EGC2 Week

European Parliament, Brussels, 6th-7th March 2013

Radioastronomy: *a unique global ICT enabler*

"shaping Green digital cities"

Domingos Barbosa

dbarbosa@av.it.pt

INSTITUIÇÕES ASSOCIADAS:

INSTITUTO SUPERIOR TÉCNICO

Faculdade de Ciências e Tecnologia da Universidade de Coimbra

universidade de aveiro

PT Inovação

SIEMENS Communications

instituto de telecomunicações

creating and sharing knowledge for telecommunications

Radioastronomy: towards *Green ICT machines*

Research Infrastructures

Thomas Parker (Nature, 2012): Must act when facility is new

They have the Responsability to lead Science & Social Development
Early Engagement of Industry for the benefit of Science and Society

ICT: EU-AFR policy alignment – A digital Agenda
FOR MUTUAL BENEFIT

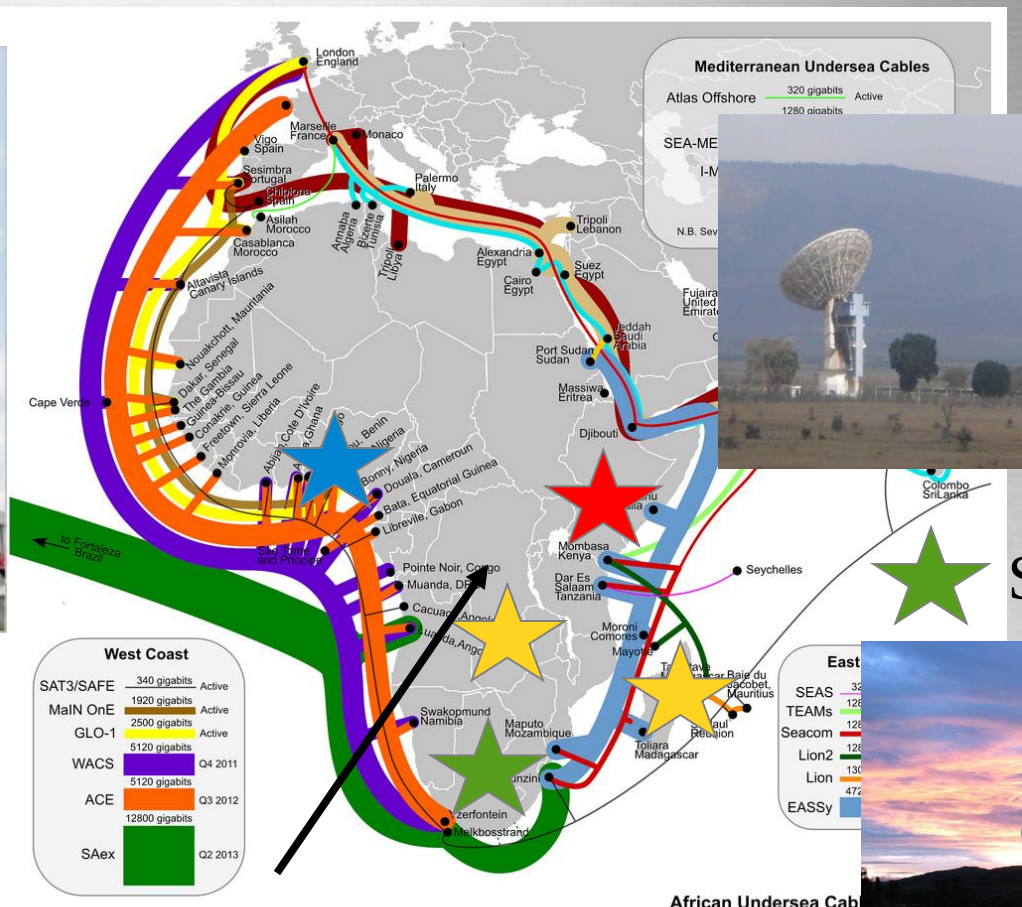
Nov. Lisbon, 2013; EUAFR -ICT/P8
(FCT hosts, Official announcement)

E-Infrastructures in Africa: e-science philosophy

An example: Africa VLBI Network - from technology to e-science infrastructure – ICT gateways !

