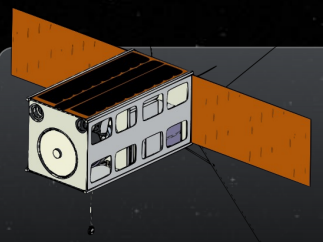
BLUE SKIES SPACE LTD

MAUVE

March 2023

Blue Skies Space

- Founded by University College London team
- Increase access to high impact science data
- Science satellites for Astronomy and Earth Observation



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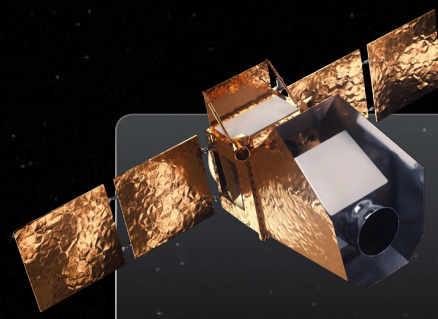
ISISPACE

C3S

UV monitoring of stars



Twinkle

ABB AIRBUS

Spectroscopy of exoplanets (2025)
16 universities as founding members

Mauve overview

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- Design tailored for UV spectroscopy of stars
- Focus on M-dwarfs & their flares
- 16U (25kg) smallsat platform with a 3 year baseline
- 13cm Telescope, 200 – 700nm wavelength range / 30 -100 resolution
- Structured multi-year surveys & dedicated time

Satellite delivery

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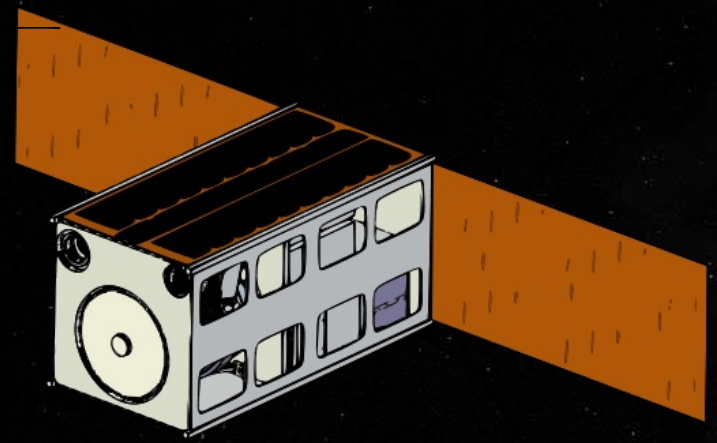
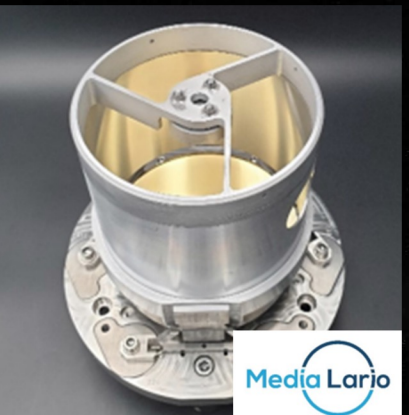
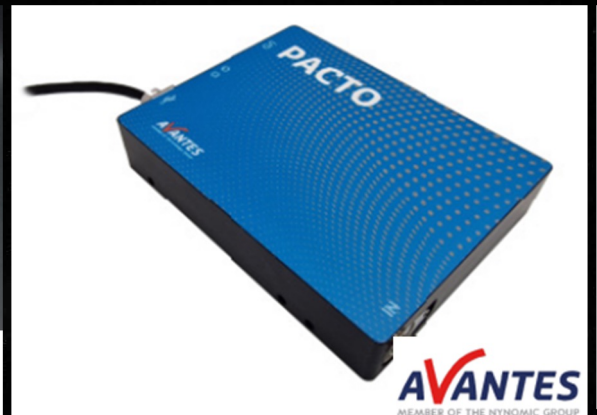


- Commissioned and operated by Blue Skies Space
- Satellite built by C3S and ISISpace
- Off the shelf telescope and spectrometer

