

# **Science communication and archival depositories of power –**

**The need for a transdisciplinary approach to research**

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# **SKA space science**

## **– innovation in technology**

### **Radio astronomers will use the SKA**

- to understand how stars and galaxies are formed, and how they evolved over time;
- to find out what the so-called “dark-matter” is that occupies 95% of the universe;
- to find out how magnetic fields are formed and evolve in the universe and how they influence astrophysical processes;
- and to perhaps detect life elsewhere in the universe.





# SKA social science and humanities

## – innovation in society

- Growing interaction between science and the public(s) and the relation between science and Indigenous Knowledge Systems (IKS).
- Debates ranging from philosophical aspects to empirical research; the 'epistemic gap' between science and common sense (IKS).
- Science communication paradigm of 'science and society' to address issues of intersection, diversion and explicit specialty in the development of science (astronomy).

### **Traits are emerging:**

- Establishing a tradition of debunking false perceptions created between science and IKS (where IKS is considered to be situated in the place of superstition, half-knowledge, ignorance and misunderstandings).
- IKS is becoming a focus of intellectual concern and the target of interventions / inventions.
- IKS serves as a resource of inspiration and provides oversight and legitimacy.

## Two models – Gaston Bachelard’s model for scientific change and Michel Foucault’s ‘archaeology of knowledge’

- *Epistemological breaks*: the way knowledge spins off from and even contradicts common-sense experiences and beliefs. The notion of a ‘break’ (*rupture*) between ordinary (*commune*) knowledge and scientific knowledge entertain the ‘western science versus indigenous knowledge’ debate.
- *Epistemological obstacles*: breaks occur between two conceptualisations and the application of an epistemological obstacle prevents such an epistemological break. These obstacles are residues from previous ways of thinking that blocks the path of inquiry. Common sense is a source of epistemological obstacle.



## Two models continue...

- *Epistemological profiles*: tracing the historical path of ideas is complex and therefore necessitates a grouping together of all the philosophies (disciplines) to obtain a complete national spectrum of a particular piece of knowledge;
- *Epistemological acts*: corresponds with the leaps (*saccades*) of genius that introduce unexpected impulses into the course of knowledge development. This epistemological act enables the acceptance of progress and rejects the continuity of knowledge.

# Ecology of knowledge

- **Francis Bacon** in his *Novum organum* (1620),
- **John Locke** in his *Of the conduct of the understanding* (1690),
- **Emmanuel Kant** (1781) in *The Critique of Pure Reason*, and
- **Susan Sontag** in her 'The aesthetics of silence' in *Styles of radical will* (1996)

set an example of interrogation into our collective 'ecology of knowledge'.

These authors bring to the fore the crucial dilemma of a lack of concepts, ideas and notions that readily inform us of the difference between the knowledge already known and the knowledge society needs.



# Innovators: Francis Bacon and Roy Bhaskar

- **Francis Bacon** differentiated between approaches to knowledge through his invitation:  
“... let there be therefore two streams and two dispensations of knowledge; and in like manner two tribes or kindreds of students in philosophy – tribes not hostile or alien to each other, but bound together by mutual services; let there be ... one method for the cultivation, another for the invention, of knowledge.”
- **Roy Bhaskar** emphasised the idea that:  
“... knowledge is a social product, produced by means of antecedent social products; but that the objects of which, in the social activity of science, knowledge comes to be produced, exist and act quite independently of men.”

# African knowledge

- SKA is considered an intellectual site for collaborations between the humanities, social sciences and natural sciences and poses a challenge: how are we going to approach this?
- We need to recognise past knowledge, captured in archives and oral traditions, about the universe we live in.
- HSRC Conference: *The re-emergence of astronomy in Africa – a transdisciplinary interface of knowledge systems* held at Maropeng – cradle of mankind in September 2012.

# African archives

- Alexandria in Egypt
- The big library of Timbuktu (the *Tombouctou Manuscript Project* of the University of Cape Town)
- Centre of Arabic Documentation at the University of Ibadan, Nigeria.
- Niamey, Niger; the Institute de Recherché and Sciences Humaines (IRSH) record manuscripts dating from the 14<sup>th</sup> century
- Académie des Inscriptions and the Bibliothèque Royale in France





# **Afrikology** – an epistemology of knowledge generation and application rooted in African Cosmology

- Dani Nabudere (2011) traces a transformative methodology that emerged from the ancient texts preserved in these libraries – indicating the dominance of a transdisciplinary approach.
- Nabudere proposes a broader definition of the application of archival texts since these texts are not the sum of all our knowledge. What we preserve in our knowledge archives is often the result of ideologies and beliefs sanctioned by dominant (ruling) political powers.
- Social transformation: a renaissance, symbolizing the renewal of a society, dates back to ancient times and forms part of the African philosophical, scientific and cultural practice. This is an advanced acceptance of the cyclic characteristic of nature and society, best illustrated by the rise and fall (and rise) of dynasties dating back to the Egyptian Pharaoh system.

# Transdisciplinary approach

“The transdisciplinary ethic rejects any attitude which refuses dialogue and discussion, no matter whether the origin of this attitude is ideological, scientific, religious, economic, political or philosophical. Shared knowledge should lead to a shared understanding based on an absolute respect for the collective and individual diversities united by our common life on one and the same Earth.”

Transdisciplinarity Article 13 of the 1994 Charter of Transdisciplinarity adopted at the *First World Congress of Transdisciplinarity*, Convento da Arrábida, Portugal, November 1994.



# Science communication as mediator

There are two types of science communication that scientists are involved with:

The first is popularisation of research as the public reconstruction of scientific projects, discoveries, achievements and theories from a science-focused point of view.

The second is meta-discourses about S&T and the science-society relationship, such as disputes about risky technologies and conflicts between science and social values (animal experimentation, etc.).

(Peters (2008:131).

# Archives and new knowledge

## Two scenarios in Africa:

- Anthropological and ethnographical documentation that serve the sole purpose of informing the coloniser in the past.
- The dominance of a world order, subjected to capitalism, that introduced concepts and terminologies to 'commodify' knowledge with a term like 'knowledge economy' entering our way of thinking in a mostly unchallenged manner.

# Journey down the Nile?

- What SKA will discover in science will have a profound impact on societies and our current knowledge systems. How will society manage this new knowledge?
- The production of knowledge and application in the so-called 'knowledge society' is complex, fragmented and sometimes incompatible. We will need new ways to bring greater good to humanity as a whole in their environments and cultural contexts.





MALAY SCHOOL - Boys learning to read the Koran

G.F. Angas.