



Observações das Novas em ondas da banda radio

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2009-2019



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FCT
Fundação para a Ciência e a Tecnologia
MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR



O céu noturno: Noudar Castle



Credit: SKA South Africa



Credito: Miguel Claro

<https://www.miguelclaro.com/wp/?portfolio=milky-way-noudar-castle>

O céu noturno: Deserto Karoo



Credit: SKA South Africa

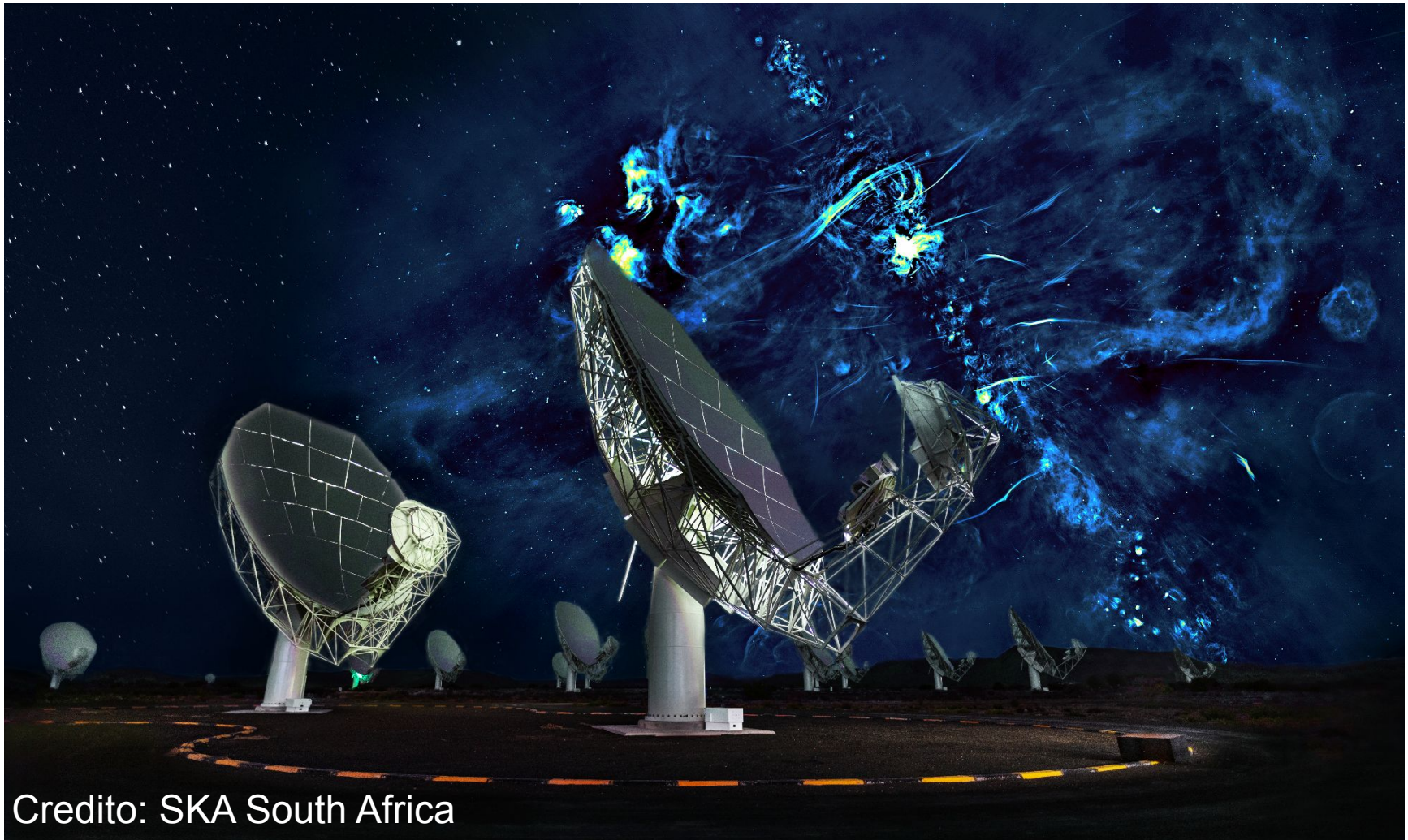


Credito: SKA South Africa

O céu noturno: Deserto Karoo



Credit: SKA South Africa



Credito: SKA South Africa

A busca de explosões nucleares



Credit: Sergey Kuposov, Institute of Astronomy, Cambridge.

O que são novas?



