



# **Cooperative Programs among forefront NSF and NASA observatories**

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# NASA/NSF Partnership for Forefront Observatories

- NASA and NSF observatories have observatory-level agreements to award time on each other's facilities for research requiring multiple observatories
  - All observing time is awarded by a TAC following a regular proposal and review process
  - Intent of programs is to remove "double jeopardy" for meritorious research
  - Each TAC has a limit on the amount of time that can be awarded on a partner observatory
- These partnerships enable individual investigator investigations
  - Intended for "bottoms up" research
  - Establishing "key projects" that require data from multiple observatories occurs through a different process (e.g. Deep Fields, Frontier Fields, etc.)



Extant arrangements include:

- Hubble offers joint observations on Hubble and
    - NASA's Chandra, Spitzer
    - NOAO optical telescopes (including Gemini, WIYN, Mayall, Blanco, SOAR, and smaller telescopes)
    - NRAO radio telescopes (GBT, VLA, VLBA)
    - ESA's XMM-Newton
  - Chandra offers joint observations on Chandra and
    - NASA's Hubble, Spitzer, Swift, NuSTAR
    - NOAO optical telescopes (including Gemini, WIYN, Mayall, Blanco, SOAR, and smaller telescopes)
    - NRAO radio telescopes (GBT, VLA, VLBA)
    - ESA's XMM-Newton
  - Spitzer offers joint observations on Spitzer and
    - NASA's Hubble, Chandra
- During cryogenic prime mission, Spitzer had partnerships with NOAO and NRAO



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- Fermi offers joint observations on Fermi and
  - NOAO optical telescopes (including Gemini, WIYN, Mayall, Blanco, SOAR, and smaller telescopes)
  - NRAO radio telescopes (GBT, VLA, VLBA)
  - Arecibo
  - VERITAS
  - JAXA's Suzaku
  - ESA's INTEGRAL
- Swift offers joint observations on Swift and
  - NRAO radio telescopes (GBT, VLA, VLBA)
- NuSTAR offers joint observations on NuSTAR and
  - JAXA's Suzaku
- ESA's XMM-Newton offers joint observations on XMM-Newton and:
  - NASA's Hubble, Chandra, NuSTAR, Swift
  - ESA's INTEGRAL
  - ESO's VLT

- NRAO offers joint observations on NRAO radio telescopes and
  - NASA's Hubble, SwiftNRAO also participates by making time available to space observatory TACs
- NOAO does not offer joint observations through NOAO TACs, but participates by making time available to space observatory TACs
  - <http://www.noao.edu/gateway/nasa/>
- SOFIA does not have any extant joint observation agreements
- Other forefront observatories (e.g. ALMA, JWST) are encouraged by NSF and NASA to establish appropriate observatory-level agreements to enable the astronomical community's most compelling science investigations