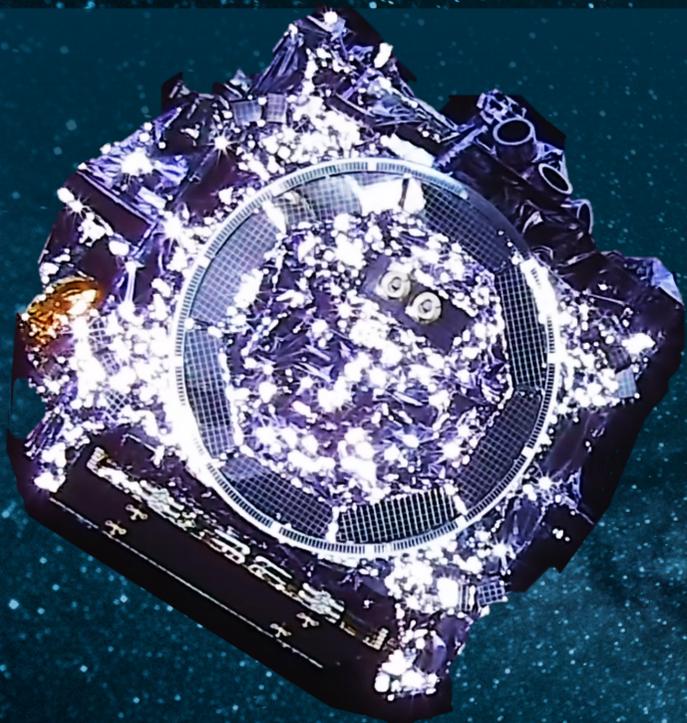


Euclid in the ESA Science Program



Günther Hasinger

Director of Science

ESA-ESO Euclid Workshop, ESAC

25.10.2022



COSMIC OBSERVERS



IN DEVELOPMENT



ACTIVE



microwaves

sub-millimetre

infrared

optical

ultraviolet

x-rays

gamma rays

gravitational waves

LEGACY



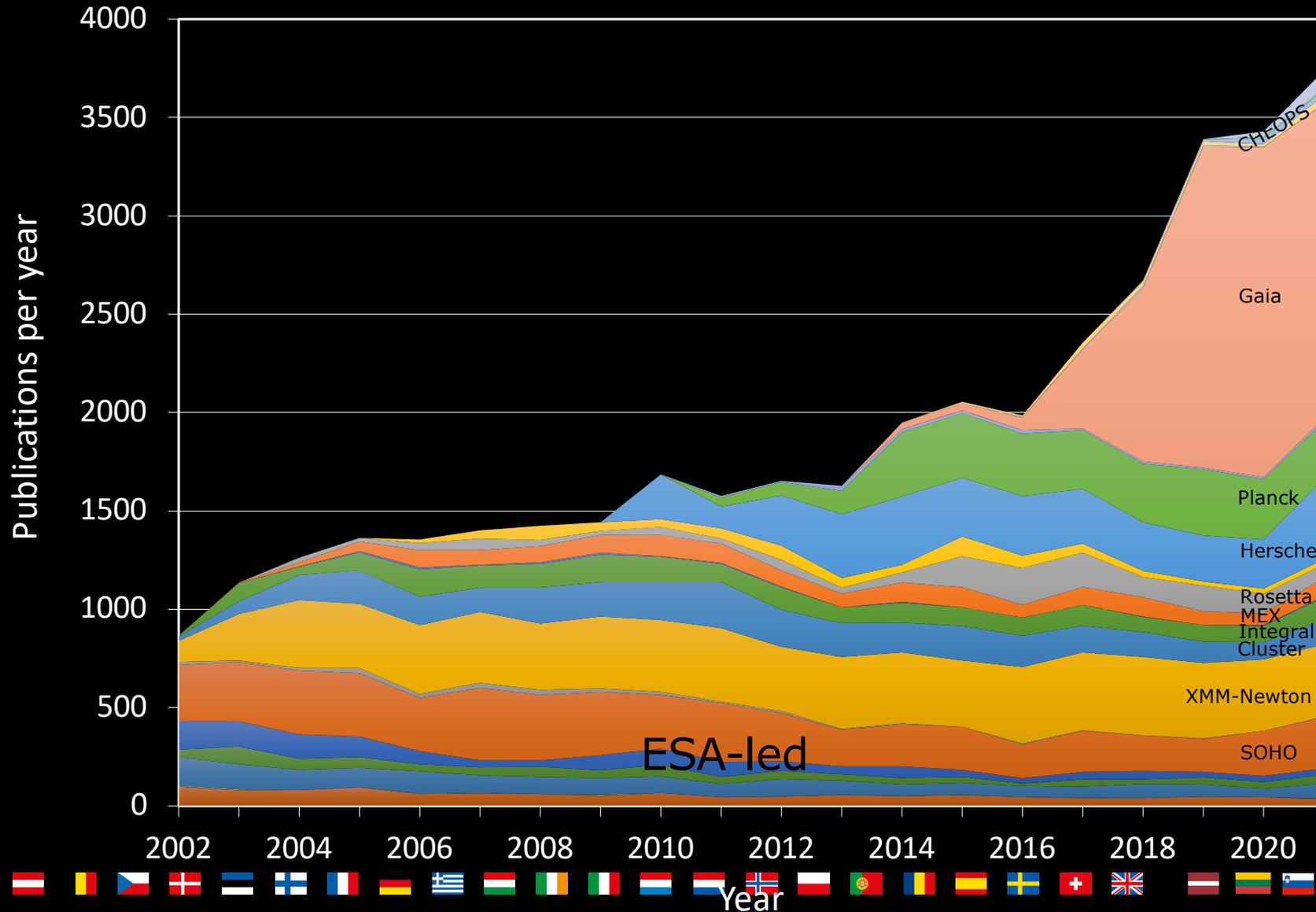
lisa pathfinder (2015-2017)

microscope (2016-2018)



