OGLE V

the Next Phase of the OGLE Survey

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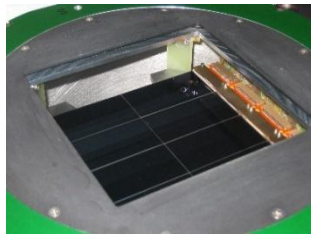
The Optical Gravitational Lensing Experiment (1992 - ….)

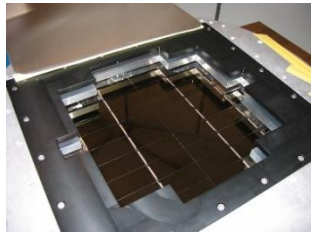
Phases of the OGLE Survey:

OGLE-I (1992 – 1995). 1 m Swope telescope at Las Campanas Observatory, Chile. ~2 million stars observed. Microlensing

OGLE-II (1997 – 2000). 1.3 m Warsaw telescope. ~40 million stars observed. Variable and non-Variable Stars in GB, MC



OGLE-III (2001– 2009). 8k x 8k mosaic CCD. ~200 million stars observed (GB, GD, MC). Extrasolar Planets, Microlensing



OGLE-IV (2010 – ….). 32-chip 256 Mpixel mosaic CCD. >Two billion stars regularly monitored

(March 17, 2020 – August 12, 2022: CoViD-19 pandemic stopped observations)