C3S





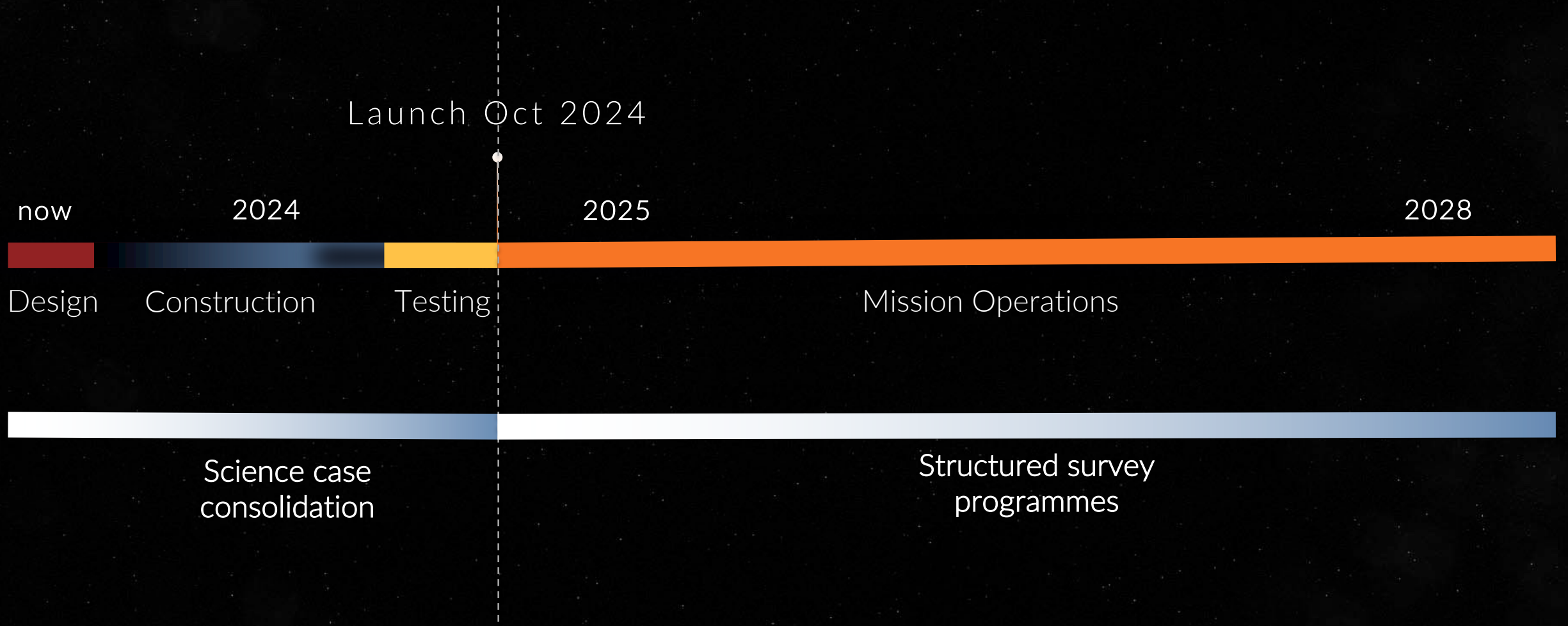

C3S Onboard computer


C3S Electrical Power System


Sodern Star Tracker

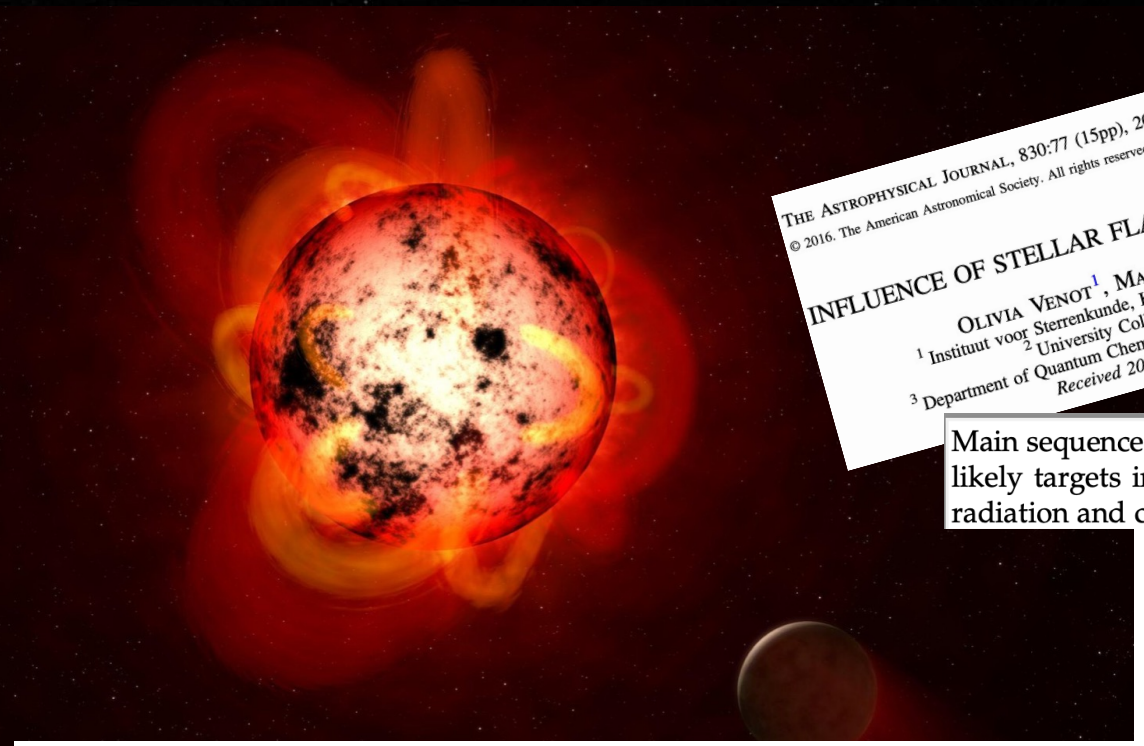
ISISPACE

Mission development



Mauve science

Characterise M-dwarfs and their flaring activity



The Astrophysical Journal, 830:77 (15pp), 2016 October 20
doi:10.3847/0004-637X/830/2/77