Credit: SKA South Africa

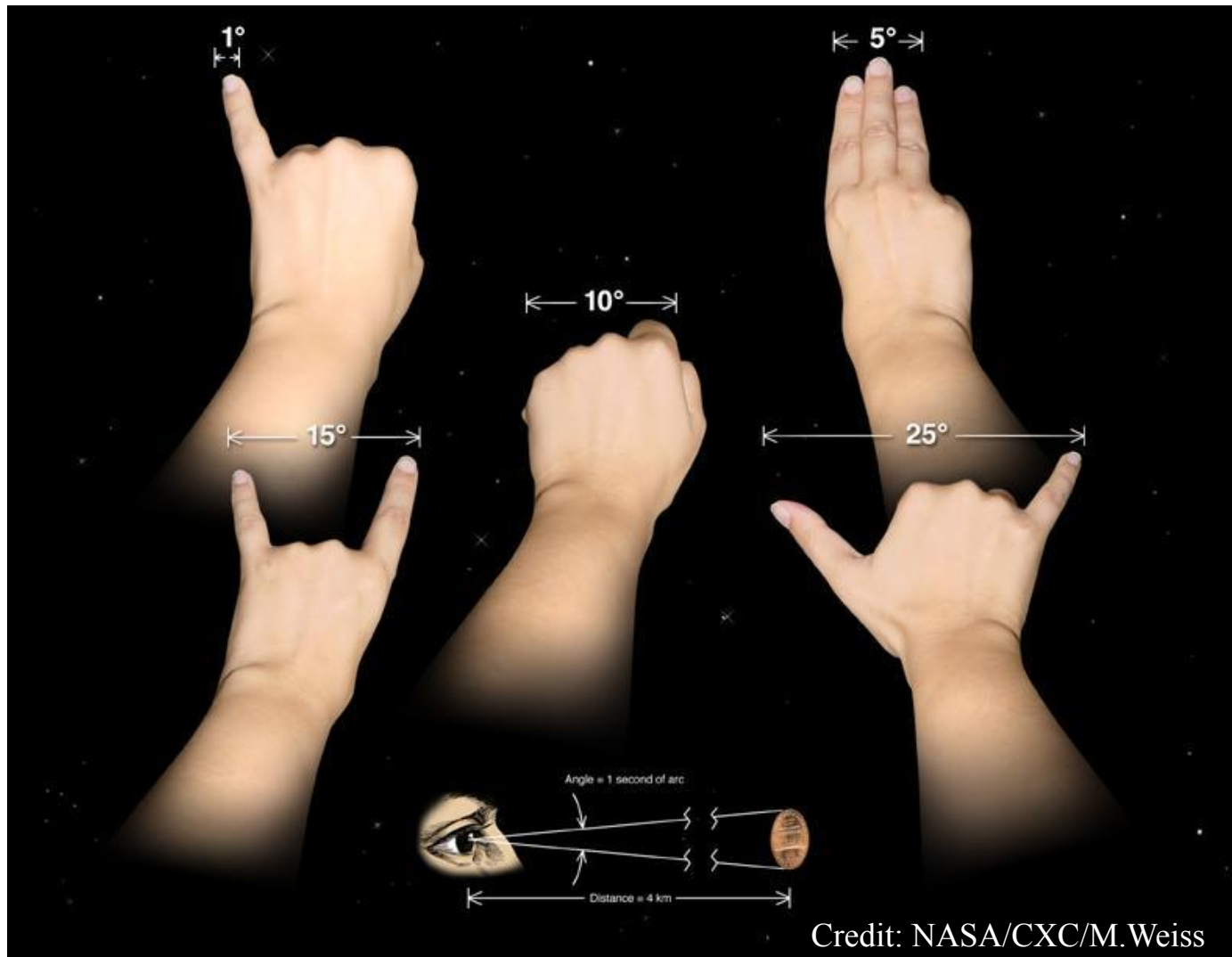


Credit: NASA's Goddard Space Flight Centre

Breve interlúdio



Credit: SKA South Africa



Credit: NASA/CXC/M. Weiss

Breve interlúdio



Credit: SKA South Africa

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$\theta = 31$ arcminutes

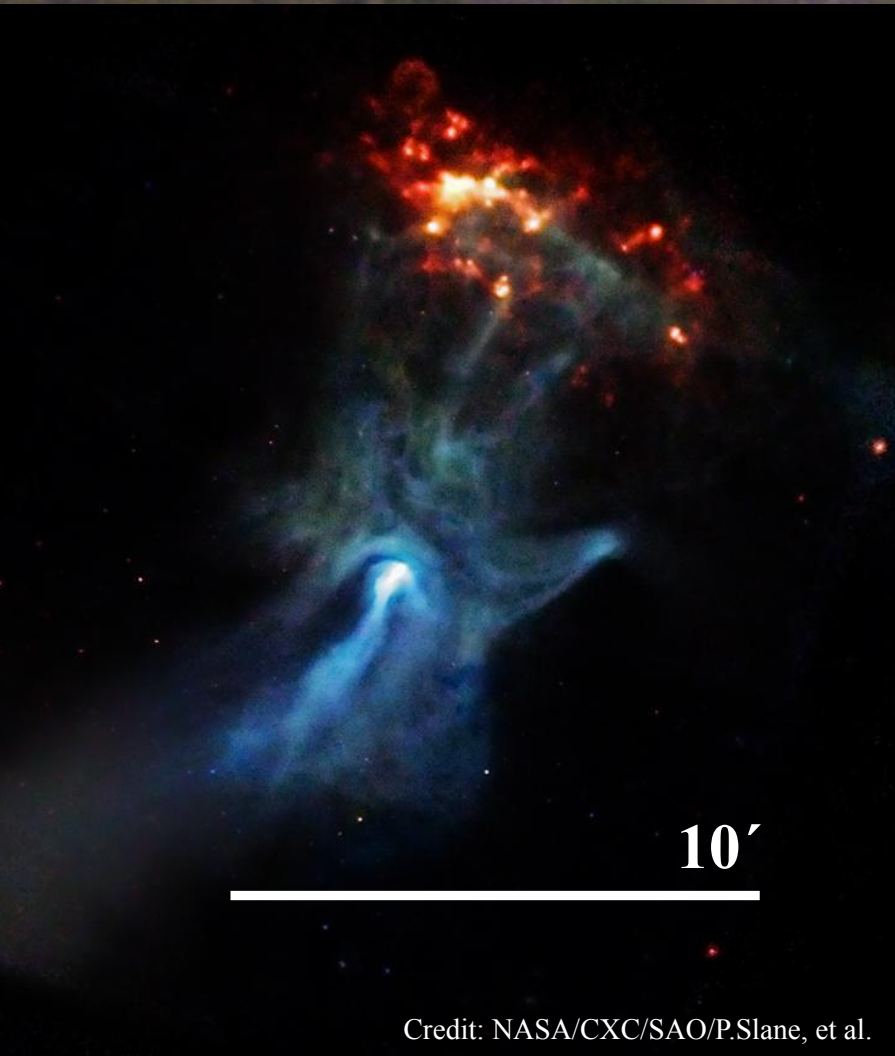
$1^\circ = 60$ arcminutes
 1 arcminute $= 60$ arcseconds
 $1' = 60''$



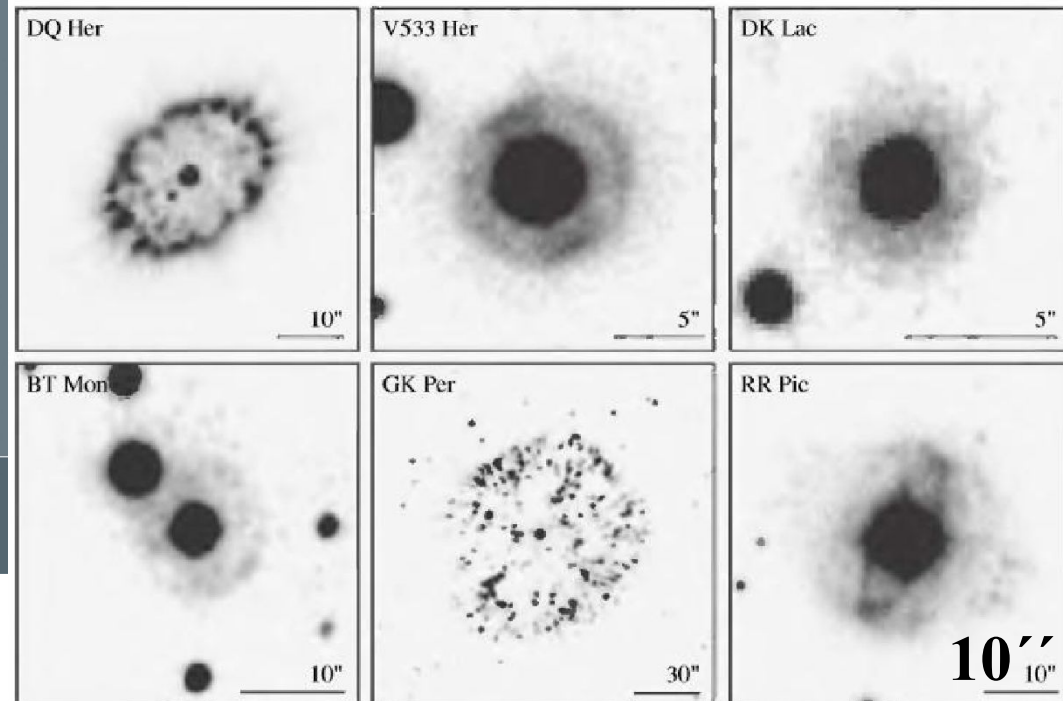
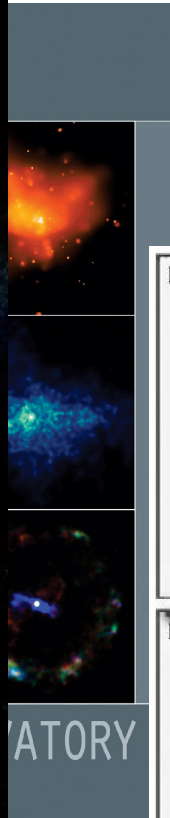
A busca de explosões



Credit: SKA South Africa



Credit: NASA/CXC/SAO/P.Slane, et al.



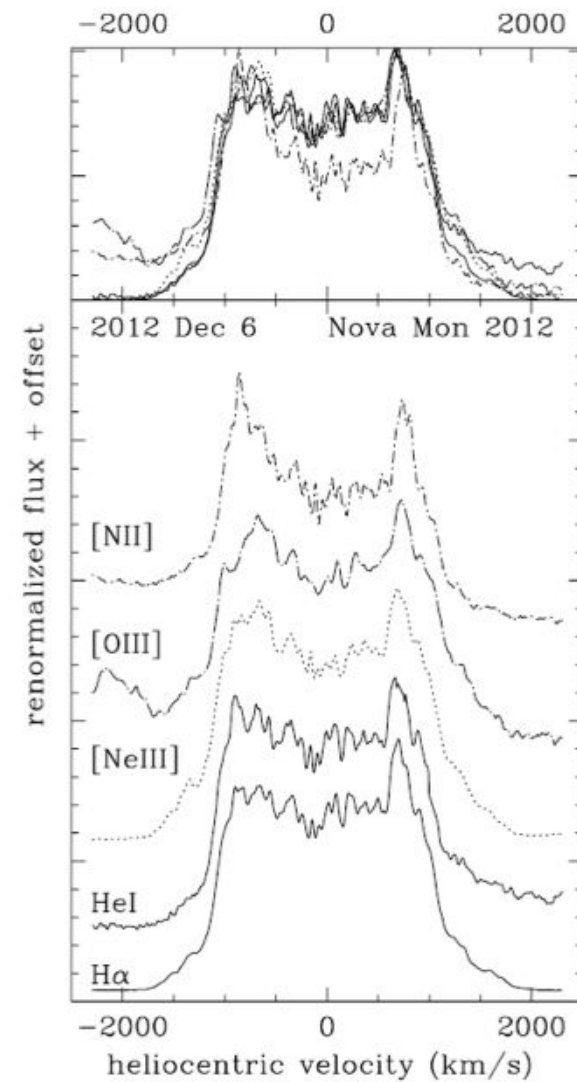
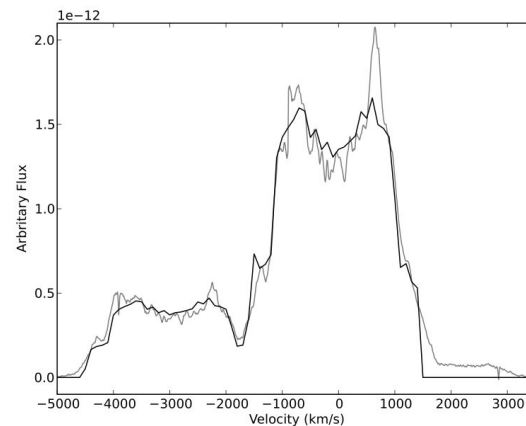
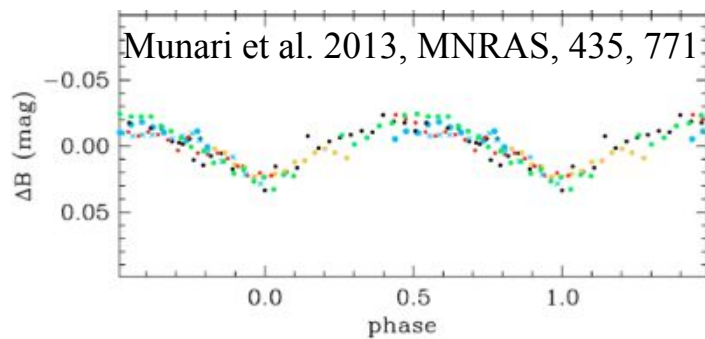
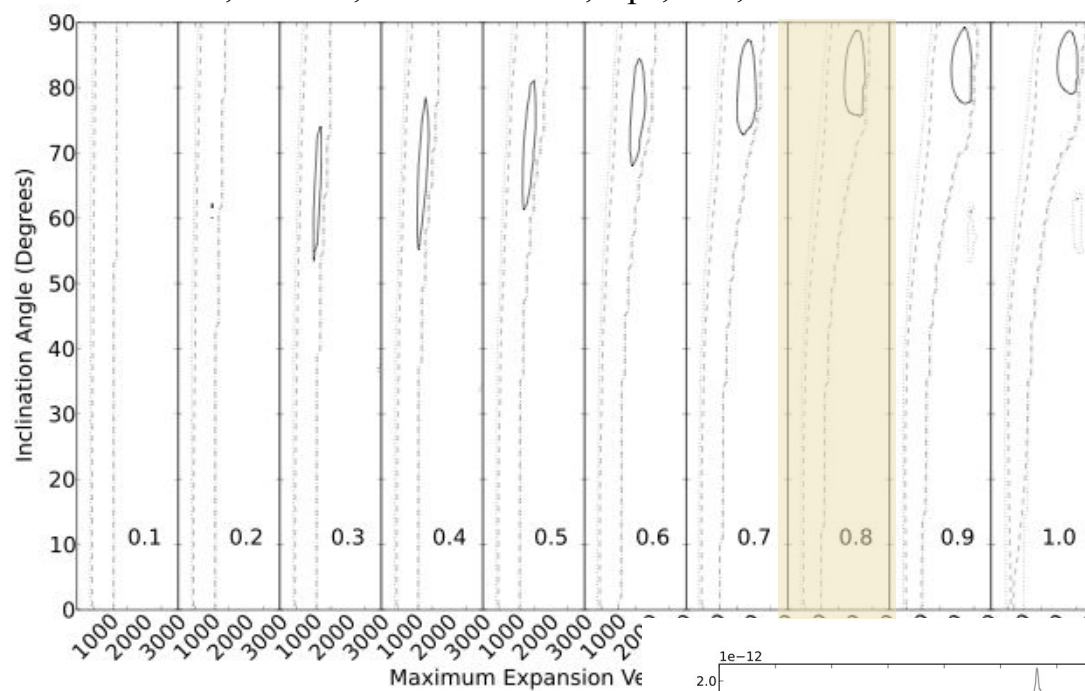
$3.26 \text{ pc} = 1 \text{ ano luz} = 9,460,730,472,580.8 (9.5 \times 10^{12}) \text{ km}$