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ESA Missions: Refereed Publications



Most papers ever in 2019-2022 (>3500)

About half of these were from Gaia

Strong positive trend with doubling time ~8yr

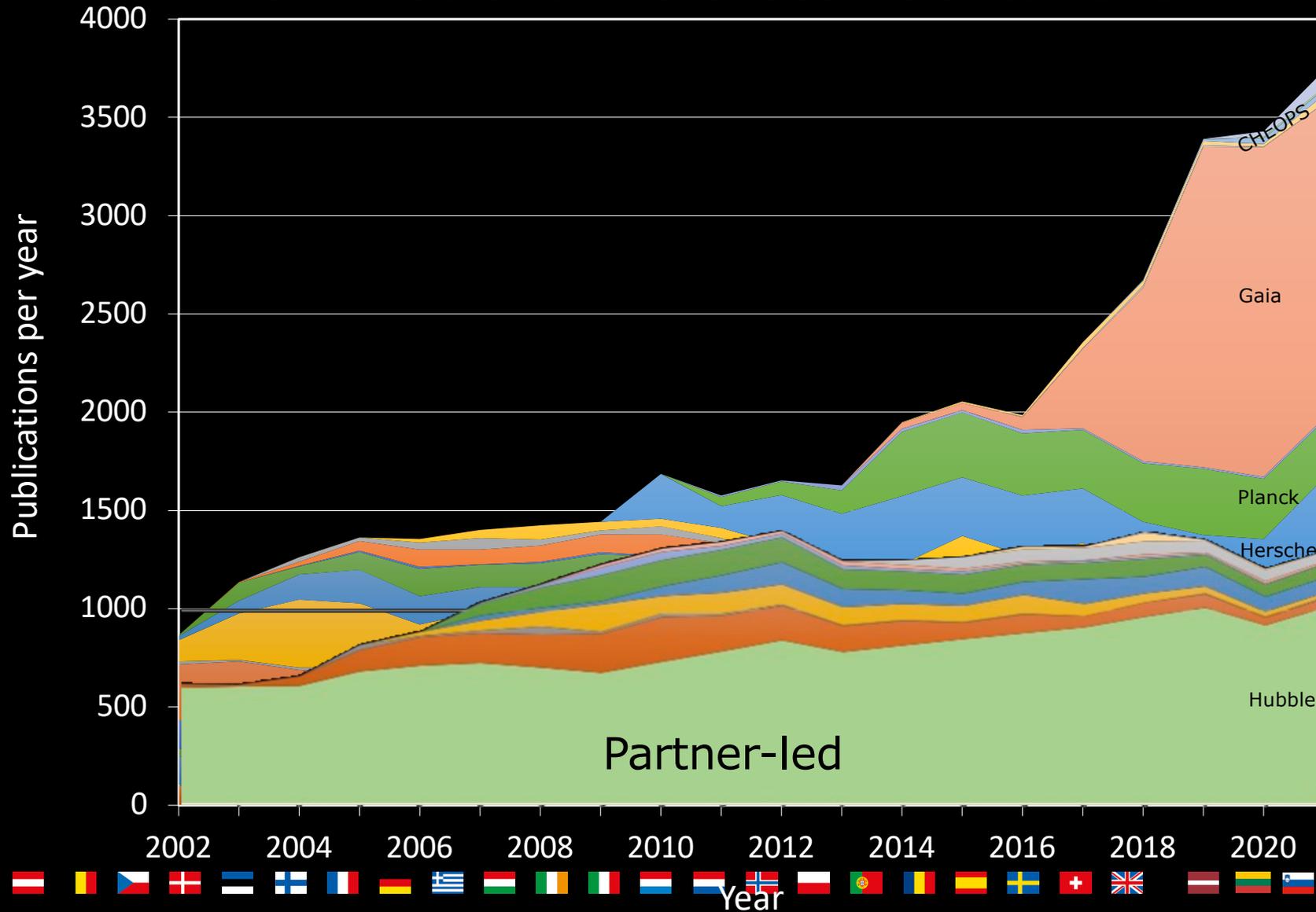
Pandemic caused some slow-down, but has recovered

~12% of worldwide "market share", including all ground based and theoretical astrophysics (16% including partner missions).

Citation impact strongly increasing.



