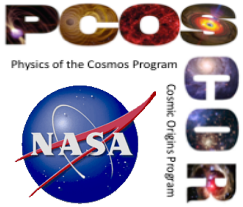
Agenda

- **Overview of Program strategic technology development process**
  - Technology gaps identification and prioritization
- **How the COPAG can help**
- **Suggestions for technology gap inputs**
- **Technology gap input form**

PCOS/COR Technology Investment Process

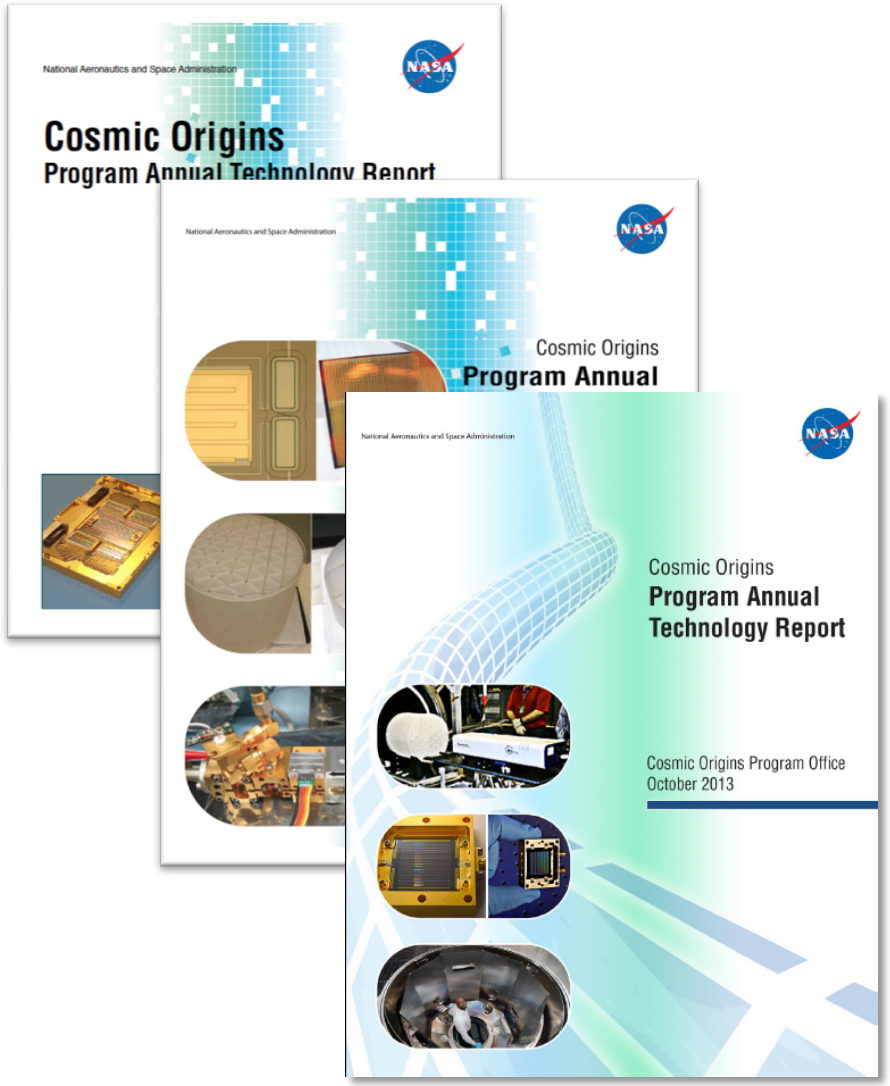


- Prioritize the science — Decadal Survey
- Determine the technology gaps — Community input
- Prioritize the gaps — Program Technology Management Board
- Solicit proposals and make the investments — NASA HQ

Overview of the Technology Gaps Identification and Prioritization Process

- The community identifies technology gaps each June by working with the PAG or through direct individual submission to the Program Office.
- The Program Technology Management Board (TMB) reviews and vets community identified technology gaps, defines their priorities, and recommends investment consideration to HQ.
  - TMB membership includes senior members of the Program at NASA HQ and in the Program Office, and subject matter expert(s) as required.
- The TMB prioritizes the technology gaps based on a published set of criteria that addresses scientific priorities (Decadal Survey), benefits and impacts, and timeliness.
- The technology gaps and the resulting priorities are published each year in the Program Annual Technology Report (PATR).

