

# ESCAPE: "Extreme Solar Coronagraphy Antarctic Program Experiment"

## Solar Coronagraphy from Dome C

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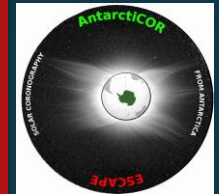
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# ESCAPE: Solar coronagraphy from Dome C

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## ESCAPE TIMELINE Project PNRA: 2015/AC3.02



ESA- PROBA3 Mission Concept – Courtesy of ESA



# ESCAPE: Solar coronagraphy from Dome C

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## ESCAPE OBJECTIVES

### Science

Mapping the plasma (electrons) of the inner solar corona

### Site Characterization

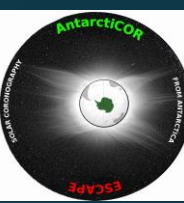
Demonstrate that Dome C is one of the very few sites on the Earth for solar corona observation

### Technology

Demonstrate the feasibility of use of innovative micropolarizer array cameras for scientific purposes

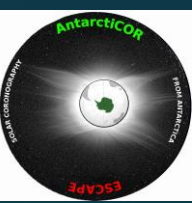
### Space Demonstrator

Validate the optical design of the ASPIICS coronagraph on board the ESA-PROBA3 mission (launch 2024)



