Observatory Science Operations

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Atacama Large Millimeter/submillimeter Array
Expanded Very Large Array
Robert C. Byrd Green Bank Telescope
Very Long Baseline Array

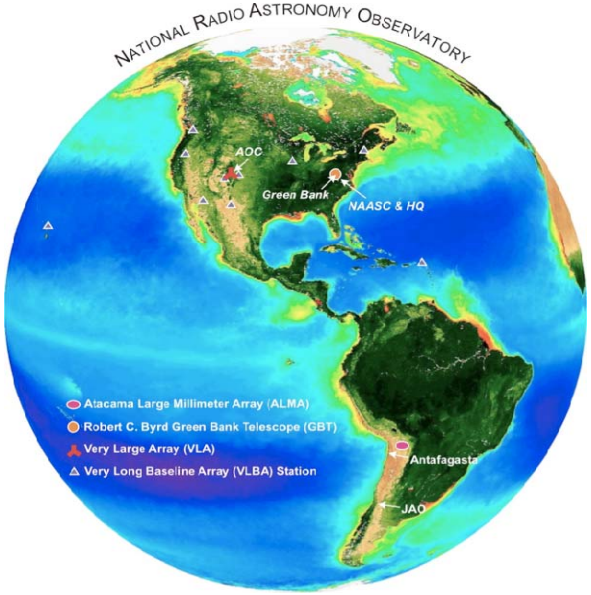
NRAO

Current Science Operations

- NRAO currently operates four telescopes

EVLA

GBT



VLBA

ALMA

Current Science Operations

- Telescope support
  - data quality analysis
  - provision of fundamental calibration data (e.g. calibrator databases)
  - testing and development of new observing modes
  - scheduling
  - scientific support of software systems
  - data pipelines
- User support
  - proposal calls, submission, handling
  - helpdesks
  - documentation
  - scheduling block verification
  - user training (schools, workshops)
  - symposia

Synergies across telescopes and sites

- Telescope support:
  - by necessity mostly site specific (although personnel may be shared, e.g., for VLA and VLBA)
- User support:
  - currently site specific, the user has quite a different view of the observatory depending on which telescope they want to use
  - but: there is clear synergy between our telescopes
    - ALMA, EVLA, VLBA all interferometers
    - GBT, EVLA, VLBA all part of the HSA
    - Science goals may require use of all four telescopes

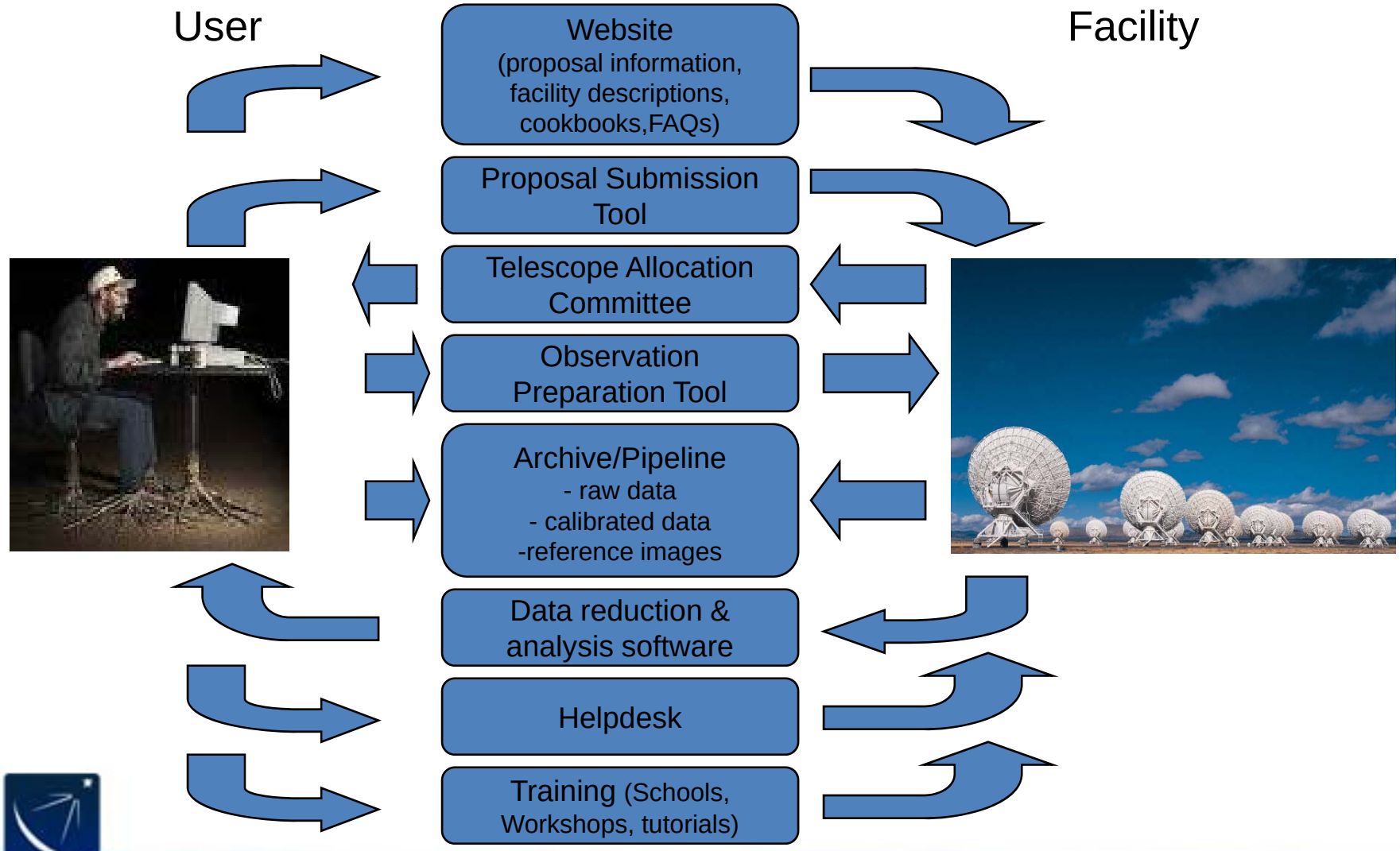
Goals for integrating science operations

