

Comparative Advantages and Global Research Infrastructure Partnerships

Rob Adam, Director-General, Department of Science and Technology, South Africa



Overview

- Principles for making decisions regarding research infrastructure.
- The role of international partnerships, particularly for developing countries.
- Putting it together, the example of multiwavelength astronomy in Southern Africa.



Key Problem for R&D planners:

"Britain does 5% of the world's research and tries to maintain sufficient competence in the other 95% to be able to move into it if necessary."

- Sir William Stewart, former Chief Scientific Advisor to UK Government.

South Africa does 0,5% of the world's research. Clearly it will not be able to move into the other 99,5% as readily. How do you choose (and, indeed, should you?).



Some principles for choosing priority areas.

1. Some areas are absolutely necessary for national competitiveness, for any size of country, e.g. information technology, biotechnology. Omit these at your peril!
2. Other areas present some "geographic" advantage, e.g. astronomy & "human origins" for South Africa.
3. Other areas present a "problem" advantage, e.g. HIV/AIDS vaccine for South Africa.
4. Other areas present a "knowledge" advantage, e.g. traditional knowledge or deep level mining for South Africa.



An attempt at a set of criteria for "core competence clusters".

1. A global competitive edge is possible, e.g. salmon production in Chile, deep level mining in South Africa
2. It is sustainable – e.g. does not depend just on a single research leader or funding window.
3. Hard to emulate. E.g. fluorochemicals or radiopharmaceuticals on the platform of a nuclear industry.
4. Multiple applications are the norm, e.g. high performance computing, nanotechnology.
5. Should be able to attract international investment and collaboration, e.g. astronomy and vaccine development in South Africa.



Why global research infrastructure partnerships?

- Harness collective global knowledge and experience to develop infrastructure
- Support leveraging of new international funding for infrastructures
- Promote access to and exchanges between infrastructures
- Facilitate mobility of researchers
- Assist in meeting global challenges, e.g. sustainable development



Instruments for global infrastructure cooperation

- Transnational access to major research infrastructures for teams and individuals
- Integrating and networking between existing facilities
- High-speed communication networks, including Grids and test-beds
- Design studies: international cooperation in feasibility and practical preparatory work
- Development of new infrastructures



Modalities for global partnerships.

1. Excellence-based, peer-to-peer global science partnerships, e.g. CERN, Southern African Large Telescope. Governance and location an important issue.
2. Directed network building and programming (e.g. European Developing Countries Clinical Trials Partnership, International Centre for Genetic Engineering and Biotechnology, GEOSS)
3. Large-scale science institutional capacity-building (e.g. CGIAR system, Trieste System). Global efforts required to address developing countries infrastructure needs such as high speed connectivity and access to data sets.

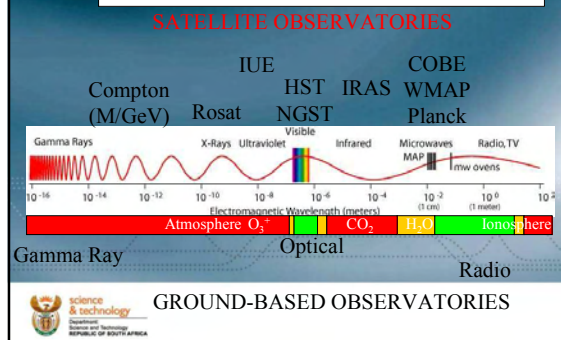


Southern Africa – competitive advantages for astronomy

1. Dry, high altitude locations with low levels of radio frequency interference and certainty of future radio quiet zone via legislation. Low light pollution. Very few people and no conflicting economic activities.
2. Astronomical richness of the Southern skies.
3. Roads, electricity and communications in place. Land, labour and services available and affordable.
4. World class and affordable engineering and project management skills.
5. Excellent academic infrastructure with strong tradition of astronomy.



The Electromagnetic Spectrum



SALT – launched November 2005



HESS – completed September 2004



Square Kilometre Array (bid December 2005)

SKA SOUTH AFRICA
SQUARE KILOMETRE ARRAY

Co-ordination

Space Agency

Science and Technology
Department
REPUBLIC OF SOUTH AFRICA

Conclusion

- **Smart, mutually beneficial developed / developing world infrastructure partnerships will enhance global science capacity.**
- **FP7 should play an important role to facilitate such global partnerships**

science & technology
Department
REPUBLIC OF SOUTH AFRICA

Thank You

- More:
- <http://www.dst.gov.za>
- <http://www.esastap.org.za> (European South African Science and Technology Advancement Programme)
- <http://www.ska.ac.za>

science & technology
Department
REPUBLIC OF SOUTH AFRICA