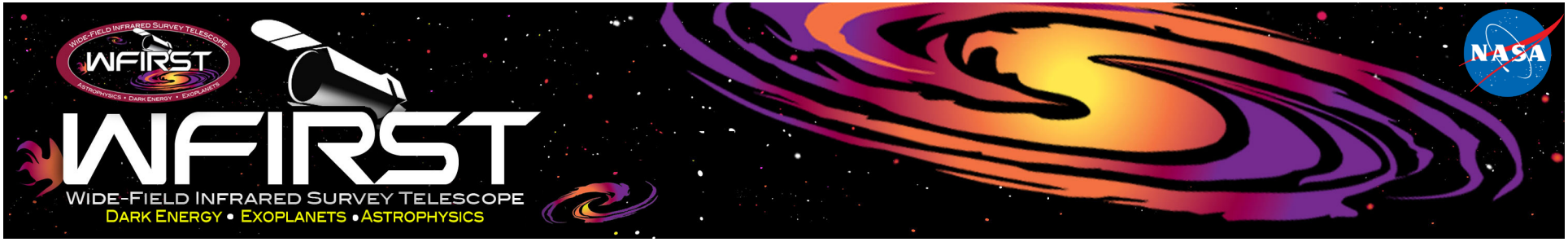


IPAC/WFIRST Science Center Activities

R. Cutri and the IPAC/WFIRST Team

IPAC and STScI work with GSFC to provide WFIRST Science Center functions

- Leverage combined strengths and experience with science operations, data processing, archiving for major infrared/optical surveys and NASA's Great Observatories
- Major activities are coordinated by one of the institutions, and it is expected that all institutions will participate in each activity
- In particular, IPAC draws upon expertise gained from:
  - IRAS, 2MASS, GALEX, WISE/NEOWISE
  - Spitzer, Herschel, NExScI K2 support activities
  - NED, IRSA, Exoplanet Archive
  - Ongoing development of: NASA Euclid Science Center, LSST Science User Interfaces, ZTF Real-time processing

Science Center Coordination Assignments for IPAC

- GO/GI proposal program peer review and TAC process
- Coronagraph Instrument Observation Planning, Science Data Processing, Calibration, Science Operations, Community Support
- Microlensing High Level Science Data Processing, Alerting, Calibration, Planning and Coordination, Community Support

WFIRST Science Preparatory Activities
https://wfirst.ipac.caltech.edu/

WFIRST
WIDE-FIELD INFRARED SURVEY TELESCOPE
DARK ENERGY • EXOPLANETS • ASTROPHYSICS

WFIRST *at IPAC*
Wide-Field Infrared Survey Telescope

HOME | NEWS | SCIENCE | DOCUMENTS | SIMULATIONS | COMMUNITY | PUBLICATIONS | CONTACT

IPAC will partner with Goddard Space Flight Center and the Space Telescope Science Institute to provide the Science Center functions for WFIRST. The WFIRST mission is currently in a NASA Pre-formulation phase. This web site describes IPAC's current role in developing and curating telescope instrument and simulation efforts, as well as engaging the greater scientific community in preparing for the science of WFIRST.

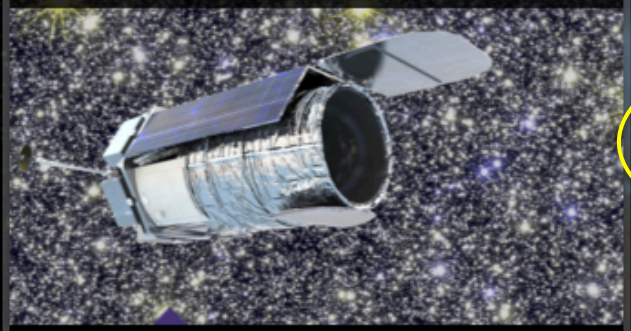
Recent Site Updates

- Jan. 19 2016 — AAS227 WFIRST Splinter Session talks
- Dec. 18 2015 — Cahoy et al. 2010 CGI albedo sim. data
- Oct. 15 2015 — Hirata wfGSETC exposure time calculator

Important Dates

- Feb. 29 - Mar. 2 2016 — Community Astrophysics with WFIRST (Early registration deadline is Jan. 31)