The Program Annual Technology Report (PATR)

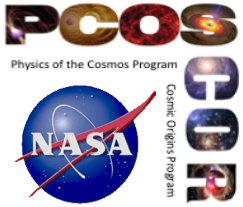


The PATR is an annual report that summarizes the Program's technology development activities for the prior year.

- Provides an overview of the Program and its technology development activities.
- Provides a status of the Program's strategic and targeted technology development for the prior year and announces the new SAT award selections.
- Summarizes the technology gaps obtained from the community.
- Contains a prioritized list of technology gaps for the coming year to inform the SAT proposal calls and selection decision.

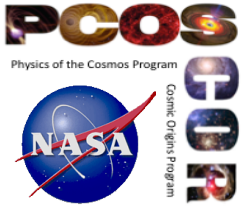
The COR PATRs can be downloaded from http://cor.gsfc.nasa.gov

Objectives and Purposes of Prioritization Process



- **Objectives**
  - Identify technology capability gaps that are applicable and relevant to the Program's objectives as described in the Astrophysics Implementation Plan
  - Rank these technology capability gaps to represent our recommended investment priorities
- **Purposes**
  - Inform the SAT solicitation and other technology development program planning (SBIR and other STMD activities)
  - Inform technology developers of the Program's capability gaps to help focus efforts
  - Guide the selection of technology awards to be aligned with Program goals and science objectives. This process supplements and does not replace the existing SAT peer review selection process
  - Improve the transparency and relevance of Program technology investments
  - Inform the community about and engage it in our technology development process
  - Leverage the technology investments of external organizations by defining capability gaps and NASA as a potential customer

How The COPAG/Community Can Contribute



- Provide feedback on the technology capability gaps identification and prioritization process
- Identify and collect technology capability gaps by the end of June each year for prioritization by the Program and for other Program level technology planning
- Propose to the SAT – due near the end of March each year.
- Serve as a peer reviewer for the SAT selection process

Technology Capability Gap Submission

- The technology capability gap submission form can be downloaded from the COR Program website at http://cor.gsfc.nasa.gov/technology/
- A technology capability gap can be identified by anyone and provided to the PO for prioritization in either of two ways:
  - Provide it to the PAG (or appropriate subgroup of) for consolidation – preferred way
  - Submit it to the Program Office (thai.pham@nasa.gov) and it will be forwarded to the COPAG for consolidation, if time permits, if not it will be added to list received from the PAG.
- Although capability gaps are solicited annually and collected at the end of June to begin the annual process, they can be submitted to the Program at any time.

Suggestions for the Next Technology Capability Gaps List

- Focus on technology capability gaps associated with missions prioritized in the Astrophysics Implementation Plan and any relevant programmatic directives
- Submit technology gaps that are directly applicable to Program objectives. Don't include gaps that are not in our charter such as technologies associated with launch vehicle, rover, avionics, spacecraft systems, etc.
- Don't include gaps that don't require technology development, that are not well defined, that are redundant (duplicate, similar, or subsets of other needs), or are at TRL 6 or higher
- Inputs should be submitted as technology capability gaps between the current state-of-the-art and the science objective targeted and not as specific implementations

An "Ideal" Technology Capability Gaps List

- Consists only of technology capability gaps that are consistent with the Program objectives as articulated by the Astrophysics Implementation Plan and any relevant current programmatic directives
- Inputs received from a broad and diverse community base
- Technology gaps are identified as capability gaps and not as specific implementation approaches
- Developed in a process that is open and impartial
- Inputs description have no perception of Program endorsement or advertising for anyone or any organization.
- List is concise, non-redundant, and well-defined
- Does not contain proprietary or ITAR-sensitive information

Suggestions for Writing Technology "Needs" as "Capability Gaps"