# ESCAPE: Solar coronagraphy from Dome C

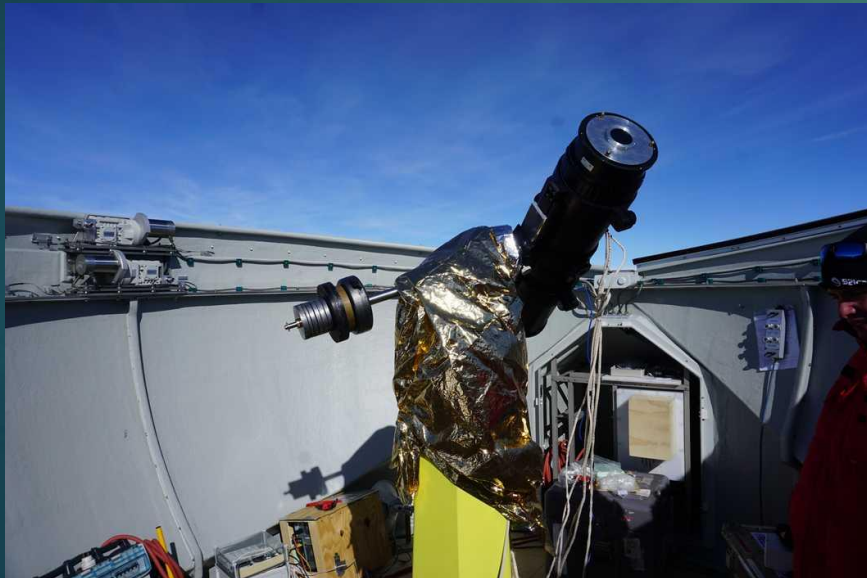
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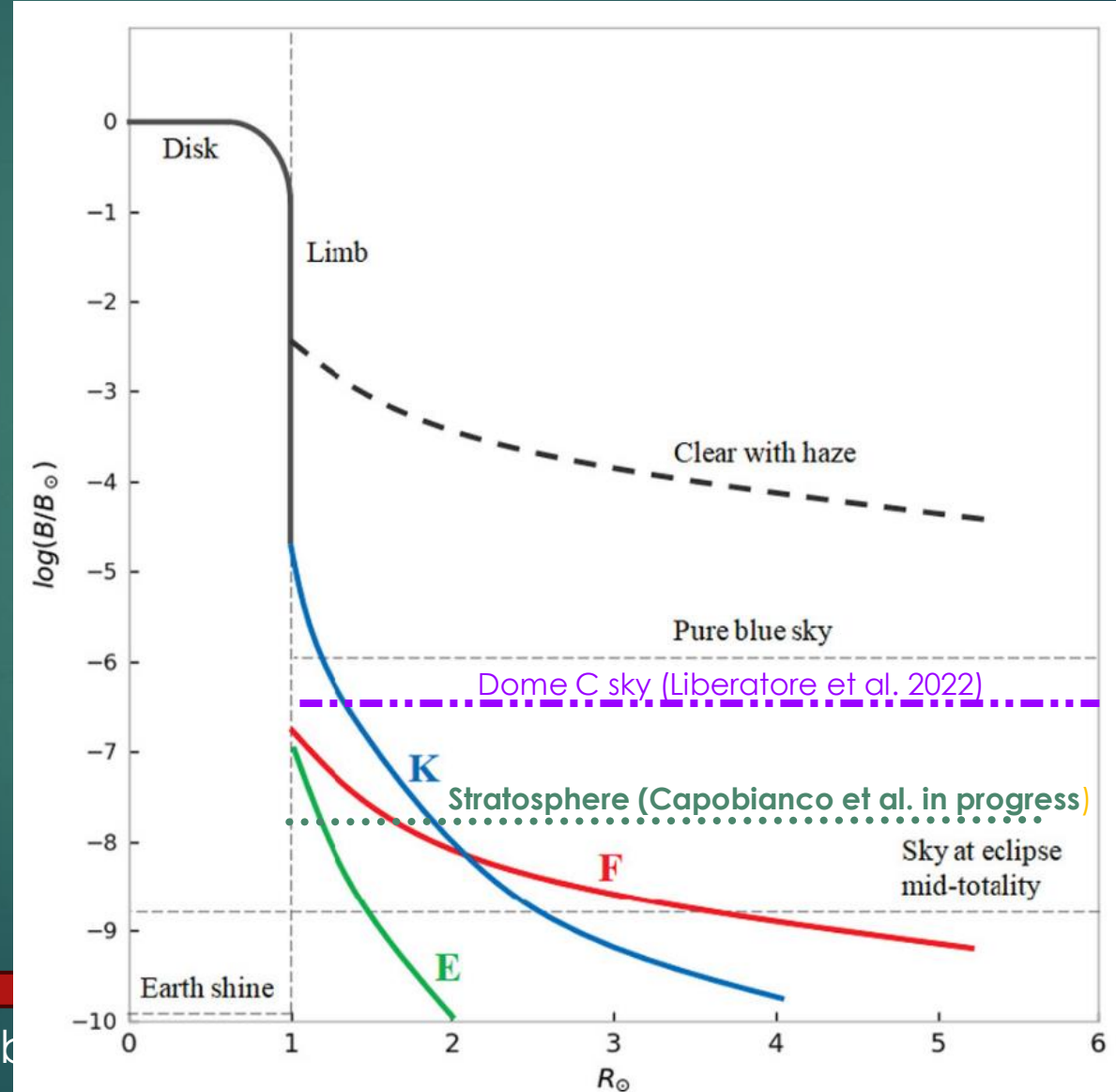
## ESCAPE SCIENCE OBJECTIVES

### Site Characterization

Demonstrate that Dome C is one of the very few sites on the Earth for solar corona observation