NASA annouces the selection of Science Investigation Teams for WFIRST. See the investigation summaries (PDF).
December 18 2015



News → 1 2 | Images → 1 2 3 4 5

Simulations Quick Links (Overview)

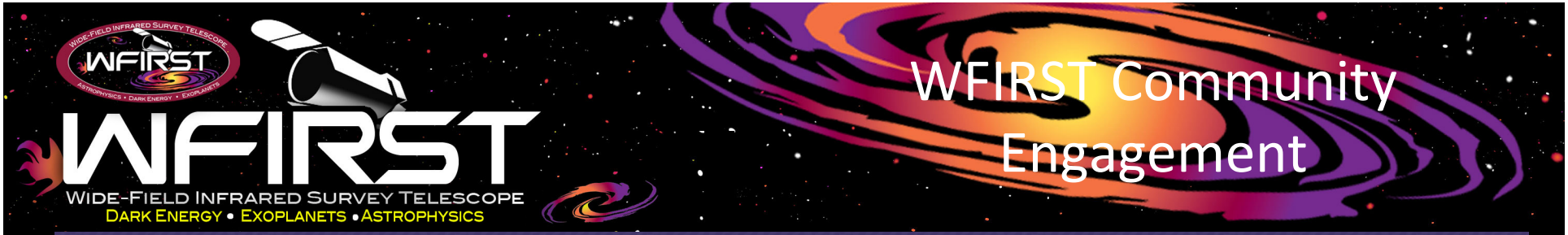
- Spacecraft & Instrument Parameters
- Exposure Time Calculators
- Simulations by Instrument
- Simulation Code
- Analysis Tools
- Simulations by Science Topic

Community Engagement (Overview)

- Workshops and Meetings
- Preparatory Science

External Links

- WFIRST study page at GSFC
- WFIRST science page at JPL
- WFIRST at STScI



Workshops and Meetings Focused on WFIRST

Upcoming Workshops and Meetings

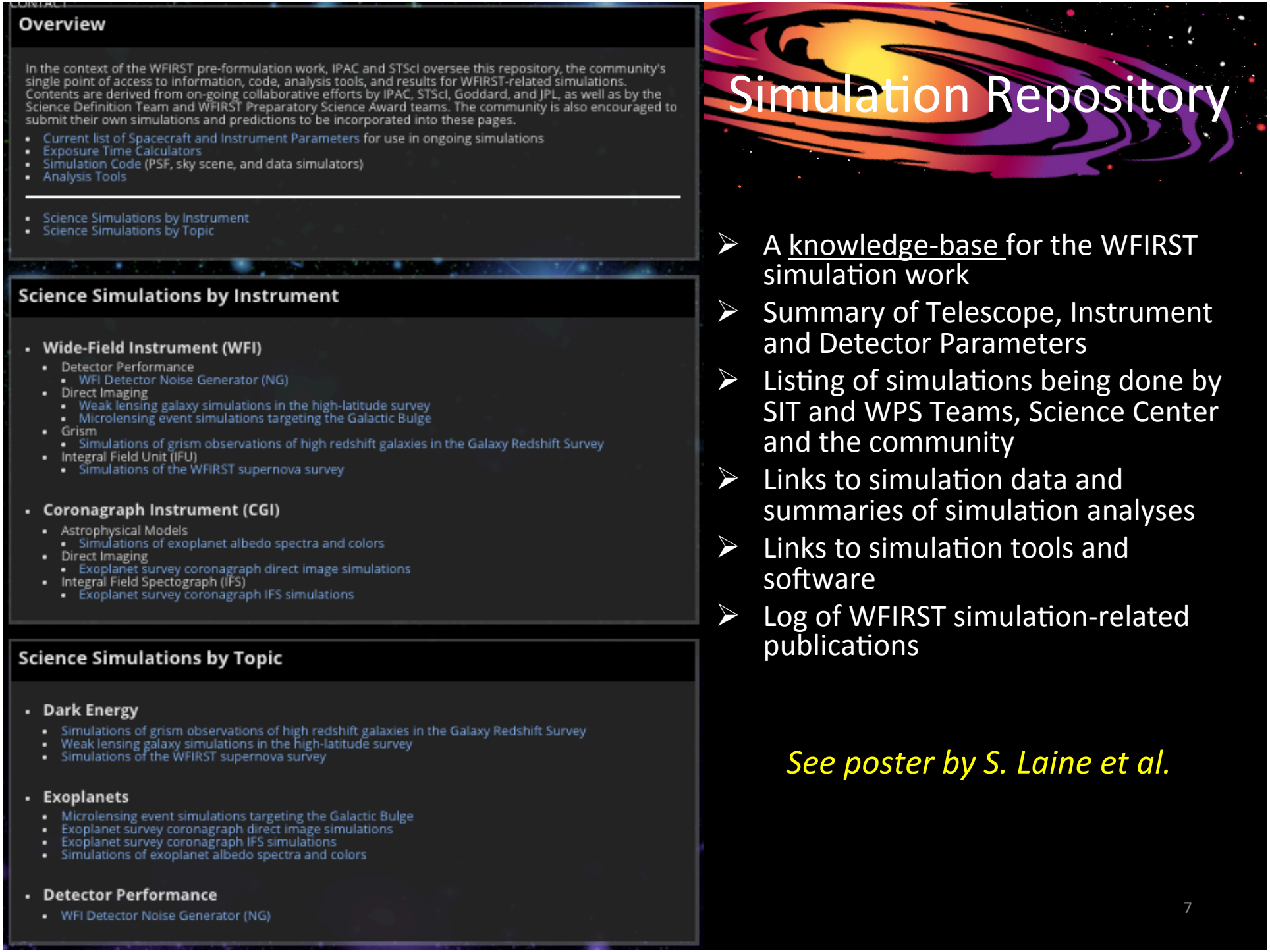
- Community Astrophysics with WFIRST: Guest Observer and Archival Science - 29 Feb - 3 Mar 2016

