

# ngVLA Workshop: Antenna Summary



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



# Session Agenda

- Overview: Steve Padin
- Overall Approach: Matt Fleming
- Intertronics Approach: Peter Shield
- MTM Approach: Lutz Stenvers
- Vertex Approach: Brian Schrader
- CARMA Lessons: Dave Woody
- System Considerations: James Lamb



# General Observations

- Appears there are no technical show-stoppers for the antenna design
  - Selection of antenna design likely based primarily on cost
- Implications of large N
  - Capacity of industry
  - Logistics
  - Systems engineering and product/quality assurance
- Note lessons learned from other telescopes (e.g. modular subsystems, ease of bearing access, diagnostic software for antenna maintenance, minimize mechanical devices, etc.).
- High level antenna specs developed; more detailed specs needed



# Some Cost Considerations

- Offset/symmetric cost ratio important if antenna design based solely on cost (offset = 1.1-2.0x symmetric?)
- General discussion of cost seemed to focus on collecting area & surface RMS
  - Don't forget pointing and operational considerations (e.g. reliability)
  - Consider foundation design in performance (pointing) and cost
    - Integrated foundation/structure design?
- Easy field assembly, modularity, transportation of subcomponents
- Large N-small D vs small N-large D
  - Point source sensitivity and costs of infrastructure, antenna subsystems, operations, and maintenance favor larger D
  - Surface cost, survey observations, and transportability favor smaller D



# Science Requirements

- Clarity on science requirements
  - Frequency range (1-118? 1-40? 10-118?)
  - Field of view (> reflector diameter)
  - Image dynamic range (> optical configuration, beam shape stability)
  - Fast switching (timescale, settling time)
  - Array re-configuration (y/n?)





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