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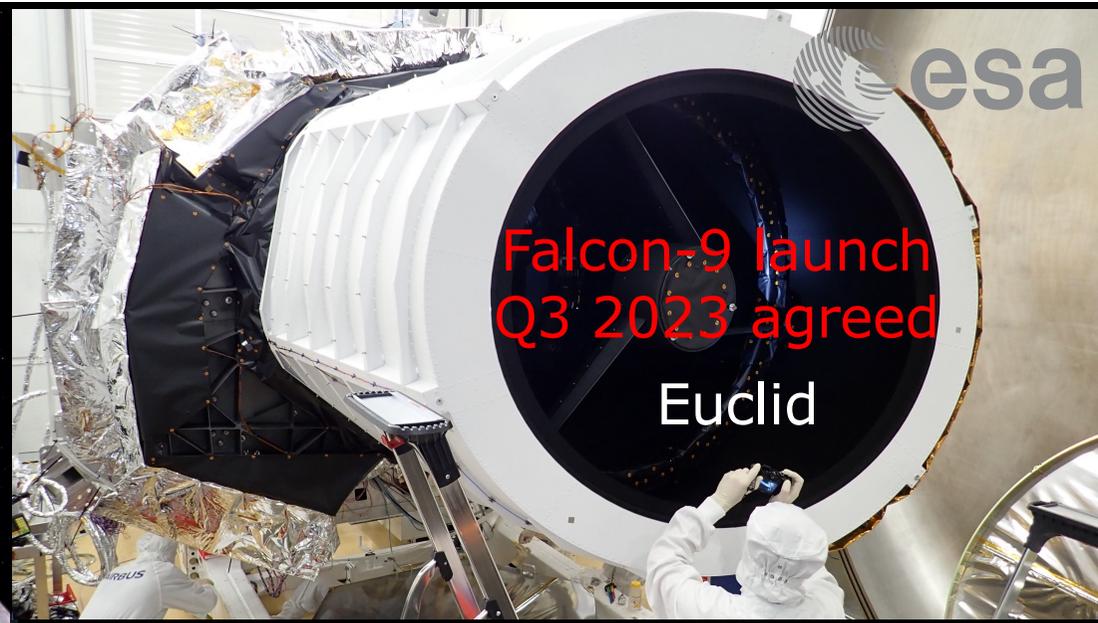
Citation impact strongly increasing.