Nova V959 Mon (2012)

Credit: SKA South Africa

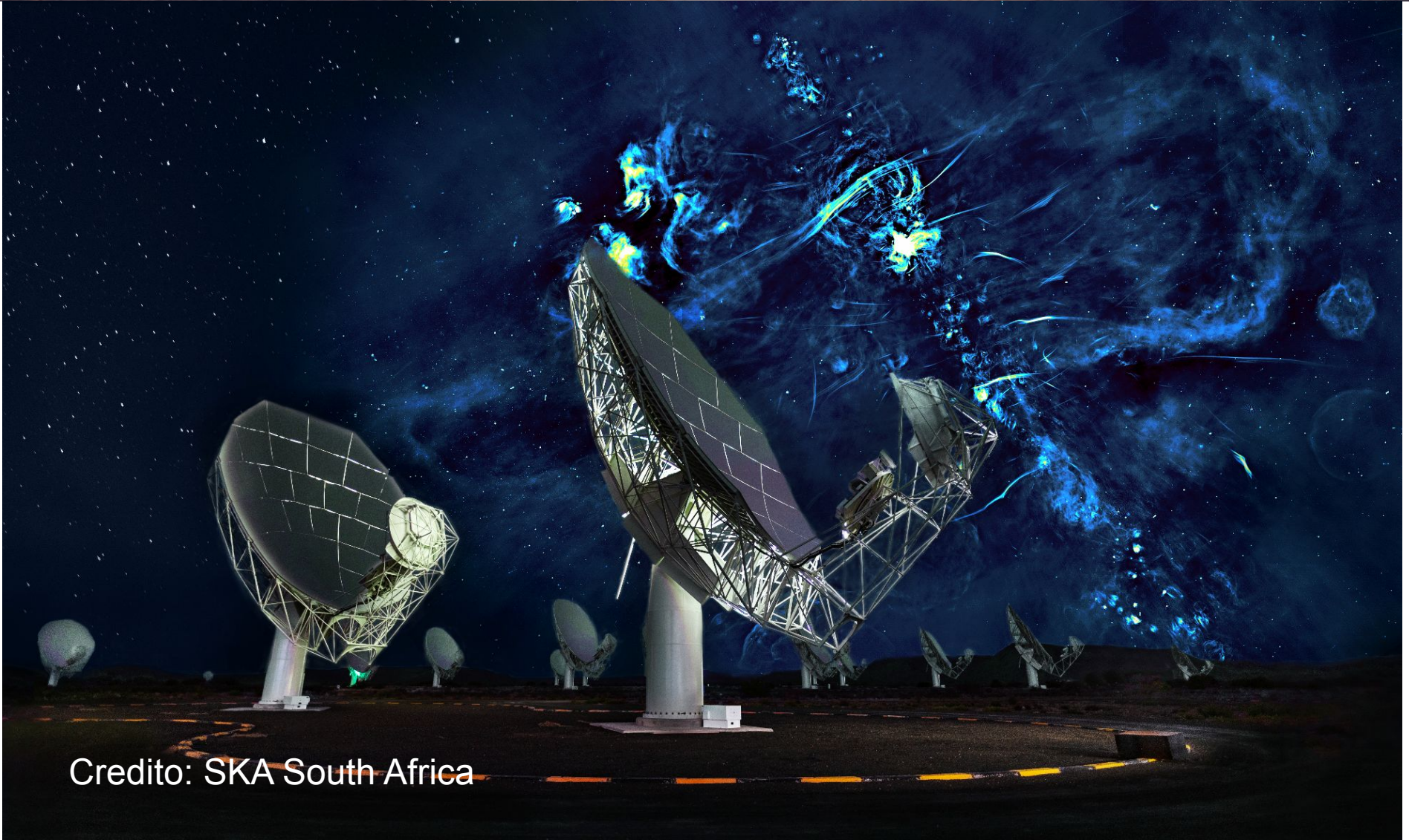
Ribeiro, Munari, & Valisa 2013, ApJ, 768, 1991



