

# ESA's Space Safety Programme

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ESA S2P Team

Cleanspace Industrial Days 2023,

16.10.2023

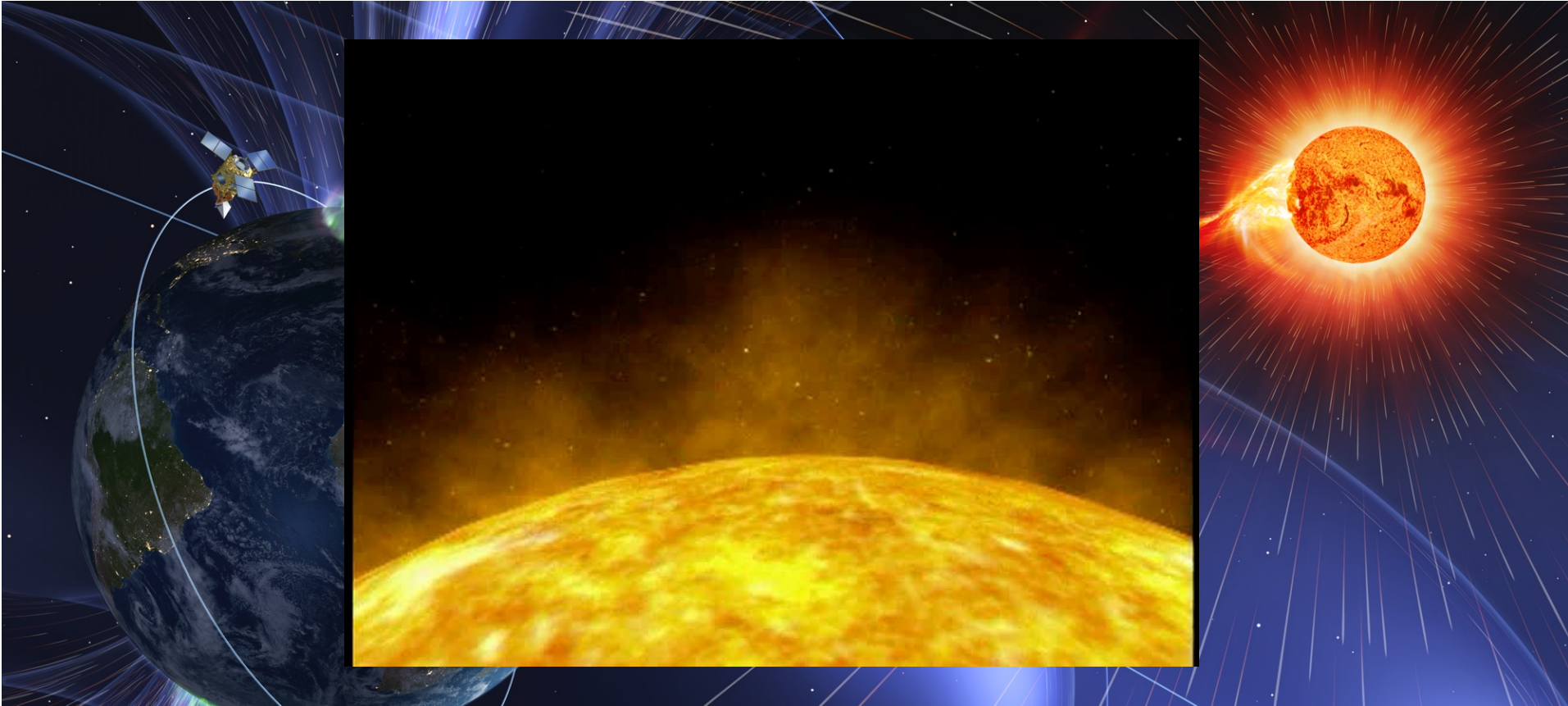


# PROTECT ASSETS FROM SPACE HAZARDS

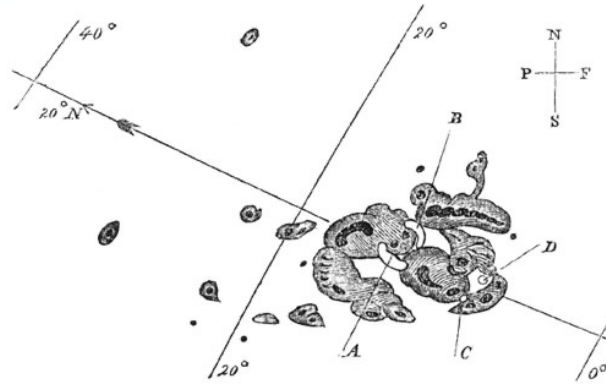
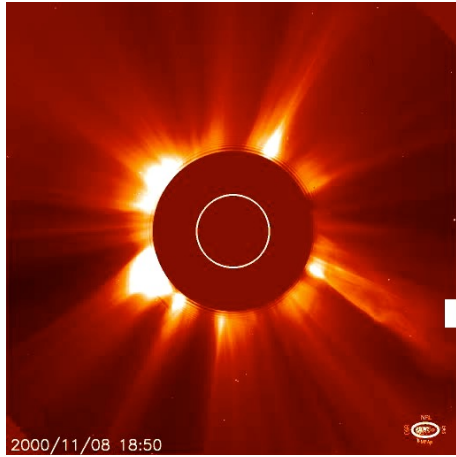




