

# Science with MeerKAT/SKA – a new window on Transients

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# MeerKAT – a SKA Precursor

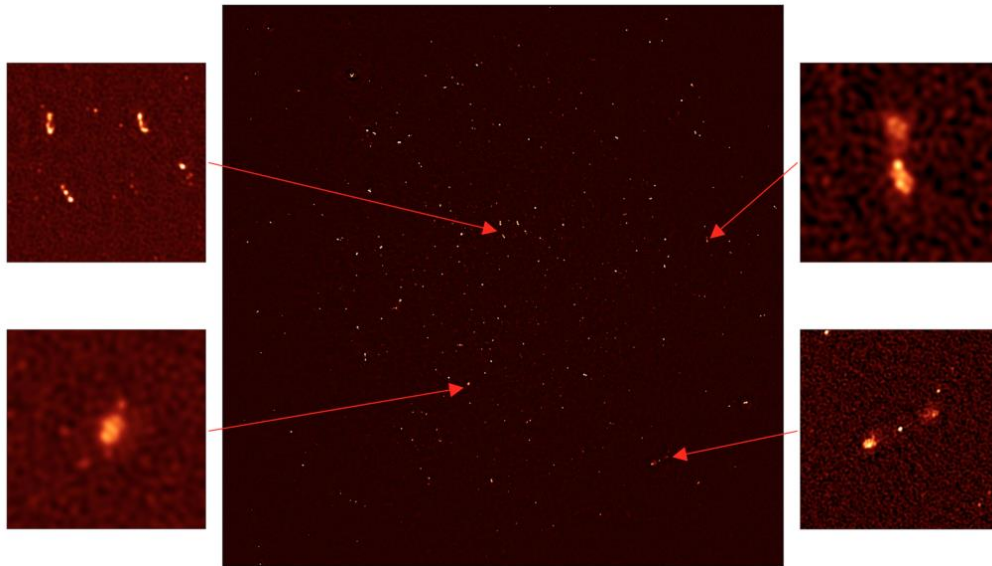
- 64 dishes over an 8-km baseline
- 13.5-m offset Gregorian
- Compact core, extended baseline
- Most sensitive cm-wavelength instrument in the southern hemisphere
- First dish constructed in 2015, full science second quarter 2018???



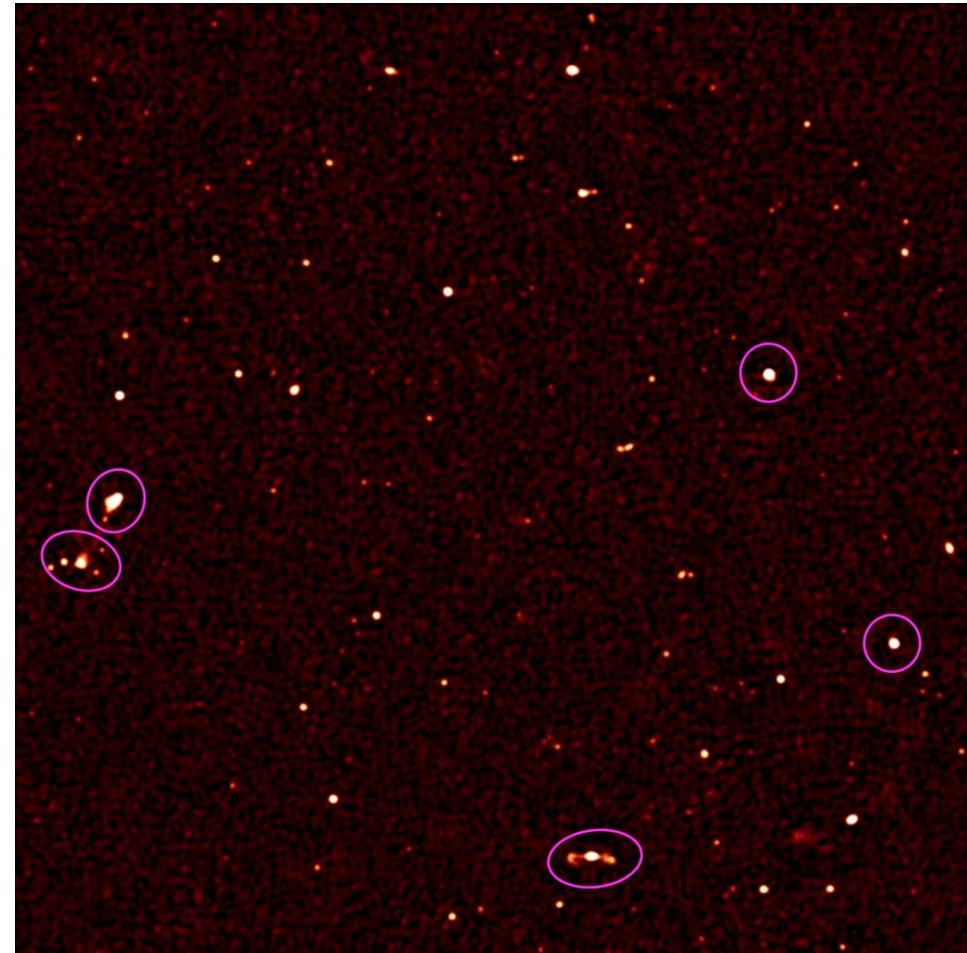
Credit: SKA South Africa



# MeerKAT – a SKA Precursor



Credit: SKA South Africa





# Panchromatic observations of novae - from explosion to the enrichment of the interstellar medium

- Co-I on the Large Science Program on MeerKAT, ThunderKAT (~3000 hours)
- Background: Modelling optical and radio emission of novae
- Interest in simultaneous optical-radio observations: vis MeerLICHT (UCT/Radboud/Oxford)
- Interest in public engagement