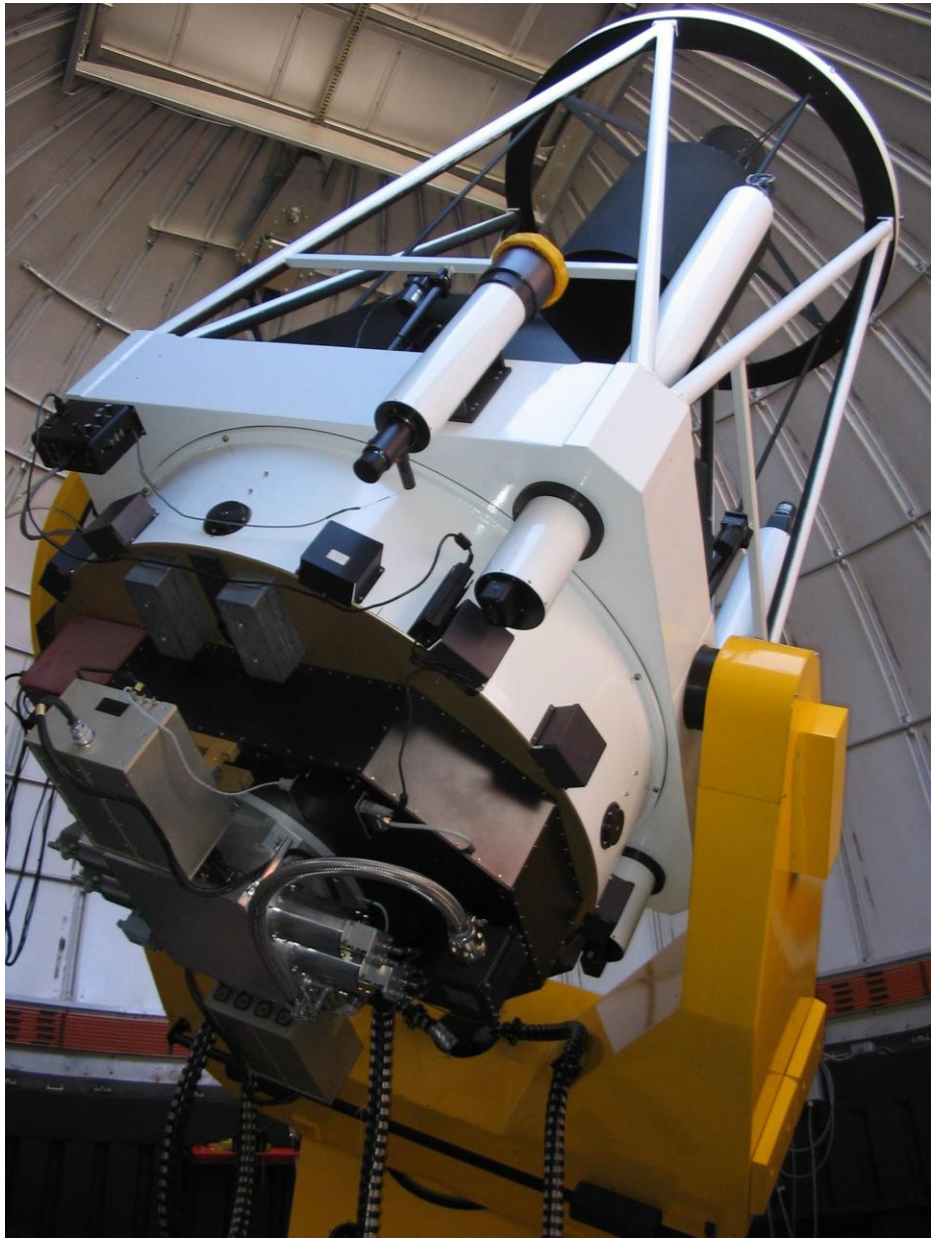
http://ogle.astrouw.edu.pl

OGLE

Las Campanas Observatory Chile

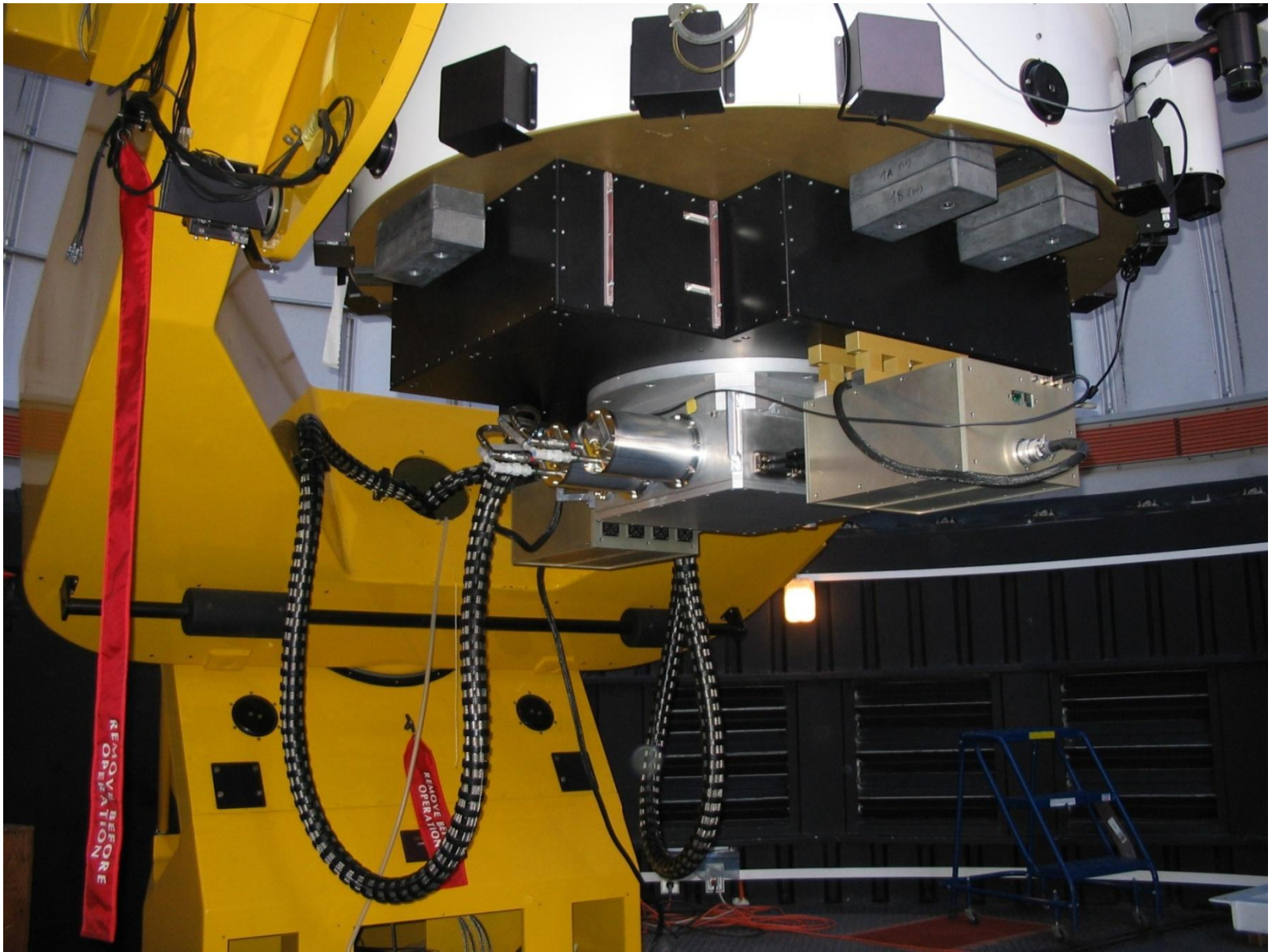
OGLE

HARDWARE



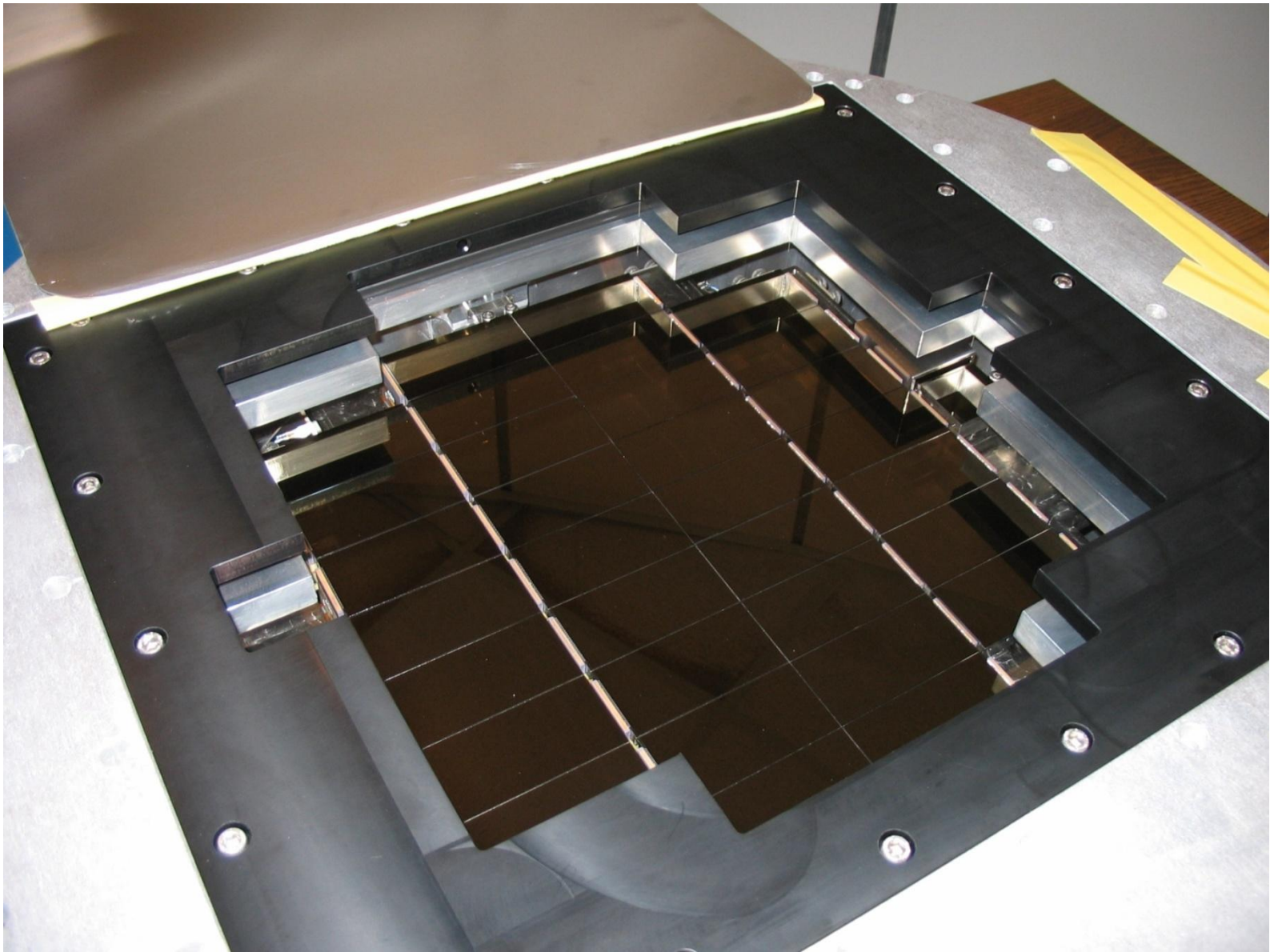
OGLE

HARDWARE

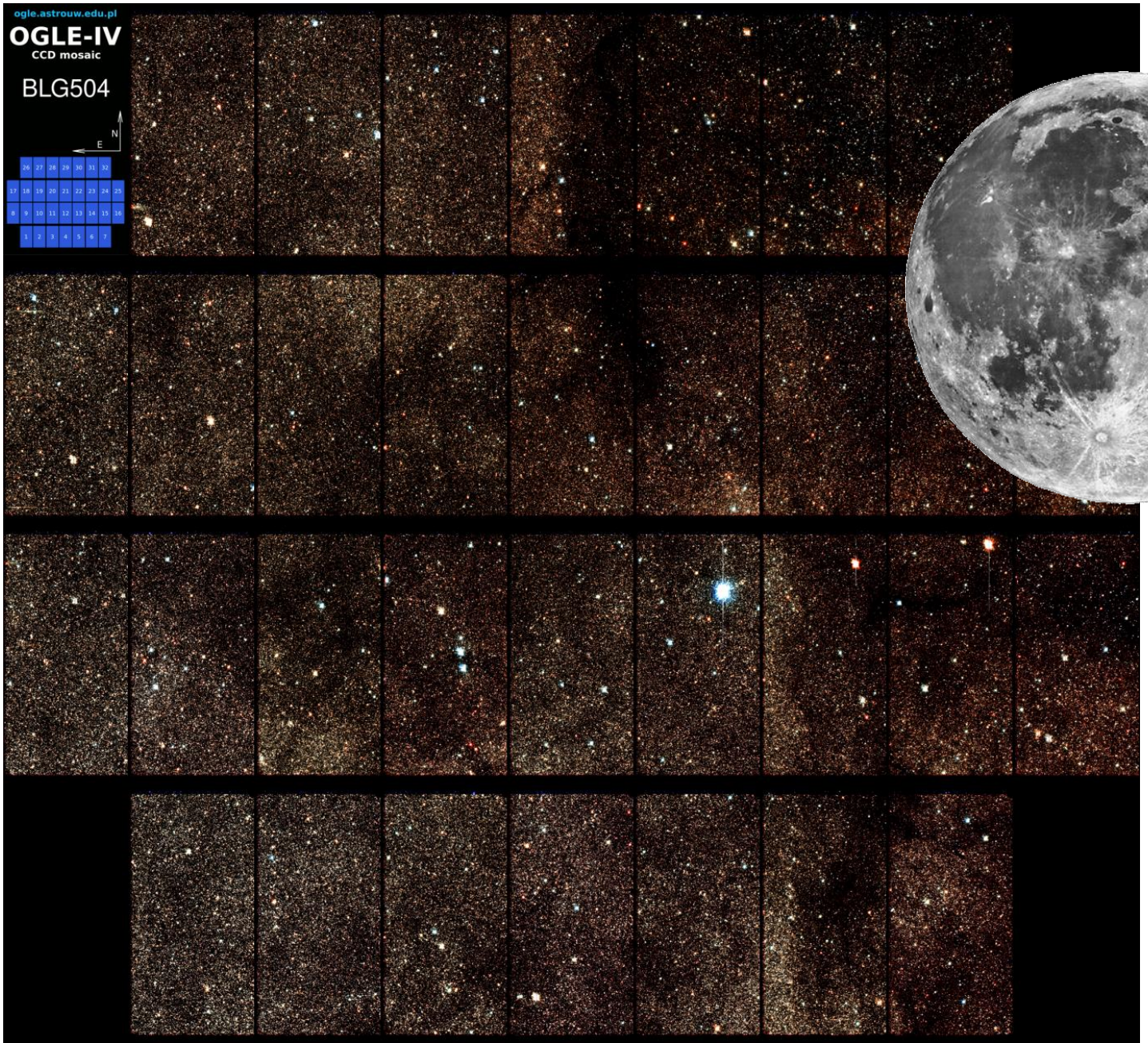


OGLE

HARDWARE

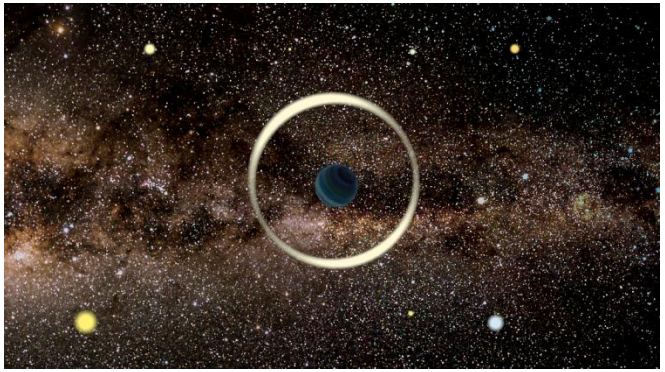


OGLE – IV CAMERA: 1.4 deg^2 FOV, I~21mag

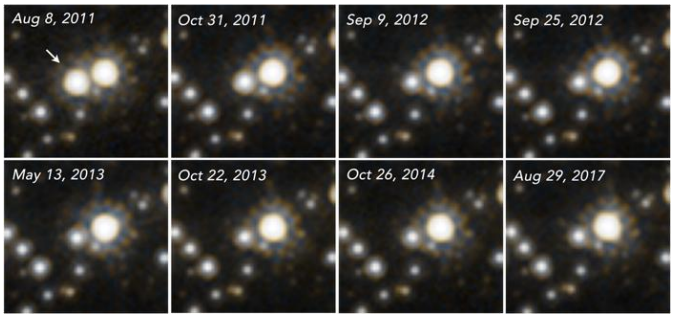