# Space Weather – key concepts

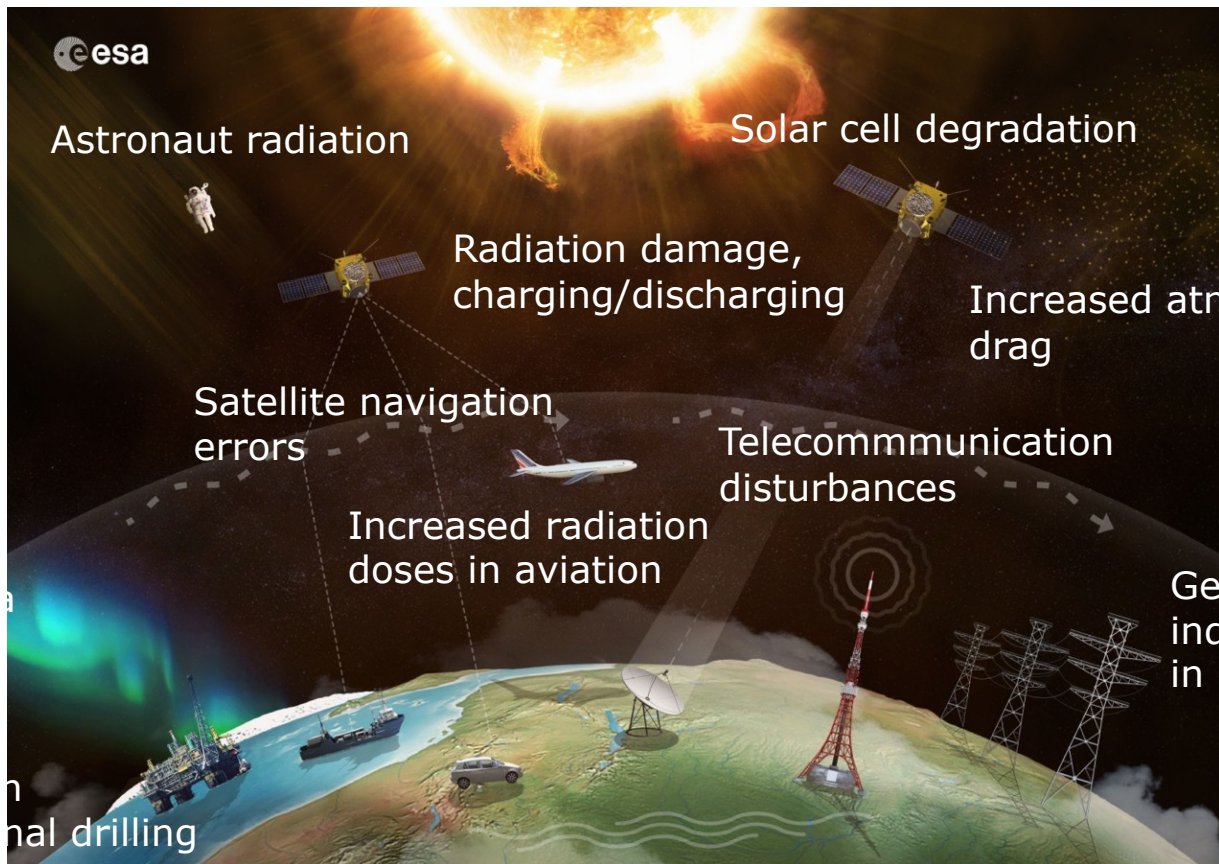


# Carrington Event (1859) – Coronal Mass Ejection

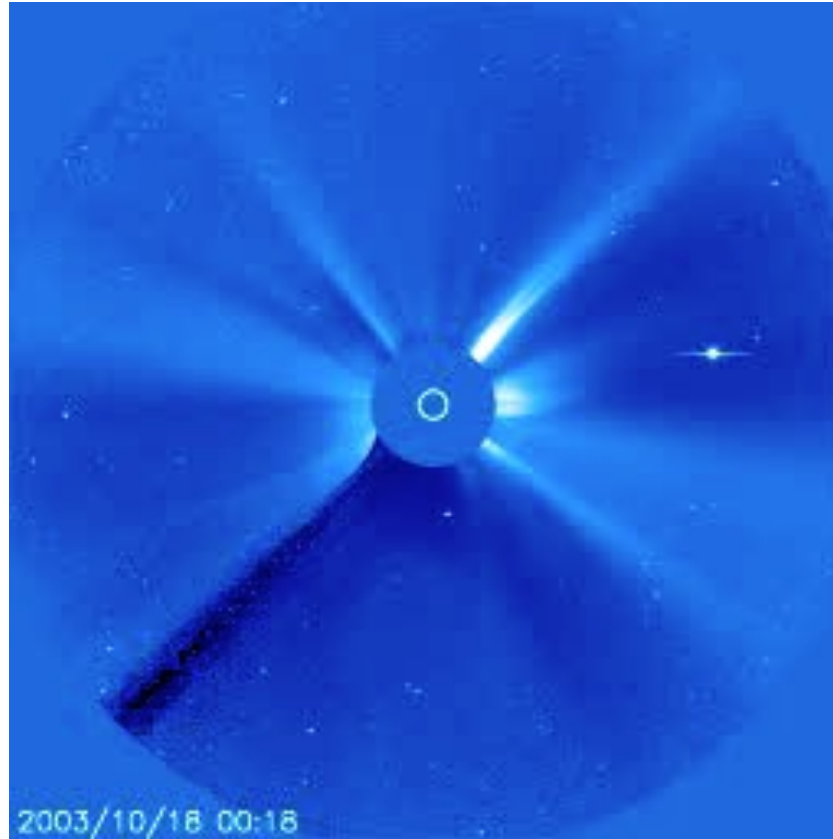




# Space Weather hazards on infrastructure

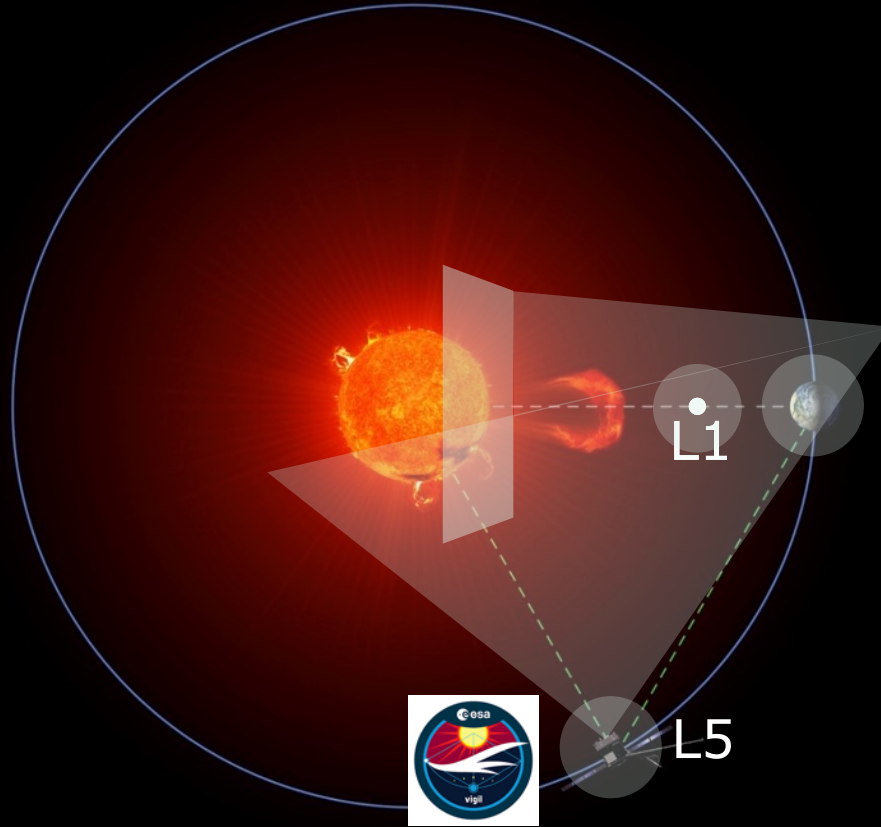


# Halloween storms in October-November 2003





# Space Weather Monitoring including Vigil



# COSMIC: Aurora Mission

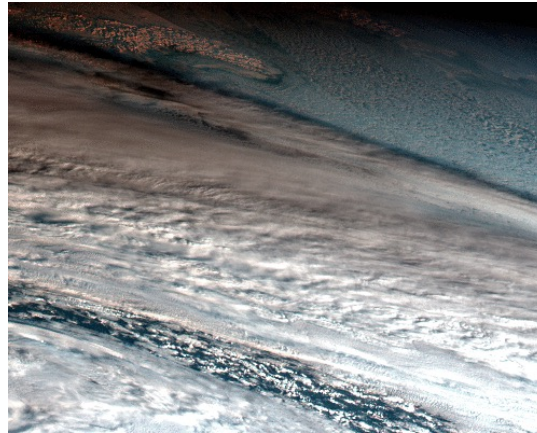




**(30m diam)  
February 2013  
Chelyabinsk**



