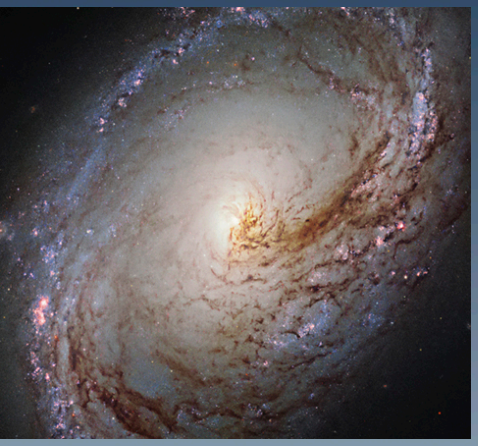
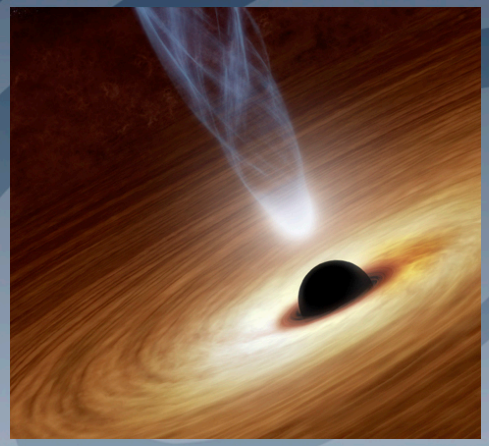
National Aeronautics and Space Administration

Astrophysics






Large Mission Concept Studies Kick Off
AAS 227th Meeting
Kissimmee, Florida
January 6, 2016

Paul Hertz
Director, Astrophysics Division
Science Mission Directorate
@PHertzNASA

Guiding documents for the mission concept studies are posted at
http://science.nasa.gov/astrophysics/2020-decadal-survey-planning/

Large Mission Concept Studies

- NASA will study large mission concepts as candidate for prioritization within Large Missions category
  - Science case
  - Technology assessment
  - Design reference mission with strawman payload
  - Cost assessment
- Charge to the Astrophysics Program Analysis Groups (PAGs): COPAG, ExoPAG, PhysPAG (December 2014)
  - "I am charging the Astrophysics PAGs to solicit community input for the purpose of commenting on the small set [of large mission concepts to study], including adding or subtracting large mission concepts."
- PAGs reported to the Astrophysics Subcommittee in October 2015
  - PAGs unanimously endorsed a common set of four mission concepts to study
  - Astrophysics Subcommittee reported to the NAC Science Committee that NASA should study these four mission concepts
  - All three PAG reports posted at **http://cor.gsfc.nasa.gov/copag/rfi/**

Large Mission Concept Studies

NASA will initiate mission concept studies of the following four large mission concepts:

- **FAR IR Surveyor** – The Astrophysics Visionary Roadmap identifies a Far IR Surveyor as contributing through improvements in sensitivity, spectroscopy, and angular resolution.
- **Habitable-Exoplanet Imaging Mission** – The 2010 Decadal Survey recommends that a habitable-exoplanet imaging mission be studied in time for consideration by the 2020 Decadal Survey.
- **Large UV/Optical/IR Surveyor** –The Astrophysics Visionary Roadmap identifies a Large UV/Optical/IR Surveyor as contributing through improvements in sensitivity, spectroscopy, high contrast imaging, astrometry, angular resolution and/or wavelength coverage. The 2010 Decadal Survey recommends that NASA prepare for a UV mission to be considered by the 2020 Decadal Survey.
- **X-ray Surveyor** – The Astrophysics Visionary Roadmap identifies an X-ray Surveyor as contributing through improvements in sensitivity, spectroscopy, and angular resolution.