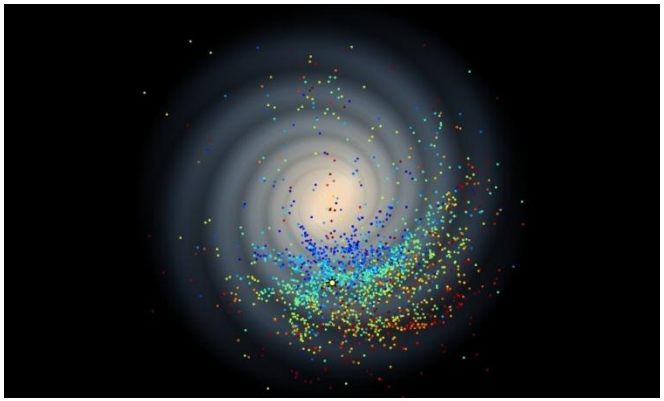
~6 million stars in this picture!

Science Factory

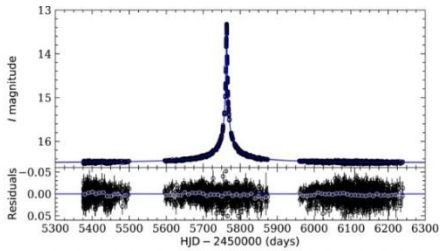


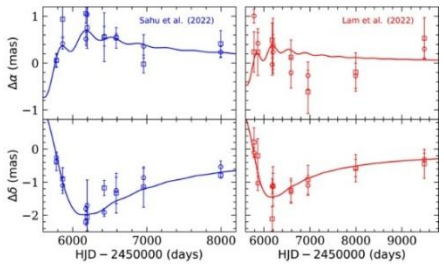
Free Floating Planets
Nature 2017, >180 citations





3-D Milky Way Map
Science 2019, >120 citations





Free Floating Black Hole
2022

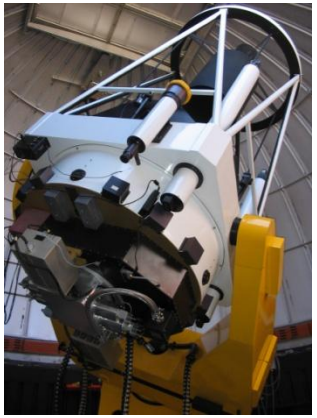
OGLE-IV (February 2023):
~460 papers
>16300 citations

The main goals of the OGLE V project

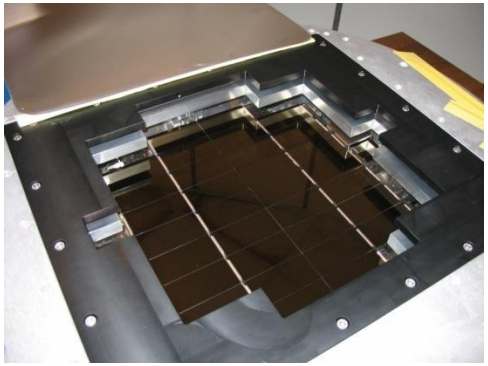
- Resuming regular operation of the Warsaw Telescope at Las Campanas Observatory
- Starting the OGLE-V phase focused on new scientific challenges of the 2020s decade

OGLE

HARDWARE UPGRADES:



A new telescope control system (TCS) for modern telescope operation
From DFM Engineering – the telescope manufacturer
(last upgrade in 2007!)