Projects in Preparation



JUICE

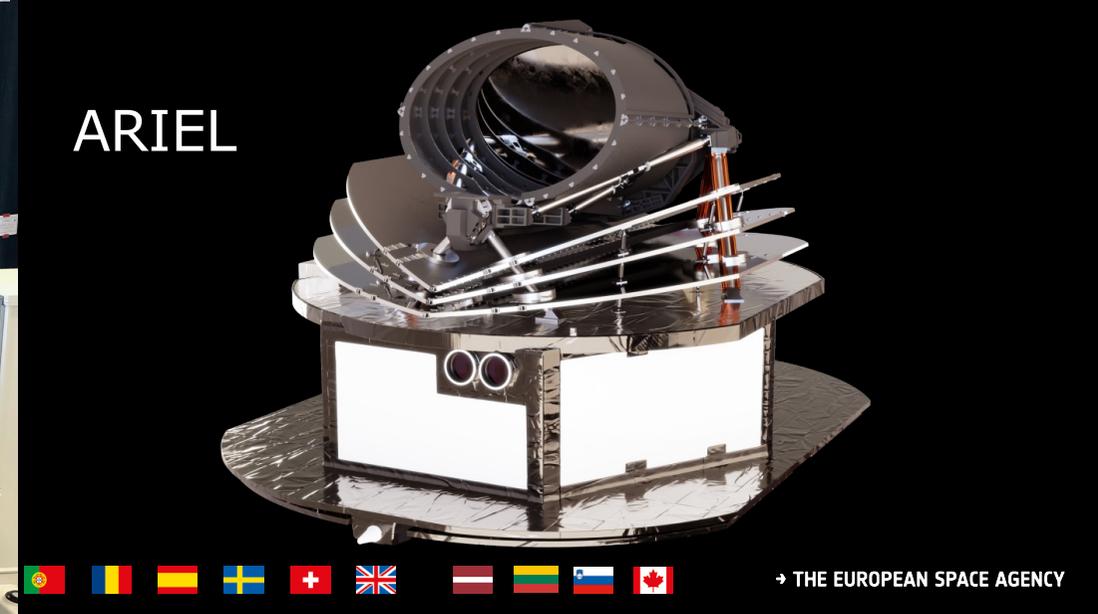


Falcon-9 launch
Q3 2023 agreed

Euclid



PLATO



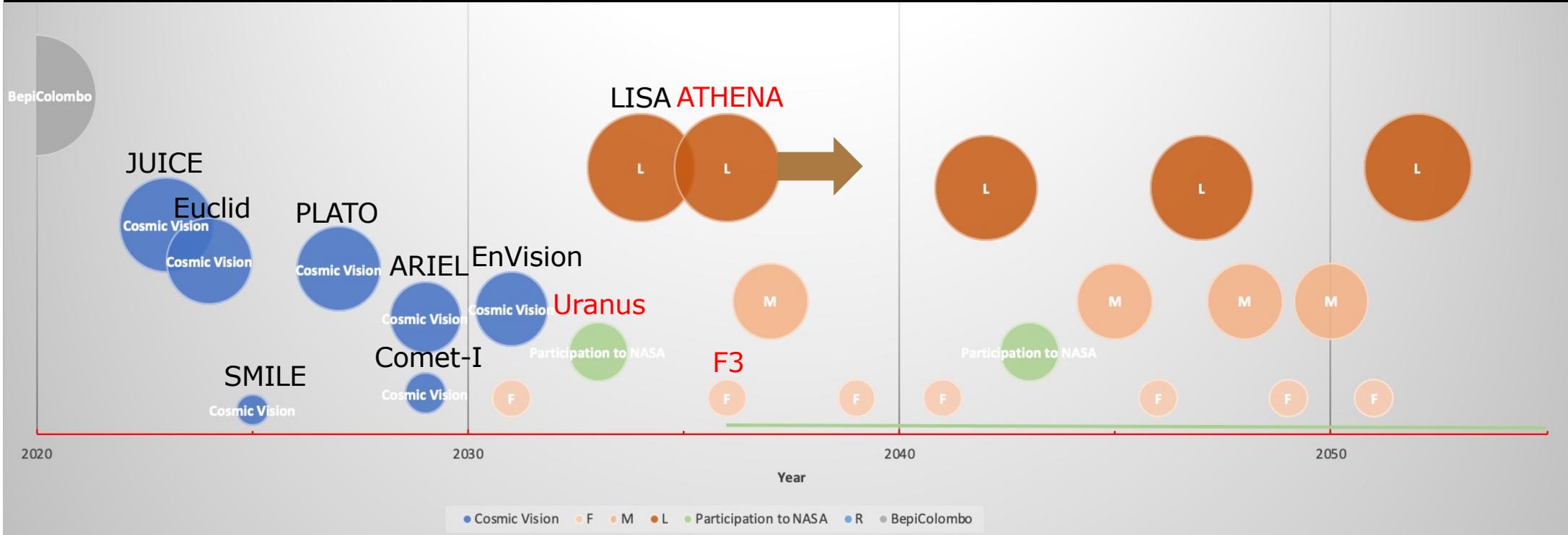
ARIEL



Revision of the SCI Long-Term Plan

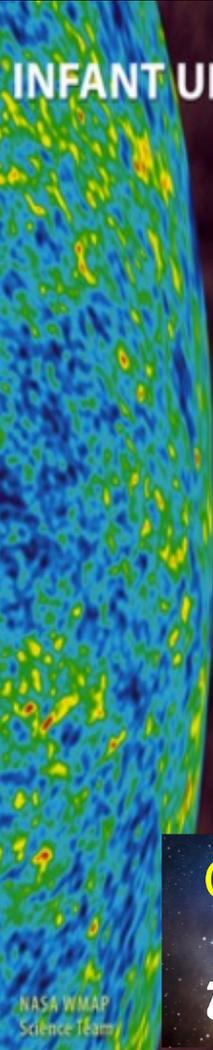


The CM22 LoR settlement, together with the current inflation means an approximately constant purchasing power since 2017, i.e. a loss of about 700 Meuro from the previous more optimistic Long-Term (10yrs) Plan. We have to work for a restoration of buying power in CM25.



Multi-Messenger Quest for the first Black Holes

INFANT UNIVERSE 13.8 billion years ago
with seeds of future galaxies



COSMIC DARK AGES
380,000 to 400 million years
after the Big Bang

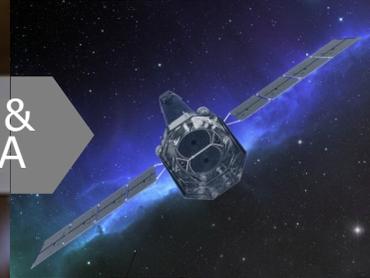
GRB EP
theseus

NASA WMAP
Science Team



Athena & eROSITA

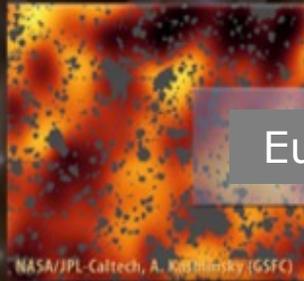
NASA/JPL-Caltech



Black holes

JWST

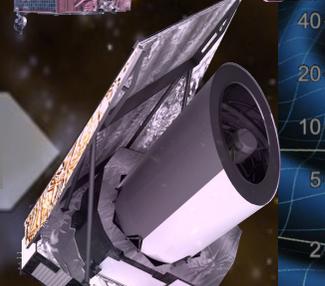
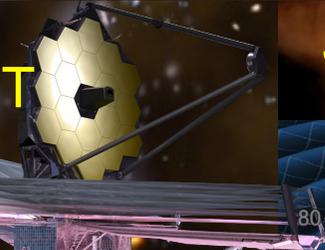
First stars



Euclid

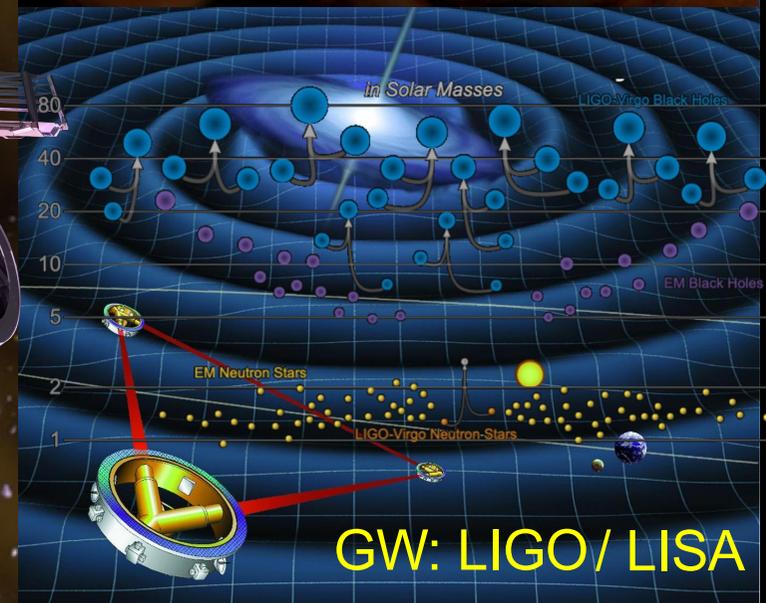
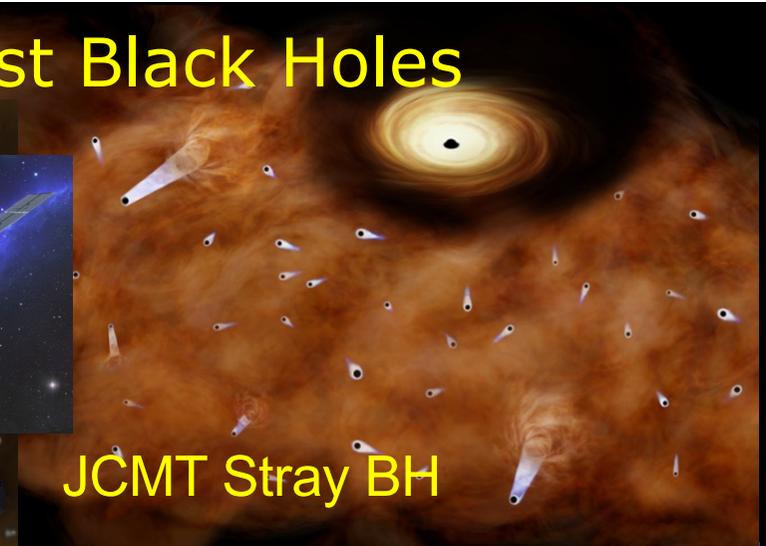
FIRST STARS & QUASARS
400 million years after the Big Bang