INFLUENCE OF STELLAR FLARES ON THE CHEMICAL COMPOSITION OF EXOPLANETS AND SPECTRA

Olivia Venot[1], Marco Rocchetto[2], Shaun Carl[3], Aysha Roshni Hashim[3], and Leen Decin[1]
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[2] University College London, Department of Physics and Astronomy, Gower Street, London WC1E 6BT, UK
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One of the factors that affect the potential hab-
itability of planets around M stars is the activity
associated with their chromospheres and coro-
nae. The relevant physical phenomena include in-
termittent and energetic flares, CMEs, stellar cos-
mic rays, enhanced coronal X-rays, and enhanced
chromospheric UV emission. Such events could
severely compromise the habitability of Earth-
like planets within the HZ of M stars [see

Main sequence M stars pose an interesting problem for astrobiology: their abundance in our galaxy makes th
likely targets in the hunt for habitable planets, but their strong chromospheric activity produces high-energy
radiation and charged particles that may be detrimental to life. We studied the impact of the 1985 April 12 flare

The Effect of a Strong Stellar Flare on the Atmospheric Chemistry of an Earth-like Planet Orbiting an M Dwarf

na Segura,[1,*] Lucianne M. Walkowicz,[2,*] Victoria Meadows,[3,*]
James Kasting,[4,*] and Suzanne Hawley[3]

The Astrophysical Journal, 826:195 (16pp), 2016 August 1
doi:10.3847/0004-637X/826/2/195

PROBABILITY OF CME IMPACT ON EXOPLANETS ORBITING M DWARFS AND SOLAR-LIKE STARS

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face- is a matter of intense debate. The most common arguments against habitability are
tellar magnetic field, strong flares, and high UV & X-ray fluxes; but none of
Tidal locking does not preclude a stable atmosphere via globa

Mauve wavelength range

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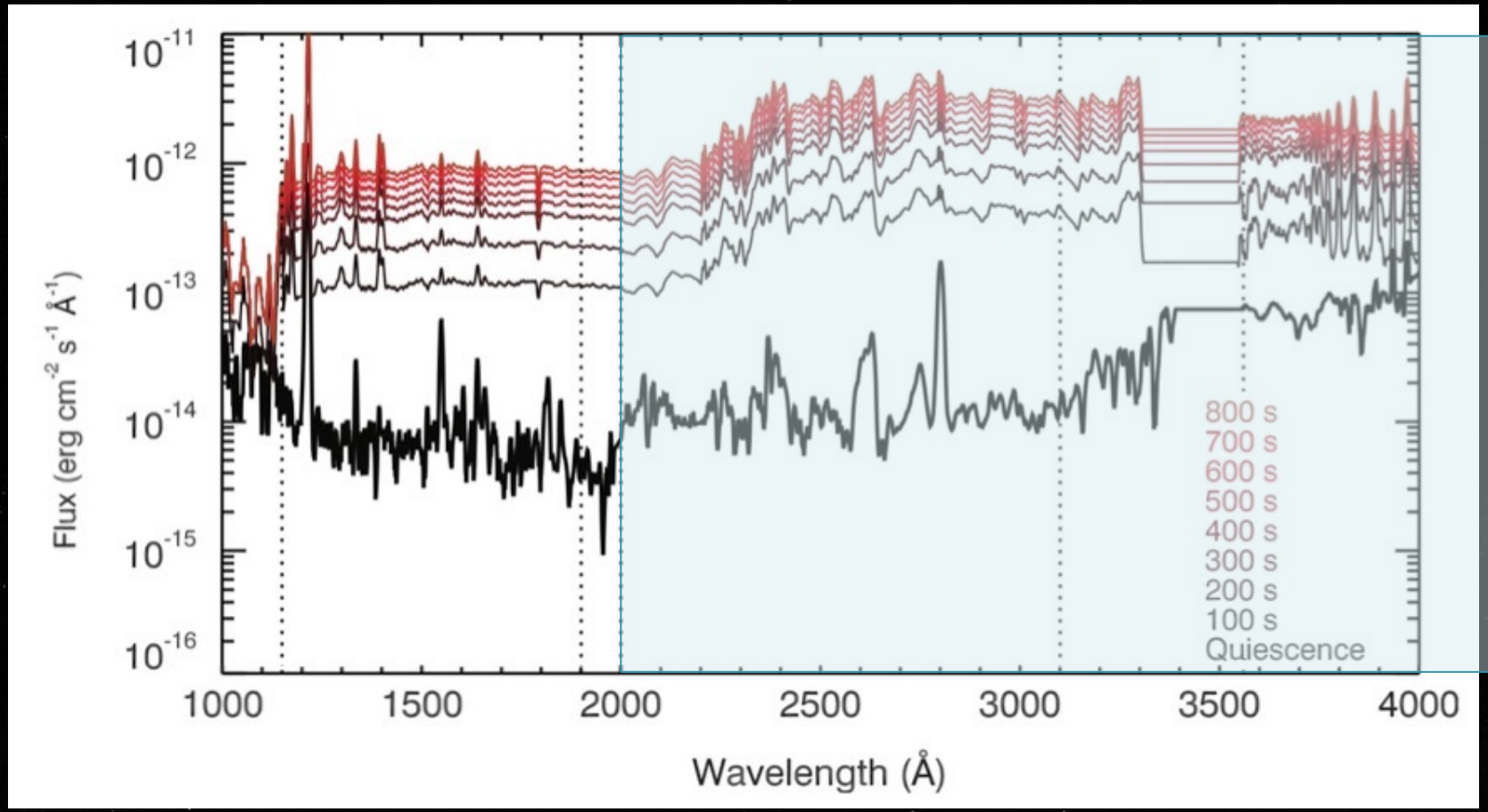
Mauve's wavelength range (200-700nm) ideal for flare monitoring