PCOS 2013 Priority	Previous Technology "Needs"		Comment	Suggested Rewording To Indicate Technology Capability Gaps		Comment
1	Large format Mercury Cadmium Telluride CMOS IR detectors, 4K x 4K pixels	Dark Energy	Should not matter what technology is used for the focal plane. It is the resolution, noise performance, and sensitivity in the IR band that is required.	Large format, high resolution, low noise near infrared imaging system	Dark Energy	Technical specifications such as number of pixels, bandpass, dark current, read noise, QE, etc. should be specified in the "Quantitative Goals and Objectives" section of the input.
	Telescope design with stringent length and alignment stability with low straylight	Gravitational Wave	Pretty good although it does pre-suppose a mission architecture. A more general description is suggested.	Ultra-stable telescope with low straylight	Gravitational Wave	Specific requirements for length and alignment stability for the needed wavefront quality and straylight should be included in the "Quantitative Goals and Objectives" section of the input.
	Large format high-resolution X-ray microcalorimeter	X-ray	Fine and does not pre-suppose a certain implementation approach. A broader way to express the gap is suggested.	Detector for high resolution imaging spectroscopy of X-rays	X-ray	Array and pixel size, eV resolution, etc. should be included in the "Quantitative Goals and Objectives" section of the input.
	High resolution phasemeter	Gravitational Wave	Fine as written	Rewording not required	Gravitational Wave	Specific measurement sensitivity and any other requirements should be noted in the "Quantitative Goals and Objectives" section of the input.
	Segmented replicating mirrors	X-ray	Using segmented mirrors is an implementation approach. Suggestion is more general.	Large, lightweight mirror system for collection of X-rays	X-ray	Metric describing required size, weight and any other specifications should be included in the "Quantitative Goals and Objectives" section of the input.

COR 2013 Priority	Previous Technology "Needs"	Comment	Suggested Rewording To Indicate Technology Capability Gaps	Comment
1	High QE, large format UV detectors	Good as submitted. Does not pre-suppose any specific implementation approach or technology and boiled down to the essential capability need - high efficiency with good resolution. Rewording not required.	Rewording not required	QE, format size, operational wavelength band and any other specific metric are to be added to the "Quantitative Goals and Objectives" section of the input.
	High Reflectivity UV coatings	Reworded slightly not to preclude any materials that may not need coatings	High reflectivity UV materials	Reflectivity, uniformity, bandpasses, etc. should be included in the "Quantitative Goals and Objectives" section of the input.
	Large, low-cost, light-weight precision monolithic mirrors for ultra-stable large aperture UV/Optical/Near-IR telescopes	Could use a little adjustment to focus on the capability gap. Could imagine that a mirror with the needed performance need not be monolithic, and that active techniques could in principle give the same benefits as having ultra-stable structures	Large, low-cost, light-weight precision mirrors for ultra-stable aperture UV/Optical/Near-IR telescopes	Mirror size with specific wavefront quality requirements and other required metrics should be included in the "Quantitative Goals and Objectives" section of the input.
	Deployable light-weight precision mirror systems for future Very Large Aperture UV/Optical/Near-IR Telescopes	"Deployable" is an implementation approach, suggest combining with the large mirror gap described above.	Included in large mirror gap described above	Mirror size range with specific wavefront quality requirements and other required metrics should be included in the "Quantitative Goals and Objectives" section of the input.
	Photon counting large-format UV detectors	Fine as written	Rewording not required	QE, noise, format size, operational wavelength band, etc. should be specified in the "Quantitative Goals and Objectives" section of the input.
	High efficiency UV multi-object spectrometers	Fine as written	Rewording not required	Format size, QE, resolution and other required specifications should be included in the "Quantitative Goals and Objectives" section of the input.

Requested Technology Capability Gaps Inputs

1. Name of technology capability desired
2. Description of desired technology capability
3. Assessment of the state-of-the-art technologies that could possibly address this capability, including their Technology Readiness Levels (TRLs)
4. Identification of quantitative goals and objectives of this technology capability
5. Scientific, engineering and/or programmatic benefits of achieving this capability (filling the “gap”)
6. Potential applications and relevant mission(s)
7. Time to anticipated need (TRL 5/6)

Inputs received via our website will be forwarded to the PAG for inclusion into consolidated technology gaps list due at the end of June.

THANK YOU!