The Watcher Robotic Telescope

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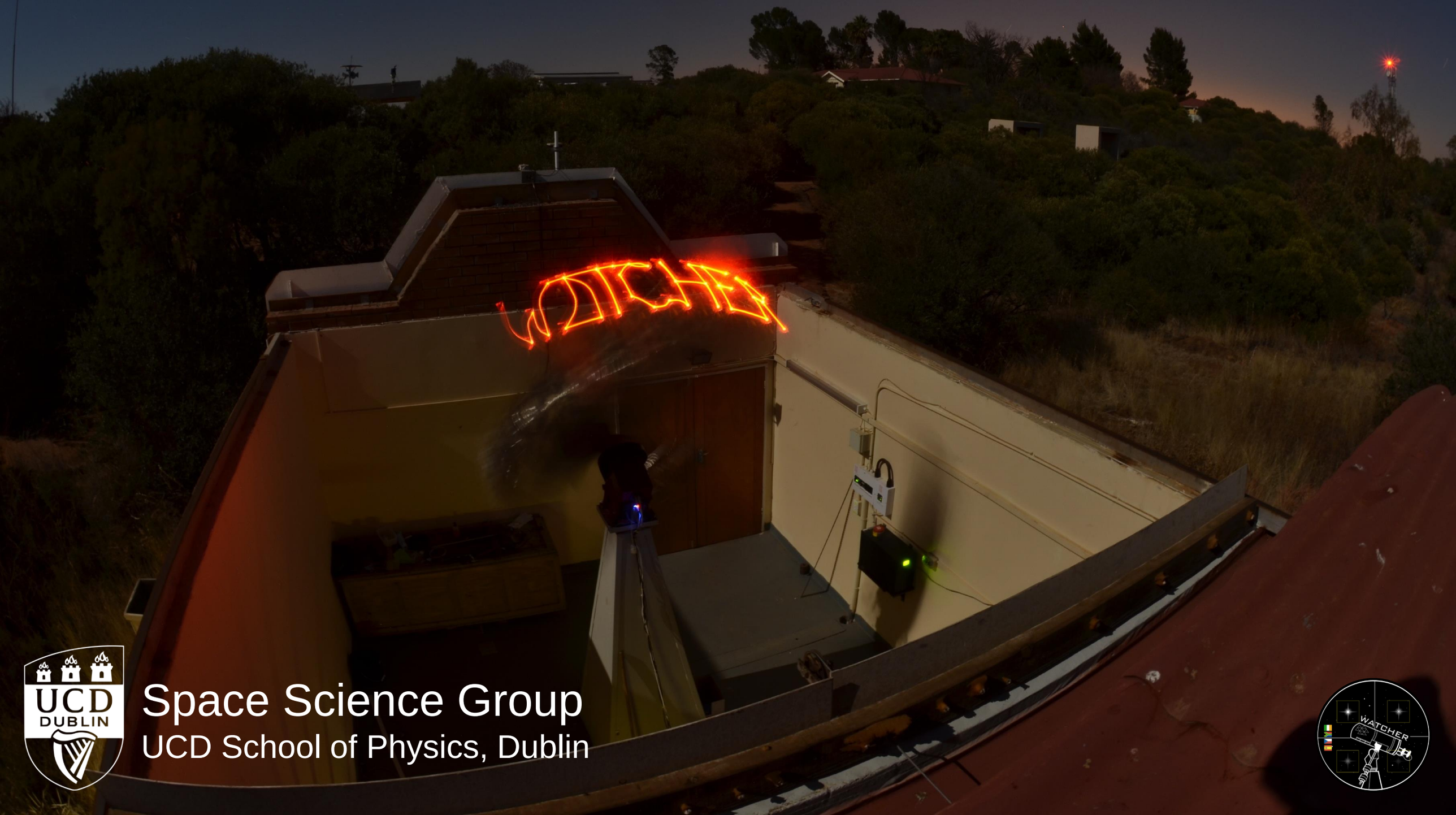