7000

AD Leo flare - Adapted from Segura et al, 2010

Evolution of spectral energy

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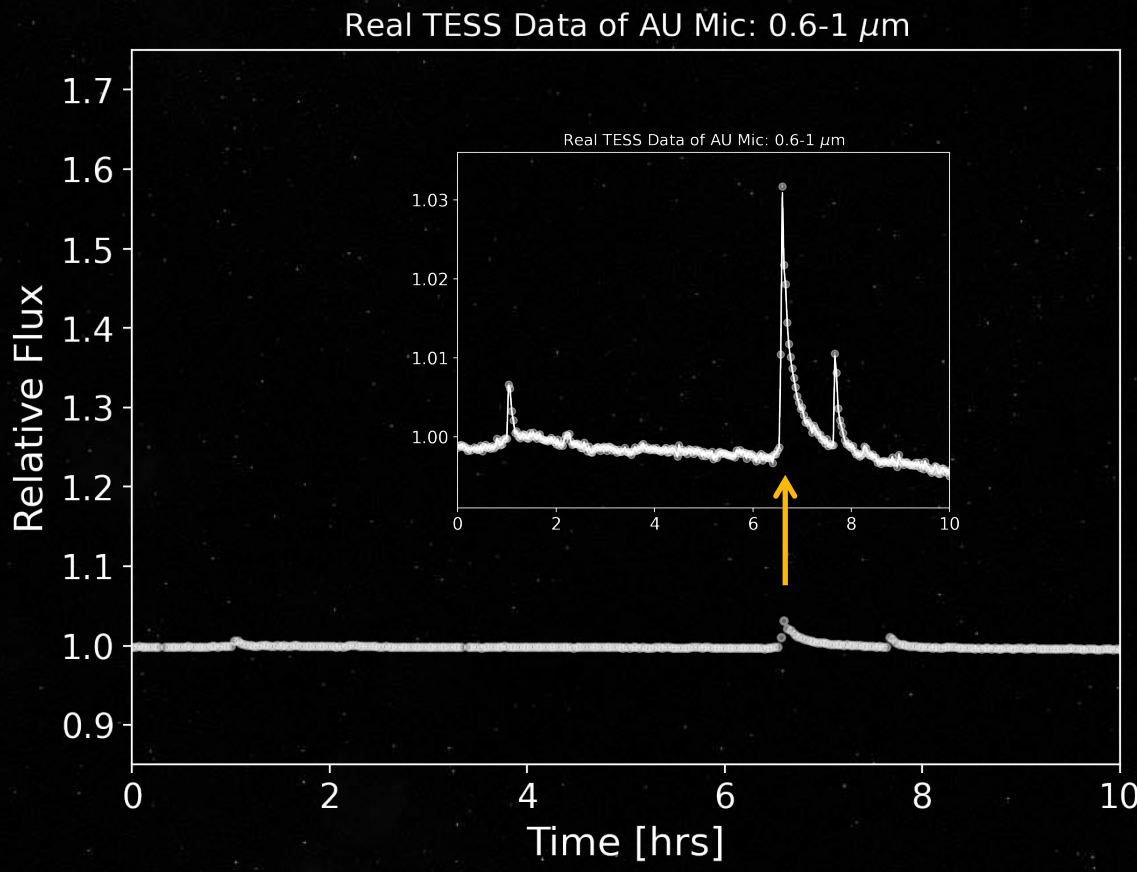
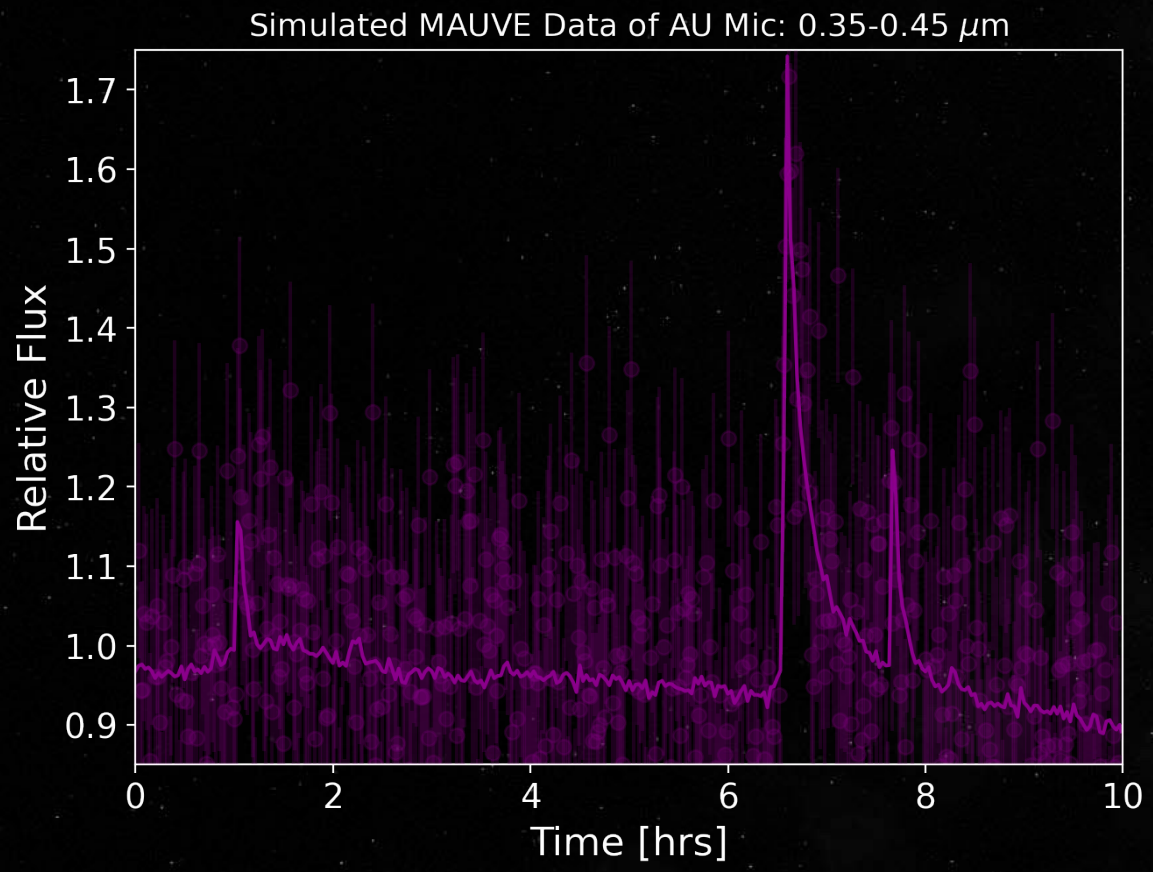
Mauve will monitor the evolution of flares through time