Large Mission Concept Studies: Science and Technology Definition Teams

NASA is asking for applications for membership on the four large mission concept Science and Technology Definition Teams (STDTs)

- STDTs have significant role and responsibility
  - Develop science case
  - Flow science case into mission requirements
  - Vet technology gap list
  - Direct trades of science vs cost/capability

- STDT members will be appointed by NASA HQ
  - Community call for applications will be released via NSPIRES and Astrophysics Programs mailing lists on the day after the AAS Town Hall
  - Responses requested by February 1, 2016

- STDTs will be chartered and managed by HQ
  - Charter and management plan available at

http://science.nasa.gov/astrophysics/2020-decadal-survey-planning/

Large Mission Concept Studies: Science and Technology Definition Teams

- Applications for the STDTs are due to NASA by February 1, 2016.
- The application material should consist of:
  - A two-page cover letter describing
    1. The STDT of choice,
    2. The reasons for the submitter's interest in the STDT, and
    3. The capabilities and experience that the submitter brings to the STDT;
  - A short statement of commitment to perform the tasks assigned to the STDT within the allocated timeframe, and
  - A one or two page resume including relevant publications.

Applications are solicited from the community at U.S.-based research and academic institutions, Government laboratories, industry, and private individuals.

http://science.nasa.gov/astrophysics/2020-decadal-survey-planning/

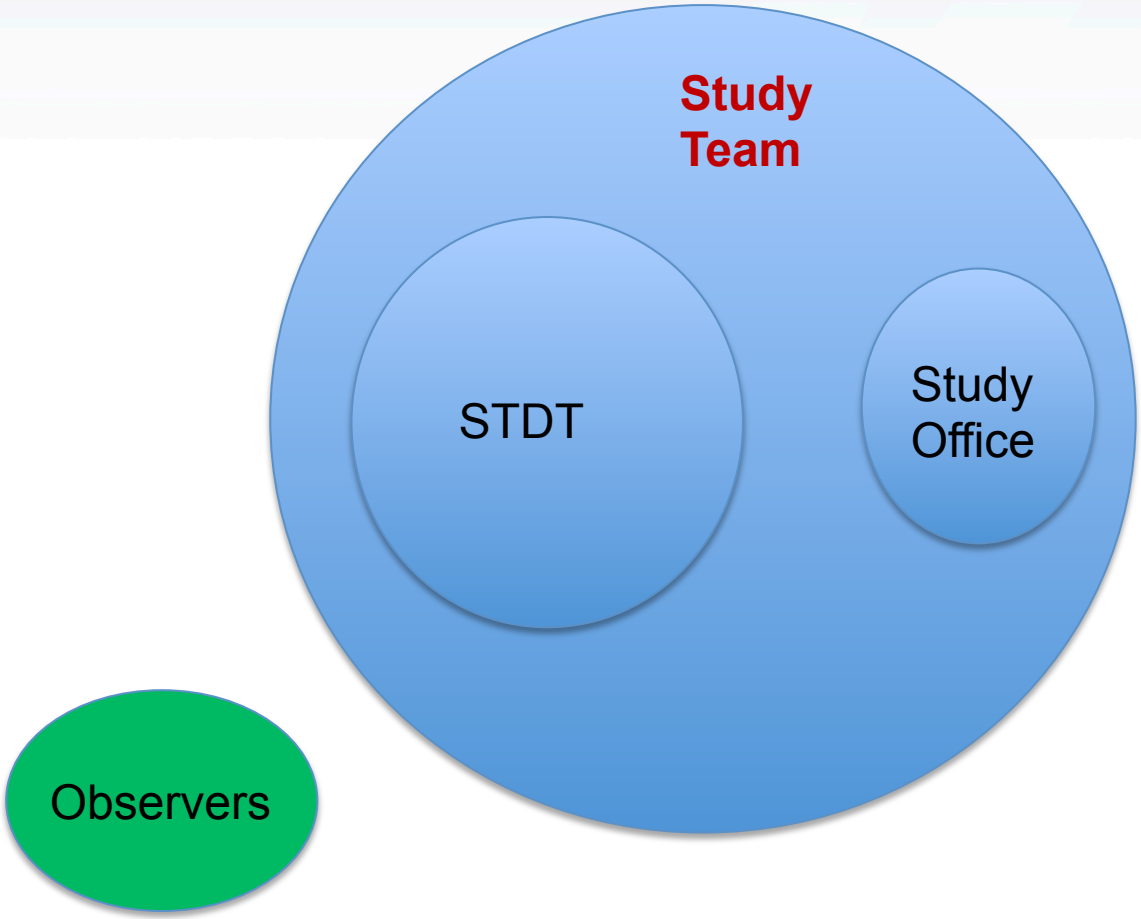
Large Mission Concept Studies: Rationale

