



# 2019 LARGE FACILITIES WORKSHOP

APRIL 2-4 | TEXAS ADVANCED COMPUTING CENTER

## Information Section

<b>Topic:</b>	Large Facility Spotlight
<b>Speaker(s) Name, Title:</b>	Adam Bolton, NOAO Scott McIntosh, NCAR Mark McKinnon, NRAO Thomas Rimmele, NSO
<b>Session Description:</b>	Introduction of the NSF funded Federally Funded Research and Development Centers (FFRDCs). Each Center introduced who they are and share an accomplishment, event, and/or challenge that took place in the past year.
<b>Session Time Slot:</b>	Tuesday, April 2 at 8:30 am
<b>Purpose and Desired Outcome:</b>	Give the Workshop participants an overview of the NSF funded FFRDCs and an understanding of a recent event being managed by the Center.

## Notetaking Section

<b>Scribe Name</b>	
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**Disclaimer:** *These are raw notes that were captured by the assigned scribe during this session at the 2019 Large Facilities Workshop. This is one individual's interpretation of what took place during the session, and its content does not necessarily represent the viewpoint of the National Science Foundation.*

### Notes and Key Points:

#### Adam Bolton, NOAO

- Big surveys and big data. Open access to astronomy research facilities. 7<sup>th</sup> decade of operations.
- Driven to new approaches to astronomy research – survey scale astronomy instruments: data intensive revolution. In lieu of pointing a telescope to a specific point in the sky to surveying the sky.
- NOAO's Community Science and Data Center (CSDC) – data mining provides the potential to have limitless researchers.
- LSST will survey the entire sky every 3-4 days. Challenge dealing with the data of real time alerts, software engineering challenge.
- ANTARES – open for business as of Dec 2018. Slide 15 collects data from 4 facilities and then to the individual PI's.
- Biggest Challenge – Achieving collaboration and synergistic development across silos with organization and communities. Need to bring the stakeholders together.

#### Scott McIntosh, NCAR

- What NCAR as you advance into the 21<sup>st</sup> research?
- Science evolution – Driven by post WWII society to improve understanding (and forecasting) weather.
- NCAR research has led to saving lives primarily through air travel.
- Challenge – NCAR 2024, 50% of staff will be eligible to retire – aging workforce, aging buildings, diversity
- Start to study impacts of ambient air pollution – forecast and advise, on a global basis.

- Protecting Critical Infrastructure – solar storms (space weather) pose threats to national power grids, communications, GPS, and global financial markets.
- Aging workforce provides an opportunity with the next generation of researchers. The Next Generation is concerned with social impacts and they want to do work that benefits the community
- Embracing the Next Generation is needed.

#### Mark McKinnon, NRAO

- Focus on infrastructure maintenance challenges.
- 40-year-old infrastructure. Upgrades are prioritized in accordance with their Risk Management Plan.
- Have the capacity (engineering and technician skills) to be able to do that kind of repair in the remote location.
- Leading a project that possibly will replace the VLA with the next generation. Target construction FY25-FY34. 10x effective collecting area & 10x better spatial resolution.

#### Thomas Rimmele, NSO

- These kinds of Facilities are built on the heritage of previous facilities. The tools for probing the sun have evolved and previous facilities have been divested, closed, and deconstructed facilities.
- New Facility under construction – DKIST, five instruments spanning UV-visible near infrared.
- Air force telescope is also on the same site. The coating facilities is in an Air Force building.
- Site location selected based on the observation.
- Operate the telescope a photograph
- Will do fundamental space weather research. Map out solar magnetic field.
- Heavy mechanical structure that move with ultra-high precision, engineering challenges
- Thermal management and control is paramount to focus on the spot on the sun to deal with the heat pots.
- About a week ago, the first images of moon and Jupiter. No “Hubble” moment.
- Huge Facility Thermal Systems for cooling. Make ice at night when electricity is cheaper.
- Could compare to a power plant, shipyards. Challenge to finding and retaining staff with these skills when they can make more money in other industries.
- Feels like the last 10% of construction is the hardest.
- Not just the construction but the organization has had significant transitions.
- Need people – not just technical qualifications but also a dedicated and a motivated team.

#### **Best Practices:**

- Build collaboration across the traditional discipline organizations and communities to solve complex problems.
- Workforce development are needed to address common challenges such as aging workforce but also for the unique technical skills required.

#### **Actionable Recommendations (Action Owner Name & Organization):**

- None

#### **Decisions:**

- None

## Session Summary

Executive leadership of the NSF funded Federally Funded Research and Development Centers (FFRDCs) shared exciting project and science accomplishments and discussed experience associated challenges their organizations are facing. Workforce management. Adam Bolton, Associate Director for NOAO's (National Optical Astronomy Observatory) Community Science and Data Center (CSDC) discussed challenges with the high volume of data from storage to user access and usability. Scott McIntosh, Interim Deputy Director of NCAR (National Center for Atmospheric Research) discussed the challenges with 21<sup>st</sup> Century research including tools and aging workforce. Mark McKinnon, Director for NRAO's, (National Radio Astronomy Observatory) New Mexico Operations discussed the Very Long Array (VLA) Infrastructure Improvement Program. Thomas Rimmele, Project Director for the Daniel K. Inouye Solar Telescope, discussed the current challenges as the construction is moving into the last year of construction including weather, workforce, and integration.