Flare occurrence

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Capture the occurrence rate and energy profiles of multiple flares

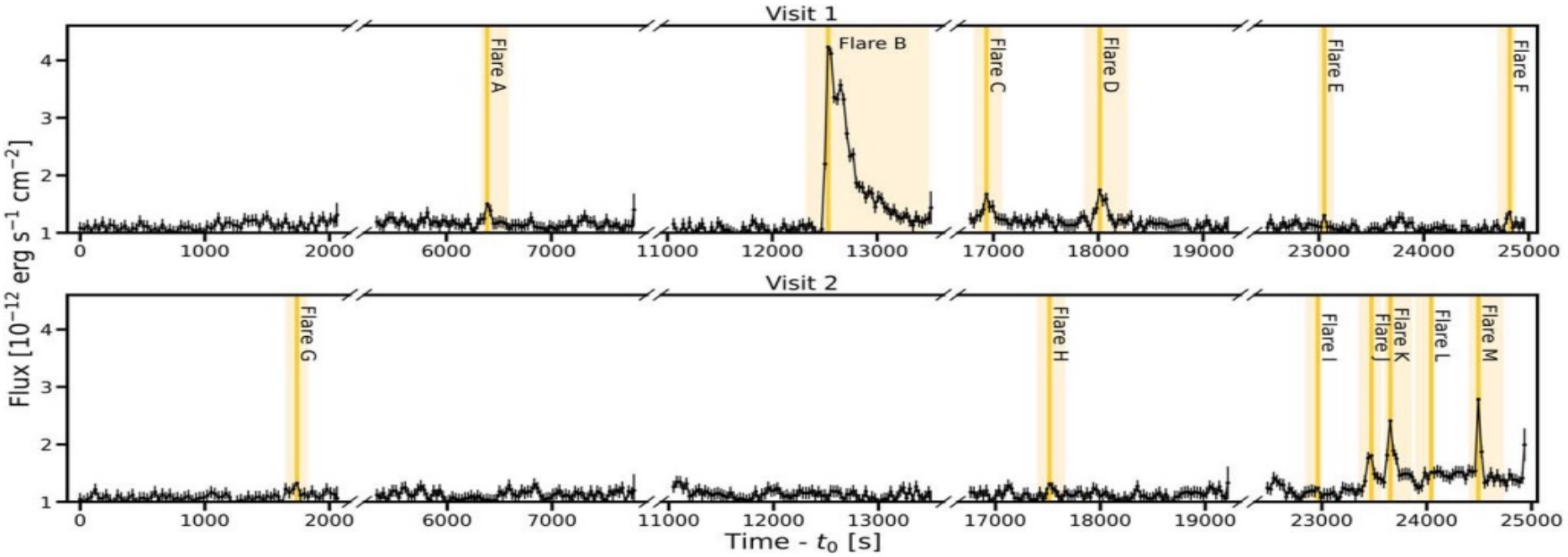

Figure 1. Flux-calibrated light curves from two HST/COS visits to AU Mic across the entire wavelength coverage (1064–1361 Å). Time of peak flare events are marked with vertical orange lines. Highlighted yellow regions are excised for the creation of a clean out-of-flare template