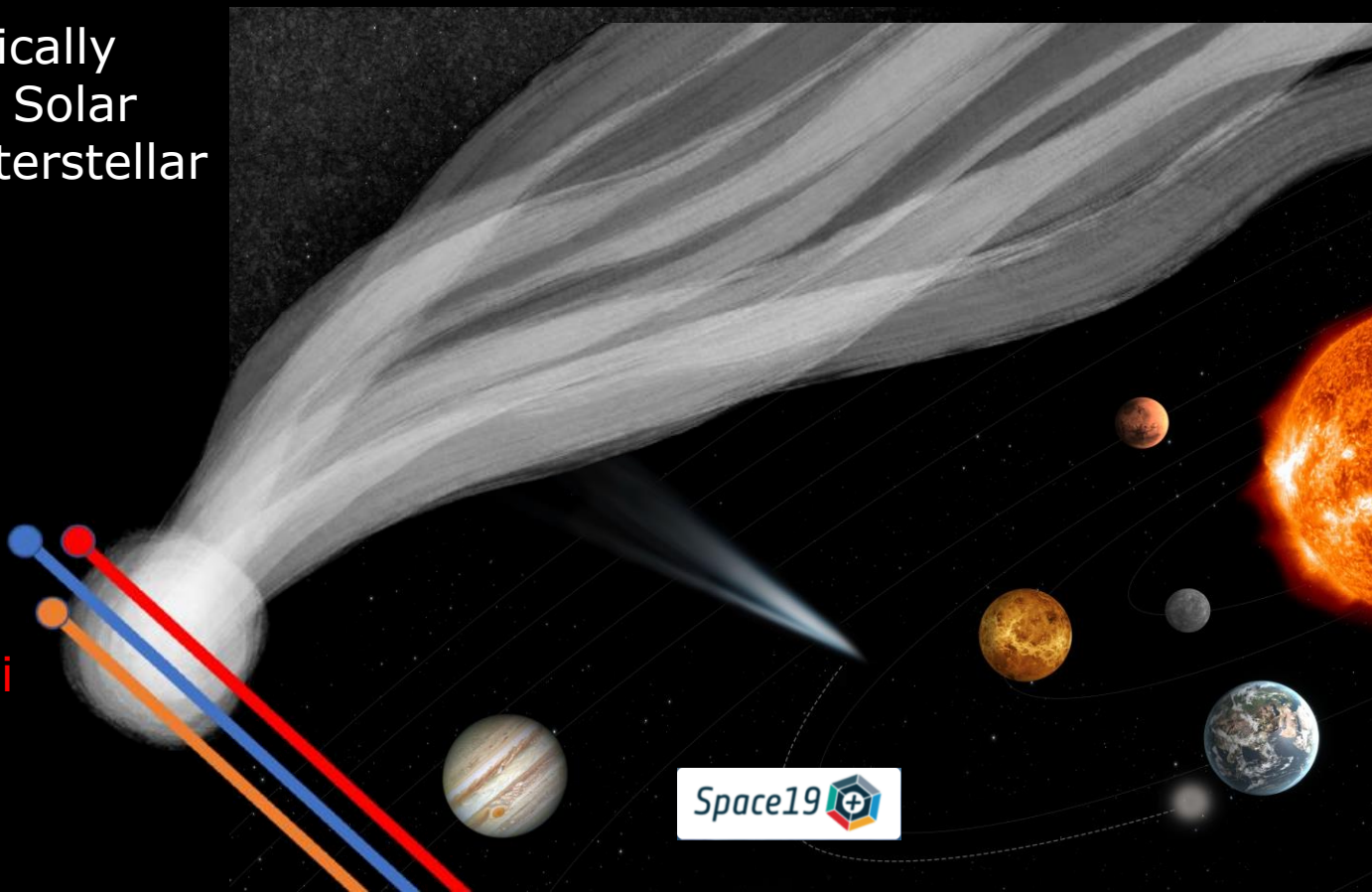
Comet Interceptor



Mission to a dynamically young object in the Solar System, or to an interstellar visitor



First ESA Fast/Flexi mission, approved June 2019!