Observações em onda radio



Credit: SKA South Africa

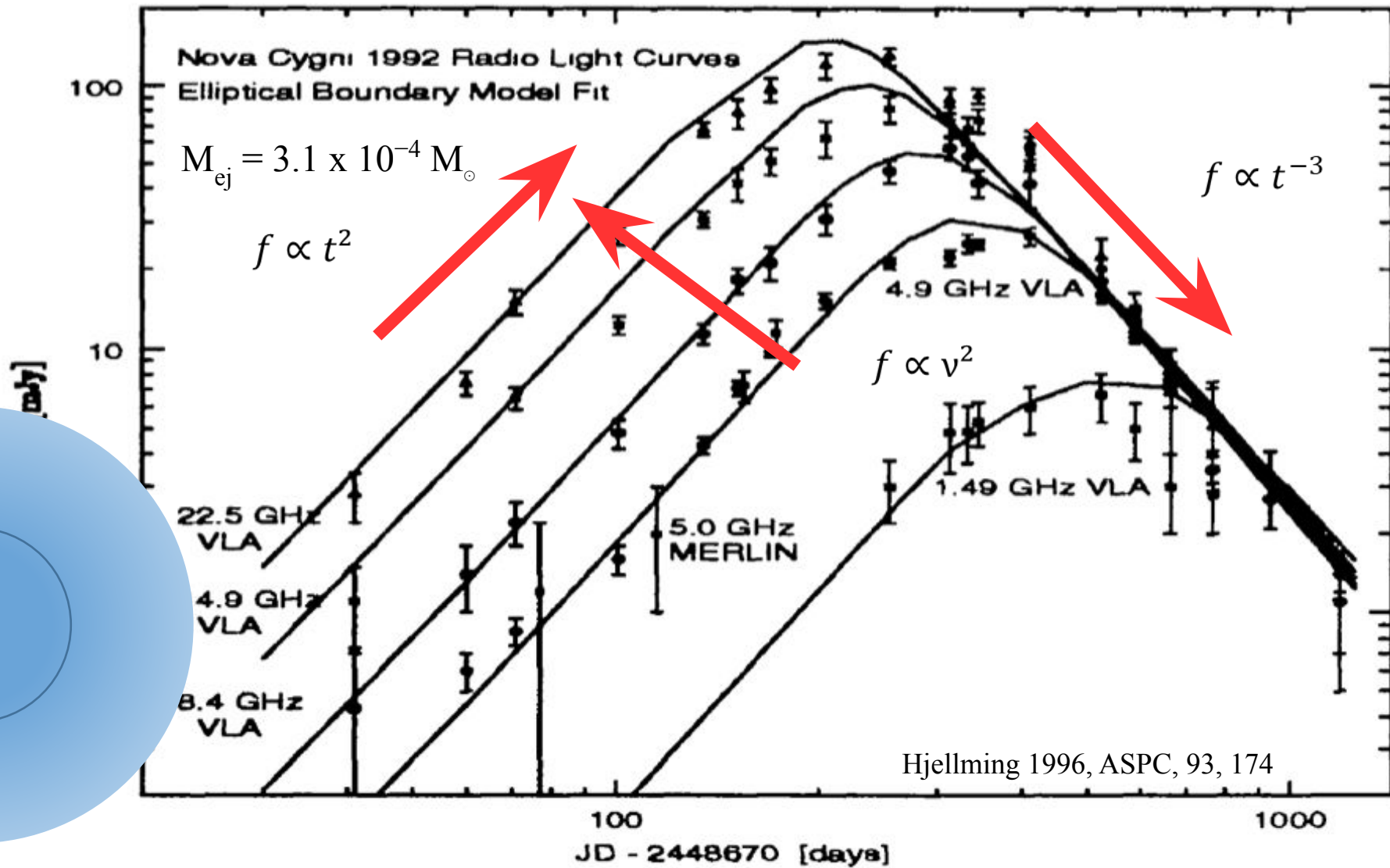


Credito: SKA South Africa

Observações em onda radio



Credit: SKA South Africa



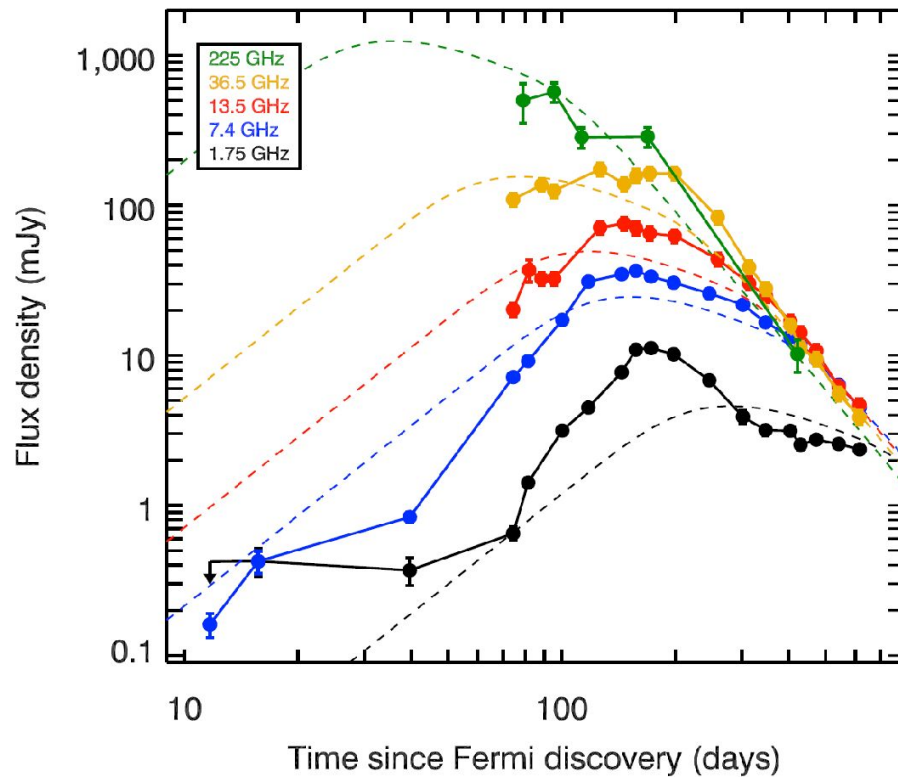
Hjellming 1996, ASPC, 93, 174



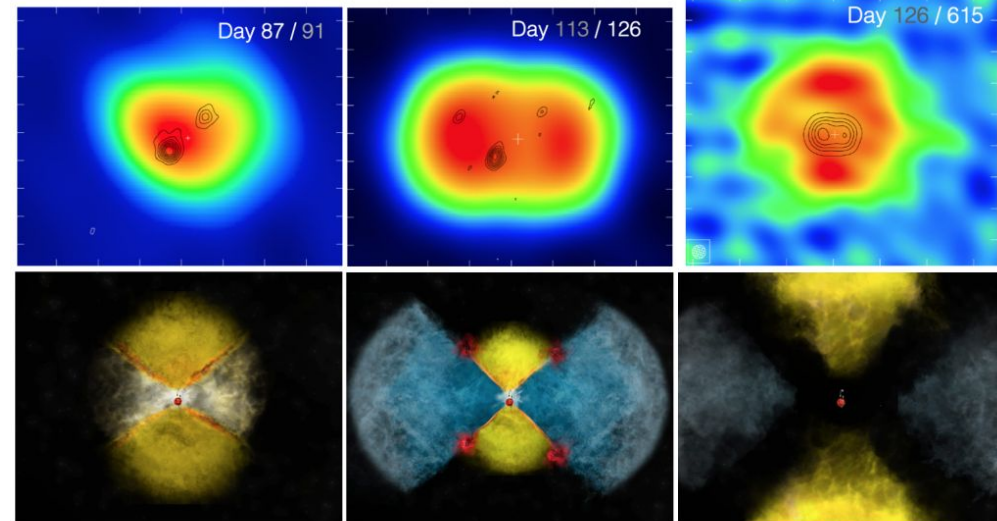
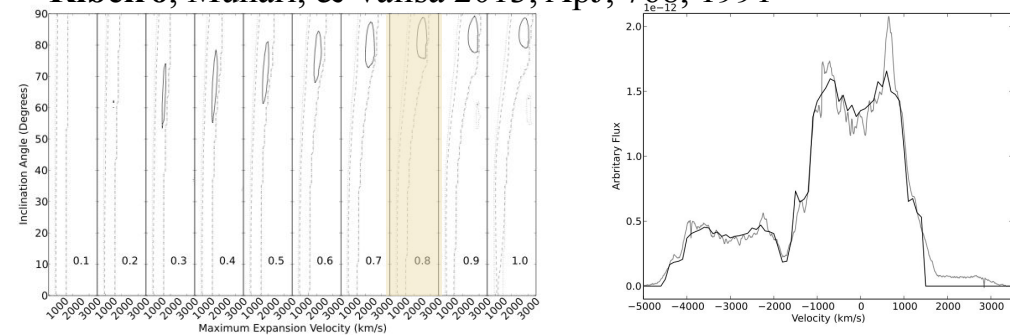
Nova V959 Mon (2012)



Credit: SKA South Africa



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



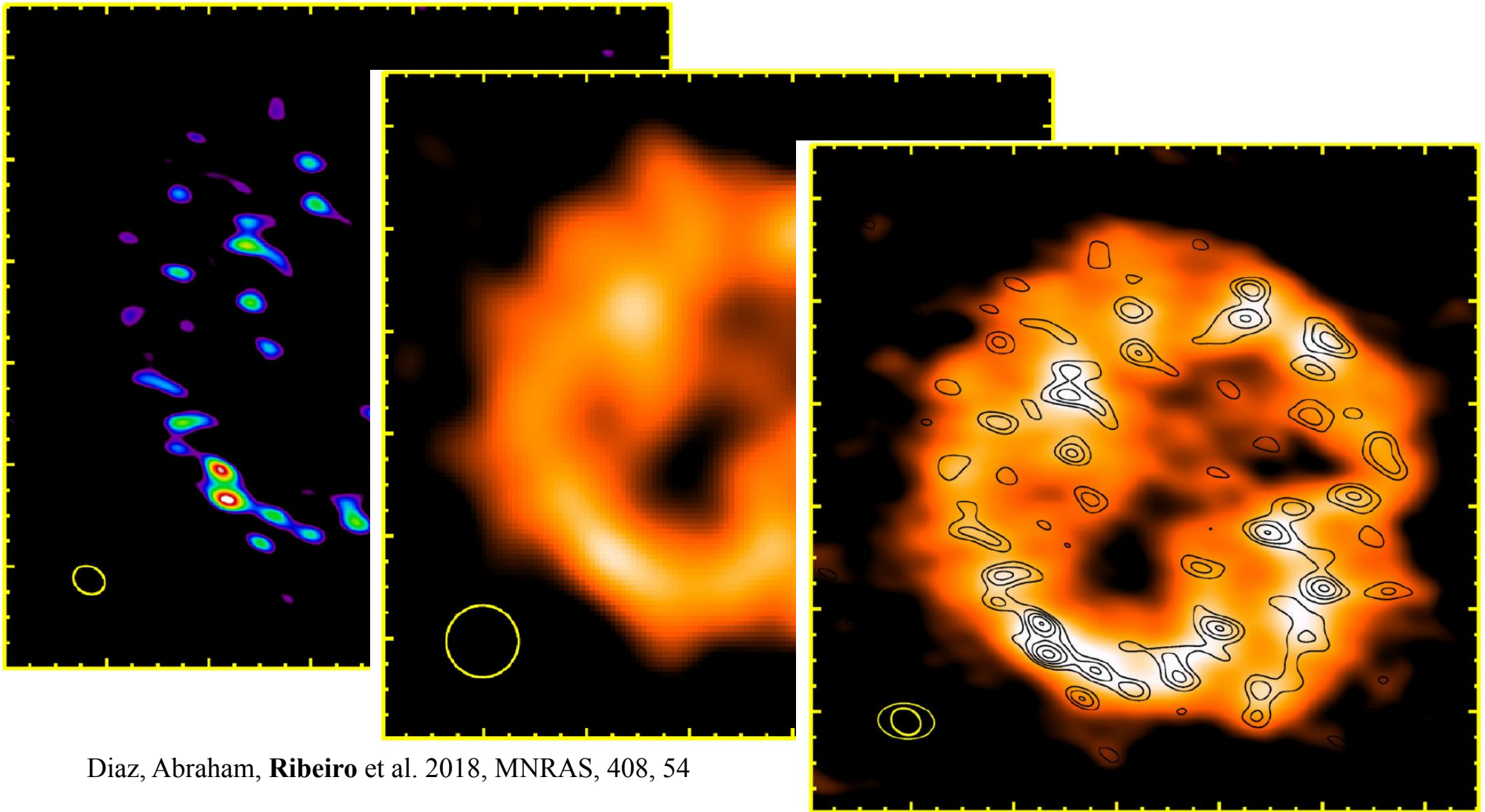
Chomiuk, ..., **Ribeiro** et al. 2014, Nature, 514, 339