Space Science Group
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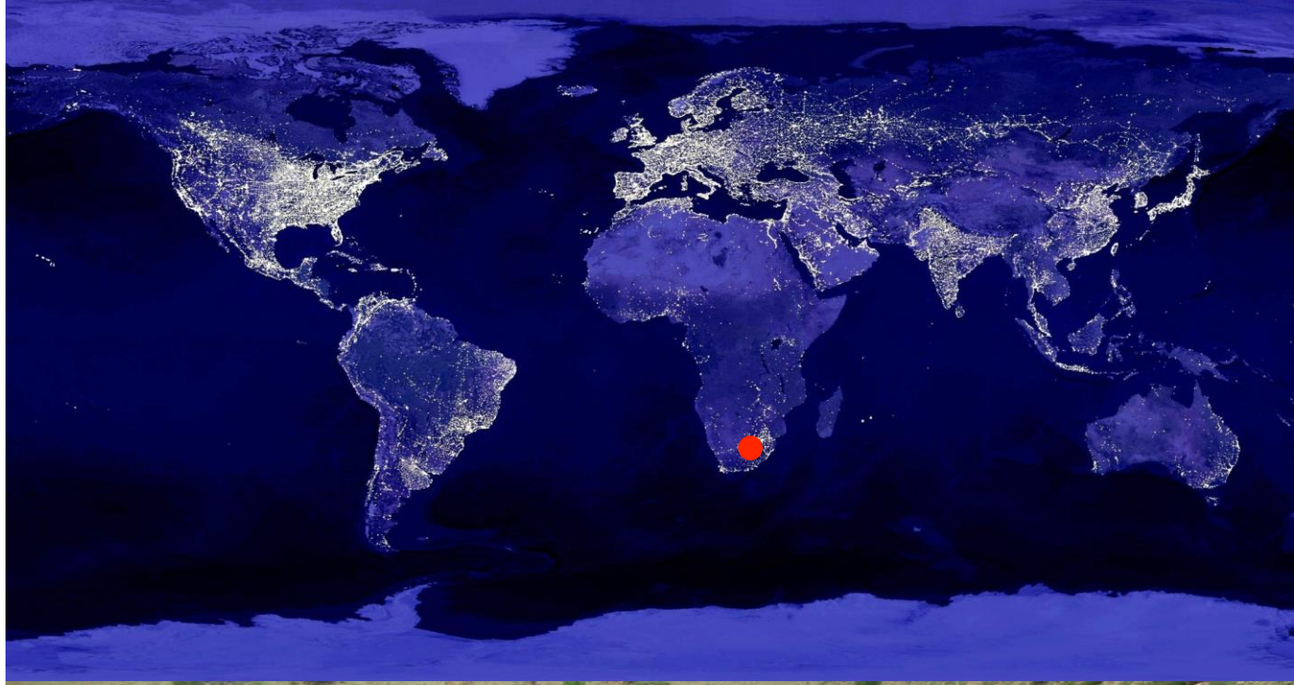
Where is Watcher?

