

Il nostro coinvolgimento in SKA

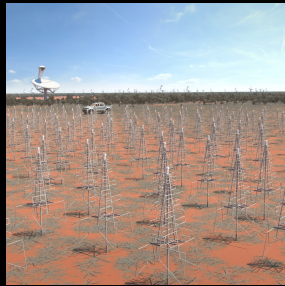
Anna Wolter



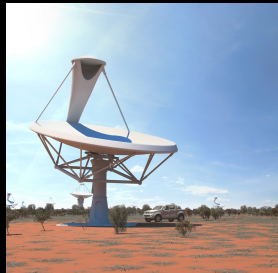
SKA Organization

- Australia, Canada, China, Germany, India, Italy, Netherlands, New Zealand, South Africa, Sweden, UK.
- Italy representative: Vettolani, Feretti
- China: agreement for 10 student/yr for 5 yrs to U. Western Australia to “learn and perform research in.. galaxy evolution, star formation..”

SKA – 1 & precursors



SKA1-LOW (MWA – Western Australia
2048 dipoles 80-300 MHz)



SKA1-SURVEY (ASKAP – Western
Australia 36 12-m with Phased Array
detectors 700 MHz to 1800 MHz)



SKA1-MID (MeerKAT – South Africa 64
12m antennas 900 MHz to 1670 MHz)

Update on timeline

- Re-baselining (== re-scoping!)
- Sep 2014 – Engineering Meeting
- Input from Science Working Groups
- -> Science Review Panels
- Science and Engineering Advisory Committee (SEAC) -> SKA Board March 2015
- Critical Design Reviews in 2016 -> Construction starts

- OAB: Ghirlanda, Wolter (tra gli “editors”)
- Bonnoli, Campana, Covino, D’Avanzo, Ghisellini, Guzzo, Melandri, Tagliaferri, Tavecchio, Trinchieri (tra gli “other contributors”)
- Cosmology, HI, jets, GRBs