Credit: B. Saxton, NRAO/AUI/NSF

Non-thermal nor spherical



Credit: SKA South Africa

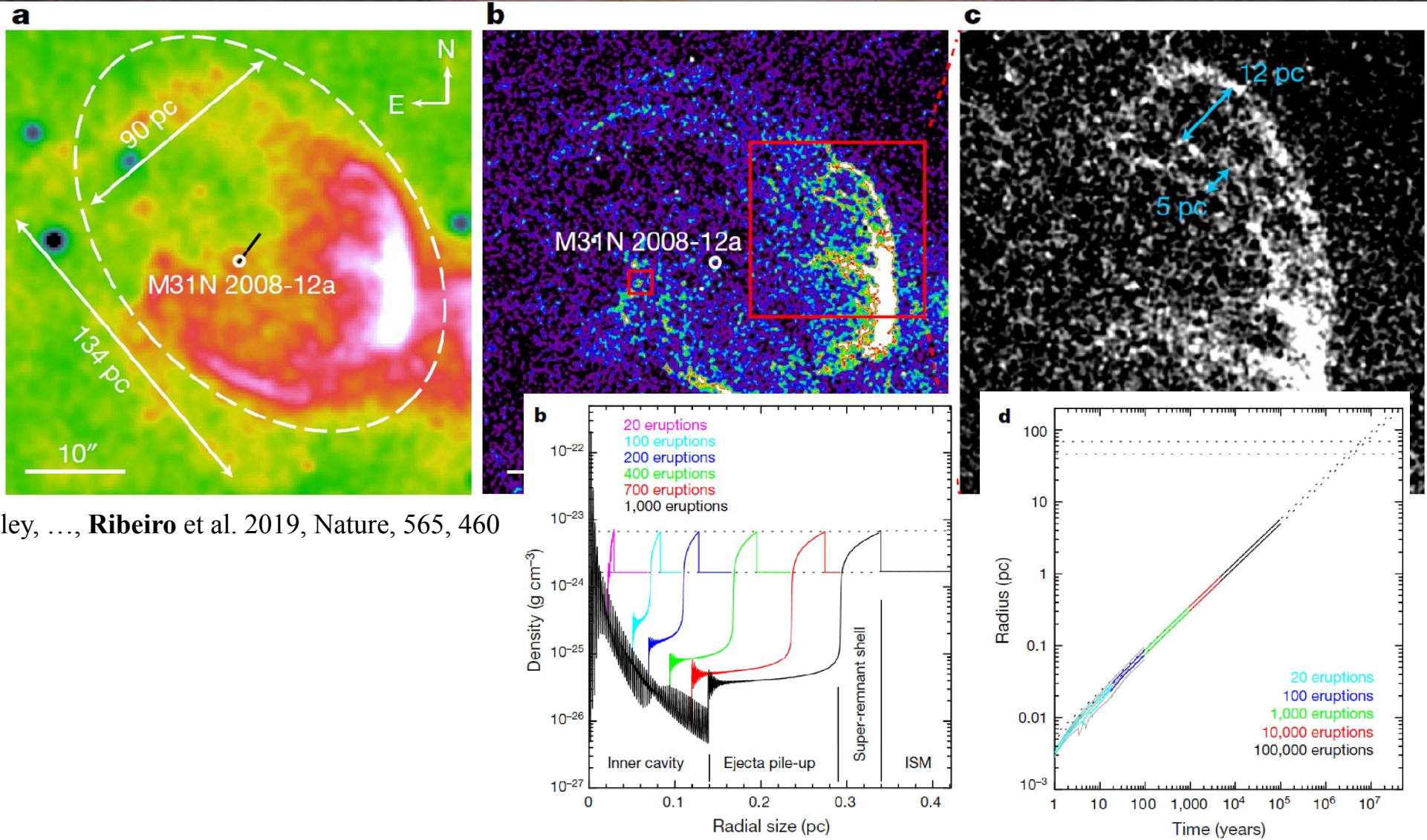


Diaz, Abraham, **Ribeiro** et al. 2018, MNRAS, 408, 54

Novae recurrentes



Credit: SKA South Africa

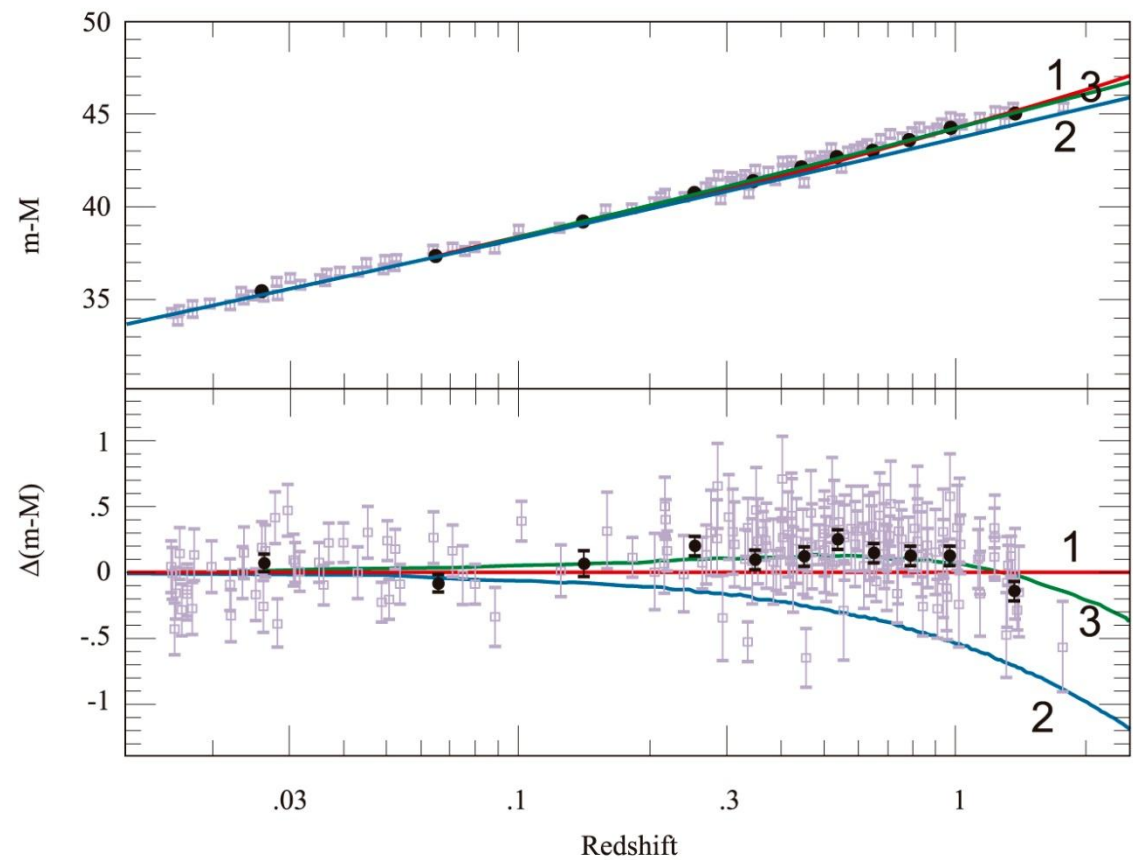
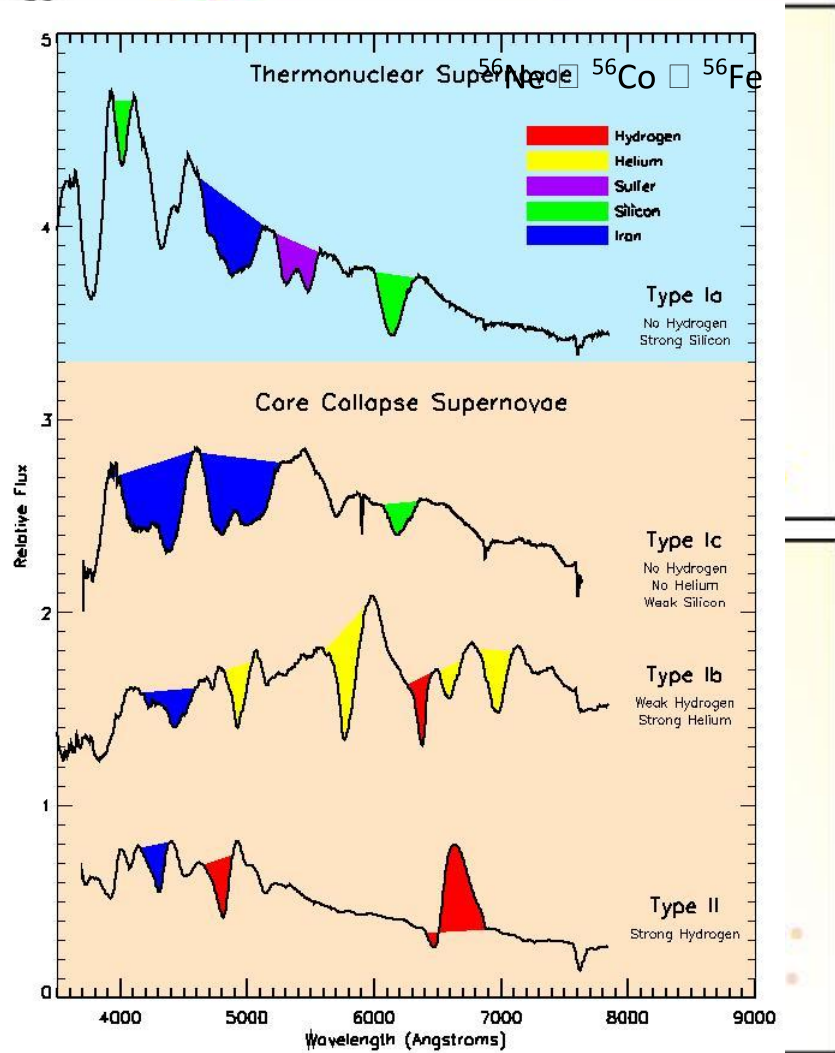