CCD Mosaic camera upgrade:
New optical filters (*g* and *z* bands of the Sloan system)
Upgrades and engineering of the electronics

OGLE V

Budget:

• New TCS:	170 000 pln
• New filters:	300 000 pln
• Camera electronics:	125 000 pln
• Installation and restarting of OGLE-V:	120 000 pln
• Total	715 000 pln
• Contribution of the Astronomical Observatory (SPUB)	215 000 pln

Risks and mitigation plan:

This is a high-gain/moderate risk project. Main risks are:

1. CoViD-19 pandemic and travel restrictions remain in 2021-2022.
2. The telescope and camera require severe engineering after >1 year off

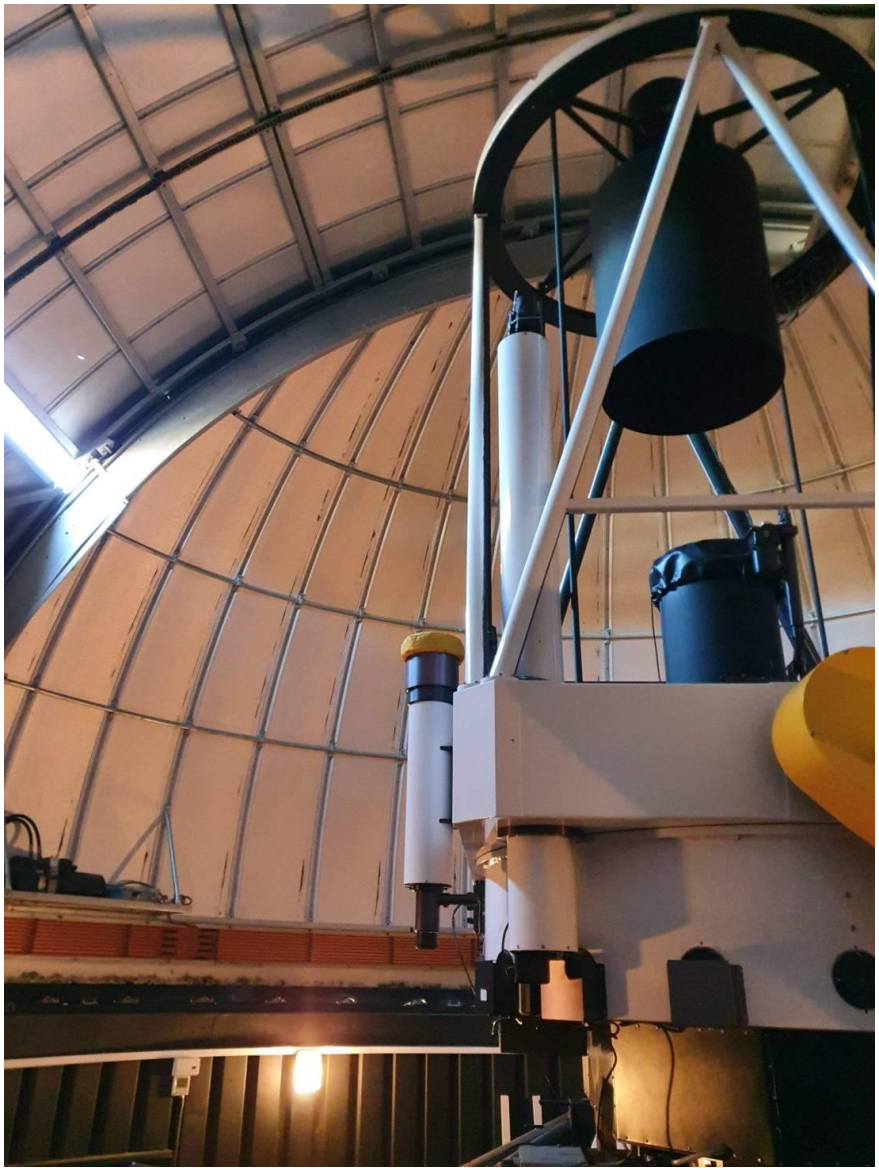
Ad. 1. Vaccinations (Chile – the world leader). Reasonable chance to the return to normalcy in the end of 2021. Remote observing