Past Workshops and Meetings

- Splinter Session at the 227th AAS Meeting: Science with WFIRST - 4 January 2016
- Splinter Session at the IAU XXIX General Assembly: Science with WFIRST - 9 August 2015
- Mocking the Universe - 27-29 July 2015
- Wide-field InfraRed Surveys: Science and Techniques - Nov. 2014
- 2014 Sagan Exoplanet Summer Workshop 'Imaging Planets and Disks' - July 2014
  - Talk: The WFIRST-AFTA Coronagraph - Macintosh
- 221th AAS WFIRST Splinter Meeting - Jan. 2013
- 2012 SPIE meeting - July 2012
- 220th AAS WFIRST Meeting-in-a-Meeting - June 2012
- Science with a Wide-field Infrared Telescope in SpacE & The 16th International Conference on Gravitational Microlensing - Feb. 2012
- 217th AAS meeting - Jan 2011
- 2011 Sagan Exoplanet Summer Workshop 'Exploring Exoplanets with Microlensing' - July 2011
  - Talk: WFIRST and Euclid - Rhodes

Ongoing Community Engagement

- July 2016 Sagan Exoplanet Summer Workshop in Pasadena
  - *Is There a Planet in My Data? Statistical Approaches to Finding and Characterizing Planets in Astronomical Data* (http://nexsci.caltech.edu/workshop/2016/)
- Late 2016 – GREAT4 Data Challenge Workshop in Pasadena
  - *Shape Measurements for Stage IV Dark Energy Surveys*
- Spring 2017 – 21st Annual Microlensing Workshop in Pasadena
  - Focus on space-based observations with Spitzer, K2 and WFIRST
- WFIRST Conferences and workshops in Baltimore (see talk by R. van der Marel)
- Dedicated WFIRST sessions and splinter meetings at upcoming AAS meetings