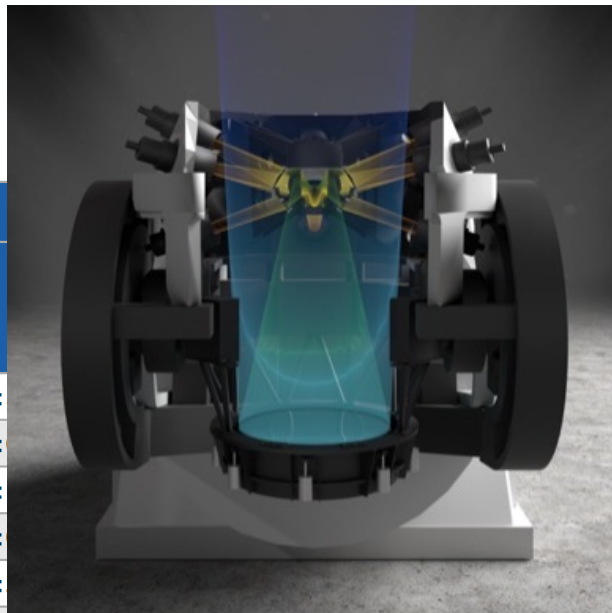
**(10m diam)  
December 2018 –  
Bering Sea**



**(0.1m diam)  
May 2019 Fireball  
Adelaide, Australia)**



# FLYEYE-1 - Concept



Object Name	Diameter [m]	Date/Time
2010RF12	8*	2095-09-05 23:
1979XB	700*	2113-12-14 18:
2019DS1	27*	2082-02-26 19:
2006QV89	28*	2019-09-09 07:
2000SG344	40*	2071-09-16 00:
99942 Apophis	375	2068-04-12 15:
2009JF1	13*	2022-05-06 08:
2008UB7	60*	2060-10-31 18:
2006JY26	8*	2074-05-03 01:
2008JL3	30*	2027-05-01 09:

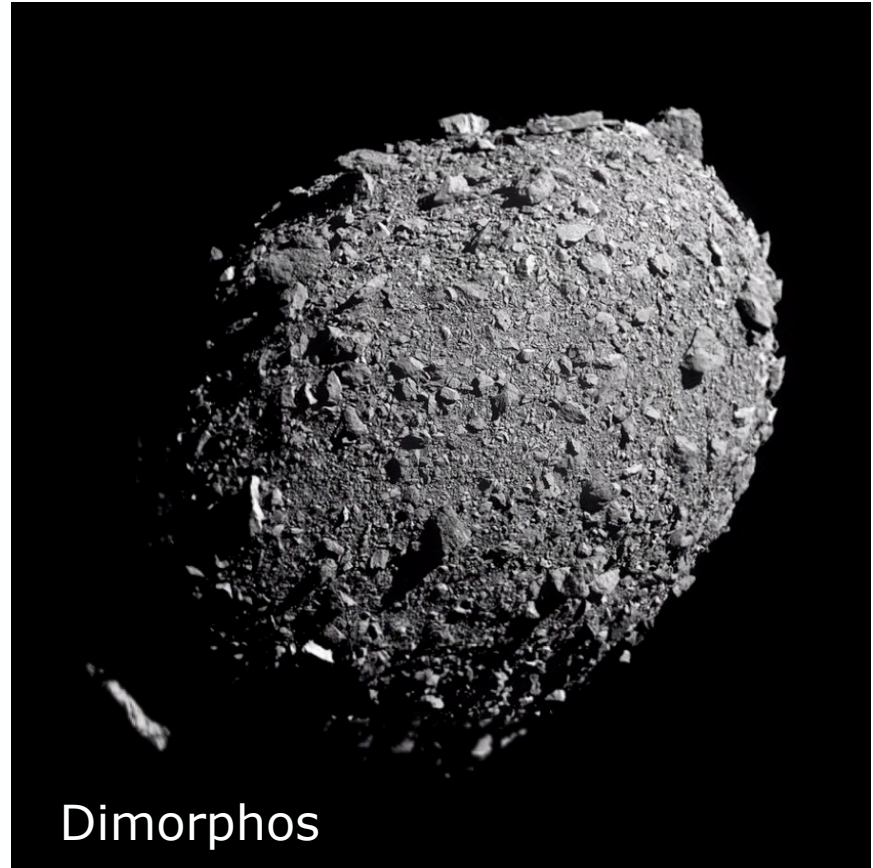
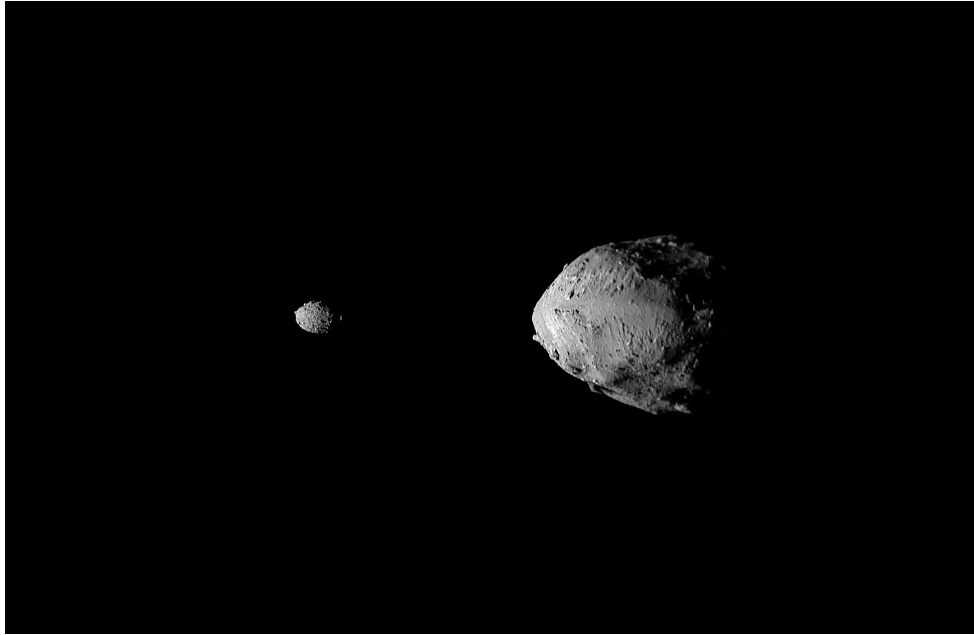
st	IP cum	PS cum	Vel. [km/s]	In list since [days]
7	1/16	-3.26	12.29	3166
3	1/1.15E6	-2.96	26.04	14277
8	1/767	-3.34	15.32	124
7	1/7128	-3.62	12.32	4695
6	1/326	-2.88	11.26	6679
6	1/434655	-3.81	12.62	4966
	1/4464	-3.75	26.41	3542
2	1/15203	-3.51	21.57	3746
6	1/47	-3.65	11.57	4635
6	1/11551	-3.94	14.01	3906