- For the users
  - engage as much of the astronomical community as possible
  - provide a unified front to users to simplify access to NRAO telescopes
  - make telescopes easy to use
  - provide as close to science quality images and other finished data products as our resources will allow
- For operations: provide the above at the lowest possible cost
  - make sure we are optimizing staff and leveraging the resources provided for ALMA
  - share what we can across telescopes

Steps toward ISO

- Observatory Science Operations Working Group
  - established January 2009: Jewell (chair), Lonsdale (vice-chair), Dickman, O'Neil, Frail, Radziwill, Chandler, Hibbard, Halstead
  - deliverables
    - define the scope of OSO
    - recommend an organizational structure of OSO as an operational unit within NRAO
    - staffing requirements and budget
    - implementation plan with schedule
    - plan due April 1, 2010
- Identify key items
  - that can be done now (recognizing imminent need for EVLA)
  - that need further study

Observers view of telescope



OSO: web presence

- Science web
  - Web-based community information and outreach is currently distributed across sites
    - needs to be rationalized, centralized, and enhanced
- Web front end for telescopes
  - New structure under development to be mirrored across all sites and telescopes to make it easy for users to find information
    - EVLA to produce a prototype, needs to be in place by September 1, 2009 for call for Shared Risk Observing
- Helpdesks
  - Observatory wide helpdesk to be implemented, based on same system as that used by Herschel/Spitzer
    - prototype needs to be implemented by Dec 1, 2009 for EVLA, testbed for ALMA helpdesk, triage centralized in CV, experts at sites

OSO: proposals and obs prep

- Proposal preparation and submission
  - The VLA/VLBA/GBT proposal preparation tools have all been unified at http://my.nrao.edu
    - decision needed on how to incorporate ALMA
- Proposal handling process
  - Currently site-specific, although VLA and VLBA are combined
    - revised proposal handling mechanisms to incorporate EVLA/VLBA/GBT being considered, ALMA proposal handling separate, under development
- Observation preparation support
  - Currently telescope specific and ad hoc, with users contacting staff members for help, data analysts performing SB verification and contacting scientific staff with questions about non-standard set-ups
    - to be provided through helpdesk, with centralized triage, site-specific SB verification

OSO: archives and data products

- Archives
  - ALMA and EVLA/VLBA use the same archiving software, but currently archive access tools for users are being developed separately
    - goal is to have unified archive access under OSO
- Pipelines
  - EVLA plans "reference" images and data products, ALMA plans "science" images; currently no pipelines for VLBA or GBT
    - pipeline goals of EVLA and ALMA need to be rationalized, extent to which pipelines can be implemented for VLBA and GBT needs further investigation

OSO: post-processing and algorithms

- Data processing
  - Integrated development for EVLA and ALMA in CASA: quarterly targets combine needs of both telescopes
    - user support to be provided through NRAO helpdesk, extent to which data processing for VLBA and GBT can also be integrated needs further investigation
- Algorithm R&D
  - Algorithms needed for EVLA and ALMA
    - algorithm R&D group being set up, focus on immediate EVLA needs

OSO: outreach and user training

- Science user outreach
  - Much of this is already integrated through the EPO office in CV, except for scientific workshops
    - improve coordination and integration of science workshops across NRAO instruments
- User training
  - Currently hold Synthesis Imaging Workshops in Socorro for the EVLA/VLBA, Single Dish Workshops in GB, CASA tutorials for NA user community, plans for ALMA Workshops in CV
    - need to coordinate and integrate workshops and tutorials for all NRAO instruments

OSO: community support and statistics

- Community support programs
  - Student programs, postdocs, visitor programs already centralized through OSAA
    - will move from OSAA to OSO
- Observing summaries and usage statistics
  - Currently telescope-specific
    - needs to be coordinated observatory-wide including ALMA; some urgency to automating this process, driven by GBT requirements

Implementation of OSO

- Have outlined individual items in the path toward integration
- OSO Working Group will recommend how it will be organized; guiding principles:
  - science output is paramount
  - maximize breadth and quality of user support
  - cost effectiveness
  - maintain the ability for professional staff to specialize to push the limits of the instruments
- Implications:
  - personnel providing telescope and user support one and the same
  - matrixing of personnel between OSO and telescope support
  - management overhead of distributed OSO

Timescales and planning

- Goal is to have a plan for OSO by April 1, 2010
- Several capabilities need to be implemented earlier, driven by GBT and EVLA requirements
- Goal is to implement OSO by FY2011