Ad. 2. Longer recovery time than expected. Under control

Rescue Mission July/August 2022

Rescue Mission July/August 2020

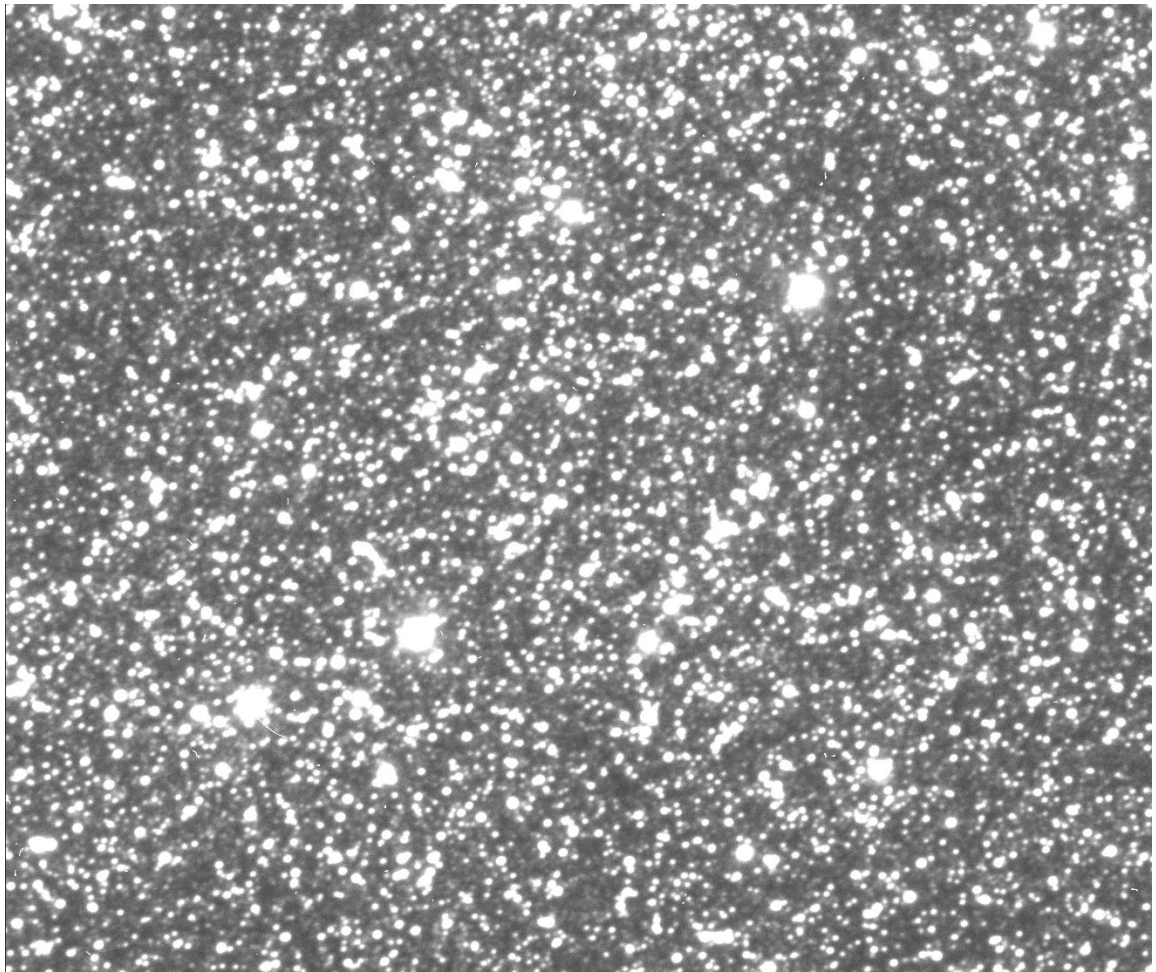
Rescue Mission July/August 2022



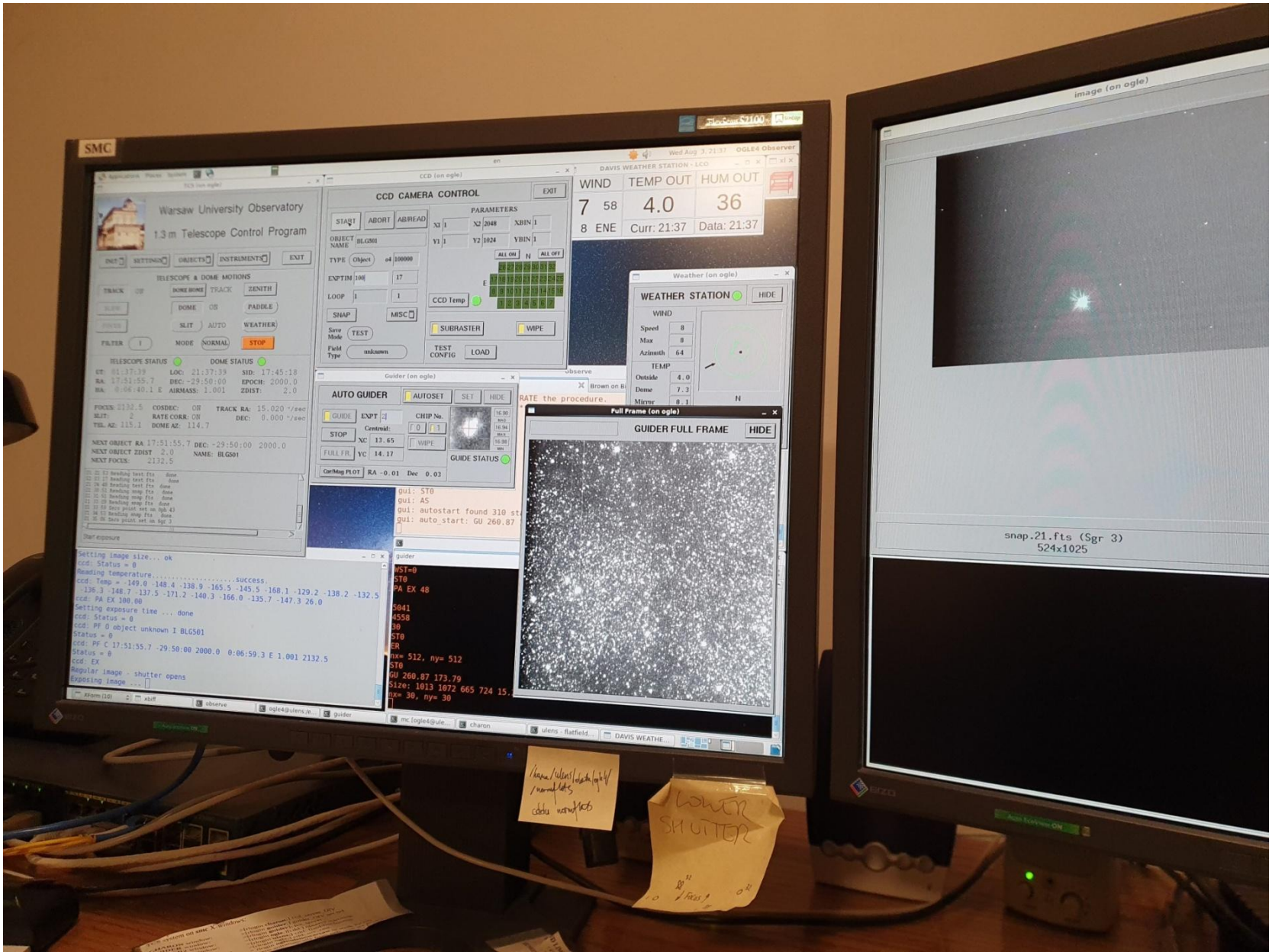
Rescue Mission July/August 2022

Rescue Mission July/August 2022

- First technical images: Aug. 4, 2022
- First official images and restarting the OGLE Survey: Aug. 12, 2022

