



# VLA EXPANSION PROJECT

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# Correlator Conceptual Design Review (CoDR)

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*National Research Council Canada*



National Research Council  
Canada

Conseil national de recherches  
Canada

**NRC · CNRC**

# Design Reviews

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- Three Design Reviews planned:
  - Conceptual (CoDR - this one) - review architecture and overall design.
  - Preliminary (PDR) - review detailed designs before prototypes.
  - Critical (CDR) - review system before major production.

# Goals for Today

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- Review:
  - Overall architecture & functional design, based on specs derived from astronomical requirements.
  - Broad-brush description of the implementation and external interfaces.
  - If needed to verify design, detailed information on critical components.
  - Cost and schedule projection.

# Remarks on Progress to Date

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- Considerable effort already invested.
- Key decisions have already been made.
- Main purpose of the CoDR is not to offer major design alternatives, unless:
  - the current design cannot meet the specs,
  - cost/schedule can be dramatically improved without performance loss.

# Questions for Panel

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1. Coherency of plan - Will the plan lead to the result proposed (or something close or even better)? Are there any gaps in the planning?
2. Will the correlator work properly with the EVLA as a whole?
3. “Show-stoppers” - Are there aspects of the plan which are extremely risky, and do not avail themselves of an apparent solution?

## Questions (cont'd)

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4. Budget - Is there a good chance that the project can be carried out for the allowed budget, and is contingency allocated in proportion to the risk?
5. Implementation Effort - Is there a good chance that the project work can be carried out in the allotted time with the proposed personnel?

# Funding

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- EVLA Correlator is part of Canadian Long Range Plan for Astronomy.
  - Confers priority for new funding in astronomy.
- North America Program in Radio Astronomy (NAPRA) letter of intent is now signed between NRAO/NSF and HIA/NRC.
  - This agreement includes this correlator project, and recognizes it as a contribution to ALMA.

# Funding Process

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- Funding application has been made to Canada Foundation for Innovation (CFI).
  - Accepted at the “Letter of Intent” level - culled to 30% over-subscription at this stage.
  - Invited to submit the full proposal for peer review in the CFI International Program.
- CFI cannot legally provide funding to the National Research Council (NRC).
  - The University of Calgary (Prof. Russ Taylor) has applied for CFI funding.
  - “Web of Agreements” may be needed.



# Funding Process (cont'd)

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- Earliest decision date for CFI is May, 2002.
  - Strong likelihood of success.
- NRC is providing limited “bridging money” to support the project meanwhile.
- Cost estimate provided to CFI is \$C18.5 M (\$US 11.6 currently).
- Corrections for inflation and \$C/\$US ratio have not yet been discussed with CFI.

# Non-Technical Program Risks

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- Risks in order of seriousness (impact x probability):
  - Being unable to obtain enough qualified personnel.
  - Serious schedule slippage due to a slow start.
  - Continuing slide in the C\$ and not being recognized in funding profile.
  - Inadequate contingency.

# Non-Tech. Prog. Risks (cont'd)

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- Developing a successful plan to design the correlator chip within our budget estimate.
- Inflation not being recognized in funding profile.
- Software effort is underestimated, and NRAO is unable provide personnel at DRAO.

# Outcome of CoDR

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- CoDR report will form part of the application for funding.
- If “show-stopper” technical difficulties are identified, we will have to make changes to the plan, to the satisfaction of the CoDR panel.

# Anticipated Additional Staffing

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Staffing - EVLA Correlator		
Position	Duration	Latest start date
Senior Eng. (7 yrs)	7	Jan 02
Digital Eng. (6 yrs)	6	Jan 02
Digital Eng. (6 yrs)	6	Jan 02
Eng. Assistant (6 yrs)	6	Apr 02
Layout Person & Production Eng or Tech.	3	Apr 02
Production Technologist (3 yrs)	3	Apr 05
Production Technologist (3 yrs)	3	Apr 05
Software Engineer (8 yrs)	8	Apr 02
Admin (Secretary) (7 yrs)	7	Apr 02
Mech. Eng. (1 yr)	1	Apr 03, intermittently over next 3 yr.