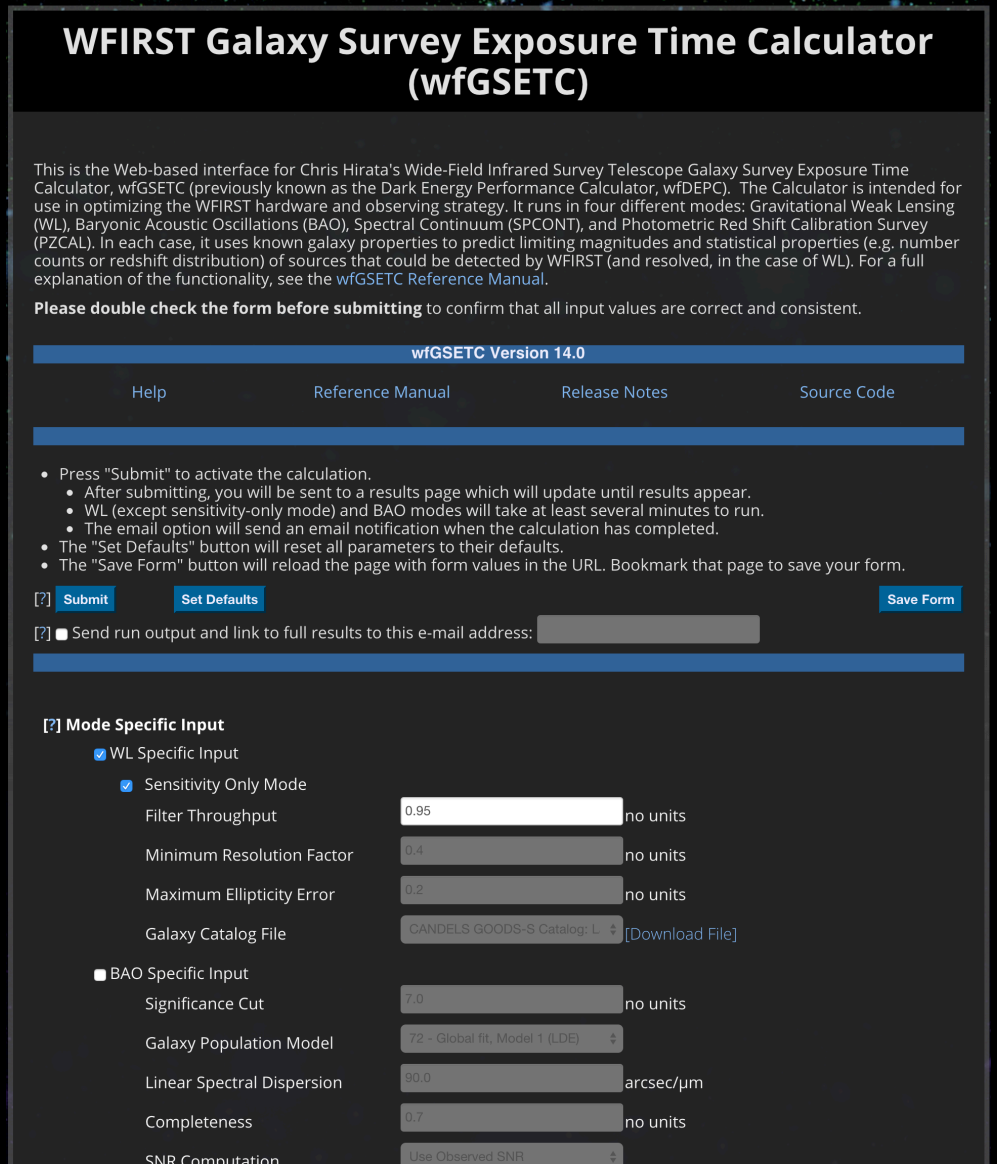


Simulation Repository

- A knowledge-base for the WFIRST simulation work
- Summary of Telescope, Instrument and Detector Parameters
- Listing of simulations being done by SIT and WPS Teams, Science Center and the community
- Links to simulation data and summaries of simulation analyses
- Links to simulation tools and software
- Log of WFIRST simulation-related publications

See poster by S. Laine et al.