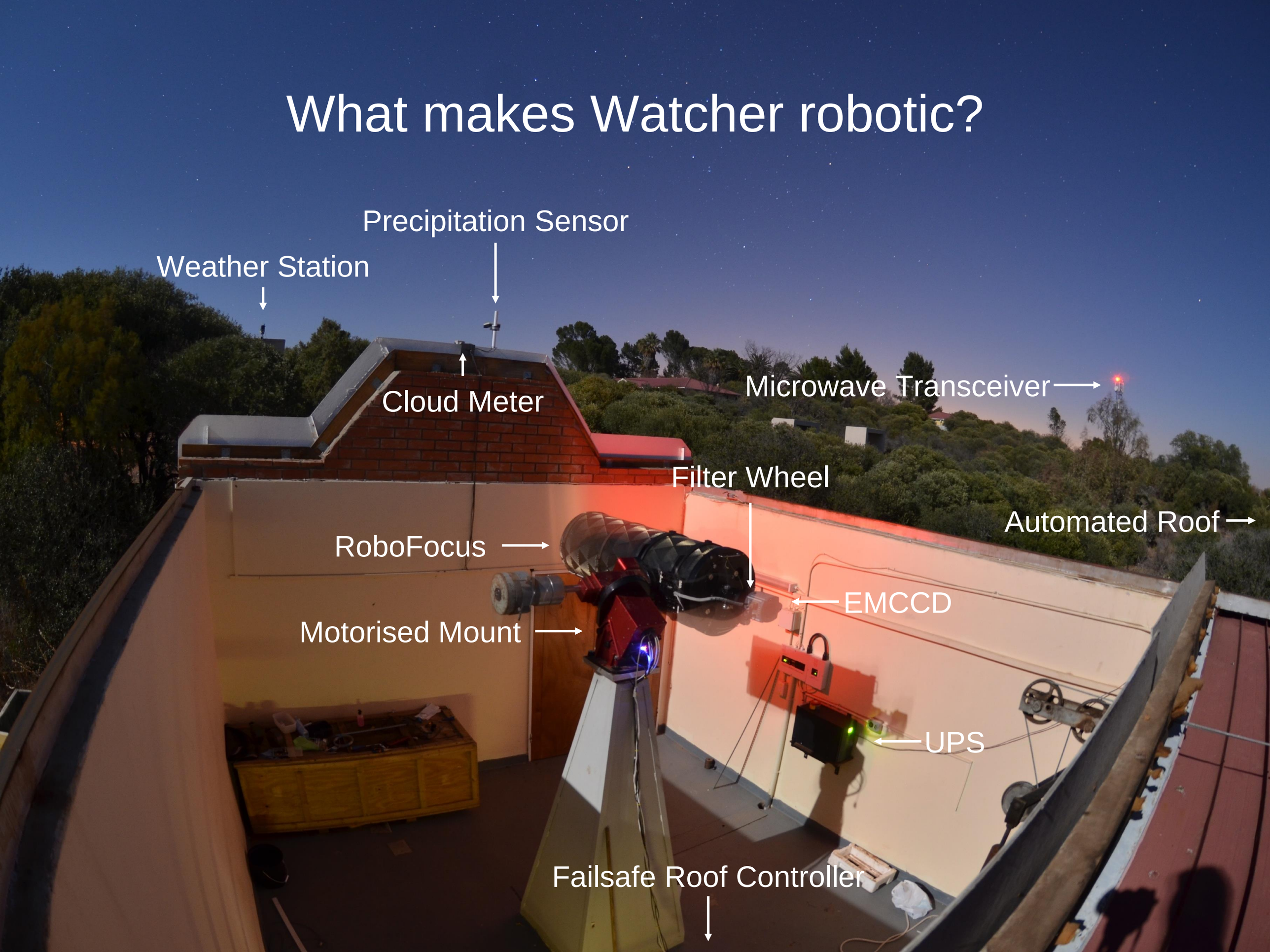
- Boyden Observatory, Maselspoort, South Africa.
- 29º 02′ 20″ South, 26º 24′ 20″ East, Elevation: 1387m.
- Approx 250 observing nights per year.
- Site chosen by Harvard in 1927 after extensive survey of southern Africa. Operated by UFS since 1976.
- First light in 2006



What is Watcher?