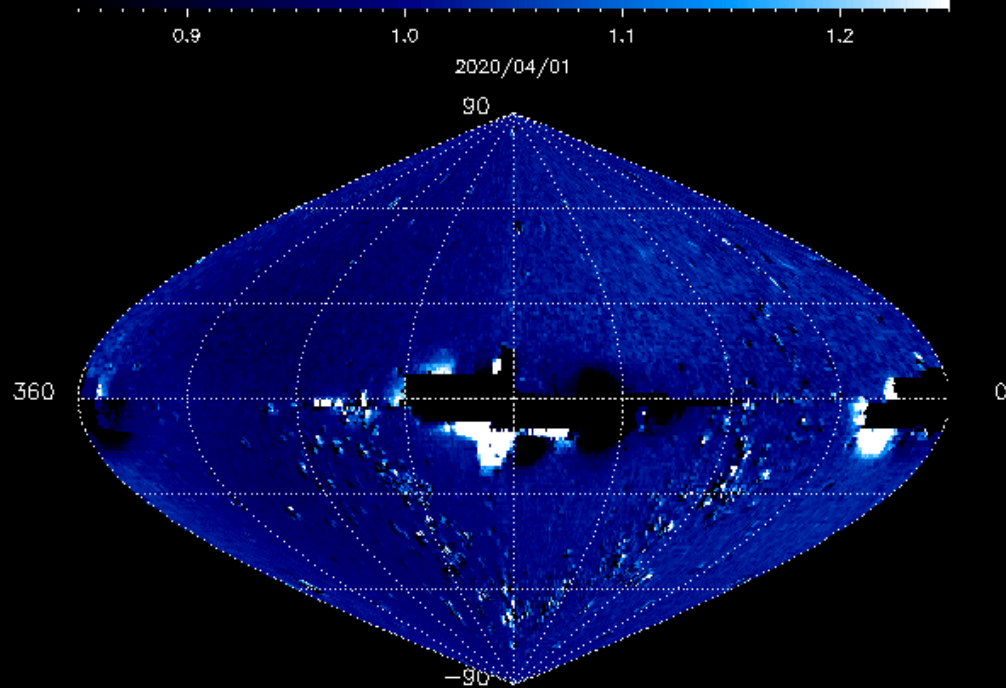


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European Space Agency

Comet C/2020 F8 (SWAN)



Amateur astronomer Michael Mattiazzo from Australia spotted this icy visitor from the outer Solar System while inspecting images that had been posted online from the Solar Wind ANisotropies (SWAN) instrument aboard SOHO, the ESA/NASA Solar and Heliospheric Observatory.