spectrum. A total of 13 flares were identified, with one double-peaked flare identified in the third orbit of Visit 1 (Flare B) and five flares present in the last orbit of Visit 2 (Flares H-L). We present the parameters for each flare in Table 1.

Feinstein et al. 2022 (HST-COS, R~1550-24,000)

1000+ M-Dwarfs

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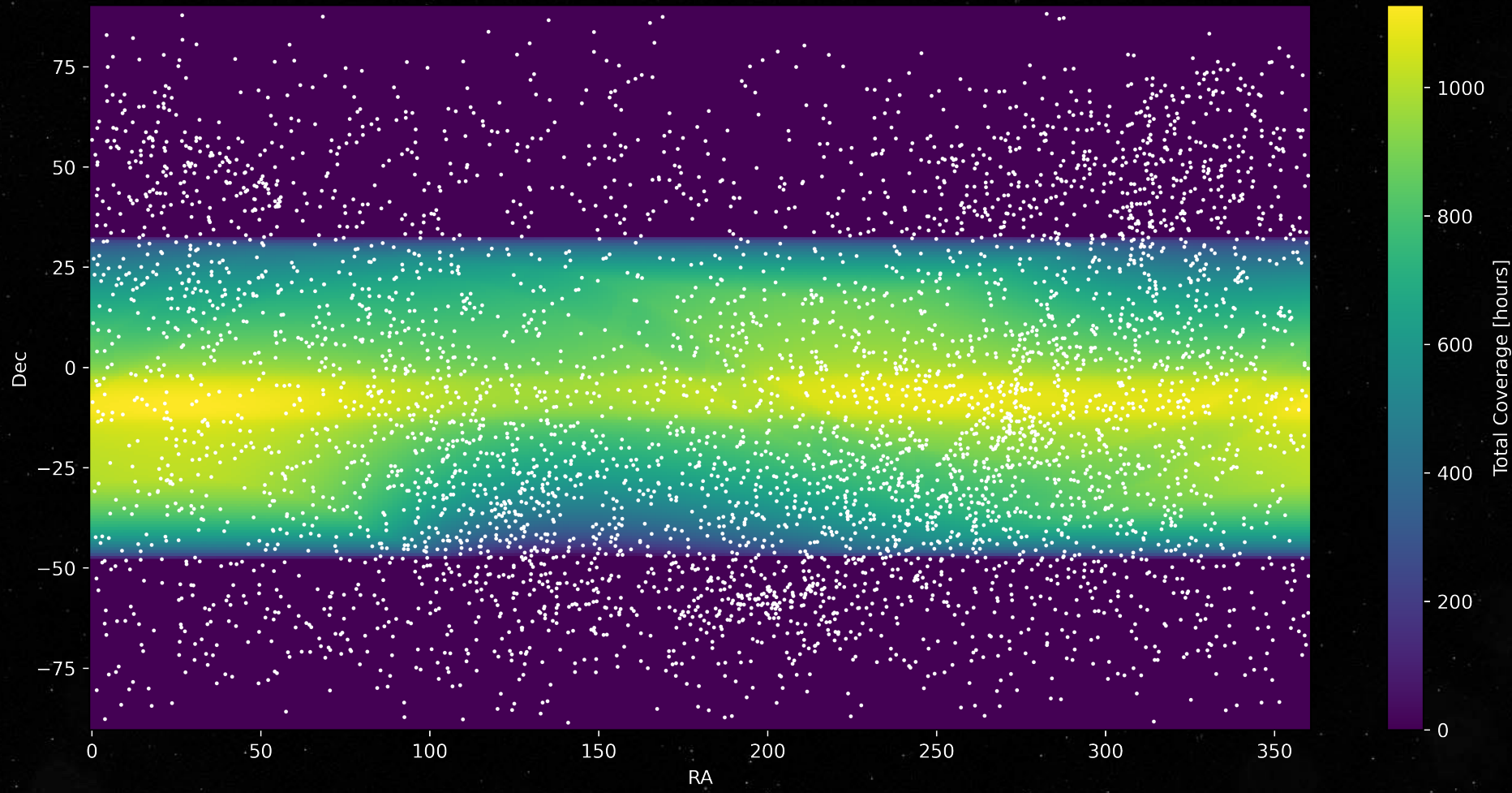
A large sample of stars available for observation by Mauve