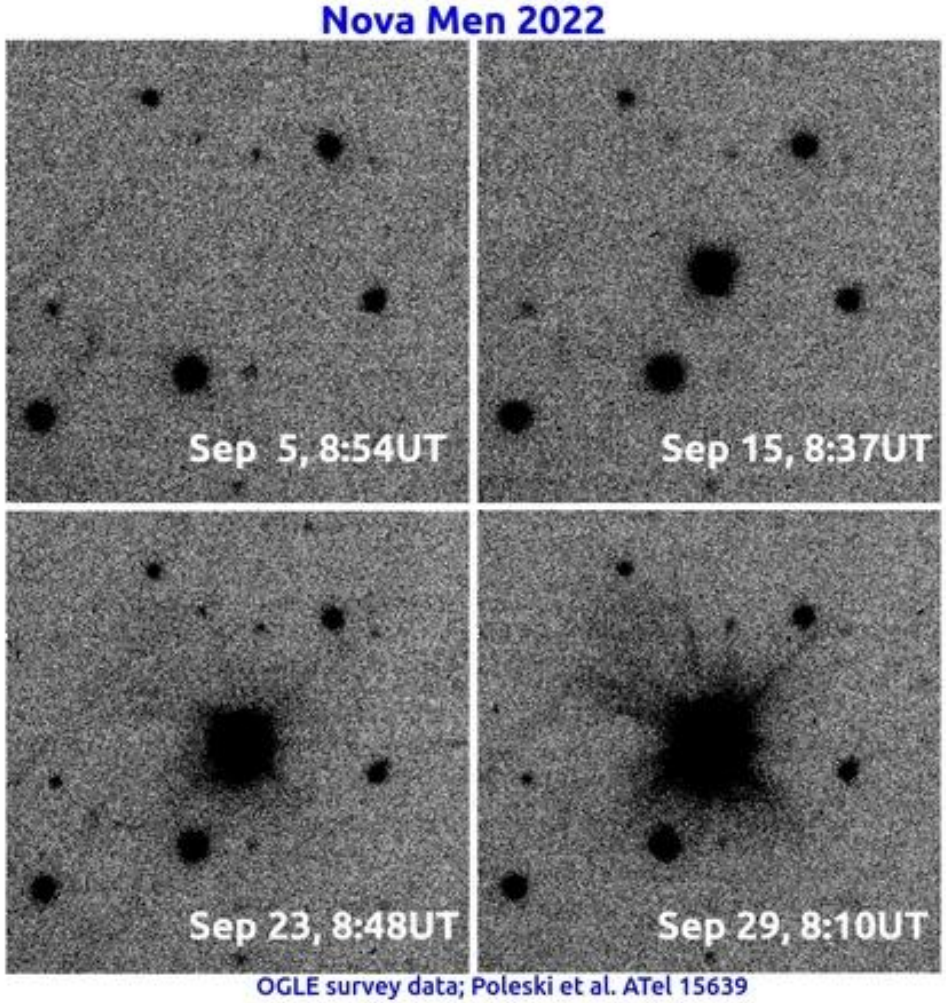


Rescue Mission July/August 2022

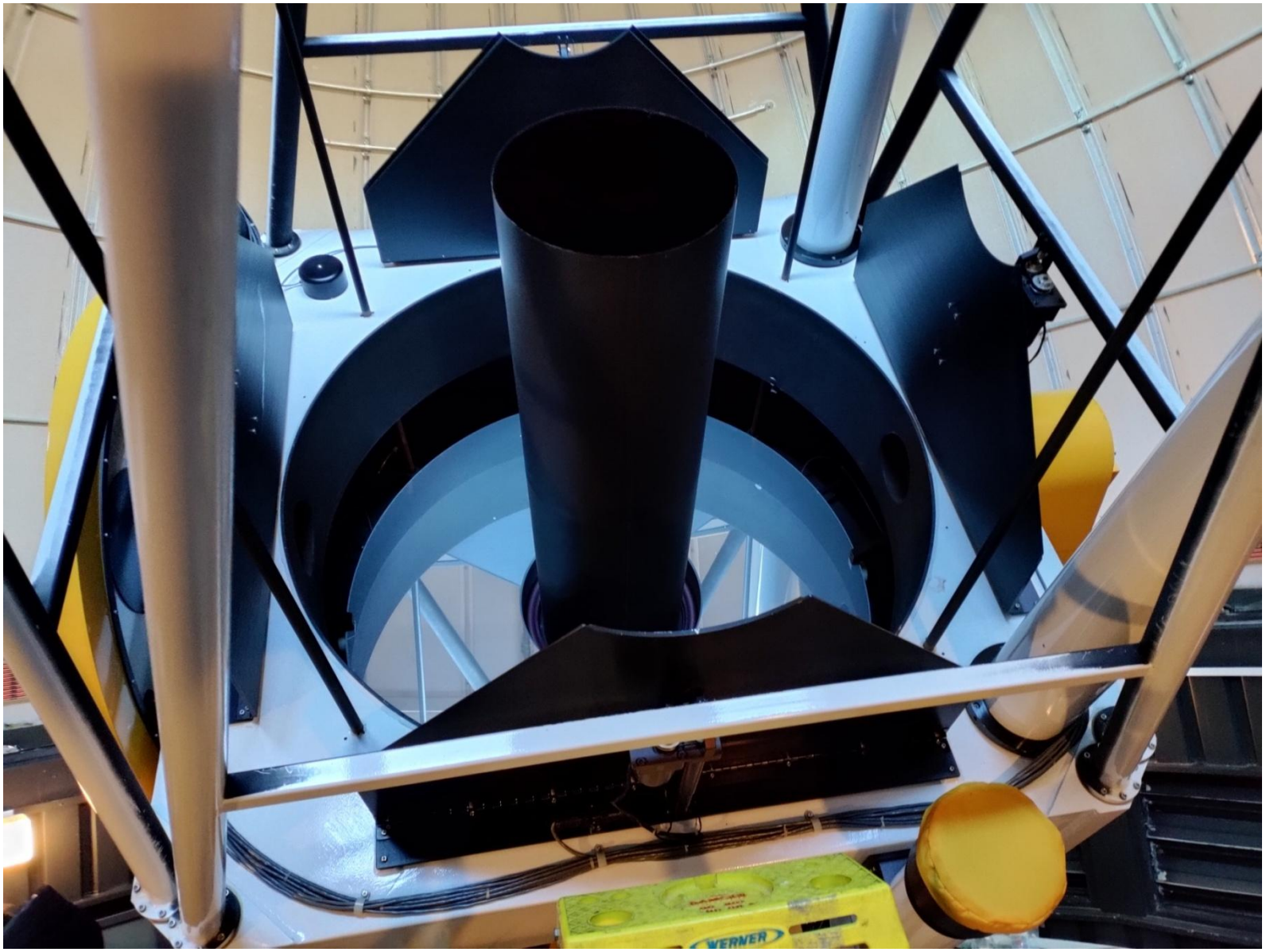


First Published Scientific Result

Prediscovery images of Nova Mensae 2022 (ATel 15639)



Second Engeenering – May 2023



OGLE V project current status

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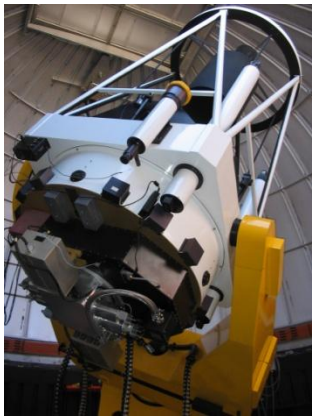
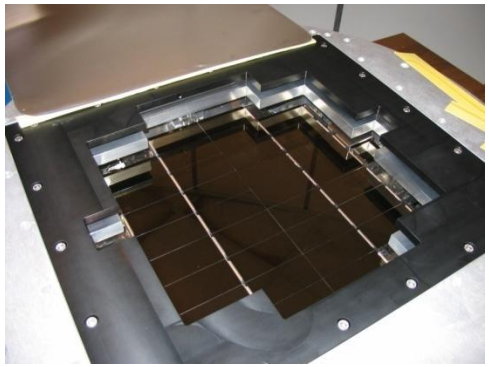
HARDWARE UPGRADES:



A new telescope control system (TCS) for modern telescope operation. From DFM Engineering – the telescope manufacturer.
Abandoned due to high price increase (40 k$ → 72 k$; USD ~3.8 PLN → USD ~5 PLN in 2022). No new installations by DFM out of US due to CoViD. Some spare parts for current TCS ordered



CCD Mosaic camera upgrade:
New optical filters (*B* and *wide-R* bands)
Ordered. Delievery – September 2023

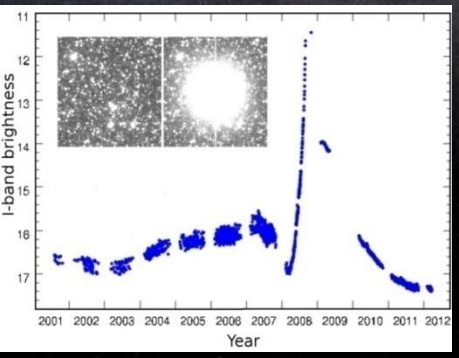
Upgrades and engineering of the electronics
Several new electronic boards ordered. On the way to Las Campanas. Upgrades will be installed during May 2023 engineering run

Milky Way over the OGLE Telescope

OGLE – an Extremely Large Sky Variability Survey

Warsaw 1.3-m @ Las Campanas

- in operation since 1992
- since 2010 as OGLE-IV (Udalski *et al.* 2015)
- >4000 deg² sky coverage
- >2.3 billion sources monitored
- 10^{12} photometric measurements by 2016
- >22,000 microlensing detections
- >80 extrasolar planets
- >1,000,000 new variable periodic stars



Milky Way

Magellanic System

http://ogle.astrouw.edu.pl