- The four Large Mission Concept Studies will inform the 2020 NRC Decadal Survey
  - NASA anticipates that the Decadal Survey Committee will use these studies in formulating their recommendation for the priorities for NASA's large strategic missions following JWST and WFIRST
- NASA defines "full success" as delivery to the Decadal Survey Committee of four compelling and executable concepts so that the science of all four large missions can be adequately prioritized by the Committee
  - By executable we mean feasible with respect to technical, cost, and risk resources outlined in the Study Report
- NASA's priority is the most compelling science that can be accomplished
- The role of the study teams is to make the best case for the concepts
- Assessment and prioritization within an astrophysics portfolio is the job of the 2020 Decadal Survey Committee

Large Mission Concept Studies: Guidelines

- Study Teams are not in competition with each other.
- Study Teams (especially leadership) are encouraged to create a collaborative environment that allows for each team to promote their concept
- Study Teams are encouraged to share or combine technical areas or observing strategies to optimize design concepts
- Study Teams should explore a range of trades to understand the relative relationship of cost, risk, and science for the concepts
- Present their implementation strategies as “reference missions” – credible hardware configurations that can achieve the science goals and are sufficiently defined for a reasonable cost evaluation
  - Recognize that any actual mission will likely vary from the study concept

Large Mission Concept Studies: Definition of term "Study Team"