Web Interface for C. Hirata's Galaxy Survey Exposure Time Caluculator



WFIRST Galaxy Survey Exposure Time Calculator (wfGSETC)

This is the Web-based interface for Chris Hirata's Wide-Field Infrared Survey Telescope Galaxy Survey Exposure Time Calculator, wfGSETC (previously known as the Dark Energy Performance Calculator, wfDEPC). The Calculator is intended for use in optimizing the WFIRST hardware and observing strategy. It runs in four different modes: Gravitational Weak Lensing (WL), Baryonic Acoustic Oscillations (BAO), Spectral Continuum (SPCONT), and Photometric Red Shift Calibration Survey (PZCAL). In each case, it uses known galaxy properties to predict limiting magnitudes and statistical properties (e.g. number counts or redshift distribution) of sources that could be detected by WFIRST (and resolved, in the case of WL). For a full explanation of the functionality, see the wfGSETC Reference Manual.

Please double check the form before submitting to confirm that all input values are correct and consistent.

wfGSETC Version 14.0

Help | Reference Manual | Release Notes | Source Code

- Press "Submit" to activate the calculation.
  - After submitting, you will be sent to a results page which will update until results appear.
  - WL (except sensitivity-only mode) and BAO modes will take at least several minutes to run.
  - The email option will send an email notification when the calculation has completed.
- The "Set Defaults" button will reset all parameters to their defaults.
- The "Save Form" button will reload the page with form values in the URL. Bookmark that page to save your form.

[?] Submit Set Defaults Save Form

[?] Send run output and link to full results to this e-mail address:

[?] Mode Specific Input

WL Specific Input

Sensitivity Only Mode

Filter Throughput	0.95	no units
Minimum Resolution Factor	0.4	no units
Maximum Ellipticity Error	0.2	no units
Galaxy Catalog File	CANDELS GOODS-S Catalog: L	[Download File]

BAO Specific Input

Significance Cut	7.0	no units
Galaxy Population Model	72 - Global fit, Model 1 (LDE)	
Linear Spectral Dispersion	90.0	arcsec/μm
Completeness	0.7	no units
SNR Computation	Use Observed SNR	

Simulation Support Activities during Phase A

- Maintain up-to-date Instrument Parameter Database
  - Add expected CGI performance guidelines
- Maintain Simulation Repository and Simulation Tools
  - **Please notify us about your simulation plans, data and publications**
- Advanced GRISM simulations to support end-to-end error budget and operations development (see talk by J. Colbert)
- Work towards common instrument simulators that can be used by the general community, with focus on CGI

Planning for Community Science Proposal Preparation

- Interact with the WFIRST GO/GI community to collect information about what observation planning and proposal preparation tools are needed
  - *e.g.* at conferences like this one, and through interaction with GO/GI representative SIT teams
- Make sure that community knows that all WFIRST instruments and capabilities are available for GO programs, especially the coronagraph
  - Communicate instrument capabilities
- Determine early if additional observing modes beyond those currently planned are important so the project and FSWG can consider adding them them
  - *e.g.* parallel WFI/CGI modes
- Leverage best practices and experience from operating Great Observatory and other GO programs
  - *e.g.* Simple tool for combined proposal input and AOR design

Phase A Activities – 1

- Science Centers are working closely with FSWG, SITs, WPS Teams
  - Science Center Leads are *ex officio* members of the FSWG
  - Science Center liaisons have been assigned to each SIT team and to each WPS focus group
- Mission Science Requirements – provide support to the Project, FSWG and SITS as they develop Science Requirements, with focus on Microlensing and Coronagraph Science and Operations
- Science Center Requirements – solicit input from FSWG, SITs and community to help us define:
  - Scope and degree of data processing required for each instrument/ observing mode
  - Data products required to support core surveys and GO science
  - Data processing/archiving latency requirements (*e.g.* microlensing event detection/alerting)
  - Overall data management plan

Phase A Activities – 2

- Develop Science Center Implementation Plan
  - Tasks plan, schedule and cost of development and operation of Science Center activities
- Work with Project Office, FSWG and SIT Teams to:
  - Refine Instrument and Survey Operations Concepts
  - Develop and test data processing/analysis algorithms
  - Develop prototype analysis pipelines to support science and system testing
  - Begin definition of ground, IOC and Science Verification test plans
- Work with FSWG and CGI Instrument Team to make Coronagraph accessible to the broadest possible community
  - Identify processing needs for variety of science objectives
  - Post-processing algorithms, tools

- We look forward to a long-term collaboration with the WFIRST Project and Science Community to plan for successful and efficient WFIRST Science Operations