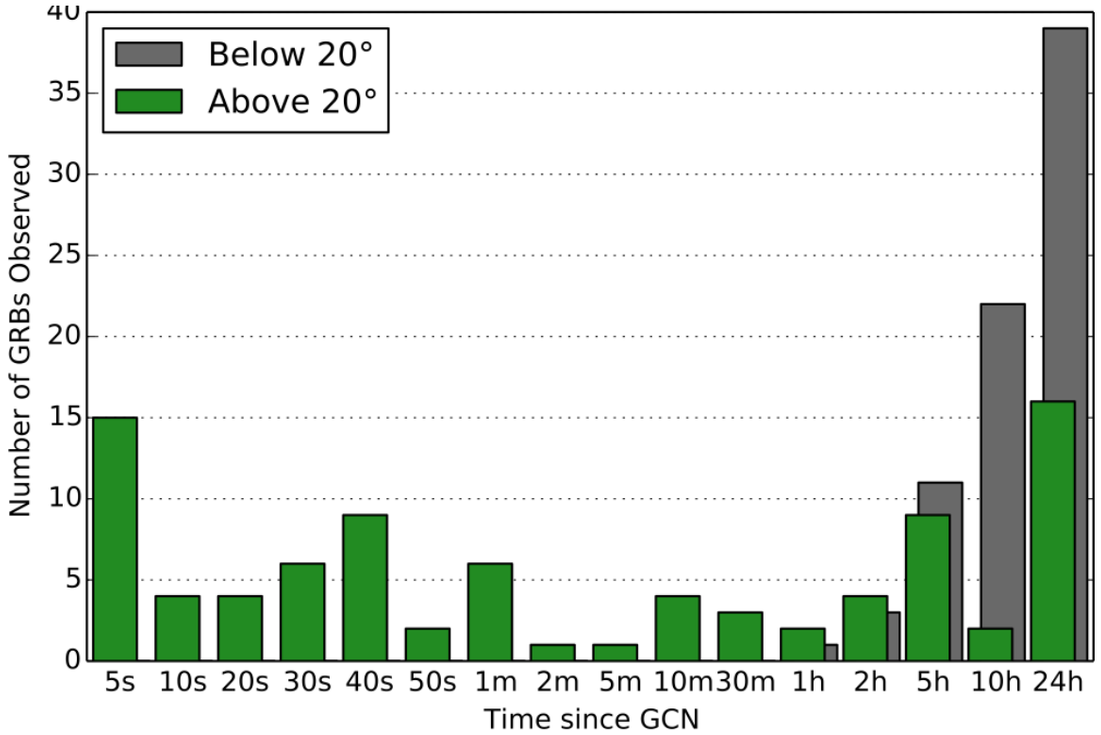
- A Fully Robotic Telescope designed primarily for GRB prompt and afterglow observations.
- 40cm Primary Mirror with Andor iXon EMCCD.
- 10’ × 10’ Field of View.
- Automatic follow-up of sources from Gamma-ray Coordinate Network (GCN).
- Semi-automatic follow-up from: Gaia Alerts, ASAS-SN, Fermi LAT, ATels.
- Filters available: Johnson BVRI, Sloan g’r’i’ and narrowband Hα, OIII

What makes Watcher robotic?