June 28, 2013

Italian SKA White Book

Editors: L. Feretti & I. Prandoni
On behalf of the SKA-Italy WG



Endorsed by
Scientific Director & Scientific Council

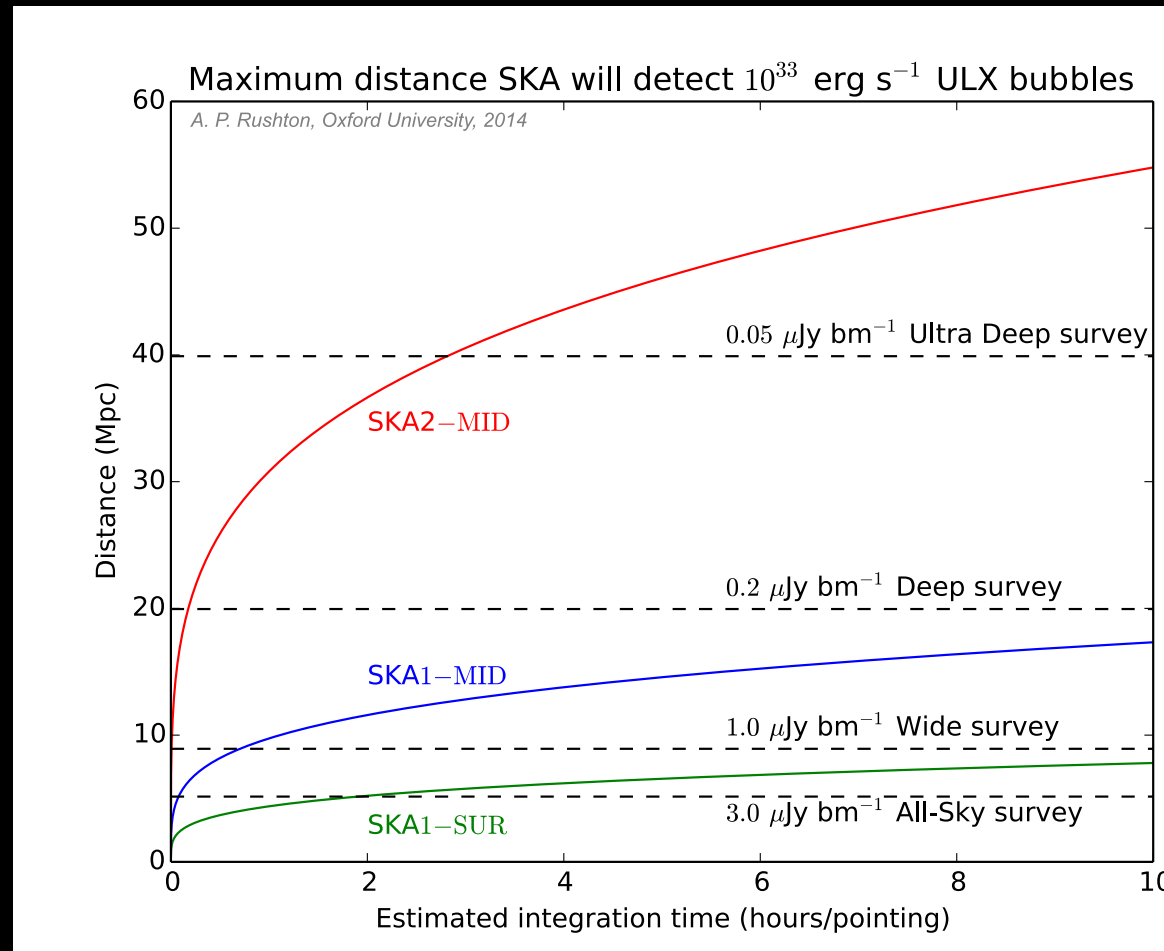


PRESS

New Science Book (in press)

- Many chapters already uploaded on arXiv
- Radio Continuum: <http://arxiv.org/html/1412.6942v1>
Revealing the Physics and Evolution of Galaxies and Galaxy Clusters with SKA Continuum Surveys by Prandoni & Seymour has 18 chapters (including: *Radio investigation of Ultra-Luminous X-ray Sources in the SKA Era* by Wolter et al.)
- Transients: *The SKA view of GRBs* by Burlon et al.
- Synergies etc: *The connection between radio and high energy emission in black hole powered systems in the SKA era* by Giroletti et al.
- [arXiv:1501.00420](http://arxiv.org/abs/1501.00420) *Studies of Relativistic Jets in Active Galactic Nuclei with SKA* Agudo et al.

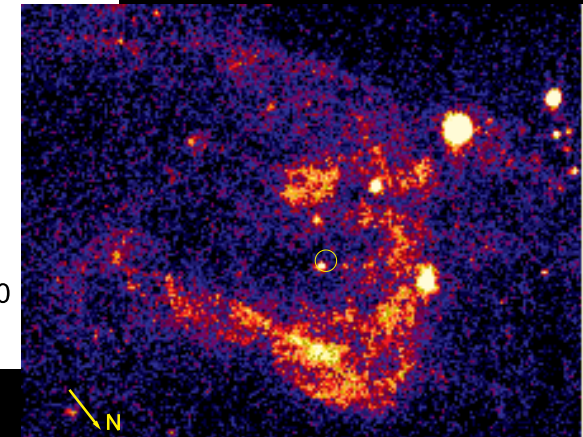
SKA1 gives a complete look to the local Universe (up to 10-20Mpc)