Darnley, ..., **Ribeiro** et al. 2019, Nature, 565, 460

Supernova tipo Ia



Credit: SKA South Africa



Davis et al. 2007, ApJ, 666, 716

José 2015, Stellar Explosions: Hydrodynamics and Nucleosynthesis

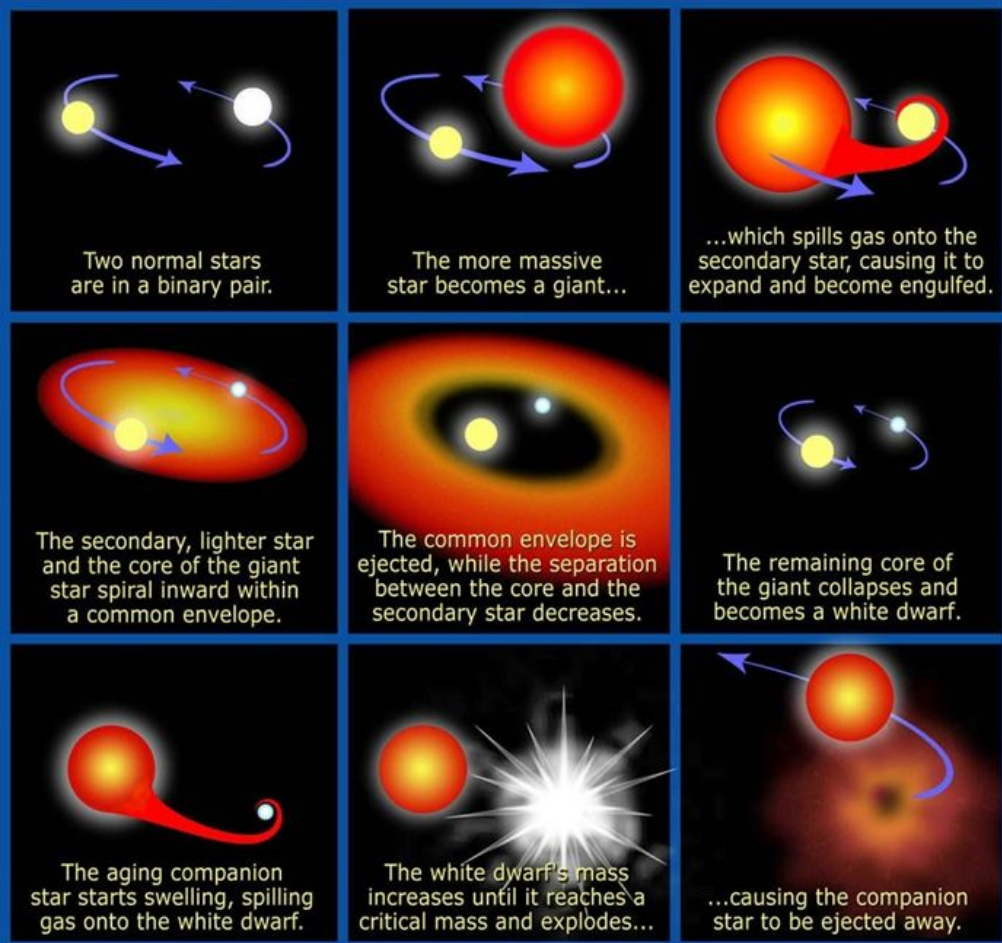
Credit: <http://inferno.berkeley.edu/index.php/kasen/supernovae/>

Supernova tipo Ia

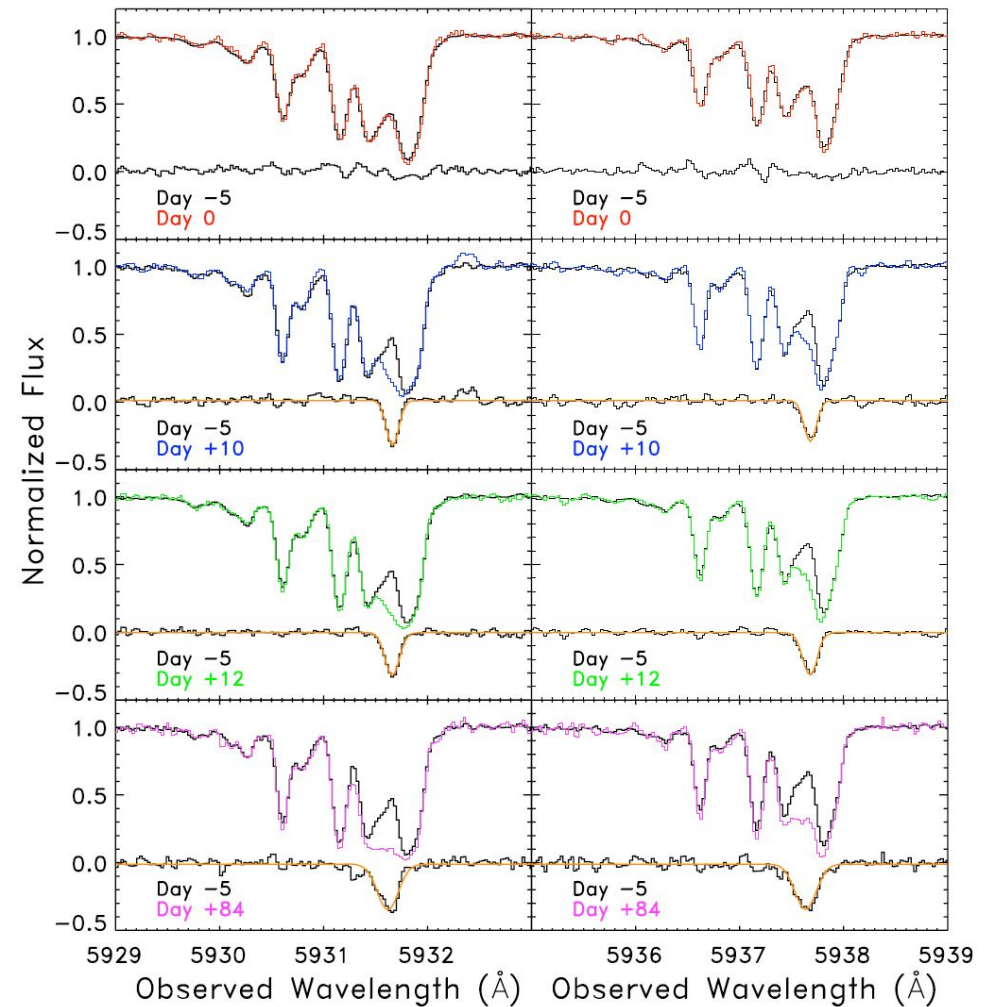


Credit: SKA South Africa

The progenitor of a Type Ia supernova



Credit: NASA, ESA, and A. Field (STScI)