State of art nodes (cities) of a digital network

Kenya



South Africa

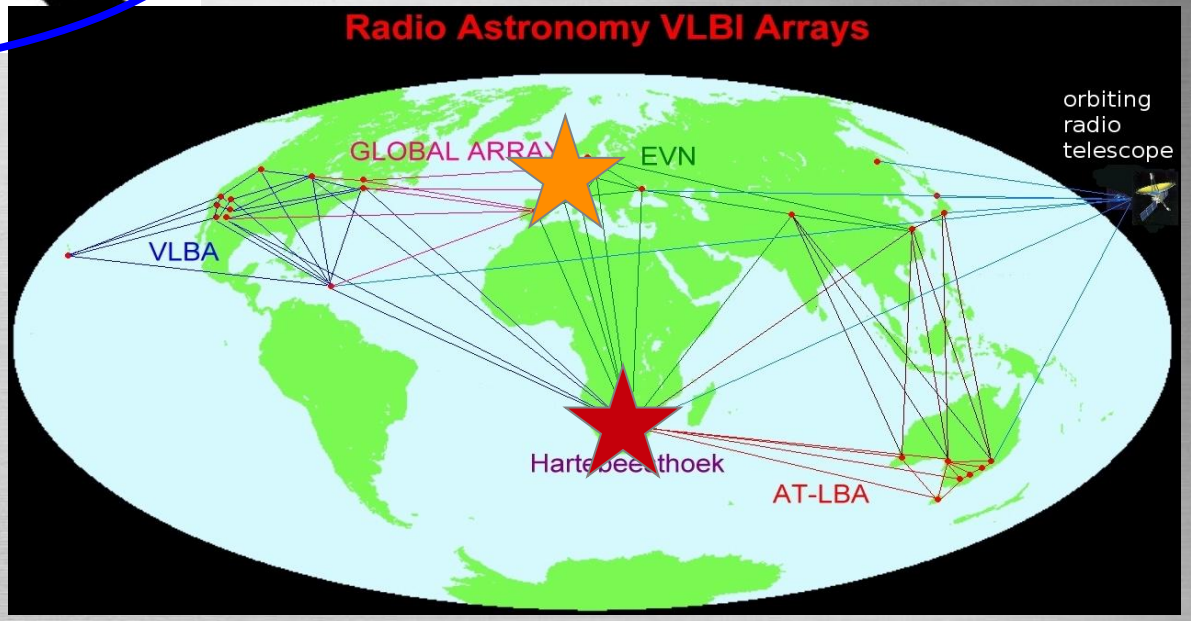
Ghana

How to fill Coast to Coast ?

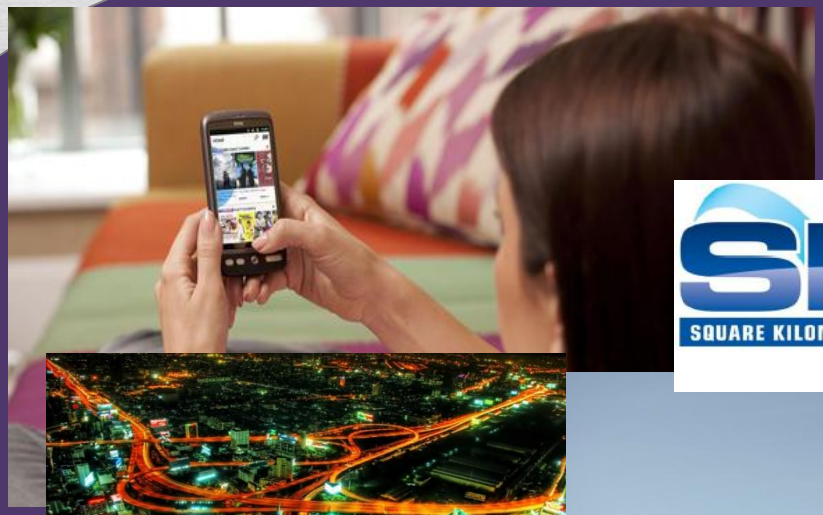
An example: Africa VLBI Network - from technology to e-science infrastructure – Connectivity !!

