

A vibrant, multi-colored image of a nebula or star-forming region, likely the Eagle Nebula, with deep blues, purples, and fiery orange-red hues, set against a dark background of stars.

# Preparing for the 2020 Decadal Survey

# Astrophysics

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# Preparing for the 2020 Decadal Survey

NASA has two objectives in preparing for the 2020 Decadal Survey

- Objective 1: Provide information to the Decadal Survey committee to enable prioritization of large missions
  - Science case
  - Strawman design reference mission with options/switches
  - Technology readiness assessment
  - Cost box
- Objective 2: Initiate technology development for candidate large missions so that technology will be ready when needed
  - Technology needs to be at TRL-5 when it is time to start the highest priority large mission in the 2020 Decadal Survey
  - This will be the next large mission after WFIRST/AFTA, and could be started when funding becomes available as WFIRST/AFTA approaches launch



# Preparing for the 2020 Decadal Survey

- Step 1: Identify (large or strategic) mission concepts to study
- Step 2: Initiate studies
- Step 3: Conduct studies
- Step 4: Identify technology requirements to motivate early technology development
- Step 5: Deliver results to 2020 Decadal Survey committee



# Preparing for the 2020 Decadal Survey

Step 1: Identify (large or strategic) notional mission concepts to study

- There are a limited number of legitimate candidates for the highest priority mission after WFIRST
- Use community process to identify the missions before forming STDTs
- Proposed Plan: Ask each NASA PAG (Program Analysis Group) to recommend 1-2 missions for study
  - The three Astrophysics PAGs (Cosmic Origins PAG/COPAG, Exoplanet Exploration PAG/ExoPAG, Physics of the Cosmos PAG/PhysPAG) each provide analysis for the NAC Astrophysics Subcommittee in the science areas of the three science-based astrophysics programs
  - Must draw candidates from NWNH, SMD Science Plan, and 30-yr Visionary Roadmap
  - Astrophysics Subcommittee will collect input and provide list of candidates to Division Director
  - Division Director will select studies



# Notional Timelines to Identify Studies

Timeline A	Timeline B	
January 2015	Summer 2015	Announcement of this process including presentation to the Astrophysics Subcommittee, formal charges to the PAGs, and presentation to the NRC Mid-Decade Review Committee.
January 2015 - June 2015	Summer 2015 - December 2015	Community discussion and input led by the PAG Executive Committees. Each PAG will determine an appropriate process for community discussion and input.
June 2015	January 2016	Meetings of the PAGs in conjunction with the meeting of the American Astronomical Society / Meetings of the PAGs at a NASA-sponsored Astrophysics PAG jamboree in June 2015. Each PAG will finalize its report identifying 1-2 mission concepts to the Astrophysics Subcommittee following these PAG meetings. These public reports will be submitted to the Astrophysics Subcommittee.
Summer 2015	Spring 2016	Meeting of the Astrophysics Subcommittee to suggest a consolidated list to the Astrophysics Division Director.
Fall 2015	Late Spring 2016	Decision by the Astrophysics Division Director identifying the small number of candidate missions that will be studied by NASA as input for the prioritization process of the 2020 Decadal Survey.



# Notional Timelines to Identify Studies

	<b>Timeline A</b>	<b>Timeline B</b>
ROSES-15: APRA and SAT proposals due in March 2016, selected in Fall 2016, funded in FY2017	Mission concept studies identified in time for proposals to address perceived technology needs.	
ROSES-16: APRA and SAT proposals due in March 2017, selected in Fall 2017, funded in FY2018	STDT interim reports released in time for proposals to address technology needs identified by the STDTs.	STDT interim reports released in time for proposals to address technology needs identified by the STDTs.
	<b>Timeline A</b>	<b>Timeline B</b>
Pros	<ul style="list-style-type: none"><li>• Earlier start to studies</li><li>• Earlier identification of technology development requirements</li></ul>	<ul style="list-style-type: none"><li>• PAG meetings take place in association with January 2016 AAS meeting</li></ul>
Cons	<ul style="list-style-type: none"><li>• Requires stand-alone PAG Jamboree in Summer 2015; less community involvement without associated AAS meeting</li></ul>	<ul style="list-style-type: none"><li>• Later start to studies and identification of technology development requirements</li></ul>



# Preparing for the 2020 Decadal Survey

- Step 2: Initiate studies
  - Form science and technology definition team (STDT)
  - Assign Center-based study office
- Step 3: Conduct studies
  - Desired outcomes
    - Science case
    - Strawman DRM with options/switches
    - Technology readiness assessment
    - Cost box
- Step 4: Interim report to identify technology requirements to motivate early technology development
- Step 5: Deliver results to 2020 Decadal Survey committee
  - Deliver as public STDT report
  - Deliver when Decadal Survey committee requires mission input



# Preparing for the 2020 Decadal Survey

The detailed process will be fleshed out but should include:

- STDT appointed for each concept study through an open call to the community; charter created for each STDT.
- Each study assigned to a NASA Center for execution; NASA Center scientist appointed as study scientist; Center will provide NASA study manager and engineering support.
- STDT defines science objectives, strawman payload, and technology development requirements; study office develops a design reference mission and conducts a cost assessment with the participation of the STDT.
- STDT issues an early interim report that includes a draft science case, a draft strawman payload and design reference mission, and technology development requirements.
  - Early interim report used as input to NASA's technology development funding process.
- The process will require multiple meetings of the STDT, usually by phone and occasionally in person; the process will require several iterations between the STDT and the study office to develop the design reference mission.
- STDT issues a final report that includes a science case with proposed science objectives, a strawman payload, a design reference mission, and technology development requirements. NASA conducts a cost assessment.
  - Products developed in time to be submitted to the 2020 Decadal Survey Committee at an appropriate point in its study process.



# Preparing for the 2020 Decadal Survey

## Notional timeline:

- Announce/socialize process with community Now
- Start PAG process to identify STDTs 2015
- Identification of STDTs/Call for STDT members 2015/2016
- Start of STDTs 2015/2016
- Interim reports / influence SAT selections 2017
- Submission of reports to Decadal Survey Committee 2019