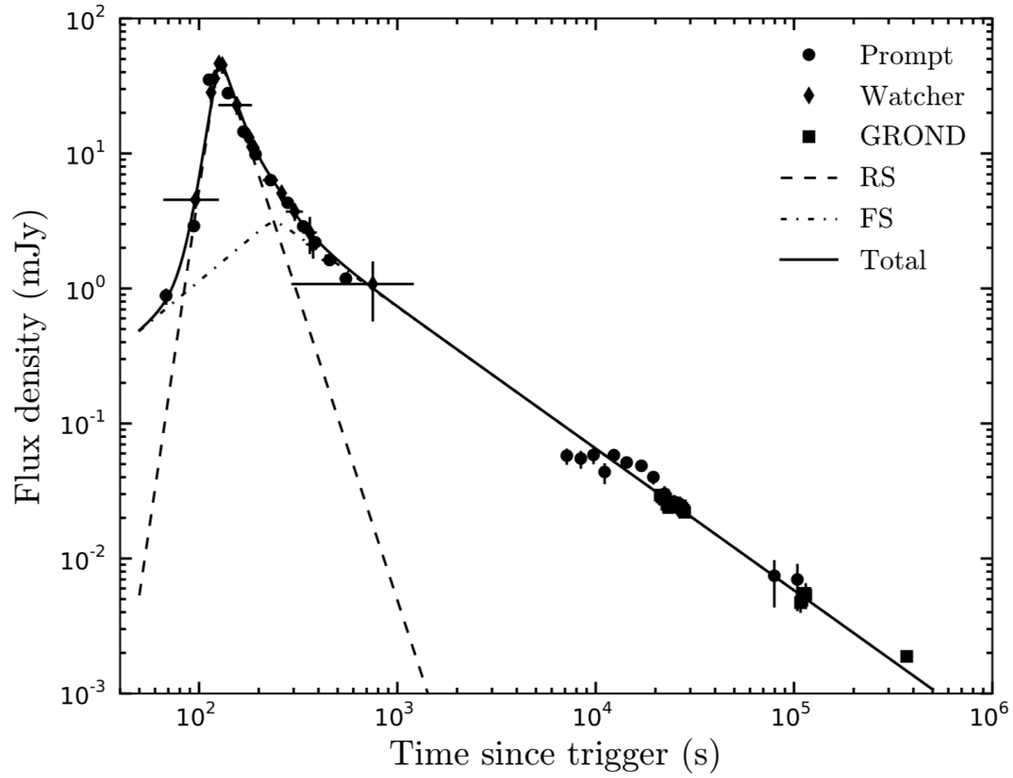


Performance

GRB response time to GCN



A. Martin-Carrillo et al. 2014



- Median Response Times
  (above horizon at alert)

  Past 5 years: 54.5s
  Since 2015: 25s

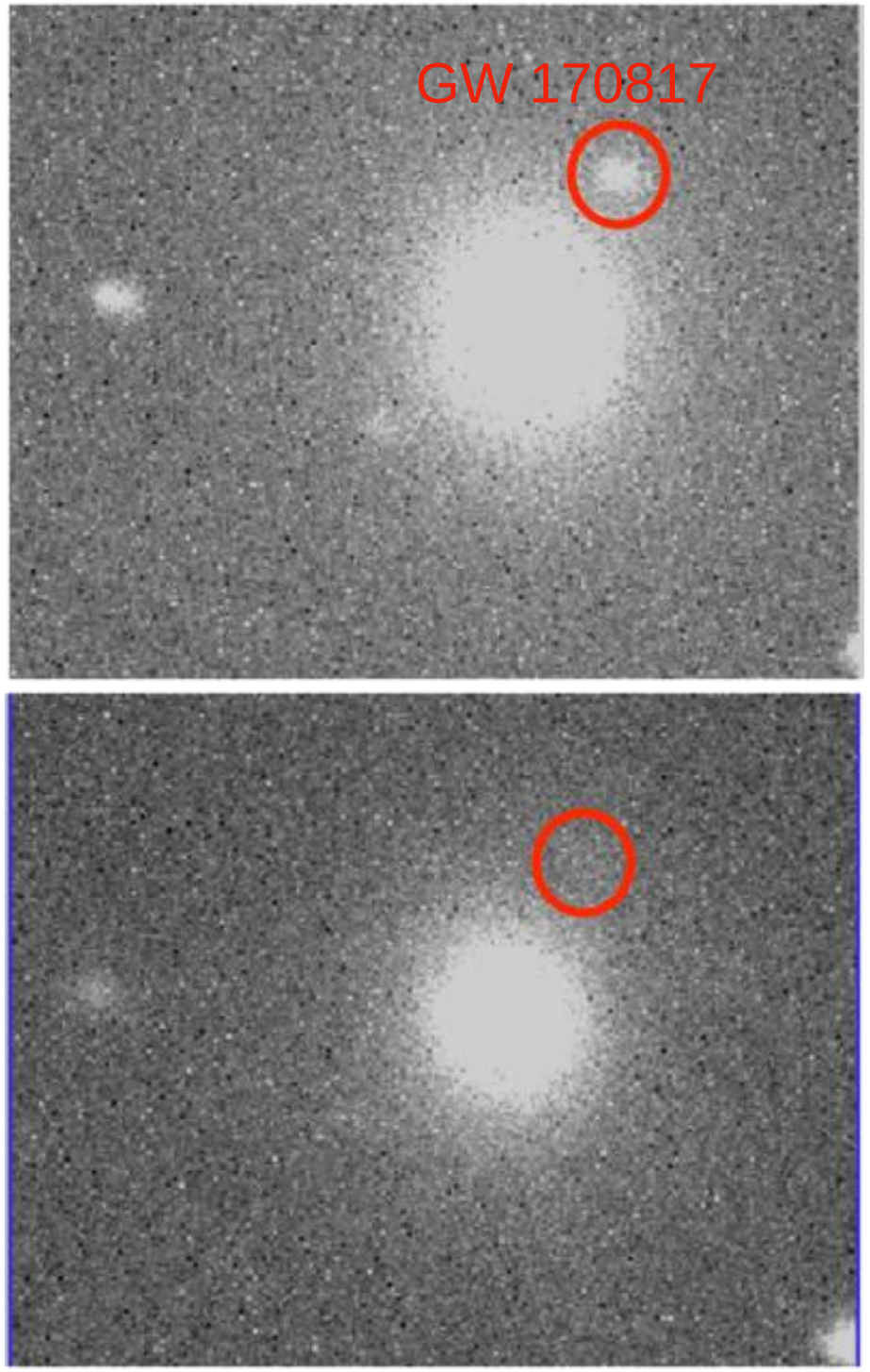
- Limiting Magnitude (5σ)