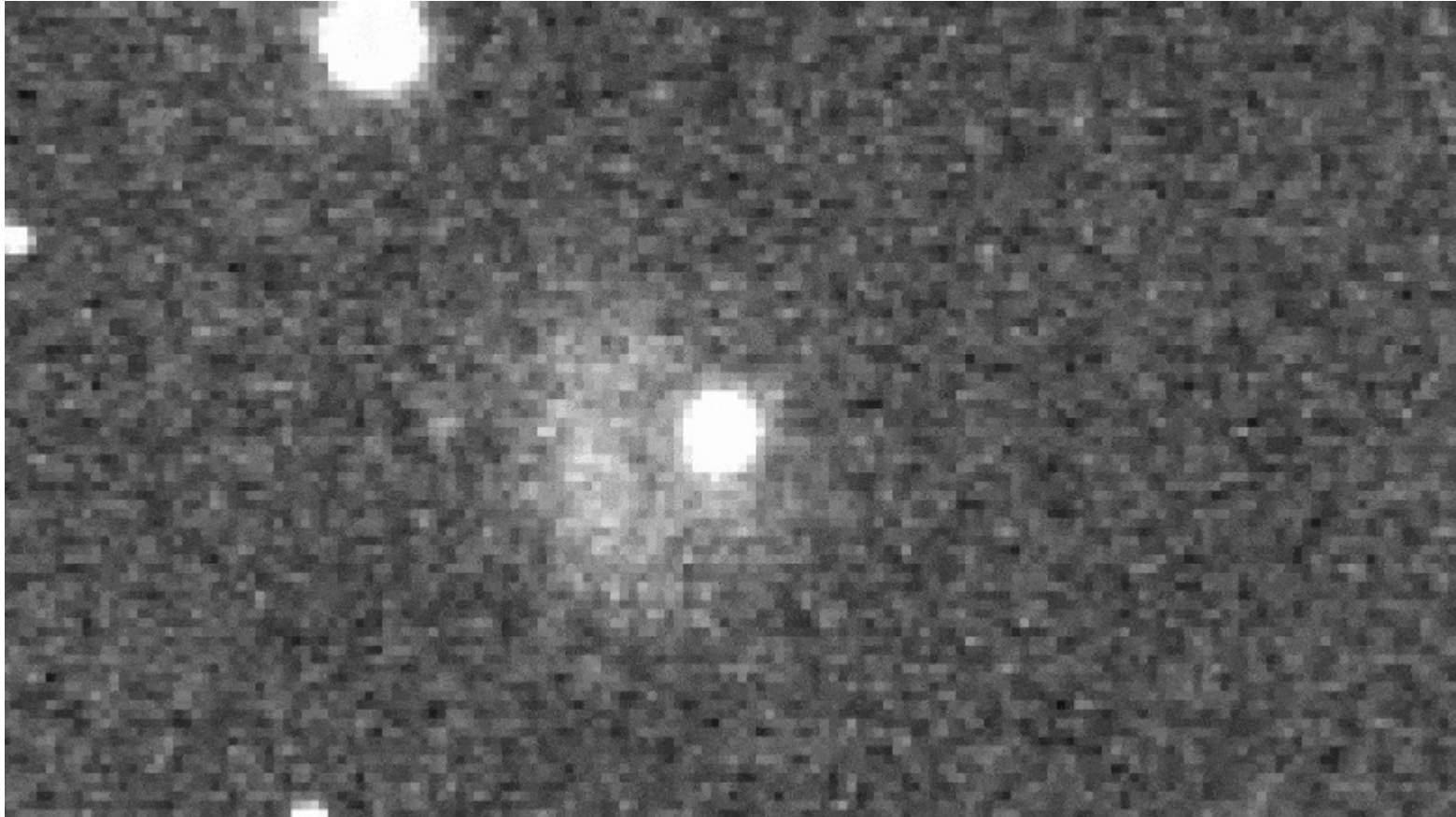


# First Warning by ESA's Planetary Defense System



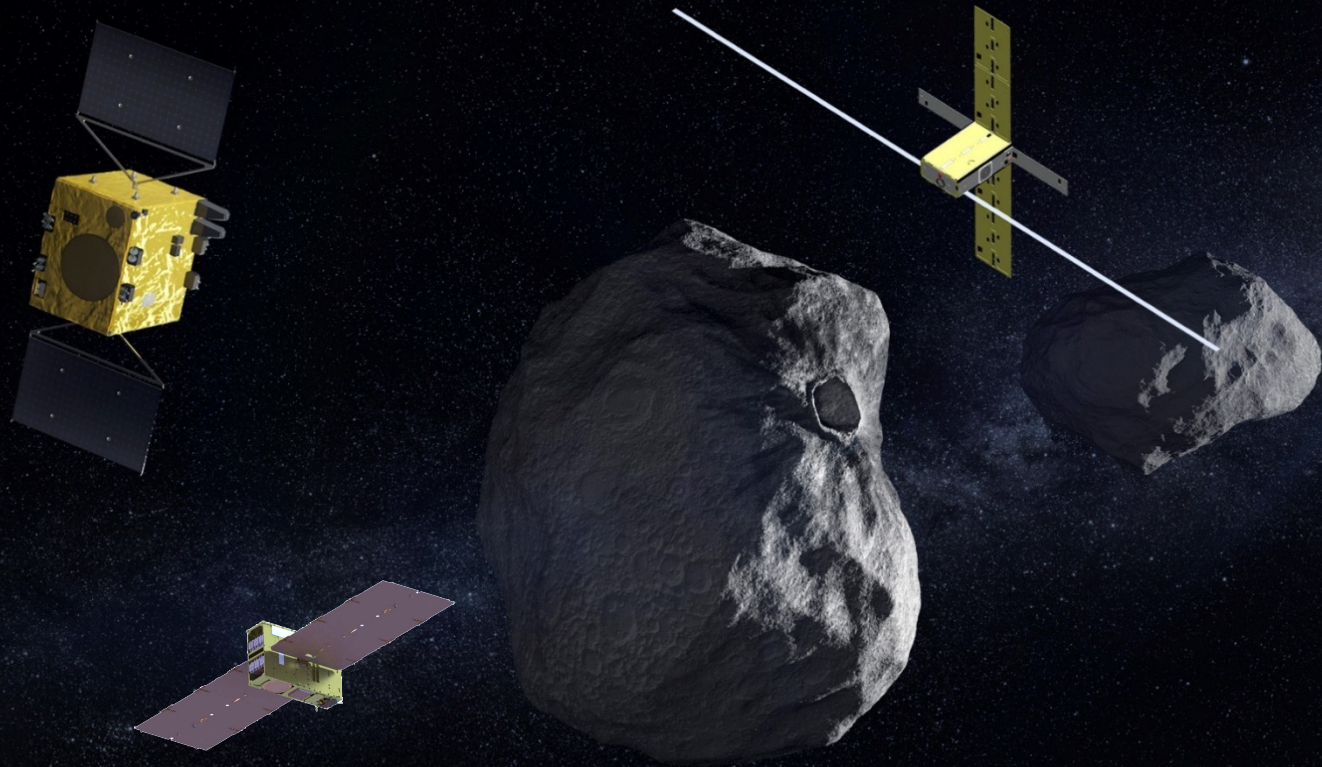
# Hera and DART







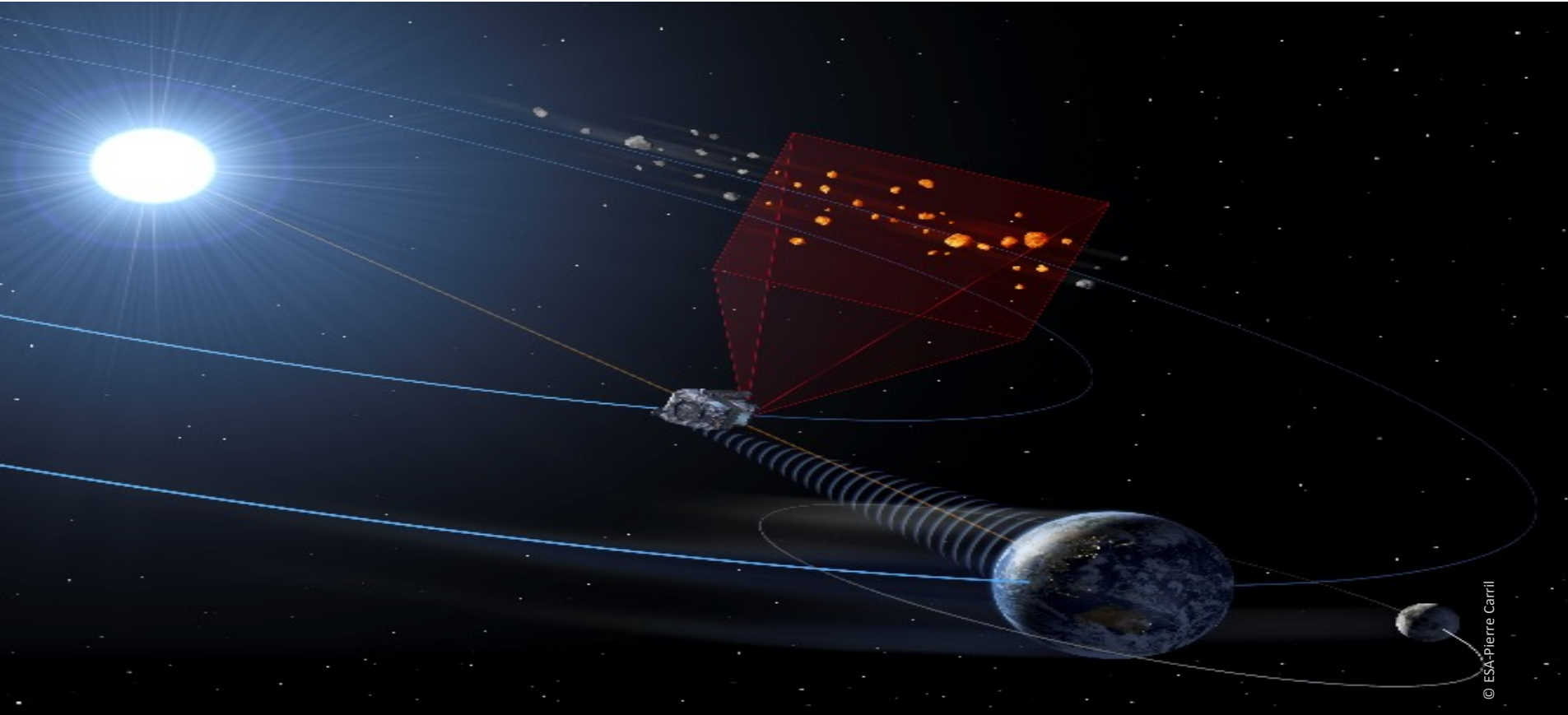