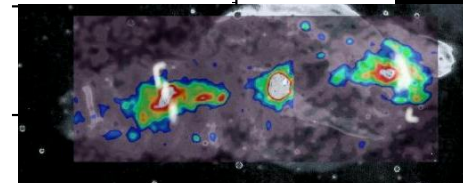
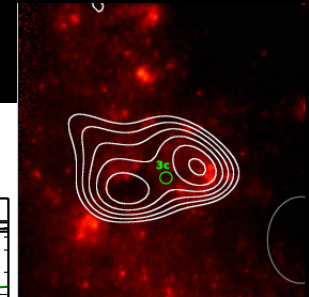
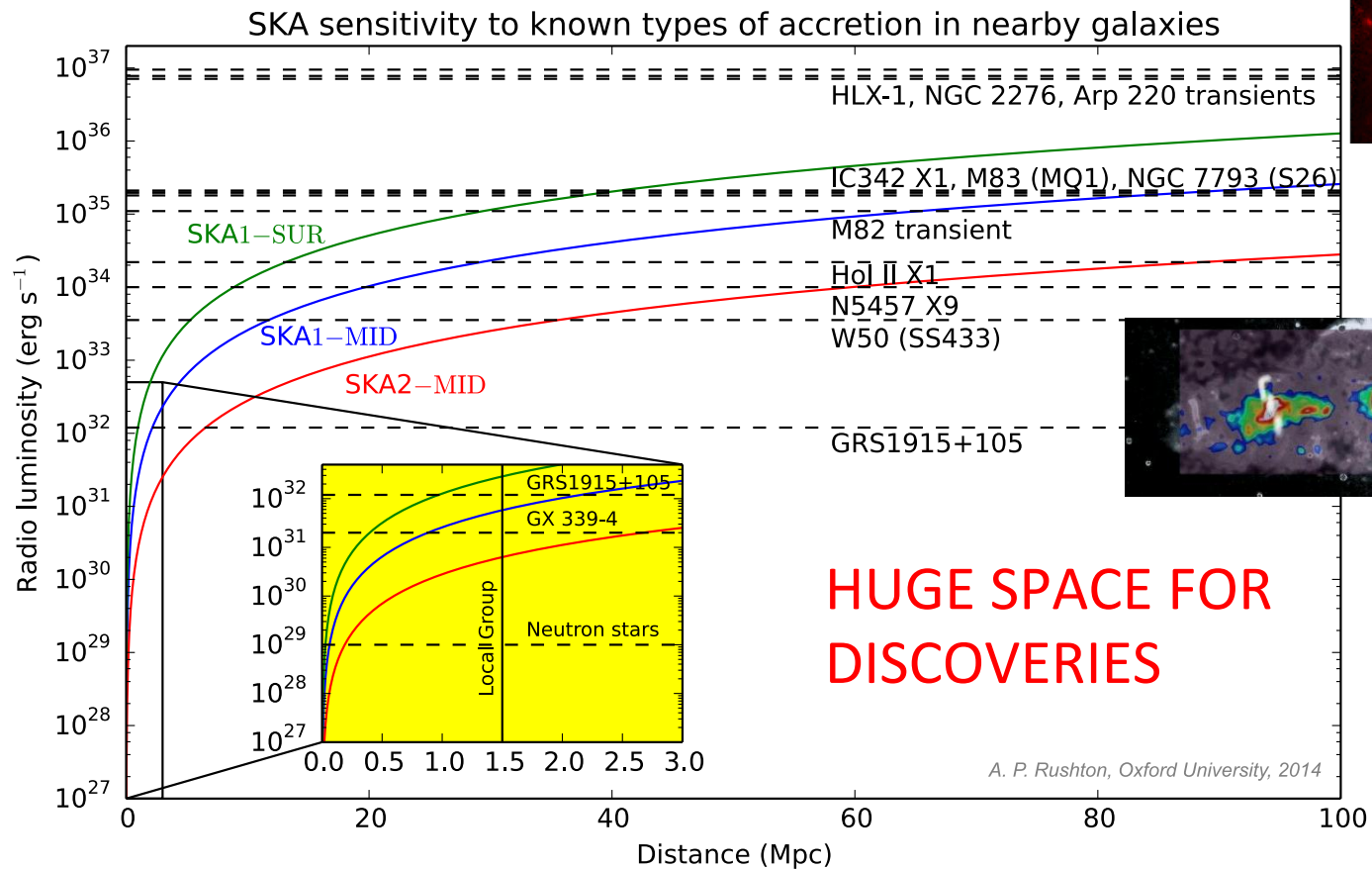
Extended structures:
Bubbles, jets?