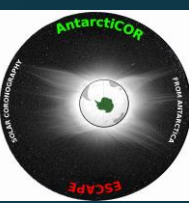


G. Capobianco



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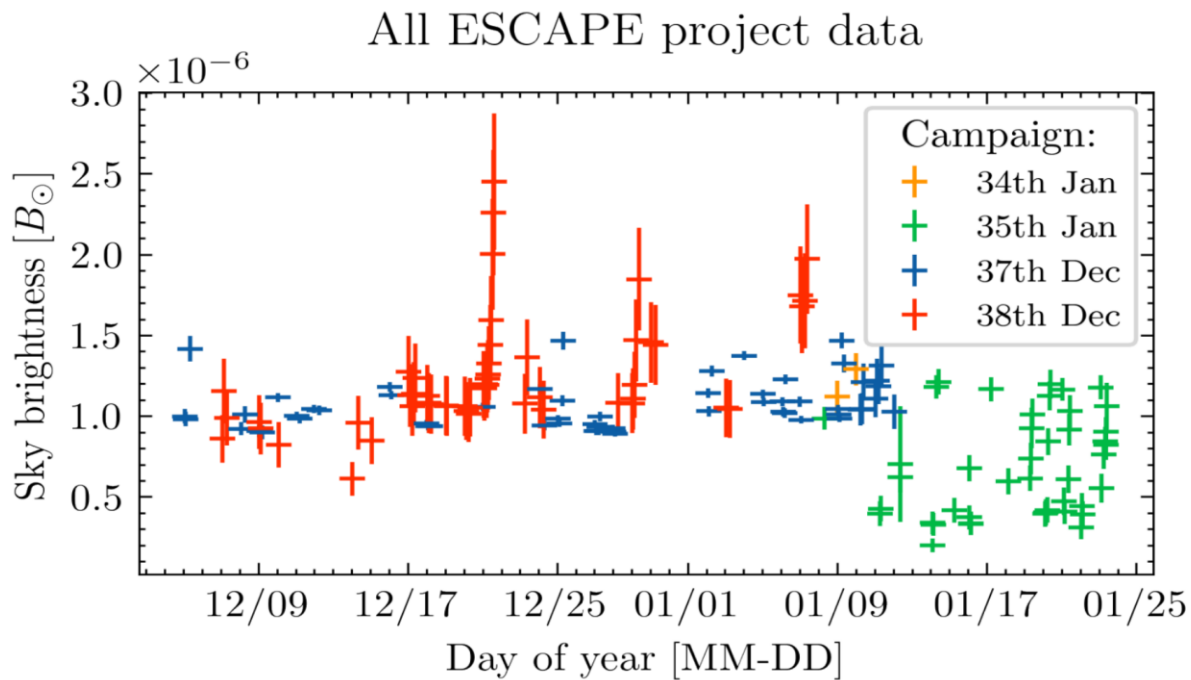
# ESCAPE: Solar coronagraphy from Dome C



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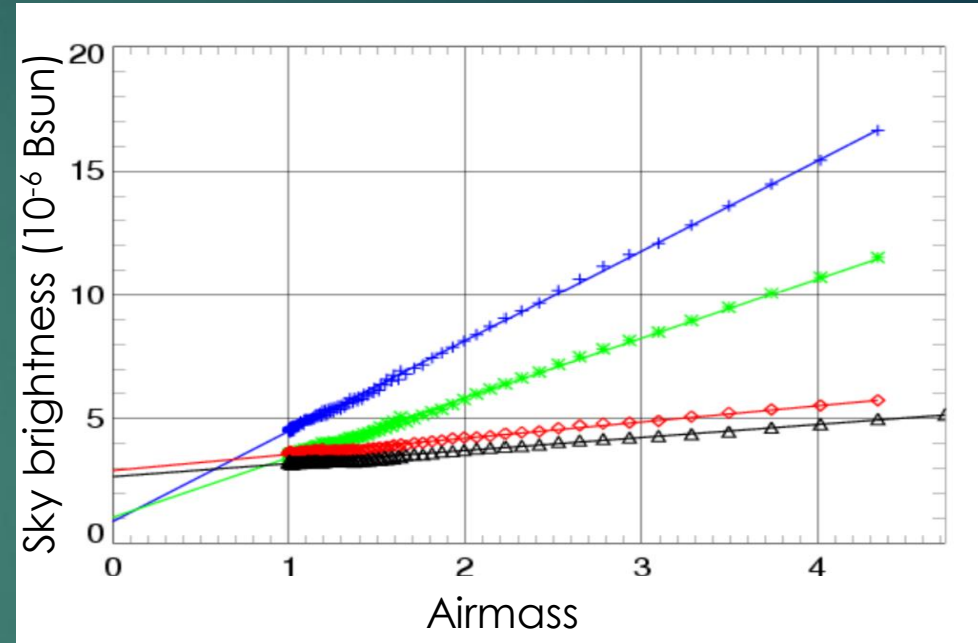
## Site Characterization

Demonstrate that Dome C is one of the very few sites on the Earth for ground-based solar corona observation



(DomeC-Haudemand et al., in progress)

## ESCAPE SCIENCE OBJECTIVES



(Mauna Loa-Tomczyk et al., 2015)

Dome C is best (known) place in the world for solar corona observations!!!