# Hera



Launch, operations, cubesat MOC and Science



# COSMIC: NEOMIR (Near-Earth Object Mission in the Infra-Red)



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# Apophis Mission Study



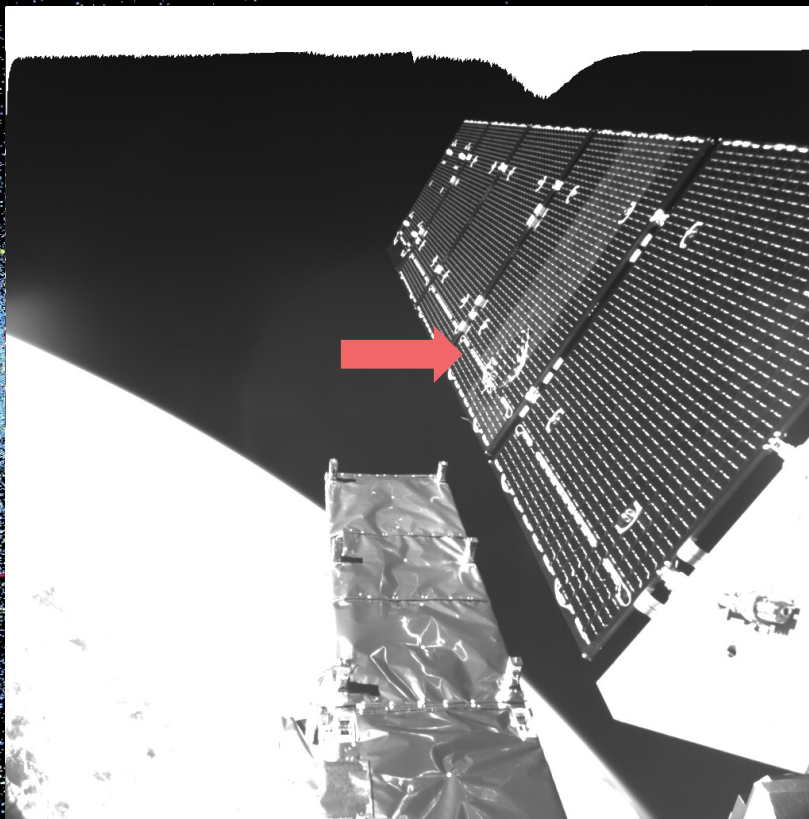
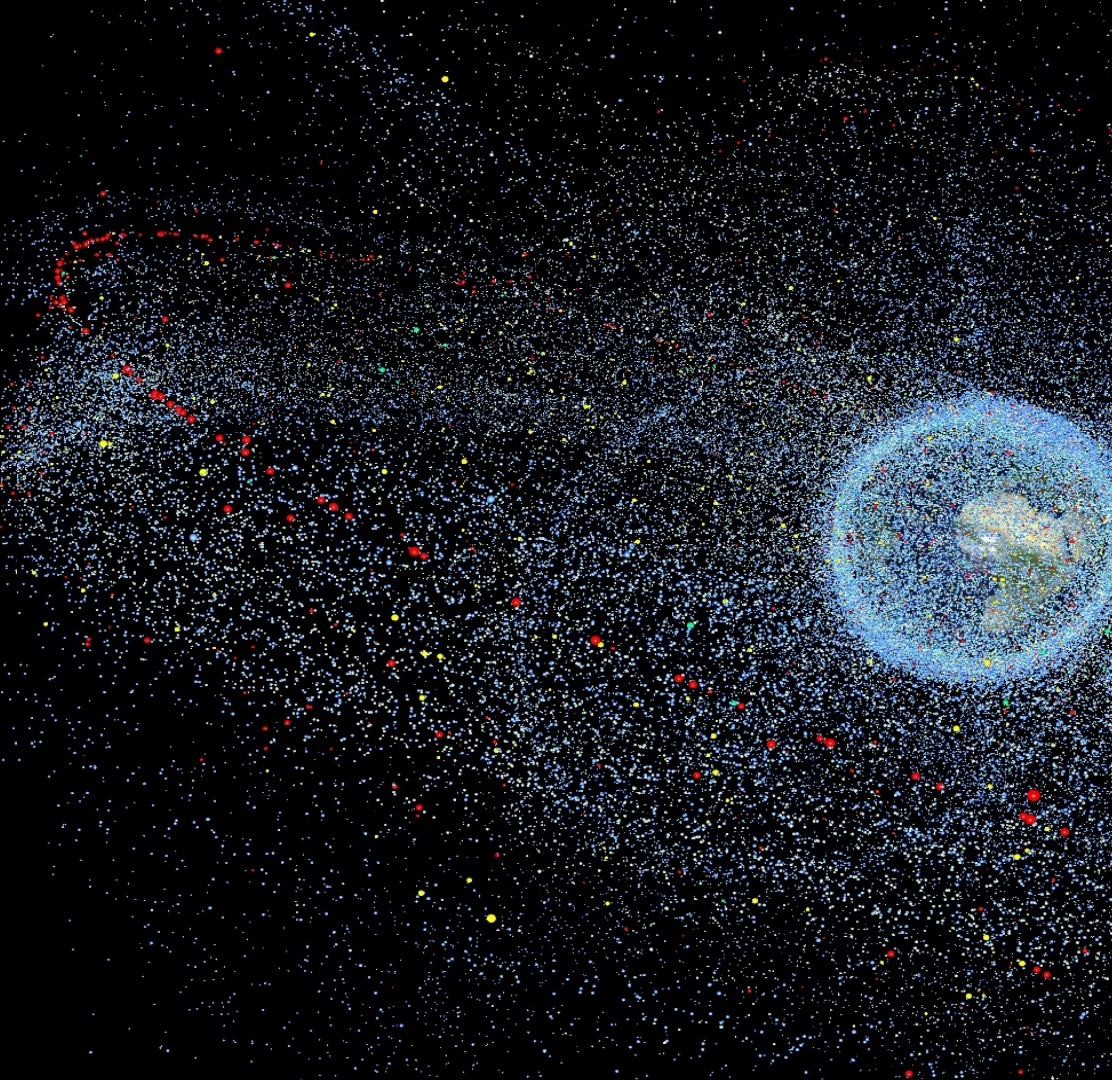
© Mark Garlick/Science Photo Library/Getty Images