Hubble Space Telescope 30th Anniversary



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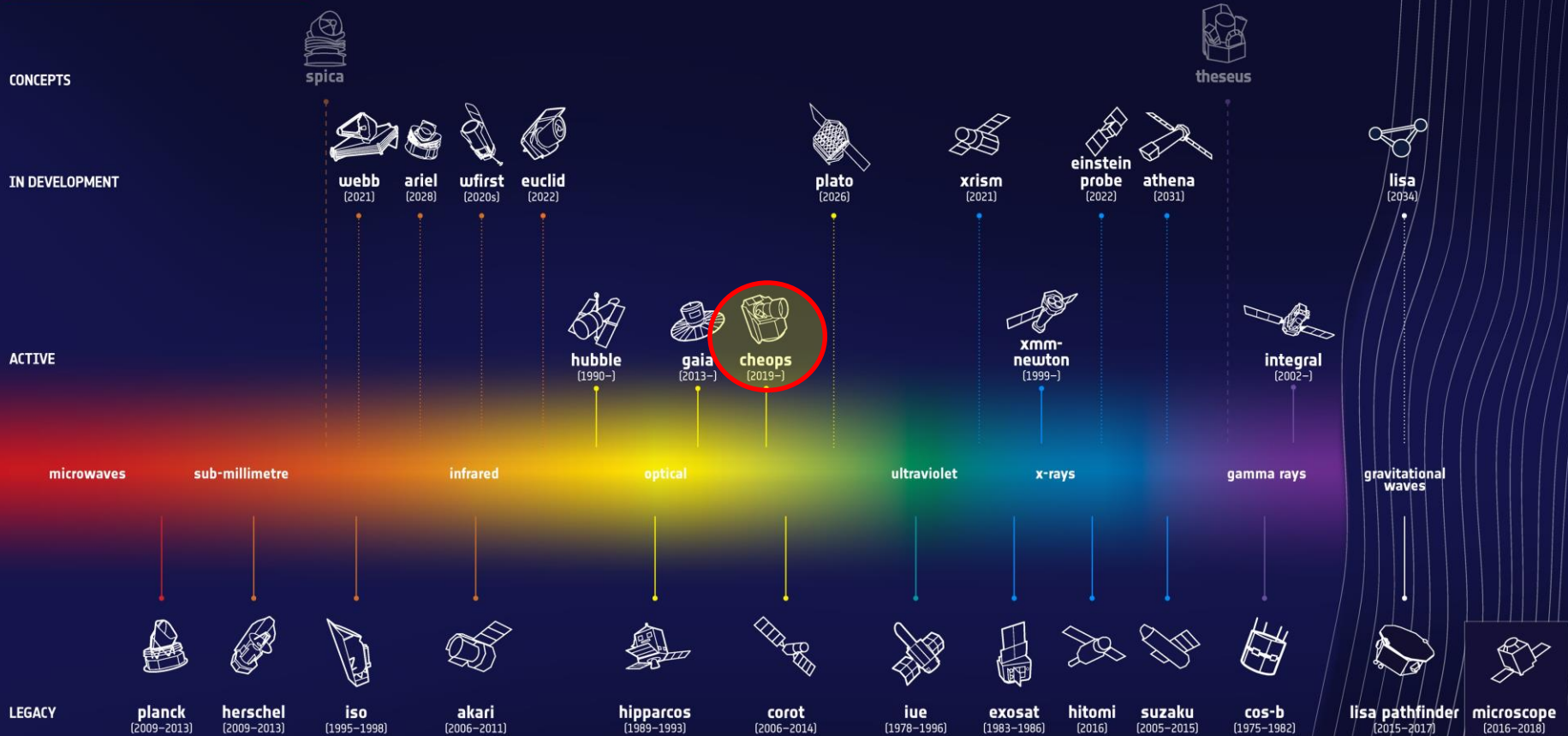