Mauve Field of Regard

Other science cases

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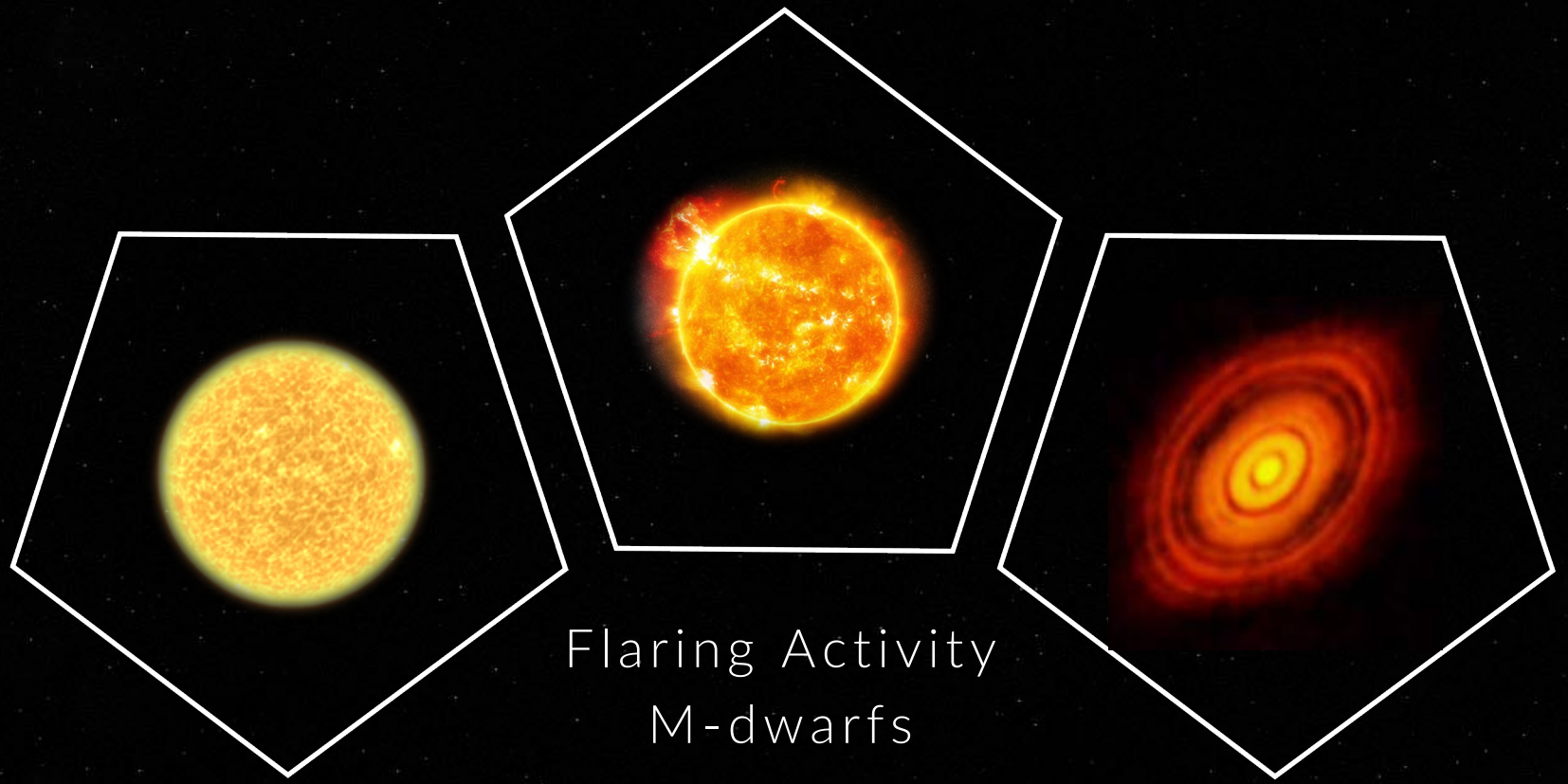
Ideas welcome for other use cases for Mauve