NASA/JPL-Caltech, A. Rubin (GSCF)



NASA/ESA
S. Beckwith (STScI)
The HUDF Team

JCMT Stray BH

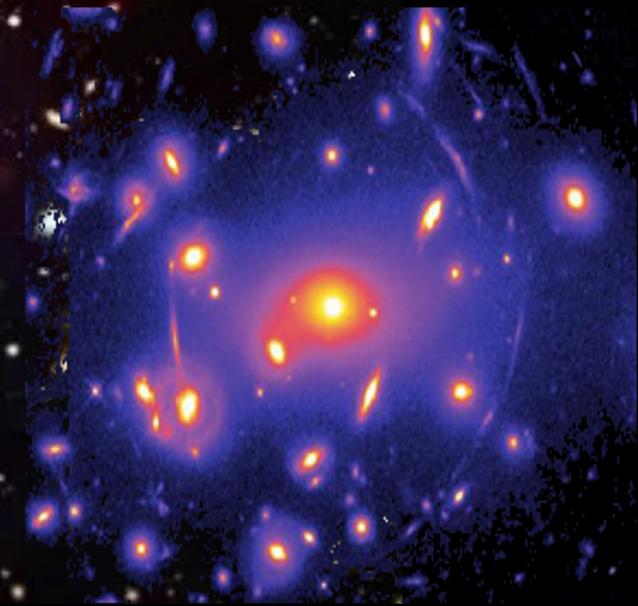
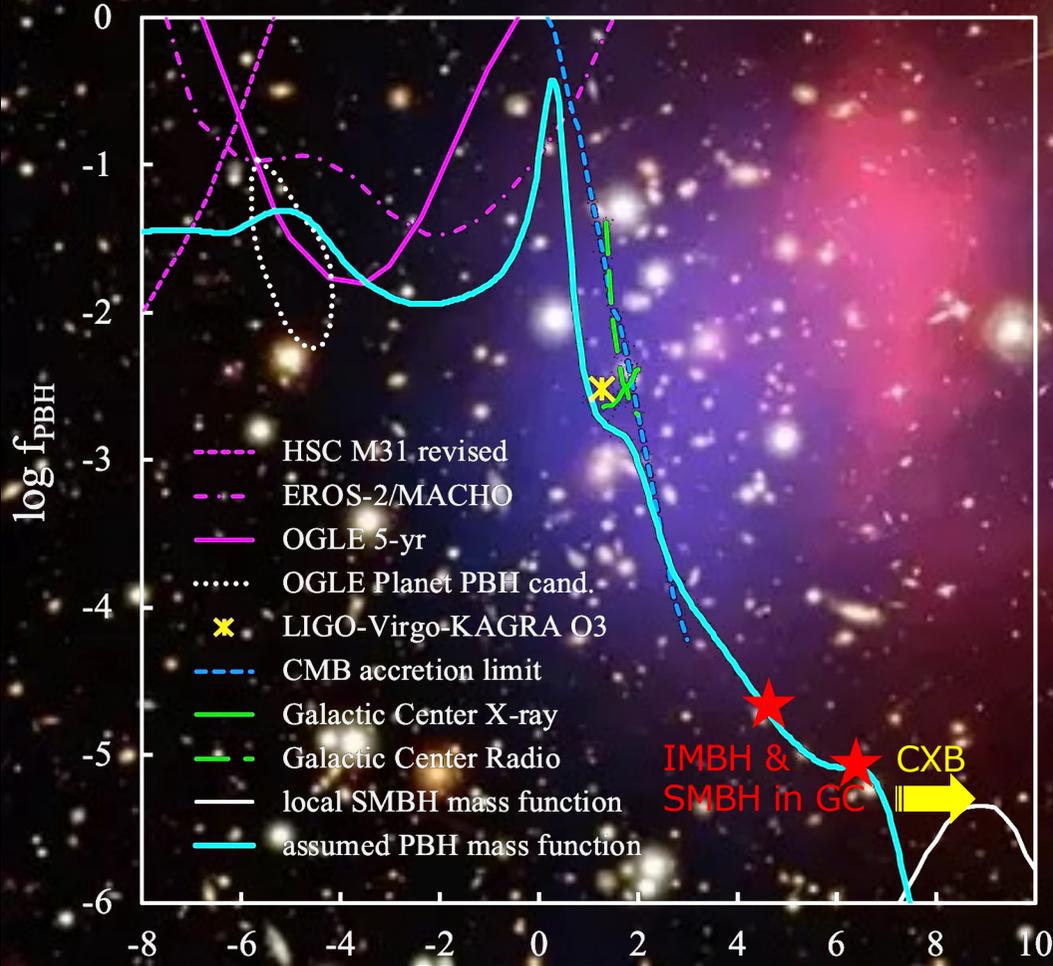