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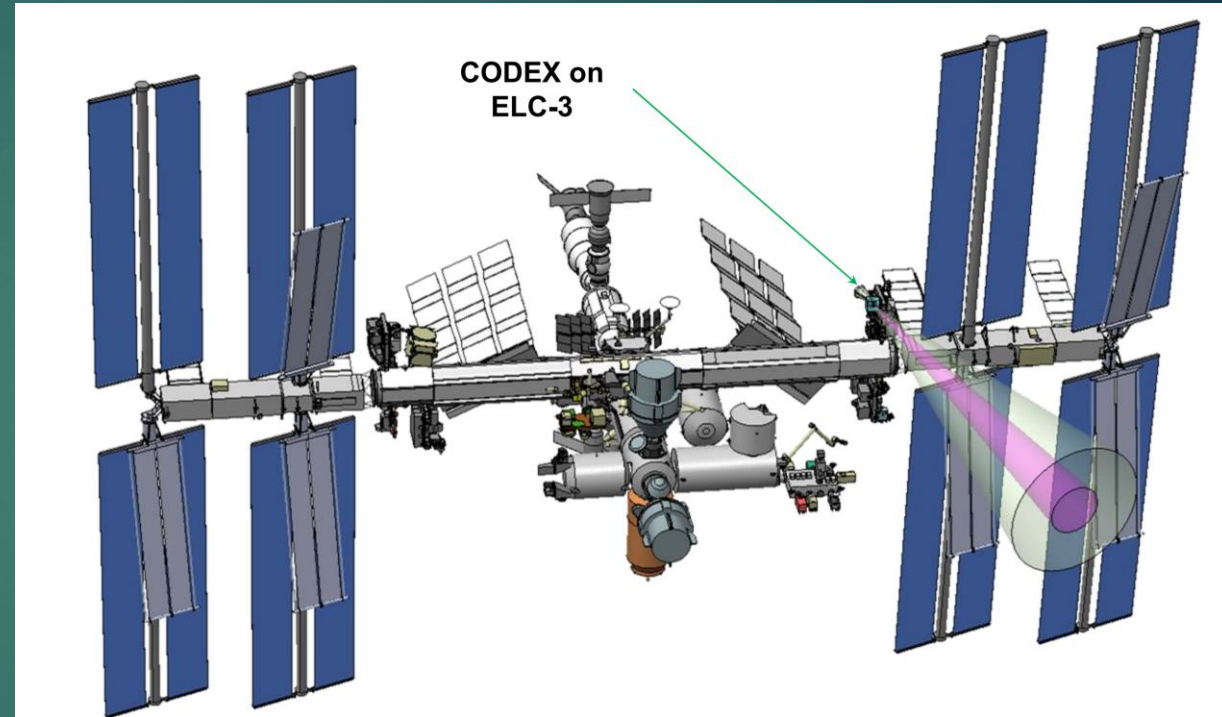
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## Technology

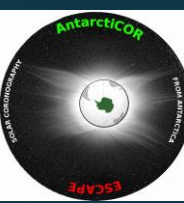
Demonstrate the feasibility of use of innovative micropolarizer array cameras for scientific purposes



## ESCAPE SCIENCE OBJECTIVES



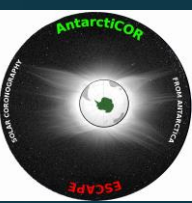
NASA-CODEX, International Space Station (Summer 2024)