Press Release (April 2012) : New high-speed 15,000km international link seamlessly connects African radio astronomers to Europe through GÉANT and UbuntuNet (2Gps point to point)

HartRAO



Radioastronomy: a *UNIQUE* driver from the Terabit Era to the Exabit Era *



Impact :

Large pipes (terabit optical fiber)

Large processing power (HPC)

Cloud Computing & Storage)

Synergies:**Galileo**, **Copernicus**

Societal Impact:

E-health (maternal care)

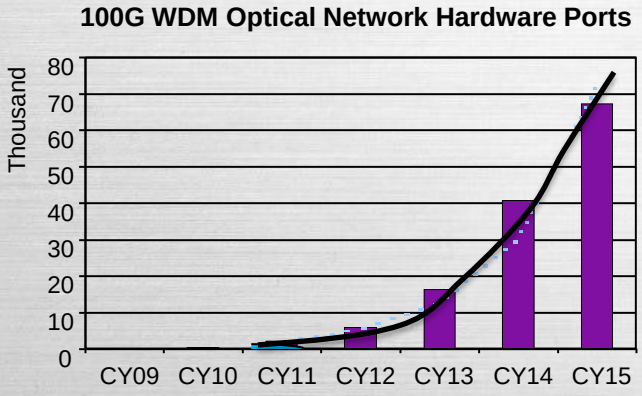
E-schooling/e-learning

Know-how transfer

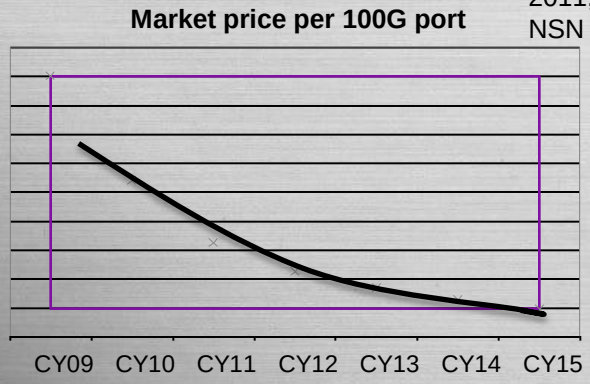
** **LTE** – 4G Convergence mobile/optical fibre networks..driving market !*

An example: driving markets, shaping standards

From Coast to Coast – the path towards 100x IP 2012 !



Source: Infonetics 2011, NSN 2012



SKA AFRICA
SQUARE KILOMETRE ARRAY

Bandwidth assumption:
1 Tbps throughout
Phase 1 and 2

360 (Phase 1) + 640 (Phase 2) = 1 000 x 100G needed

Bandwidth assumption:
41 Tbps in Phase 1
61 Tbps in Phase 2

14 760(Phase 1) + 46 240 (Phase 2) = 51 000 x 100G needed

Energy Sustainable

See Lourdes Verdes-Montenegro talk

Radioastronomy: towards *Green ICT machines*

Leadership

- Precursor of the city of the Future :
- Power the Internet of the Future technologies
- Impact on African Infrastructure
- Benefit remote communities
- Unique Training EU, AFR

Astronomy and Industry: new market opportunities for both continents

SKA, a Green ICT machine:

It is not:

A house on top of a mountain with a machine inside

A tunel ring under a valley

A Bio data center

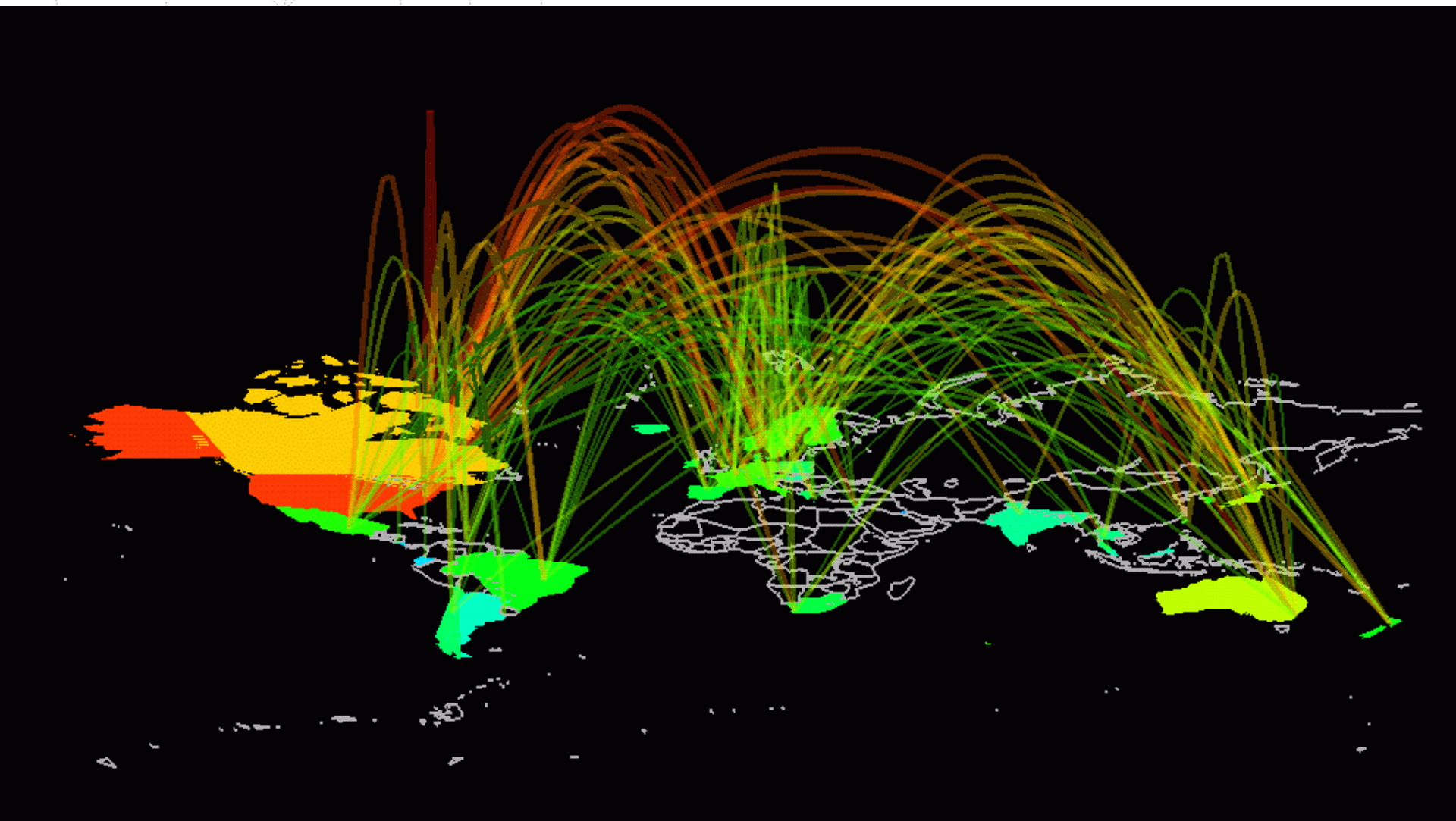
It is:

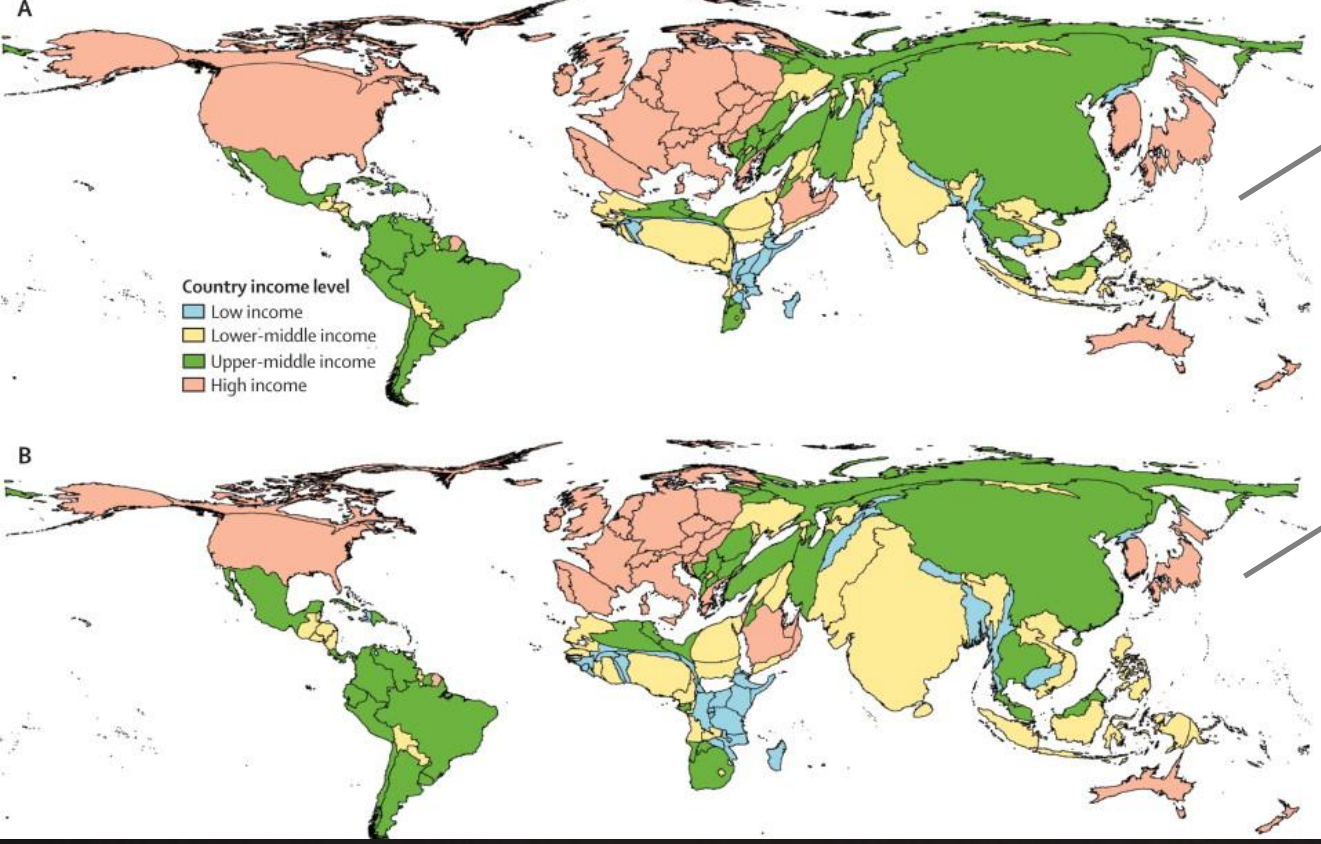
Its core: a digital city!

Remote stations: spread digital villages

The Universe camera, after an Exabyte and an Exaflop

Radioastronomy: fight the Digital Divide and ICT illiteracy





Internet Users

Mobile Phone Users

Radioastronomy: towards *Green ICT machines*

Leadership

driving innovation,
societal benefits,
market capitalization,
fulfilling H2020

Let's make it together!

Radioastronomy: AERAP Key actions

- Couple Future Internet Applications
- Cloud based distributed processing and science access, including citizen science;
- Promote hands-on activities/training projects
- Promote European and African projects for extra ICT capability exploitation: e-Science, e-Learning, synergies with distributed remote sensing, remote medicine etc.