GW: LIGO/ LISA



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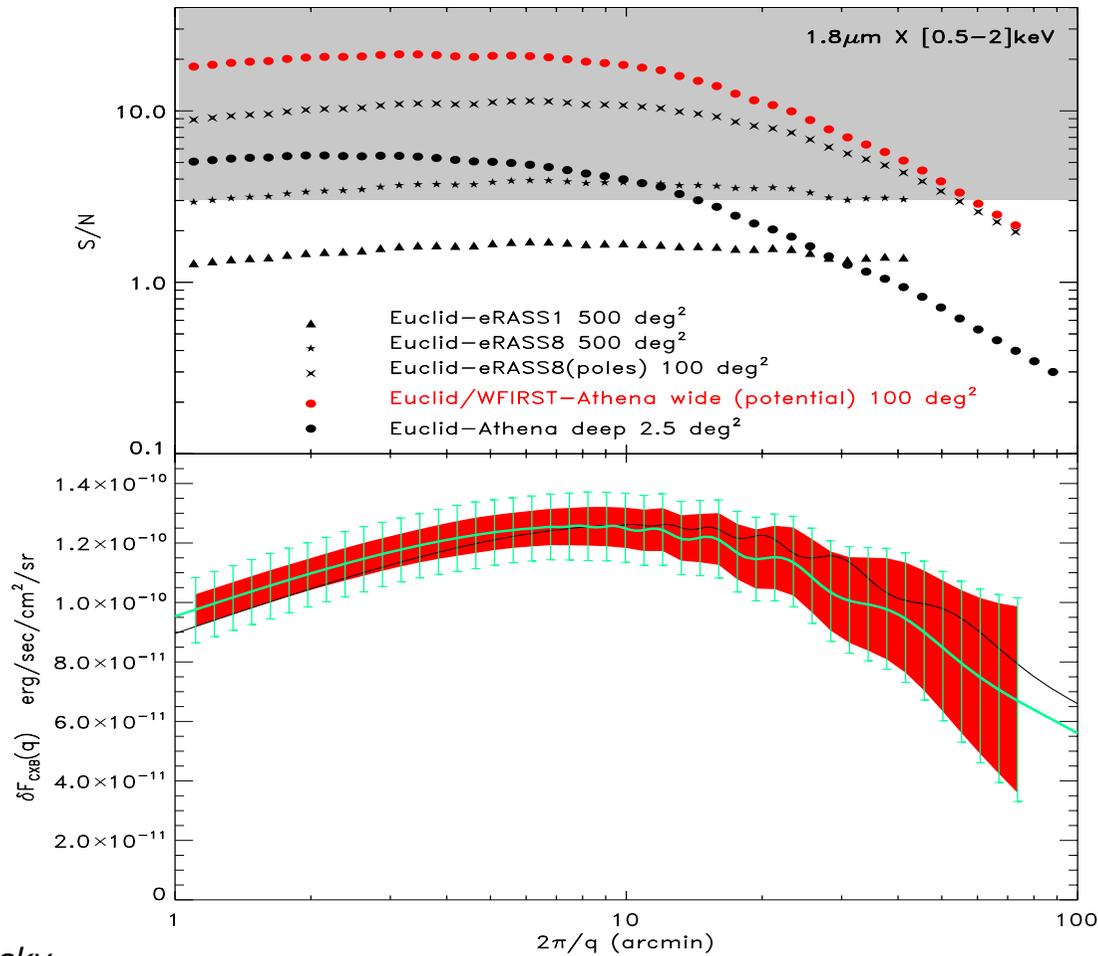
Is Dark Matter made up by Primordial Black Holes?