European Space Agency

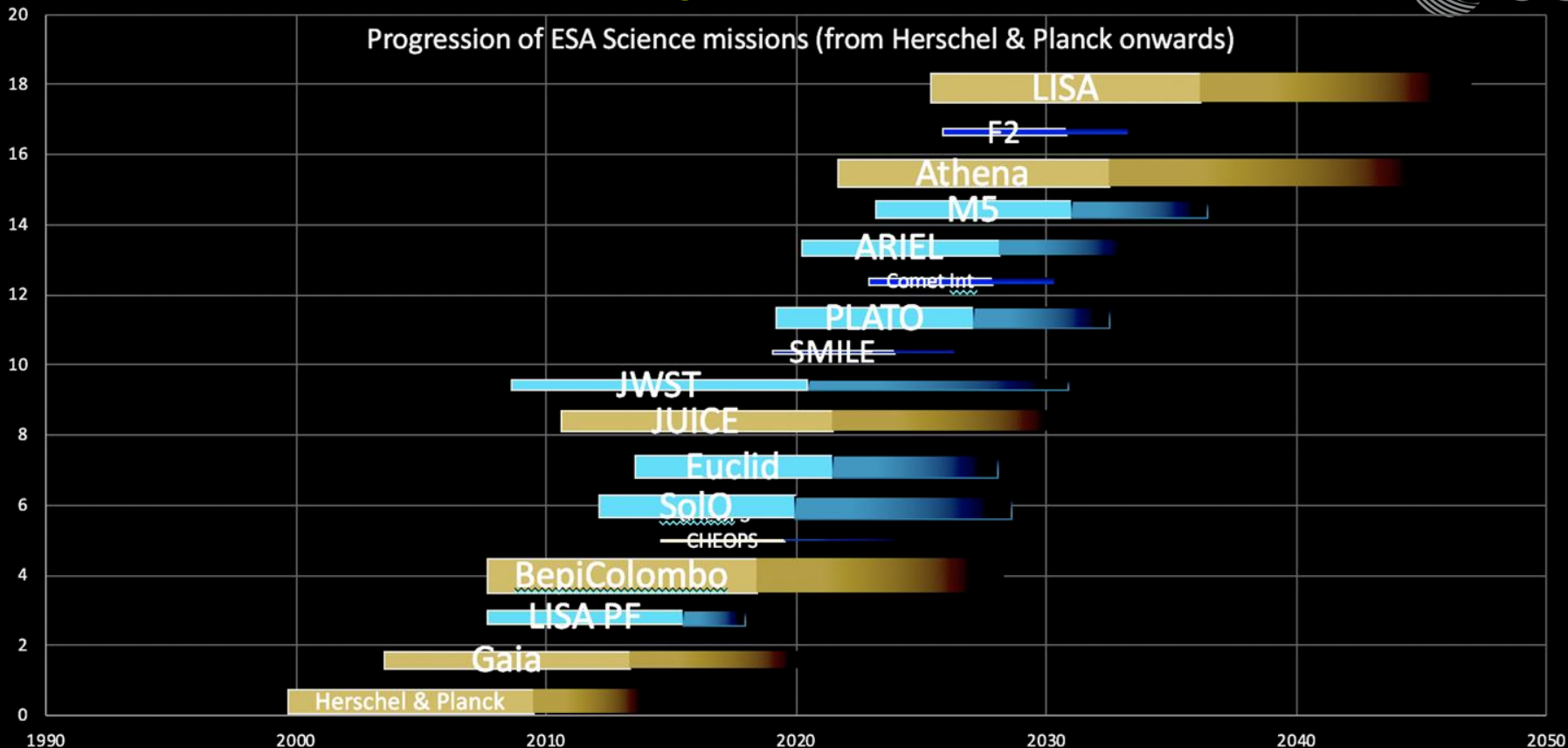
ESA Astrophysics Fleet



→ COSMIC OBSERVERS



Draft Long-term Plan



SPC Workshop Topics (14-15.4.)

