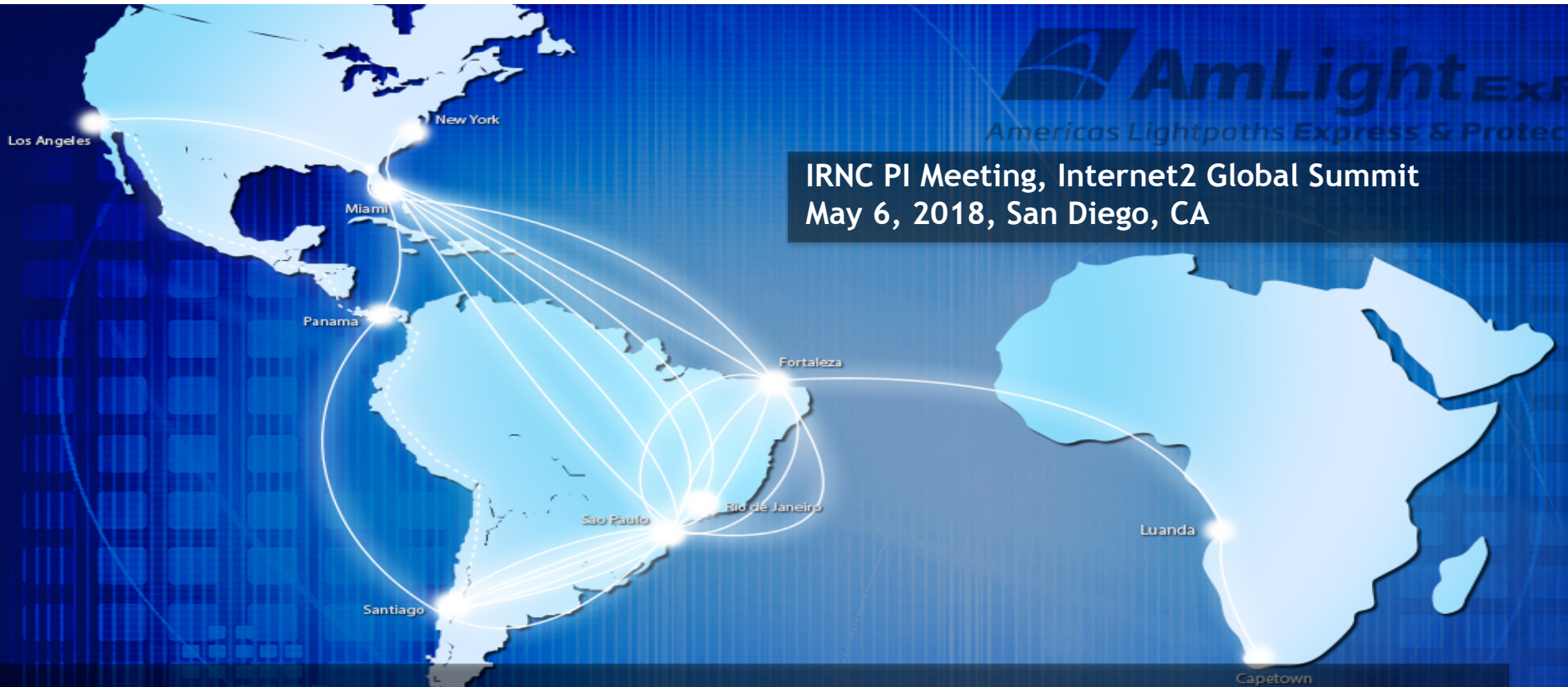


IRNC PI Meeting, Internet2 Global Summit  
May 6, 2018, San Diego, CA



# Americas Africa Research and eduCation Lightpaths (AARCLight) Study: Year 1 findings

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## AARCLight: Americas Africa Research and eduCation Lightpaths, Award #OAC-1638990

- Planning activity that aims to
  - Define a strategy for research and education network connectivity between the US and West Africa
  - Coordinate planning efforts among stakeholders in the U.S., Africa, and Brazil
  - Create economies of scale
    - Making use of the offered spectrum
    - Towards serving the broadest communities of interest in research and education