Credit: BIUST



Credit: BIUST



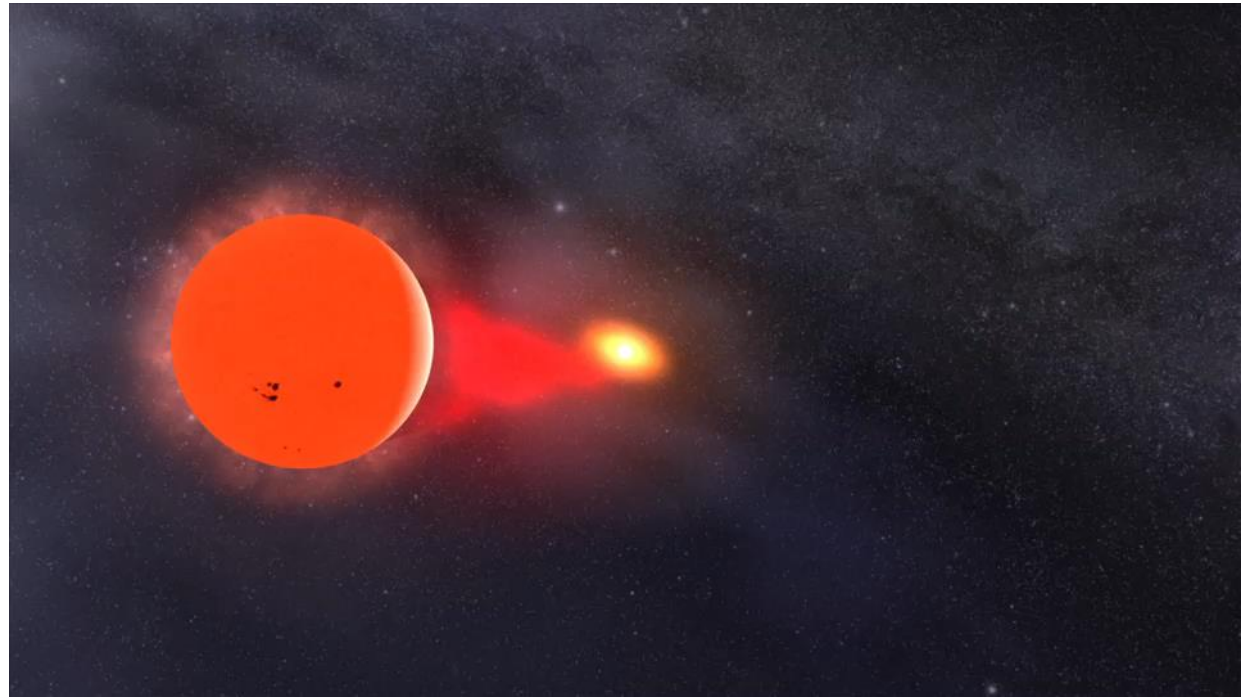
Credit: Radboud University/Joeri Borst



# Astrophysical transients:

## What are Novae?

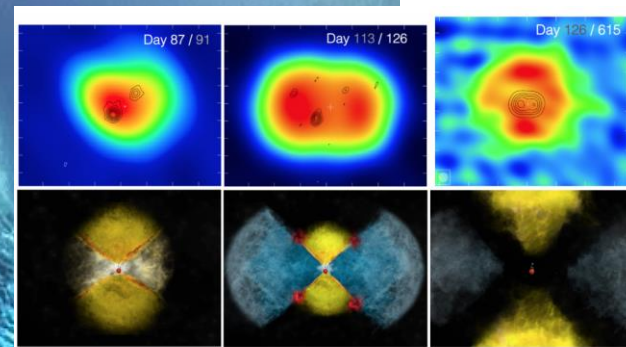
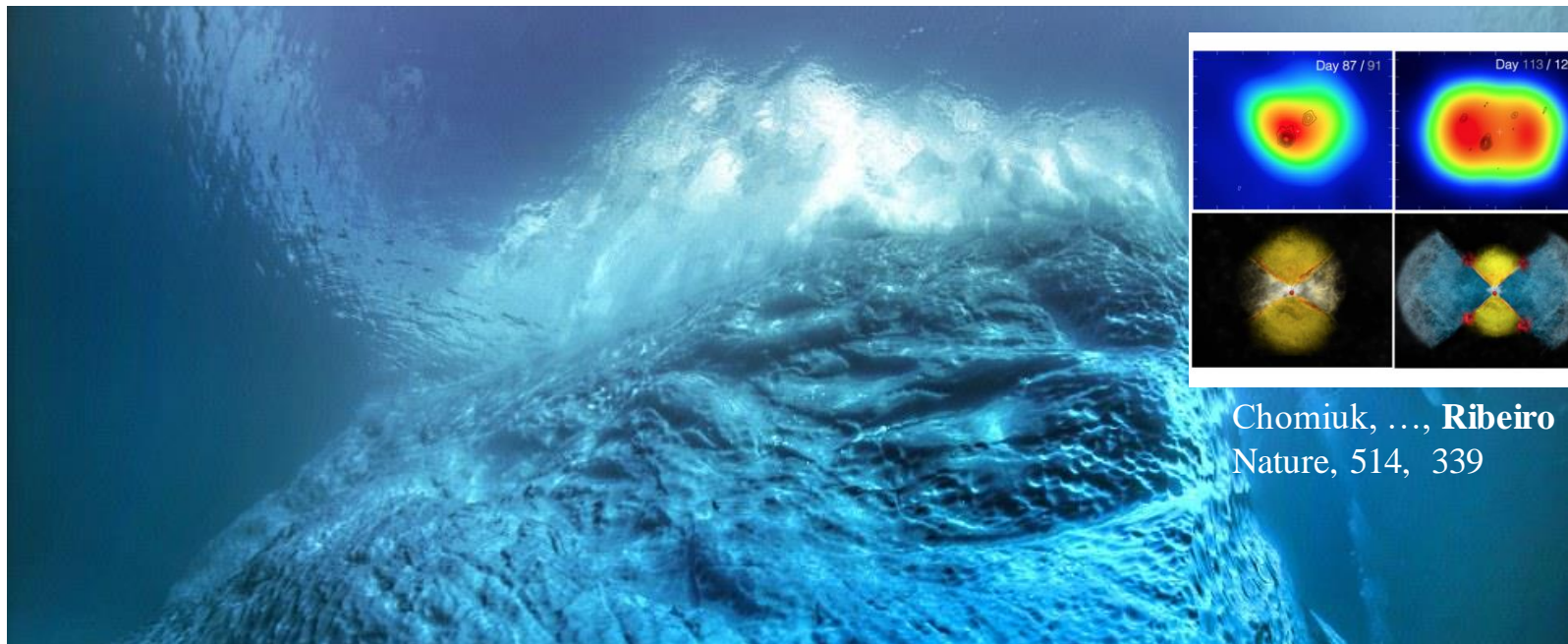
- Novae: thermonuclear explosions on the surface of a white dwarf star
- Novae: the most common stellar explosions in the local universe expelling heavy elements
- MeerKAT/ThunderKAT: will follow-up  $\sim 5$  /year
- SKA1: will be able to survey *all* observable novae in the Galaxy (we expect  $\sim 35$ /yr)
- SKA1: detection of *first* extragalactic nova in the LMC



Credit: NASA's Goddard Space Flight Centre

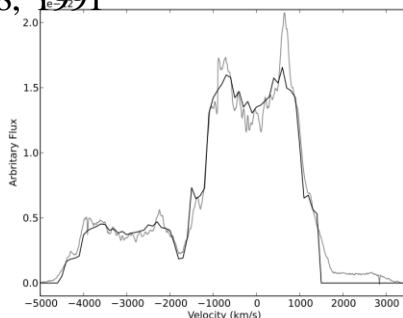
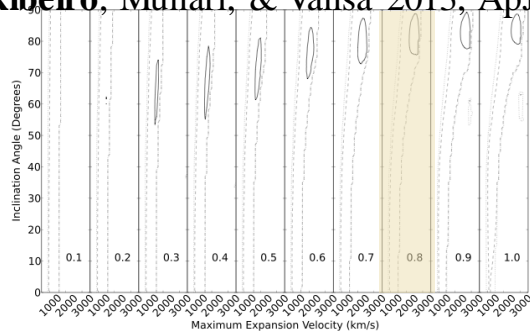


# Astrophysical transients: The tip of the iceberg




Chomiuk, ..., **Ribeiro** et al. 2014,  
Nature, 514, 339


**Ribeiro**, Munari, & Valisa 2013, ApJ, 768, 1991







# Astrophysical transients: Portuguese Synergies



- Grande Telescópio Óptico (FCUP/ENGAGE SKA)
  - 75 cm diameter, FoV  $\sim 3$  square degrees
  - In Pampilhosa da Serra
  - Primary driver: SST pilot, Space debris, near Earth Objects
    - Transient astrophysics with particular focus on extragalactic novae (ENGAGE SKA - FCUP+UA)
- **First** optical-radio simultaneous observations: MeerLICHT (UCT/Radboud/Oxford)
  - 65 cm diameter, FoV  $\sim 2.7$  square degrees
  - Permanently linked to MeerKAT





# Astrophysical transients: Optical searches for Supernovae



Year 1985.000

