

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

Data generation is increasing as a result of science instruments in Sub-Saharan Africa. The Hydrogen Epoch of Reionization Array (HERA) in South Africa generates 1.5TB per day. It's projected to generate 2TB/day by 2019. The MeerKAT array will be the largest array in the southern hemisphere until the SKA itself is complete in the 2020s. The South African MeerKAT radio telescope is a precursor to the Square Kilometre Array (SKA) telescope and will be integrated into the mid-frequency component of SKA. MeerKAT currently generates data at a rate of 4.7Gbps. The Southern African Large Telescope (SALT) is the largest single optical telescope in the southern hemisphere and among the largest in the world. It has a hexagonal primary mirror array 11 meters across, comprising 91 individual 1m hexagonal mirrors.

Communities of interest for data from these instruments are globally distributed. Research and Education (R&E) Networks will play a key role in transporting this data to processing and archives centers in the U.S., Europe, Africa, South America, Canada, Asia.

Simultaneously, a confluence of network infrastructure capacity is increasing in the Southern Hemisphere. The new SACS submarine cable is under construction, connecting west Africa to Brazil, scheduled Ready For Service (RFS) in Q3 2018. The Monet submarine cable, connecting the U.S. to Brazil, will be RFS Q4 2017. The EllaLink submarine cable, connecting Brazil to Portugal, is scheduled RFS in Q4 2019. The South Atlantic Inter Link (SAIL) submarine cable, connecting Brazil to Cameroon, is scheduled RFS 2018. Fortaleza Brazil is a key geographic location for submarine cable landings in the Southern Hemisphere, and for emerging regional network aggregation.

Americas Africa Research and eduCation Lightpaths (AARCLight) is a project, funded by the National Science Foundation (NSF), to conduct a feasibility study for the planning, designing, and defining a strategy for high capacity research and education network connectivity between the U.S. and West Africa.

We propose to report on the findings from year 1 of the study. The study focuses on the following four areas of inquiry: The planned availability of submarine cable capacity in the South Atlantic for use by R&E communities; the demand for network services between the U.S. and West Africa by the R&E communities; the coordination of efforts by the U.S., nations of Africa, and Brazil to coordinate planning efforts to strategically make use of the offered network capacity towards serving the broadest communities of interest in research and education; and the planned activities for human capacity development in Angola and nations of west Africa for the effective use of the inter-regional network capacity to support the inter-regional R&E communities.