# Collaborative Partners

- UbuntuNet Alliance
- WACREN: West and Central African Research and Education Network
- TENET: The Tertiary Education and Research Network of South Africa
- SANReN: The South African National Research Network
- SABEN: South African Broadband Education Networks
- ANSP: Academic Network of São Paulo
- RNP: Rede Nacional de Ensino e Pesquisa
- CLARA: Cooperation of Advanced Research and Education Networks in Latin America
- Internet2
- Florida LambdaRail



# Science Drivers involving US and SSA organizations

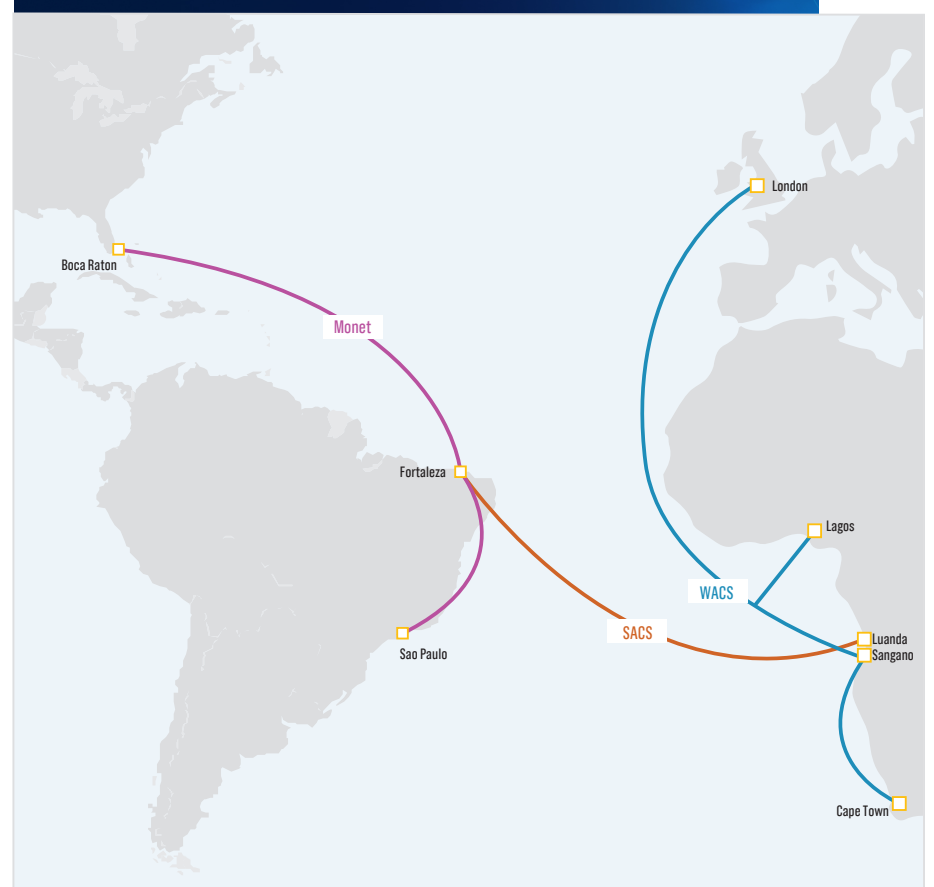
- **MeerKAT radio telescope** is a precursor to the Square Kilometre Array (SKA) telescope:
  - It will be integrated into the mid-frequency component of SKA.
  - MeerKAT generates data at a rate of 4.7 Gbps.
  - Data is either being transferred via tapes or scientists are travelling to South Africa to do research.
- **Square Kilometre Array** is an international effort to build the world's largest radio telescope:
  - SKA is estimated will generate an exabyte of raw data per day when fully operational
- **South African Large Telescope (SALT)** is the largest optical telescope in the southern hemisphere
  - 2017: 5-50 GB/night
  - 2019: ~250 GB/night
- **Biological Sciences:** Field stations depend on computer networks to support biologists conducting experiments in the field. Africa has 116 biological field stations.
- **Earth Sciences: AfricaArray (AA) Seismic Network** has 53 seismic stations deployed in 17 countries. AA participates in UNAVCO, which manages thousands of GPS sites worldwide.