Core – point like

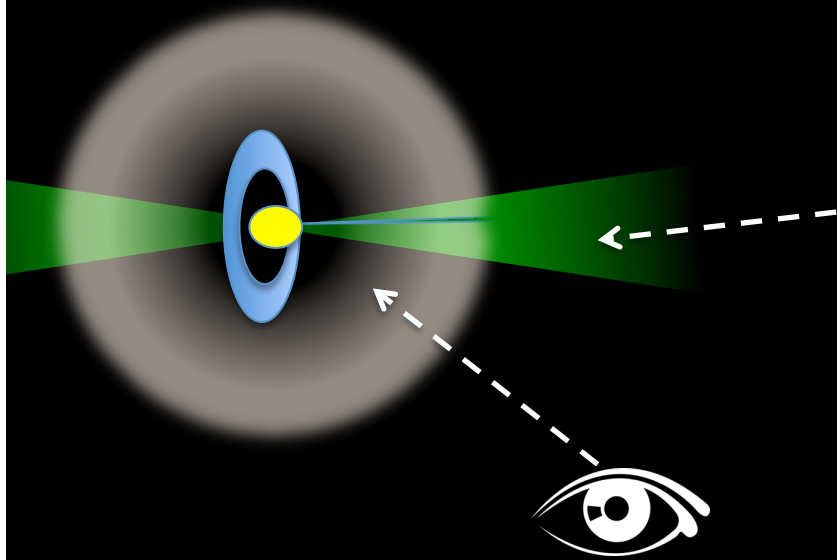
Transients



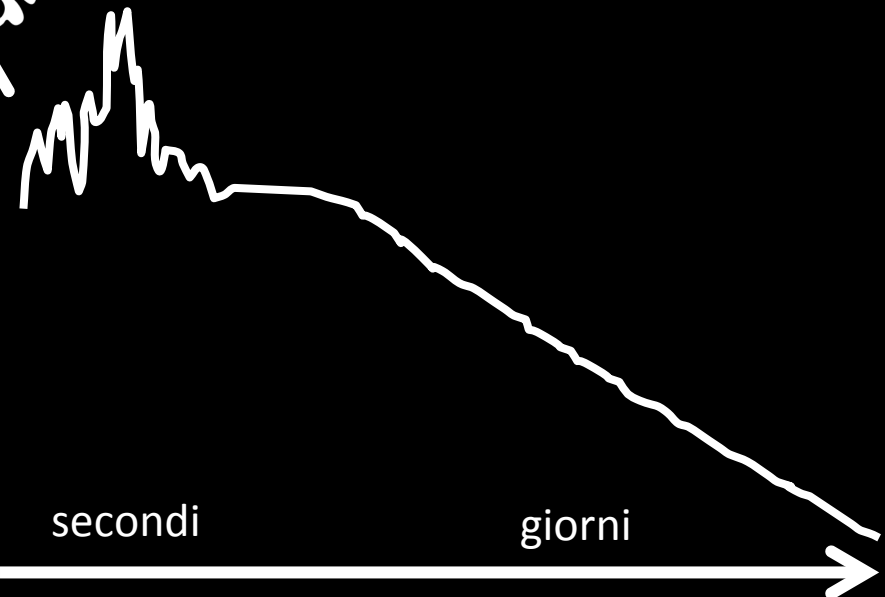
Limits for 1hr integration



Gamma Ray Burst

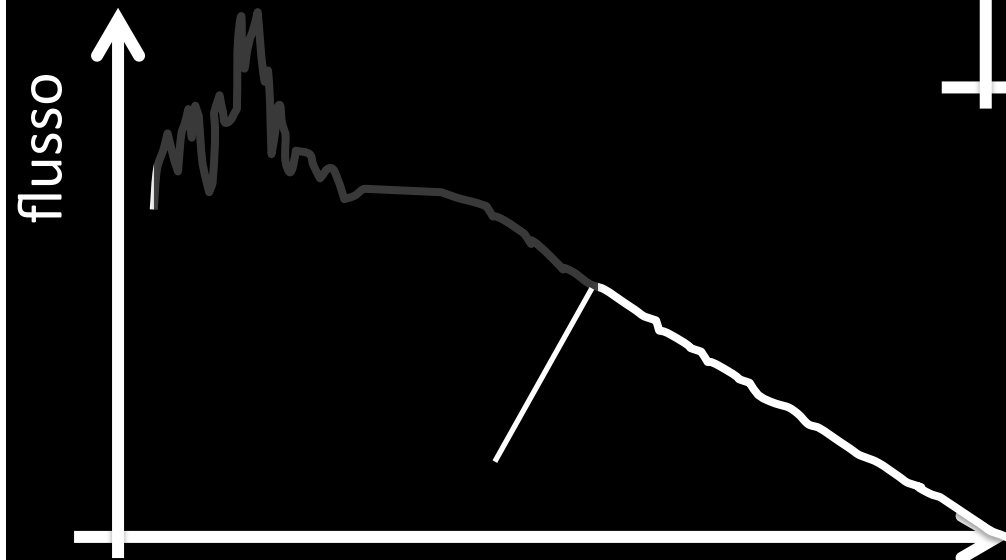


flusso



tempo

Orphan Afterglow



tempo

$$N_{orphan} \sim \frac{2}{\theta_{jet}^2} N_{GRB}$$

$$N_{orphan} > 100-300 N_{GRB}$$

Gamma Ray Bursts \leftrightarrow SKA

✓ PB: Today only 30% of GRBs are detected in radio, WHY?

ANSW: due to radio faintness wrt current facilities and follow up strategy.

SKA can follow up the entire GRB population (Ghirlanda et al. 2013 MNRAS, 425, 2543)

⚠ Search for signatures of Pop-III progenitors

- ATCA proposal nearly completed (PI - D. Burlon)
- numerical simulations on pop-III vs pop-II
- High energy properties of GRB-PopIII (F. Nappo)

⚠ Radio observation of short GRBs:

- ATCA proposal (PI - D. Burlon)

✓ PB: Orphan Afterglows should be numerous ($\sim 200 \times$ GRB) BUT never detected so far

ANSW: Orphan Afterglows can be detected by forthcoming surveys (JVLA, ASKAP, SKA)
 $1.4 \text{ GHz @ } F > 0.1 \text{ mJy} \rightarrow 10^{-3} \text{ OA yr}^{-1} \text{ deg}^{-2}$ (Ghirlanda et al. 2014 PASA, 31, 22)

⚠ Constraints on the jet structure/properties:

- JVLA survey proposal (PI – R. Kunal)
- ALMA proposal for GAIA transients follow up (PI – S. Covino)
- Multiwavelength characterization of orphans

.. e inoltre

- Working Group sui transienti radio (P.I. R. Fender)
 - Fast Radio Bursts
 - Tidal Disruption Events
- [Epoch of Reionization](#)
- [Continuum](#)
- [Cosmology](#)
- [Cradle of Life](#)
- [HI galaxy science](#)
- [Magnetism](#)
- [Pulsars](#)
- [Transients](#)
- Proposals - ? Collaboration for precursors?
- INAF – PhD fellowships???