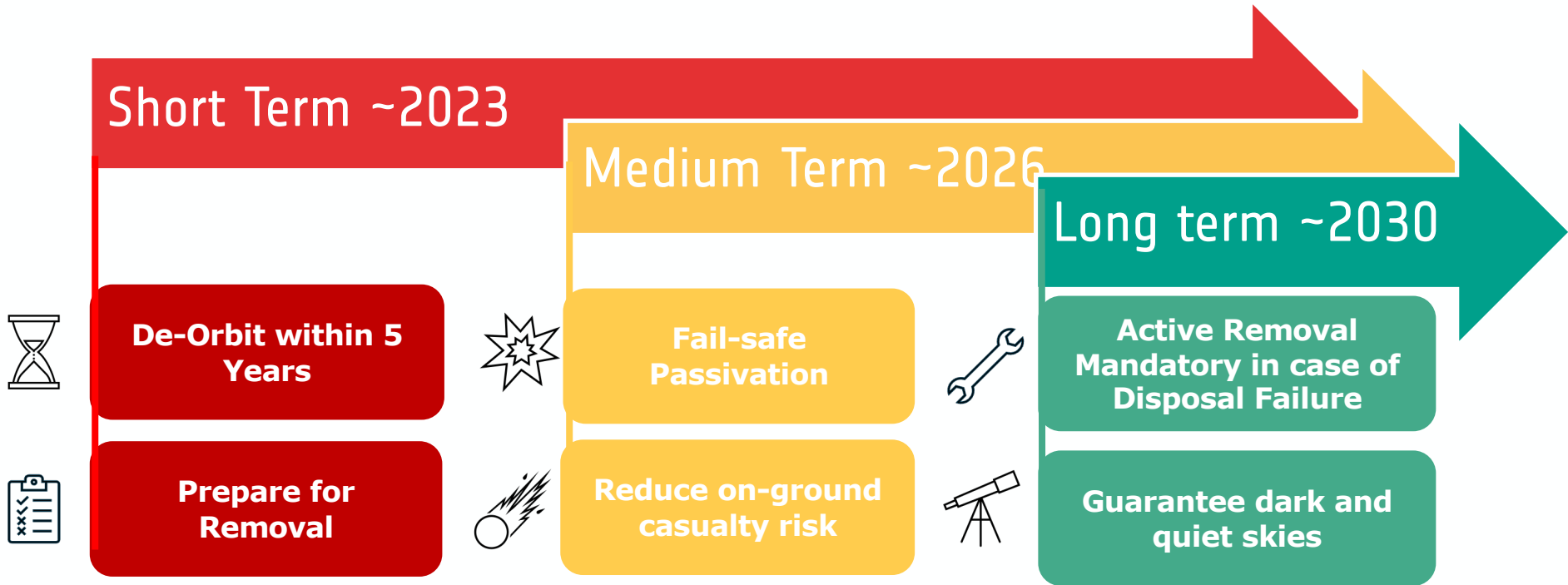


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>1mm









## Active Removal



## In-Orbit Servicing



## Objective

Demonstrate the intention of the actors of the European and global space sectors to act collectively towards jointly defined, ambitious, meaningful and measurable targets, paving the way for collaborative capacity building activities.

## Process

Co-development based on a 'draft zero' prepared by ESA  
Two phases: written feedback and in-person workshops

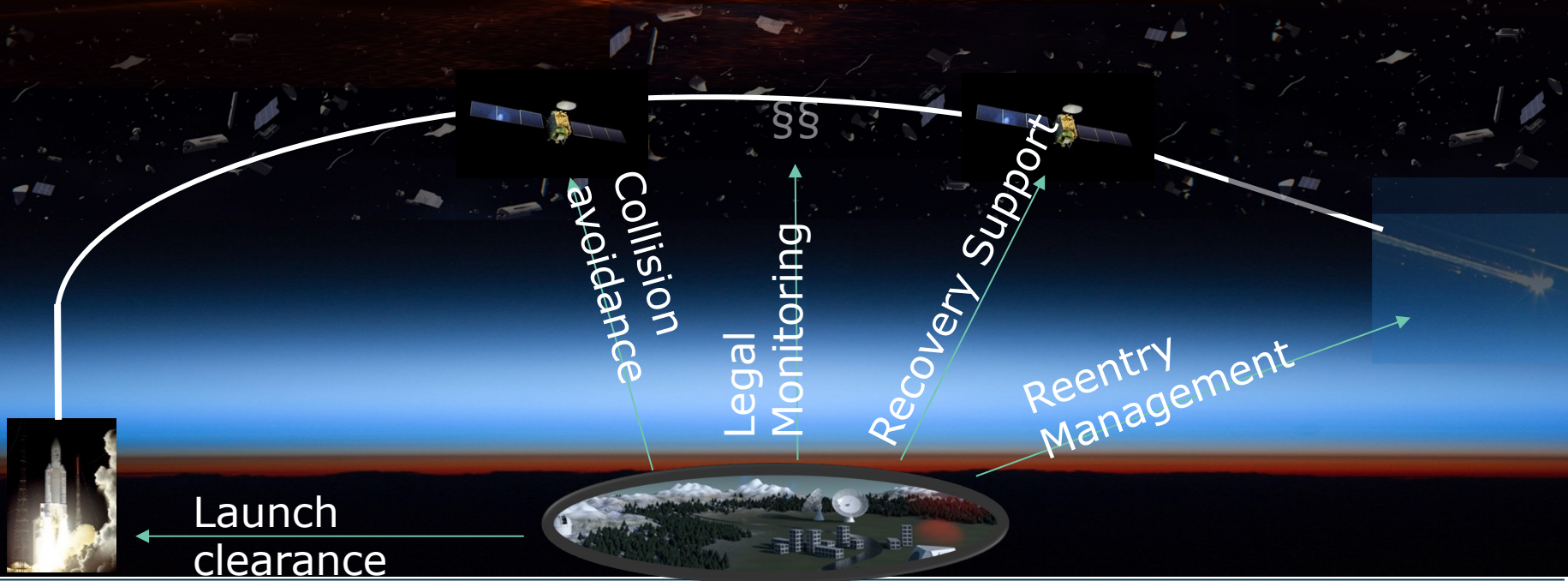
## Co-development partners

All interested actors (incl. public, private, academic and non-profit). ESA will be a partner among others.



# Towards Space Traffic Management

Space Weather Forecasts





Thank You !