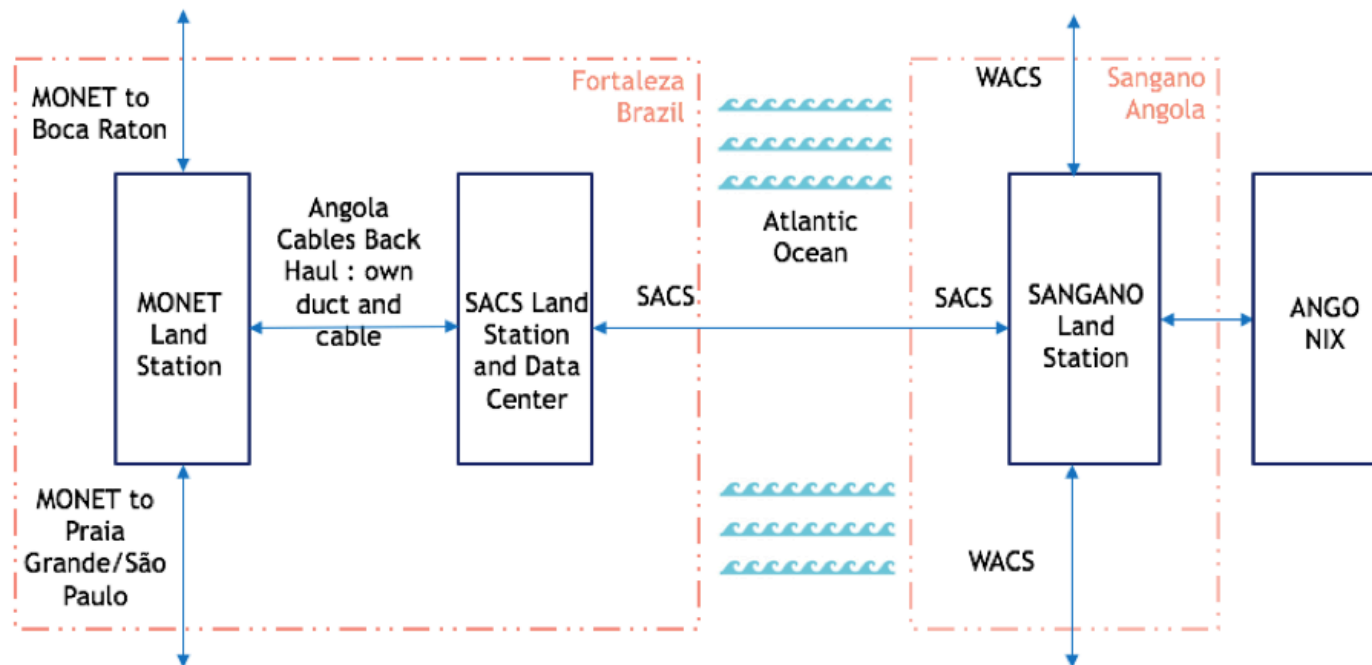


# Network infrastructure resources in the Southern Hemisphere

- 225GHz linear spectrum on Monet committed in the AmLight-Exp
- 37.5GHz of spectrum on SACS is available to the R&E community
- South Atlantic eXchange point (SAX) is under development in Fortaleza, led by RNP
- R&E exchange point in Cape Town operated by SANREN and TENET
- R&E exchange point in Lagos, operated by WACREN



# Network infrastructure capacity in the Southern Hemisphere



- In Fortaleza Brazil, SACS and Monet submarine cable systems interconnect via backhaul
- In Luanda, SACS and Monet meet in the Sangano cable landing station



# Findings in Year 1

- Data volume will be increasing from science drivers in Sub-Saharan Africa (SSA)
- Network infrastructure capacity is increasing in the Southern Hemisphere
- Linking the R&E communities in the US, Africa and Brazil is realizable via Monet and SACS submarine cable systems
- Human resource development in several science, engineering and technology areas is lacking



A dark blue world map with white lines representing flight paths. The paths connect several cities: Los Angeles, New York, Miami, Panama, Santiago, Sao Paulo, Rio de Janeiro, and Luanda. The text "THANK YOU!" and the email address "julio@fiu.edu" are centered over the map.

THANK YOU!  
julio@fiu.edu





More Slides Follow



# Year 2 Goals

- Develop a plan for the activation of the offered spectrum on SACS
- Study locations for interconnections with partners' R&E networks in Africa
- Develop a new network design with AARCLight partners
- Develop an assessment plan to measure the level of engagement by communities of interest with the potential new network infrastructure