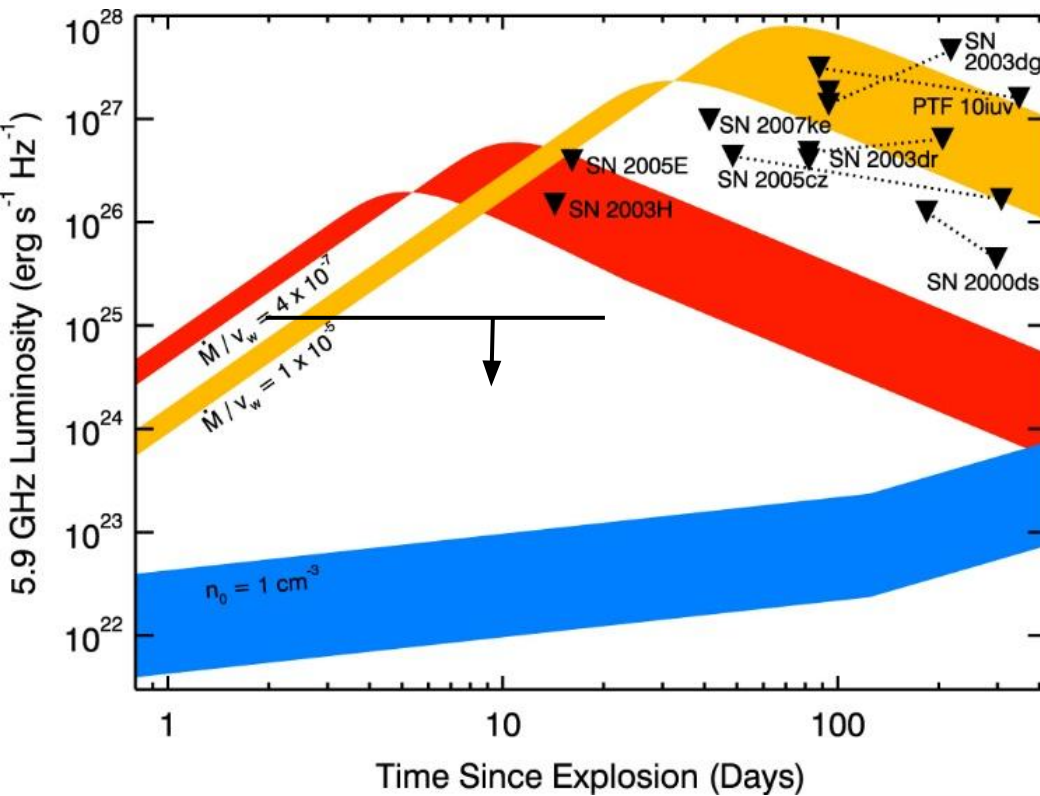
Patat et al. 2007, Science, 317, 5840

Simon et al. 2009, ApJ, 702, 1157

Supernova tipo Ia



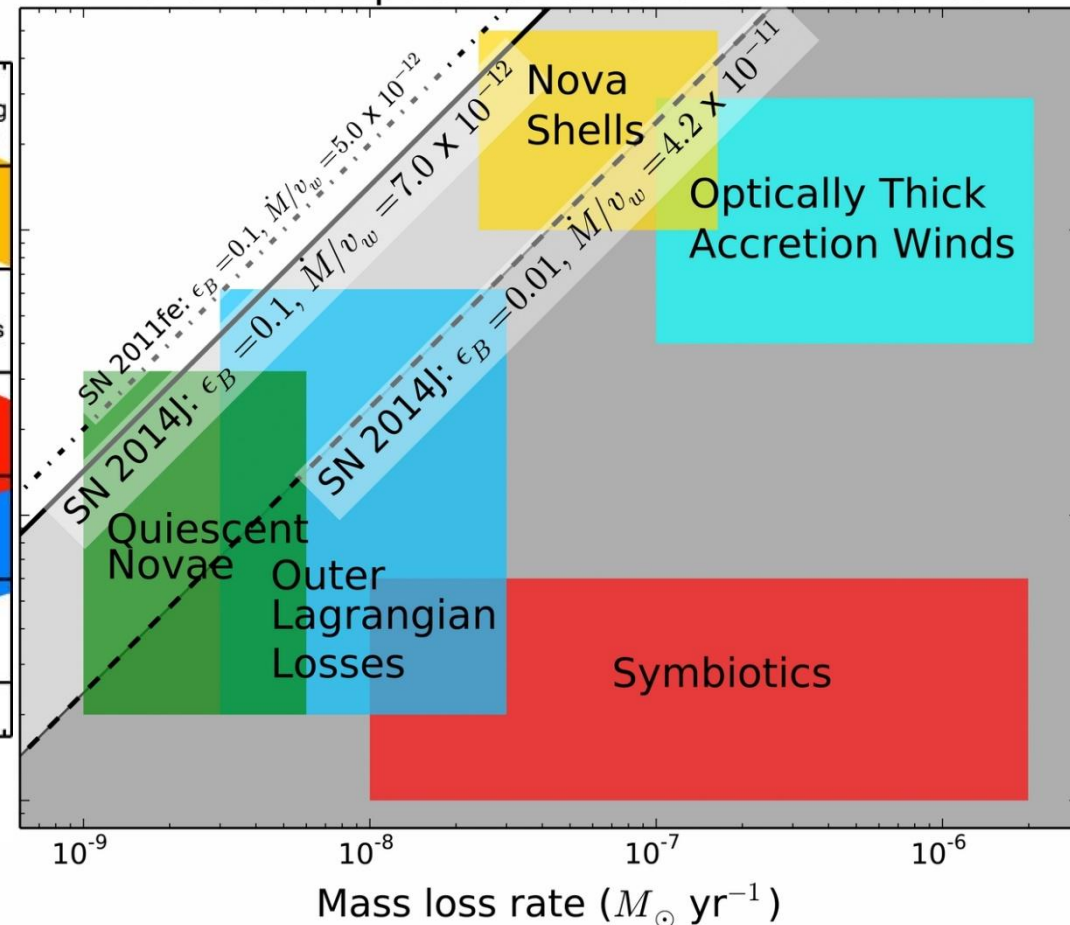
Credit: SKA South Africa



Chomiuk et al. 2016, ApJ, 821, 119

Chomiuk et al. 2012 ApJ, 750, 164

Parameter space for SNe Ia SD scenarios



Pérez-Torres et al. 2014, ApJ, 792, 38

Chomiuk et al. 2012 ApJ, 750, 164

O Square Kilometre Array SKA

Credit: SKA South Africa

- 3 sites; 2 telescopes + HQ, 1 Observatory
- 2 phases:
 - Phase 1 – Construction 2018-2024
 - Phase 2 – Construction 2024-2033

	SKA_LOW (Australia)	SKA_MID (South Africa)
Sensors	130k (500k) dipoles	197 (2000) dishes
Frequency range	50-350 MHz	0.45-15 GHz
Collecting area	0.4 km ²	0.3 km ²
Max baseline	65 (~5000) km	150 (~3000) km
Raw data output	157 Terabyte/sec 0.49 Zettabyte/yr	3.9 Terabyte/sec 122 Exabyte/yr
Science archive	0.4 Petabyte/day	3 Petabyte/day



Members
 Host Countries: Australia, South Africa, United Kingdom

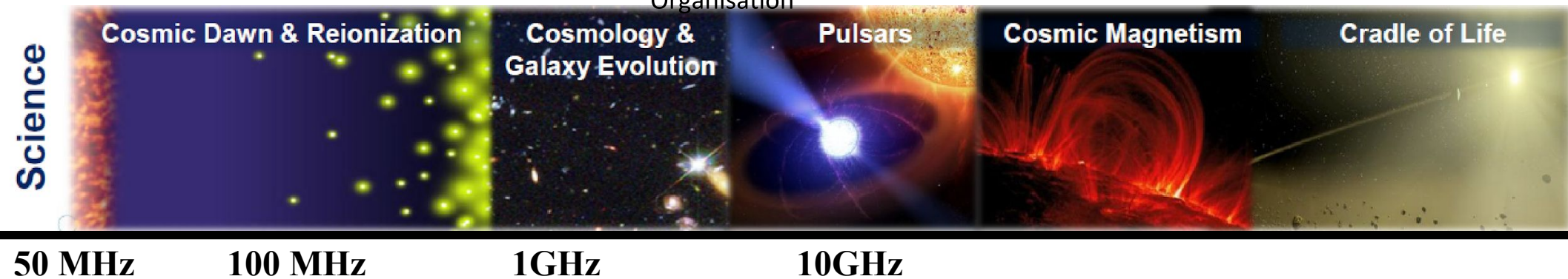
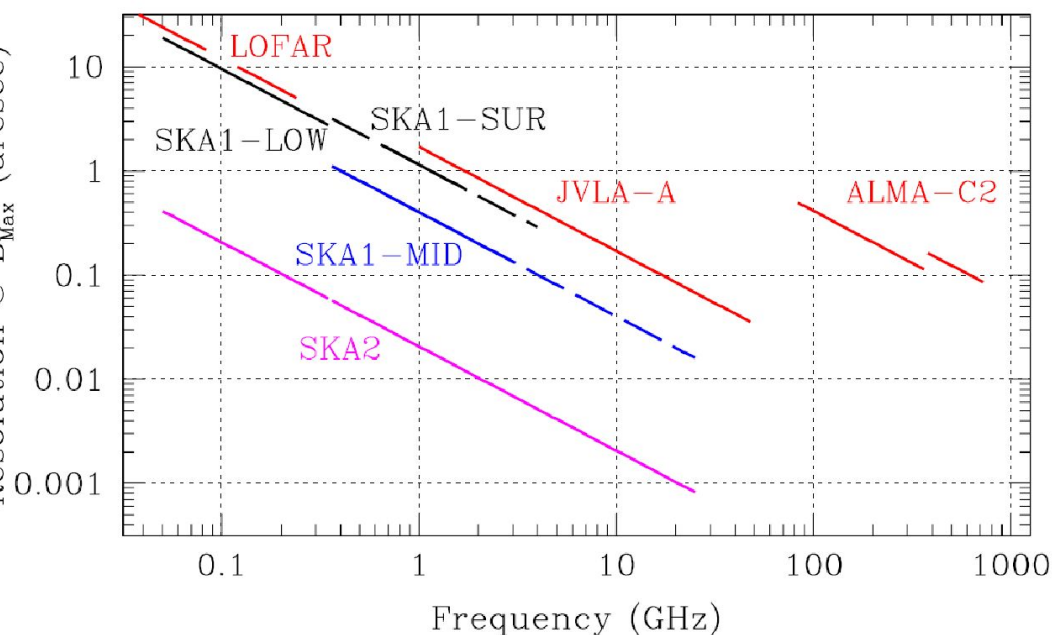
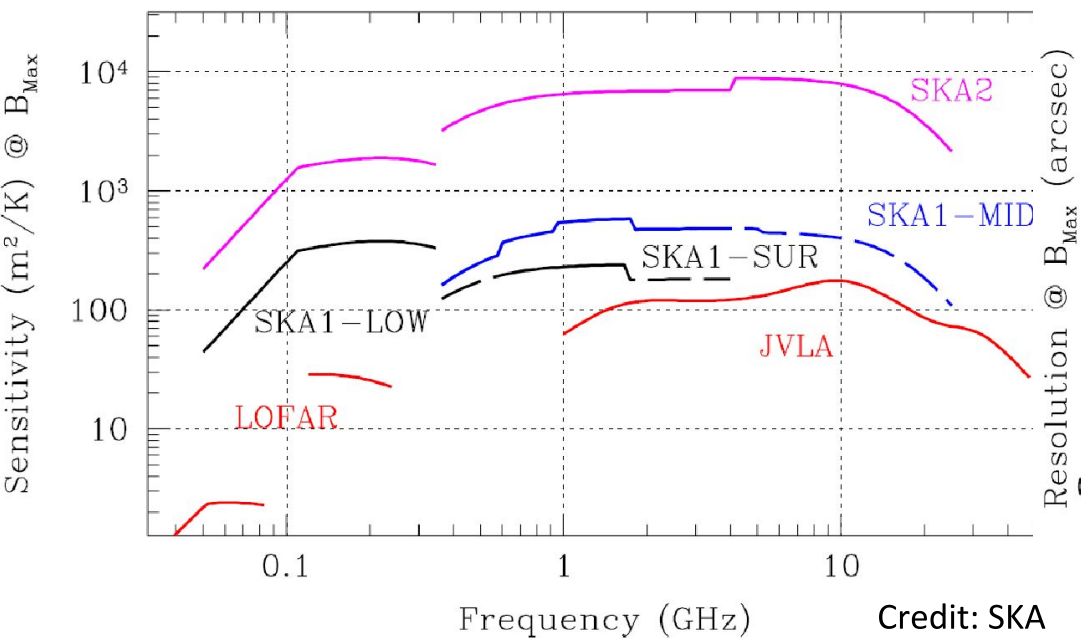
African partner countries

