Communicating big science

Lorenzo Raynard & Anja Fourie
SARAO/SKA SA
What is the SKA?

- International collaboration to build the world’s largest and most sensitive radio telescope
- SKA Organisation (SKAO) is a not-for-profit company created to centralise the leadership of the project and to formalise relationships between the international partners
- HQ: Jodrell Bank Observatory, Manchester, United Kingdom
- Eleven partner countries: Australia, Canada, China, Germany, India (Associate Member), Italy, New Zealand, South Africa, Sweden, the Netherlands and the United Kingdom.
- Array radio telescope with collecting area of one square kilometre, or one million square metres.
- Two sites:
  - South Africa: Thousands of receptors (dishes) outside Carnarvon, Northern Cape approximately 950 km from Johannesburg and 590 km from Cape Town
  - Australia: Thousands of aperture array antennas outside Cue, WA approximately 650 km north of Perth and 4,000 km west of Sydney
- SARAO/SKA South Africa is currently constructing the MeerKAT precursor array radio telescope, consisting of 64 receptors, which will be integrated into SKA Phase 1
Collaboration between South Africa and eight other African countries to construct a network of receptors across the continent.

Network will consist of MeerKAT in South Africa and converted telecoms receptors or newly-constructed receptors in each of the eight partner countries.

- Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia, South Africa and Zambia.


Longest baseline (distance) between two receptors of the SKA AVN will be between Kutunse, Ghana and MeerKAT, South Africa (7,500 km).
South Africa’s Geographic Advantage

- No. of objects south of celestial equator
- High altitude
- Low moisture content
- Lack of turbulent air
- Low levels of light pollution
- Low wind speeds
- Protective topography
- Radio quietness
- Geotechnical stability
- Infrastructure
- Security
- Area protected by law
- Knowledge advantage
Science

- Isolated
- Secure
- Scientists at work

Society

- Accountability
- Communication of:
  - Benefits and Applications
  - Economic
  - Political
  - Socio-cultural
- Scientific literacy
- Human capacity development
Government Support for Communication

- SOUTH AFRICA (Host/Partner Country)
- Department of Science & Technology
- National Research Foundation
- SARAO/SKA SA

Science Engagement Strategy  | NRF Strategy 2020  | SARAO/SKA SA Communications Strategy

- SARAO/SKA SA Science Engagement Strategy
- SARAO/SKA SA Stakeholder Engagement Strategy
## Government Support for Communication

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SKA Visitors Centre, Carnarvon, Northern Cape, South Africa
Network of Observatories and Science Centres in South Africa
WHAT IS CODESIGN?

...an approach that enables a wide range of people to make creative contributions in the formulation & solutions of a problem...

THE FIVE PHASES

1. DISCOVERY
   - I have a challenge
   - How should I approach it?

2. INTERPRET
   - I learned something
   - How do I interpret it?

3. IDEATION
   - I see an opportunity
   - What do I create?

4. EXPERIMENT
   - I have an idea
   - How do I build it?

5. EVOLUTION
   - I tried something
   - How do I evolve it?

GROUND RULES

- Defer judgement
- Encourage wild ideas
- Build on other's ideas
- Stay focused on the topic
- One conversation at a time
- Be visual & expressive
- Go for quantity of ideas

The EVALUATION CYCLE

- Do
- Evaluate
- Design
- Analyze
- Implement
The Role of Science Centres

- Virtual visitors centres
  - AR/MR/VR and mobile content
  - Content roll-out
- Multipliers
- Citizen science
- Co-design:
  - Re-imagining of sector in SA
  - Design challenges for solutions
  - Co-design of programmes and content
The South African Radio Astronomy Observatory (SARAO) is a Business Unit of the National Research Foundation. SARAO spearheads South Africa’s activities in the Square Kilometre Array (SKA) Radio Telescope, an international effort to build the world’s largest and most sensitive radio telescope, that will produce science that changes our understanding of the universe.

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