F & G stars

Flaring Activity
M-dwarfs

Young Stars

Collaboration

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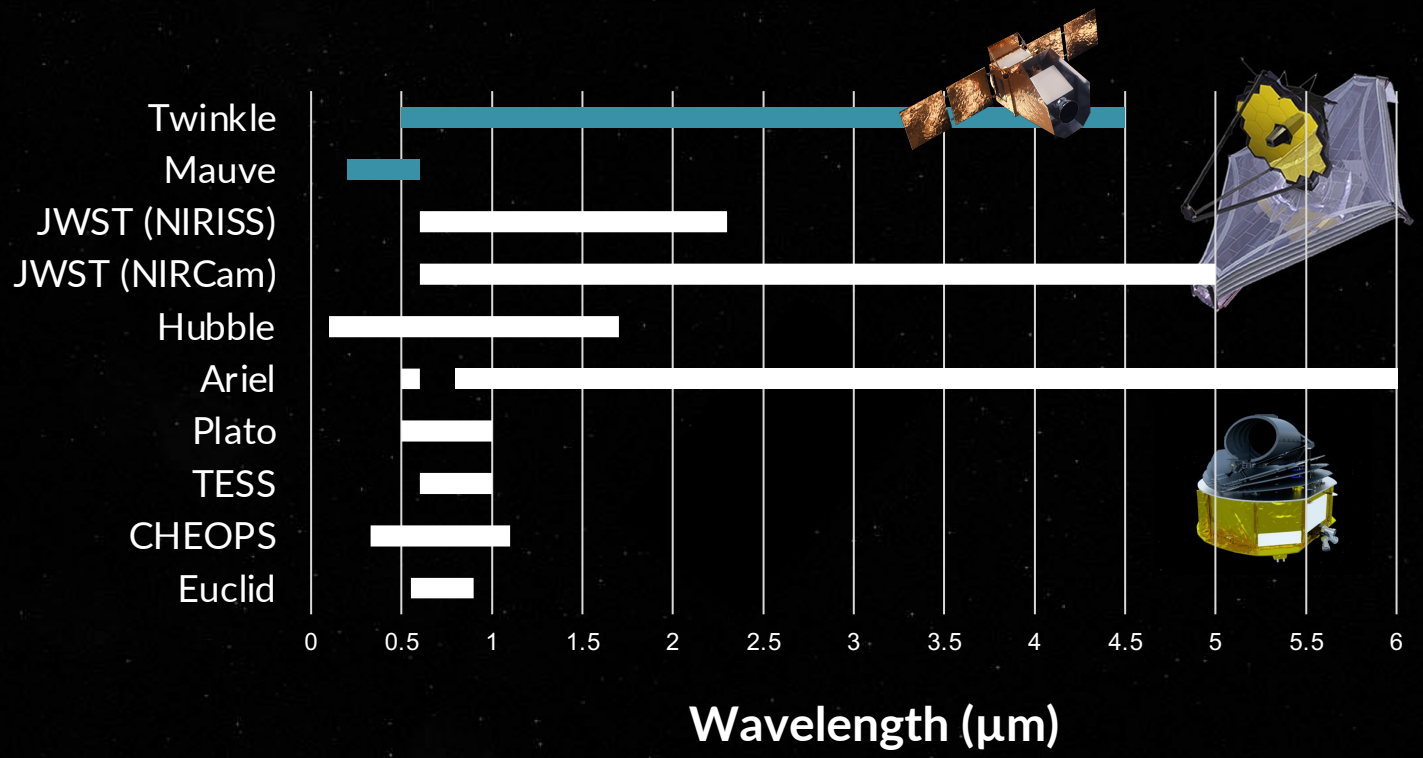
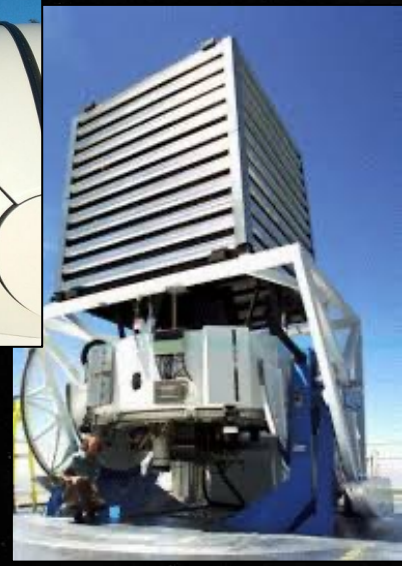
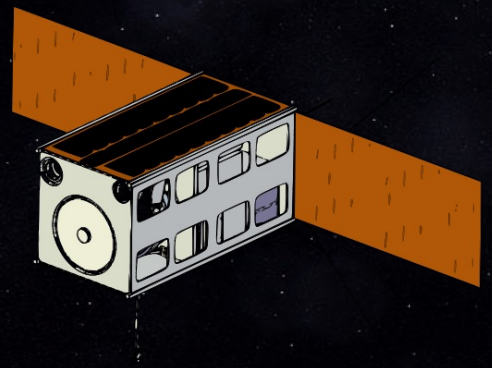
Simultaneous observations from ground and space





Pathfinder for other missions and next gen instruments



Mauve is a UV satellite flying in late 2024

1000s of hours dedicated to the survey programme

Our members shape and design the survey

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bssl.space

Additional Slides

M-Dwarfs v Vmag

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