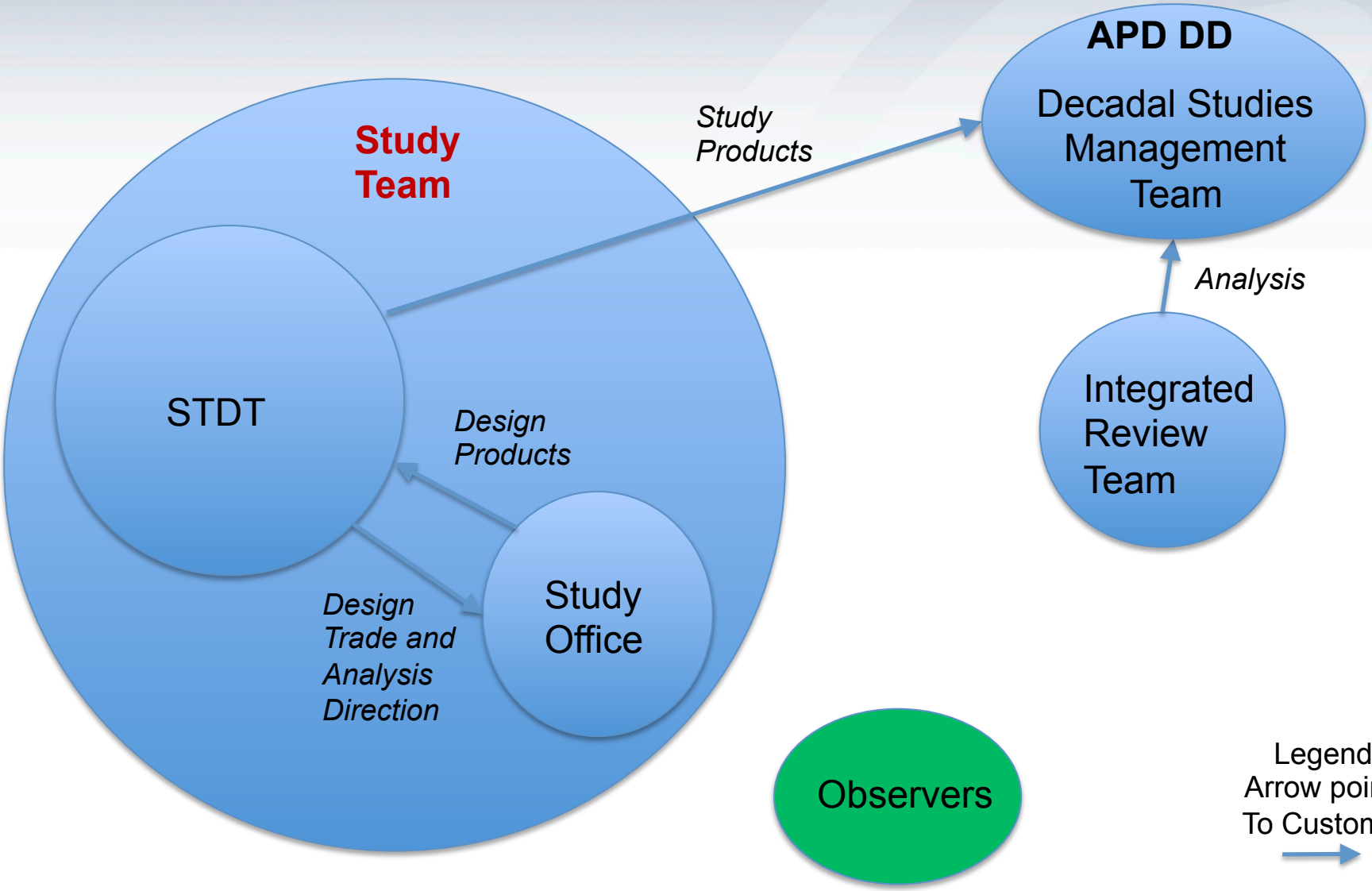
Study Team

- Union of STDT and Study Office
- Work together as one team for success of Study
- Each has distinct and complementary roles on the Study Team

Observers

- Welcome and not part of Study Team per se
- Attendance is optional or on-call

Large Mission Concept Studies: Management Concept



Study Deliverables

All products delivered to APD Deputy Division Director

M1	Comments on Study Requirements and Deliverables – Accept the study requirements/deliverables and submit plan--- or – Provide rationale for modifying requirements/deliverables	April 29 2016[1]
O1	*Optional: Deliver Initial Technology Gap Assessment* – *To impact PCOS/COR/ExEP technology cycle*	June 30 2016
M2	Detailed Study Plan – Document starting point CML – Deliver detailed study plan for achieving Decadal CML – Deliver resource required to meet the deliverables for the study duration – Deliver schedule to deliver milestones	August 26 2016
M3	Complete Concept Maturity Level 2 Audit – Identify, quantify and prioritize technology gaps for 2017 technology cycle	February 2017[2]
O2	*Optional: Update Technology Gap Assessments*	June 2017
M4	Interim Report – Substantiate achieving Concept Maturity Level 3 – Deliver initial technology roadmaps; estimate technology development cost/schedule	Early Dec 2017[2]
M5	Update Gap Assessments – In support of 2018 technology cycle	June 2018
M6	Complete Decadal Concept Maturity Level 4 Audit & Freeze Design – Support independent cost estimation/validation process	August 2018
M7	Final Report – Finalize technology roadmaps, tech plan and cost estimates for technology maturity	January 2019
M8	Submit to Decadal	March 2019

[1]APD will provide final study requirements by May 2016 (see "Near Term Activities")
[2]Timed to influence following NASA budget cycle

Large Mission Concept Studies: Near Term Schedule

Activity / Milestones	Schedule
Invitation at AAS conference for STDT nominations. Release STDT charter and brief mgmt. approach	Jan 6, 2016 (ref charter and mgmt. approach)
STDT membership applications due	Feb 1, 2016
Study Team finalization, set first meetings and telecons	March 10, 2016
Studies kick off	Early April, 2016
M1 Receive comments on the study guidelines from Study Team (Deliverable 1)	April 30, 2016
Finalize study guidelines and management plan	May 30, 2016
M2 Detailed study execution plan (Deliverable 2)	Aug 1, 2016

Large Mission Concept Studies:
Center Study Scientists and HQ Program Scientists

	Community STDT Chair	Center Study Scientist	Study Lead Center	HQ Program Scientist
Far IR Surveyor	TBD	David Leisawitz	GSFC	Kartik Sheth
Habitable Exoplanet Imaging Mission	TBD	Bertrand Mennesson	JPL	Martin Still
Large UV/Optical/IR Surveyor	TBD	Aki Roberge	GSFC	Mario Perez
X-ray Surveyor	TBD	Jessica Gaskin	MSFC	Dan Evans

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