Crosscorrelation Euclid with eROSITA and Athena



$$(S/N)^2 = 2n_q W(q)$$

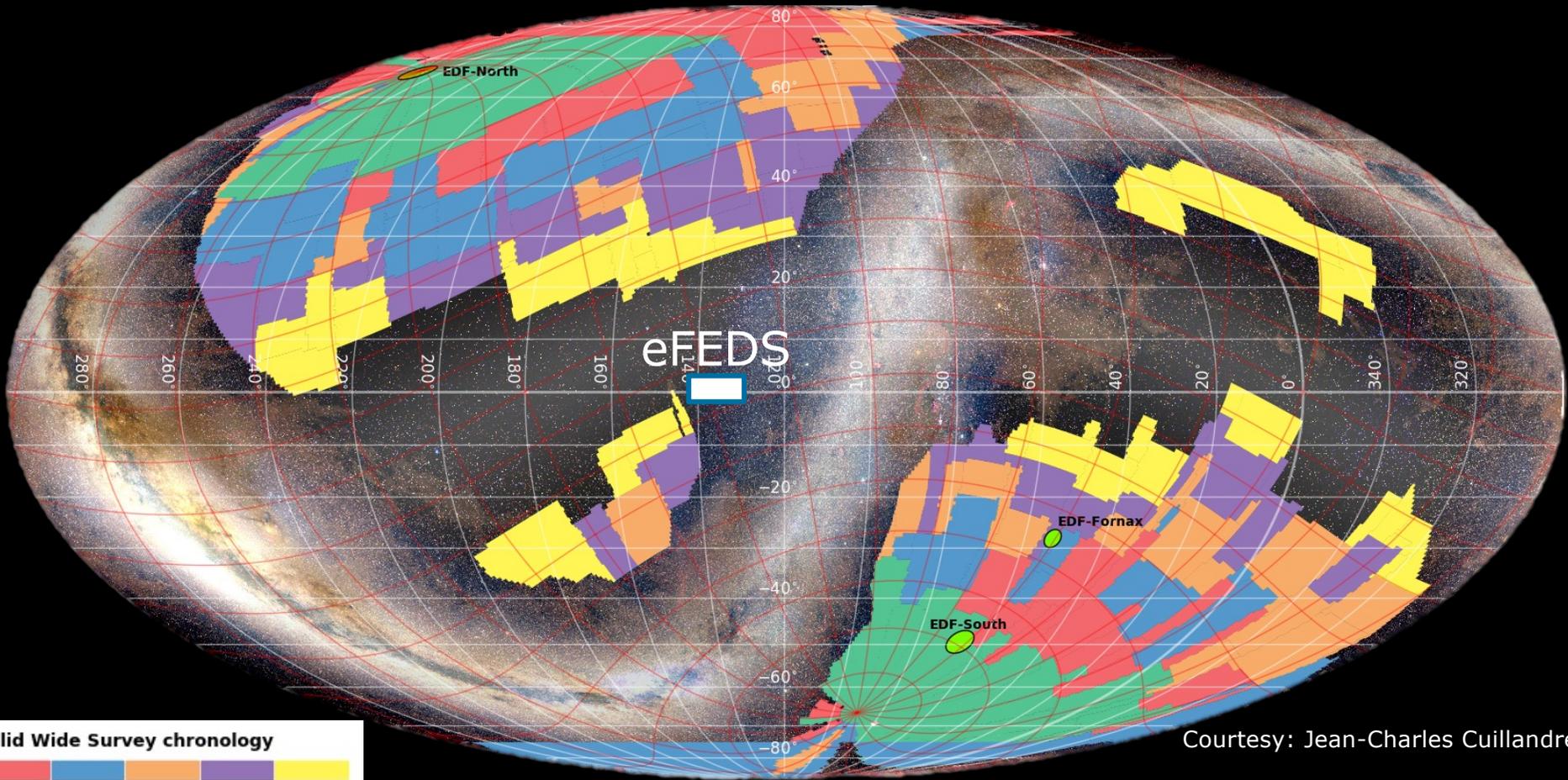


A. Kashlinsky

LIBRAE-TEAM



The Euclid Survey



Courtesy: Jean-Charles Cuillandre (CEA/IRFU)

Euclid Wide Survey chronology



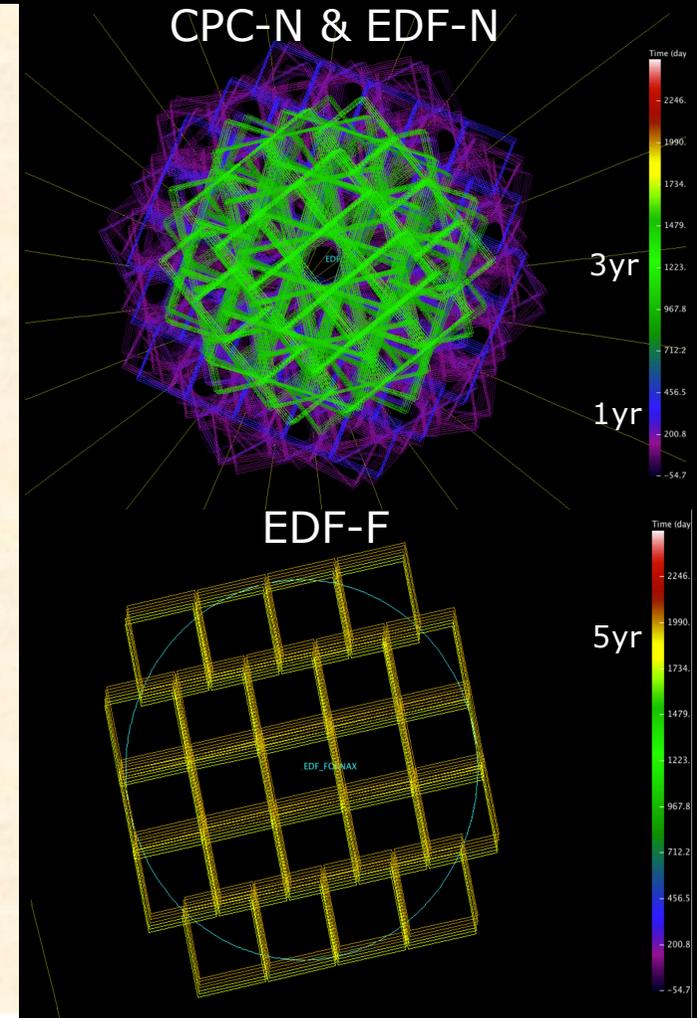
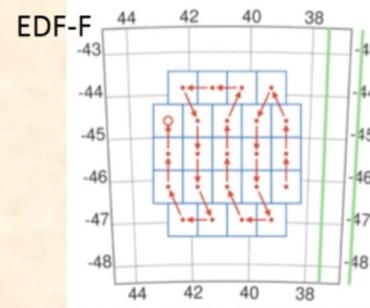
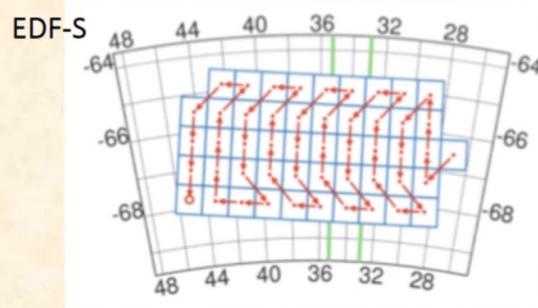
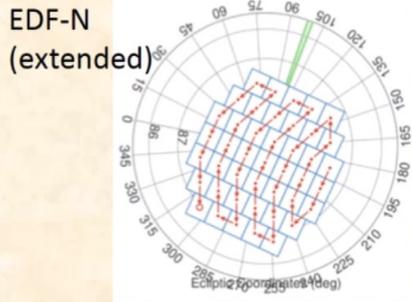
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Euclid Deep Fields