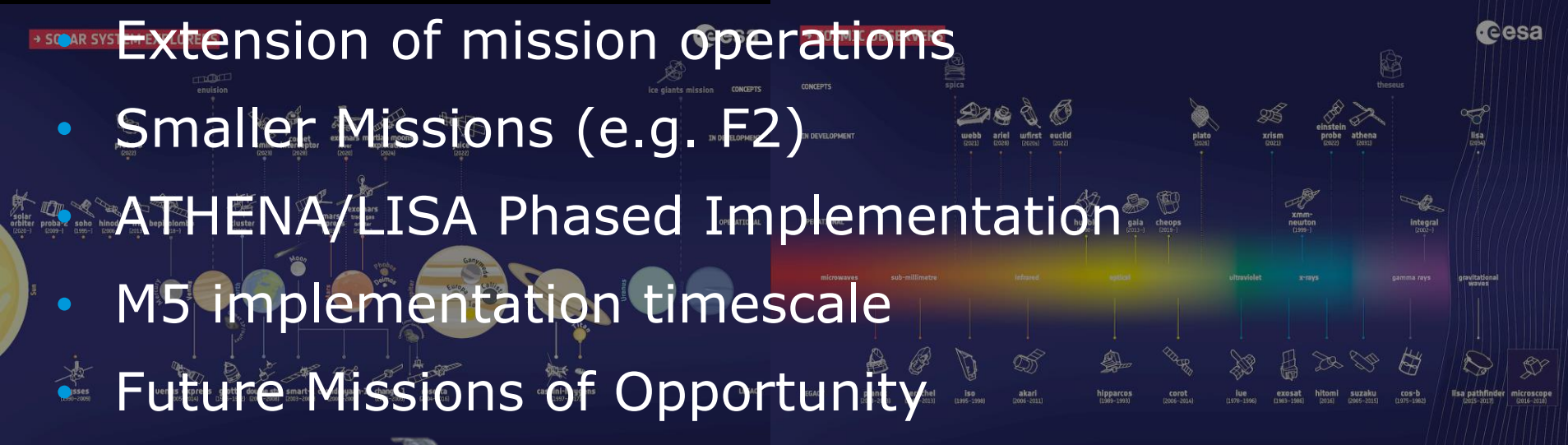
Extension of mission operations

- Smaller Missions (e.g. F2)

ATHENA/LISA Phased Implementation

- M5 implementation timescale

Future Missions of Opportunity



JUICE Launcher Signature



UNITED EUROPE IN SPACE



esa

Ariane Launcher
for JUICE
17.6.2019, LeBourget

A UNCLASSIFIED



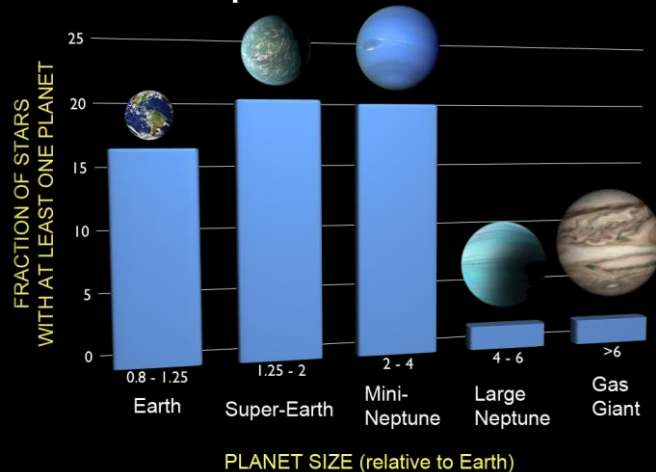
European Space Agency

Joint mission with NASA to one of the Ice Giants ?



- Three ESA CDF studies performed in 2019 to study possible contributions to a NASA-led Ice Giant mission and technology for a future mission.
- The window for a possible mission to both Uranus and Neptune is already practically closed.
- A Uranus-only mission could be launched as late as 2034.
- Depends on the decisions in the NAS Decadal Survey ('22?)

Exoplanet Statistics



Neptune: 25 August 1989

Uranus: 24 January 1986

Voyager 2: launch 20 August 1977

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European Space Agency

→ VOYAGE 2050



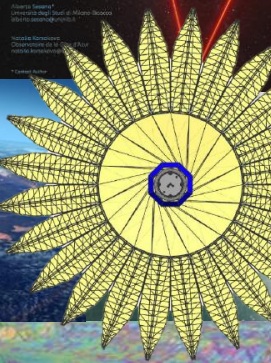
Community Workshop: October 29-30, 2019, CSIC Madrid.





Voyage 2050 White Paper
Unveiling the Gravitational Universe
at μ -Hz Frequencies

GAUSS



Longonot

~100 Voyage 2050 White Papers
200 applications for topical teams
>10000 responses from the broad public
Recommendations expected fall 2020



**Thank you
very much!**