CNES/ASI/INAF- CorMag, stratospheric balloon (2 flights in 2022 and 2023)

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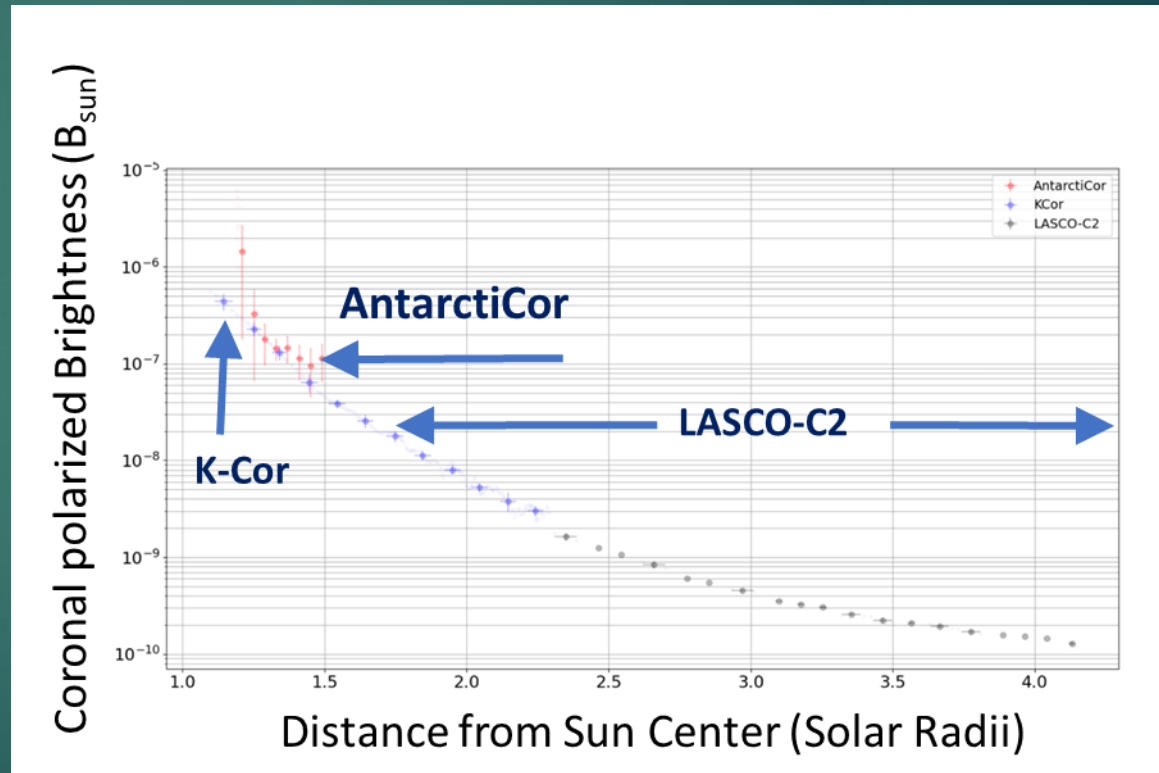


## Science

Mapping the plasma (electrons) of the inner solar corona

## ESCAPE SCIENCE OBJECTIVES

Comparison of the AntarctiCor/Kcor/LASCO C2 Polarized Brightness



Liberatore et al., 2023

# ESCAPE: Solar coronagraphy from Dome C

## ESCAPE-2

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The very low sky brightness level of Dome C suggest the possibility to try to increase the signal at the external FoV by including an external occulter (to be used only with slow wind conditions)

The use of a polarimeter based on liquid crystals device will increase the polarization contrast and provide measurements of the electron density with higher accuracy

The objective lens cleanliness is crucial for stray-light control. The use of a flow bench should help to perform the cleaning operation locally in a «clean» environment

Ground support to ESA/PROBA-3 mission (launch 2024)

Ground station for validation of space technologies (several solar mission expected in the next years)

Prospective support to space weather programs (i.e., CME generation monitor)