  60s ~18.5
  300s ~19.3

- Faintest object detected: GRB 170519A at mag ~20.5

Science targets

- Gamma-ray bursts (10% total time)
- Gravitational waves (10% total time) (gwtool.watchertelescope.ie)
- Blazars (35% total time)
- Supernovae (10% total time)
- Cataclysmic variables (20% total time)
- Microlensing events (10% total time)
- Exoplanets (5% total time)



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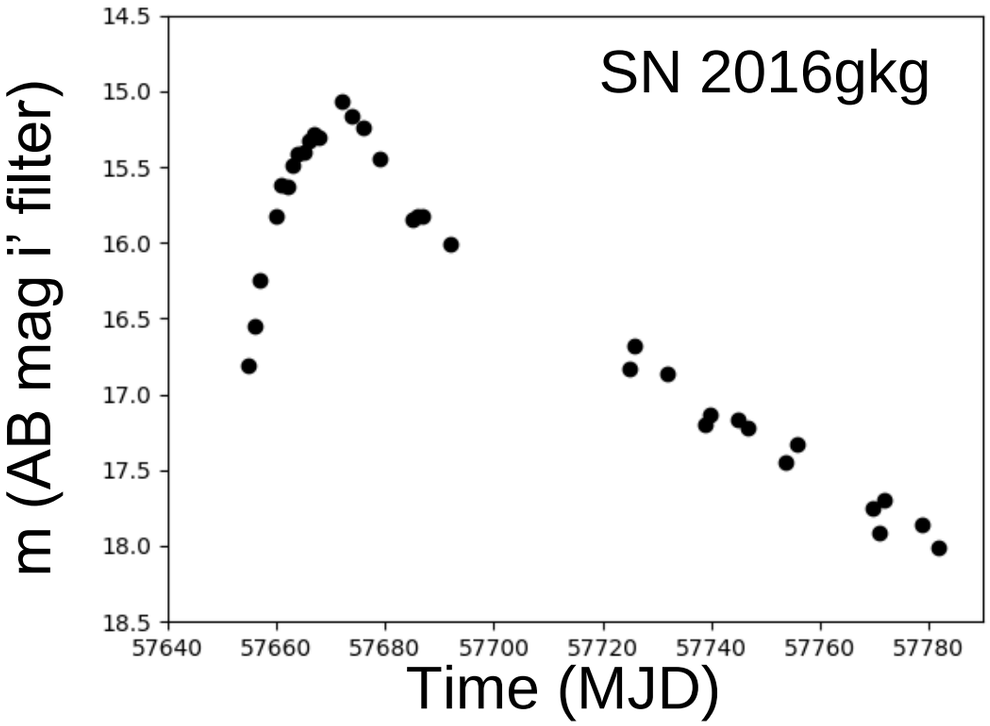