This map is intended for reference only and is not meant to represent legal borders.

1 Zettabyte = 10^3 Exabyte = 10^6 Petabyte = 10^9 Terabyte = 10^{12} Gigabyte

Credit: SKA Organisation

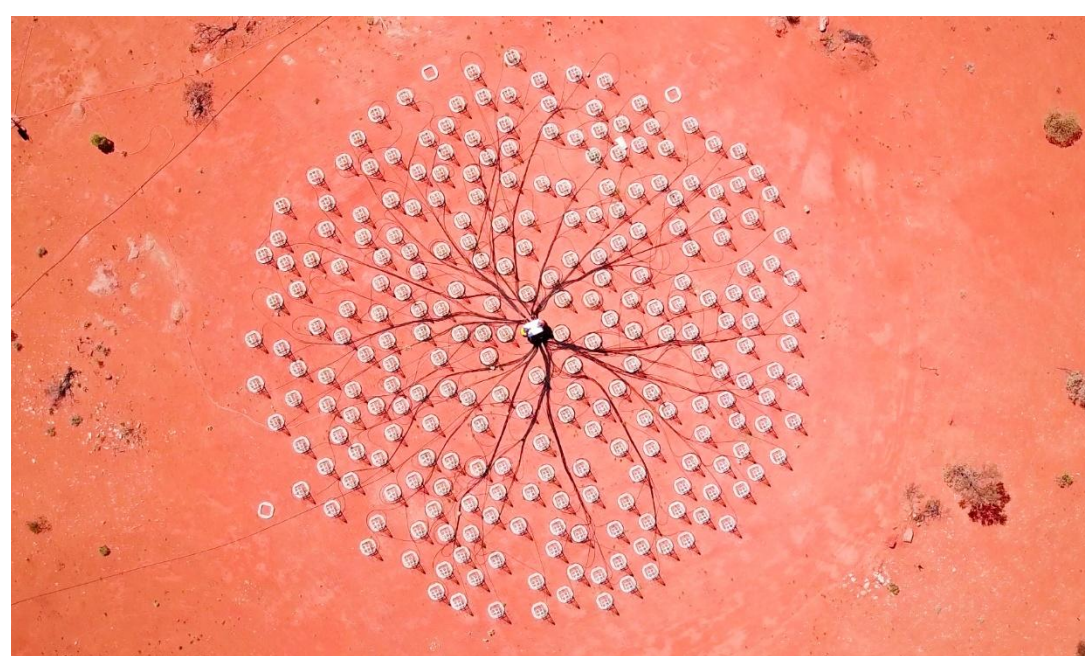
O SKA



O SKA



Credit: SKA South Africa



Credit: ICRAR/Curtin
University



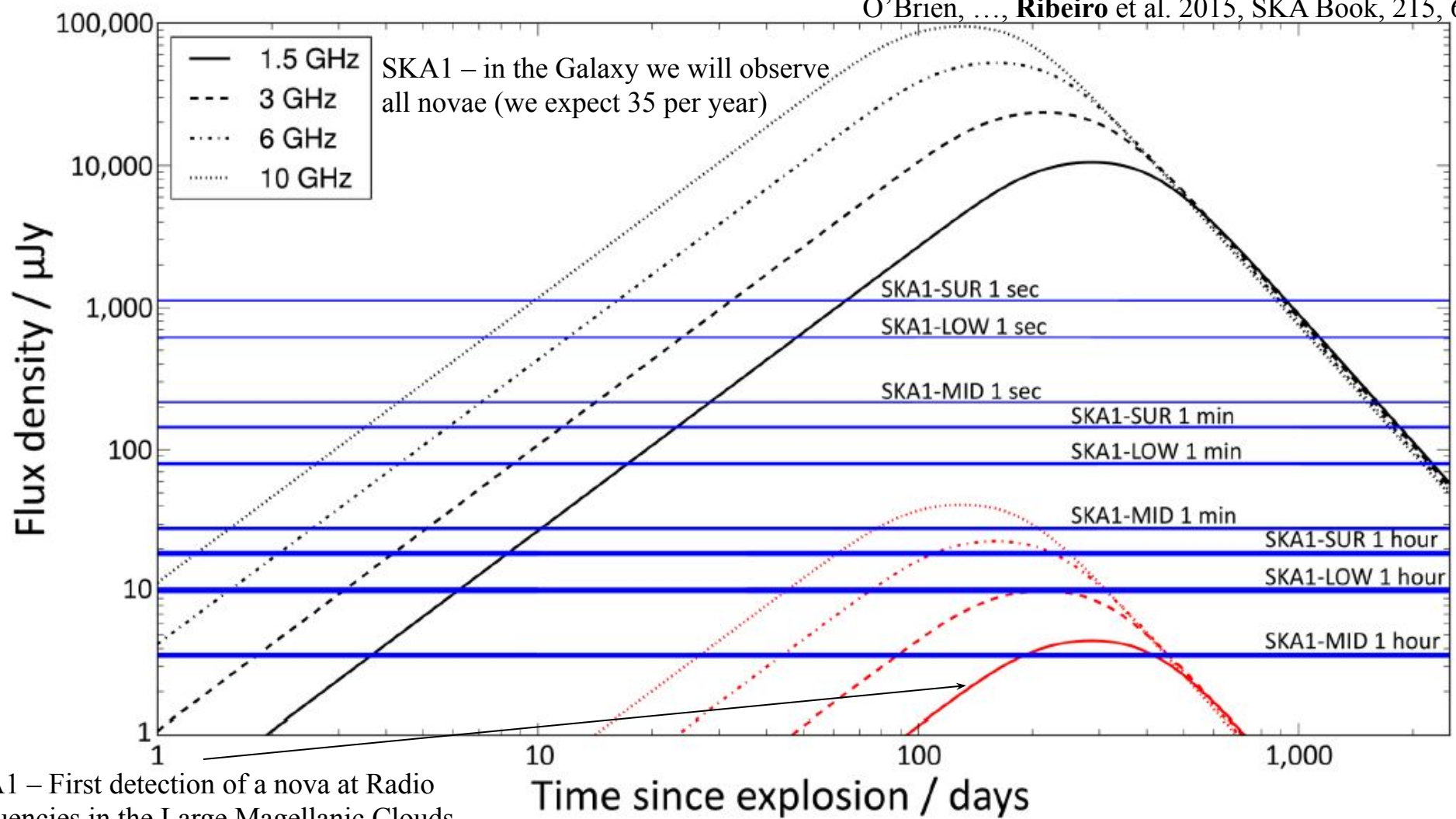
Credit: SKA
Organisation

Novas na era do SKA



Credit: SKA South Africa

O'Brien, ..., **Ribeiro** et al. 2015, SKA Book, 215, 62



SKA1 – First detection of a nova at Radio frequencies in the Large Magellanic Clouds

Conclusões



Credit: SKA South Africa

- O futuro é brilhante
- Novos instrumentos vão abrir um novo paradigma para o estudos das novas
- Os nossos modelos agora estão a ser testados no limite
- A procura dos progenitores das supernovas tipo Ia ainda são elusivos