Name	Size (deg ²)	Effective Visits*	Note	Note
CPC-N	20	10	offset 1 deg from NEP	observed by Spitzer
EDF-N (contained in CPC-N)	10	30 + 10		
EDF-S (same location as CPC-S)	23	40	observations allocated for Spitzer	agreement from Vera C. Rubin Obs. to observe it
EDF-F	10	40		observed by Spitzer

* (actual number of visits is larger to compensate for larger zodiacal background)



Diving into the early Universe



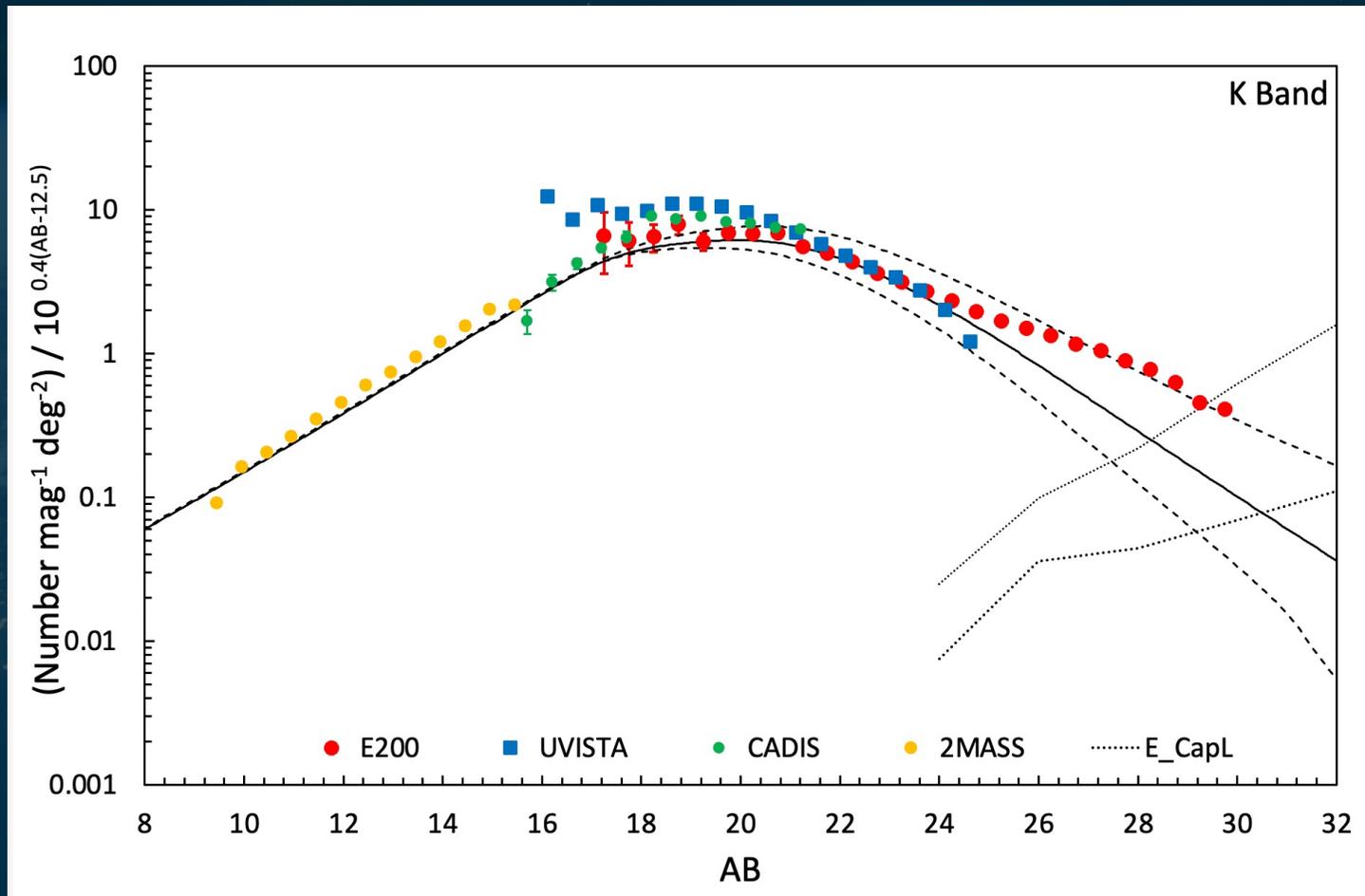
First deep JWST image released by president Joe Biden!

It may well contain a glimpse of early star formation induced by primordial black holes.



→ THE EUROPEAN SPACE AGENCY

Preliminary JWST Medium-Deep K-Band galaxy counts



First glimpse of a new high-redshift population?

Can't wait to see the Deep Survey results!





**Thank you
very much!**



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