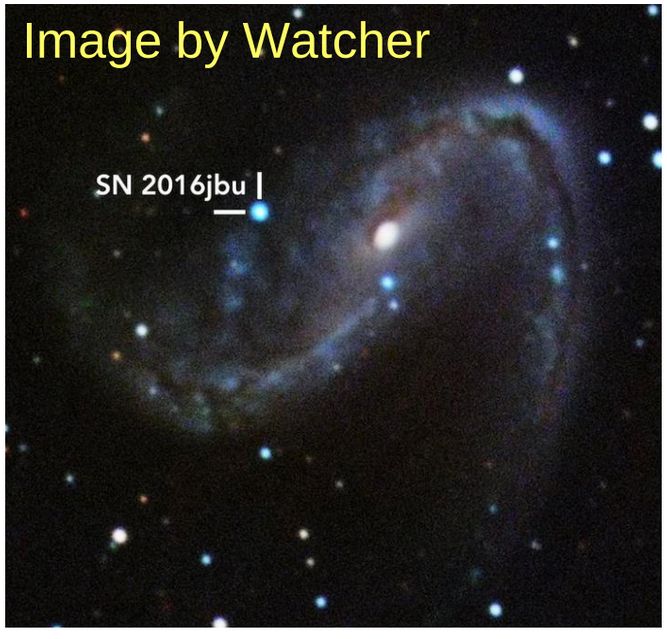

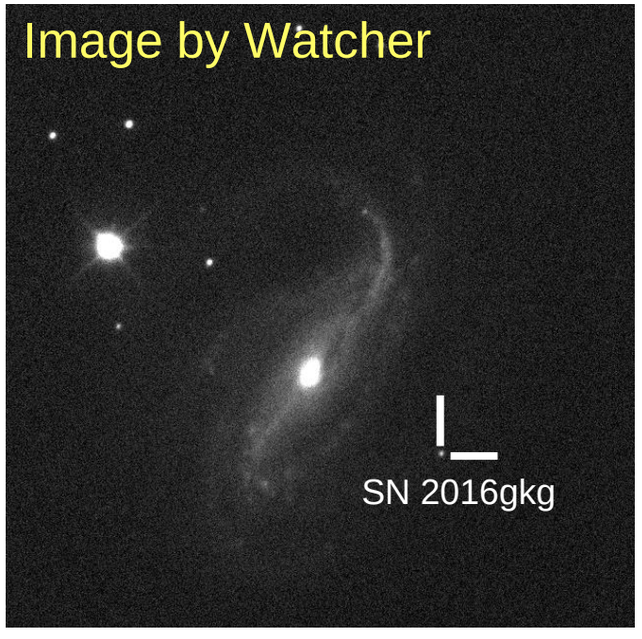

What's next?
Watcher 2 - BOOTES 6

MoU signed, installation undergoing.

Part of the BOOTES global RT network (PI: Castro-Tirado) which is optimised for continuous coverage.

60cm Primary Mirror.

Carbon Fiber OTA.

Astelco Mount:
~30º s^{-1} Slewing Speed for a BOOTES class telescope.

Support for a COLORES Imager / Spectrograph.

Watcher 1 will continue to operate.