



Lynx Mission Concept Overview

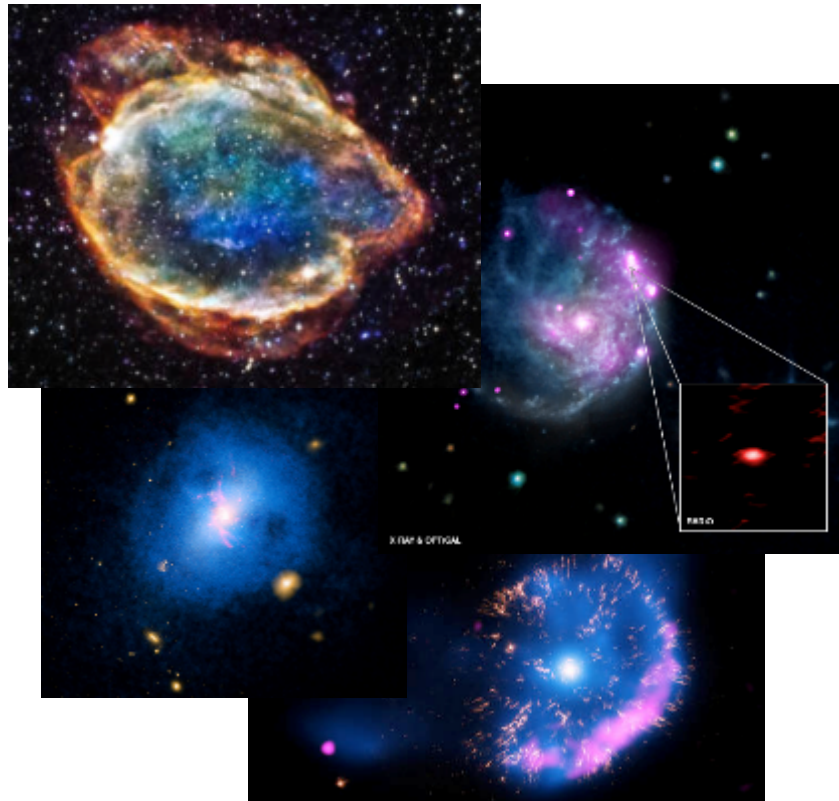
Lynx Industry Day

MSFC Advanced Concepts Office
May 22, 2017



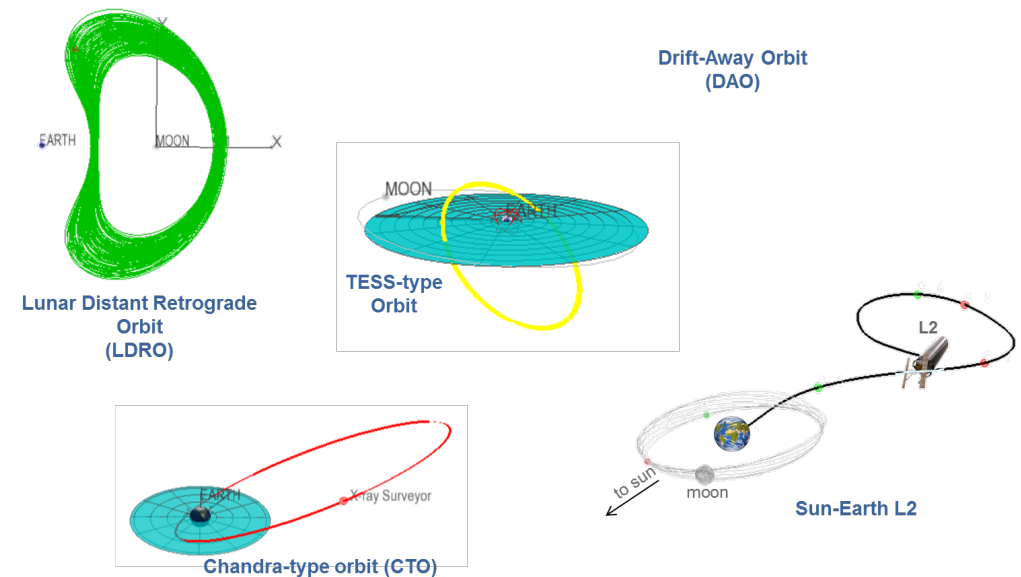
What is the Lynx Mission?

Similar to Chandra, Lynx will observe X-ray sources throughout the cosmos and help scientists learn about the processes that govern stellar and cosmic evolution.

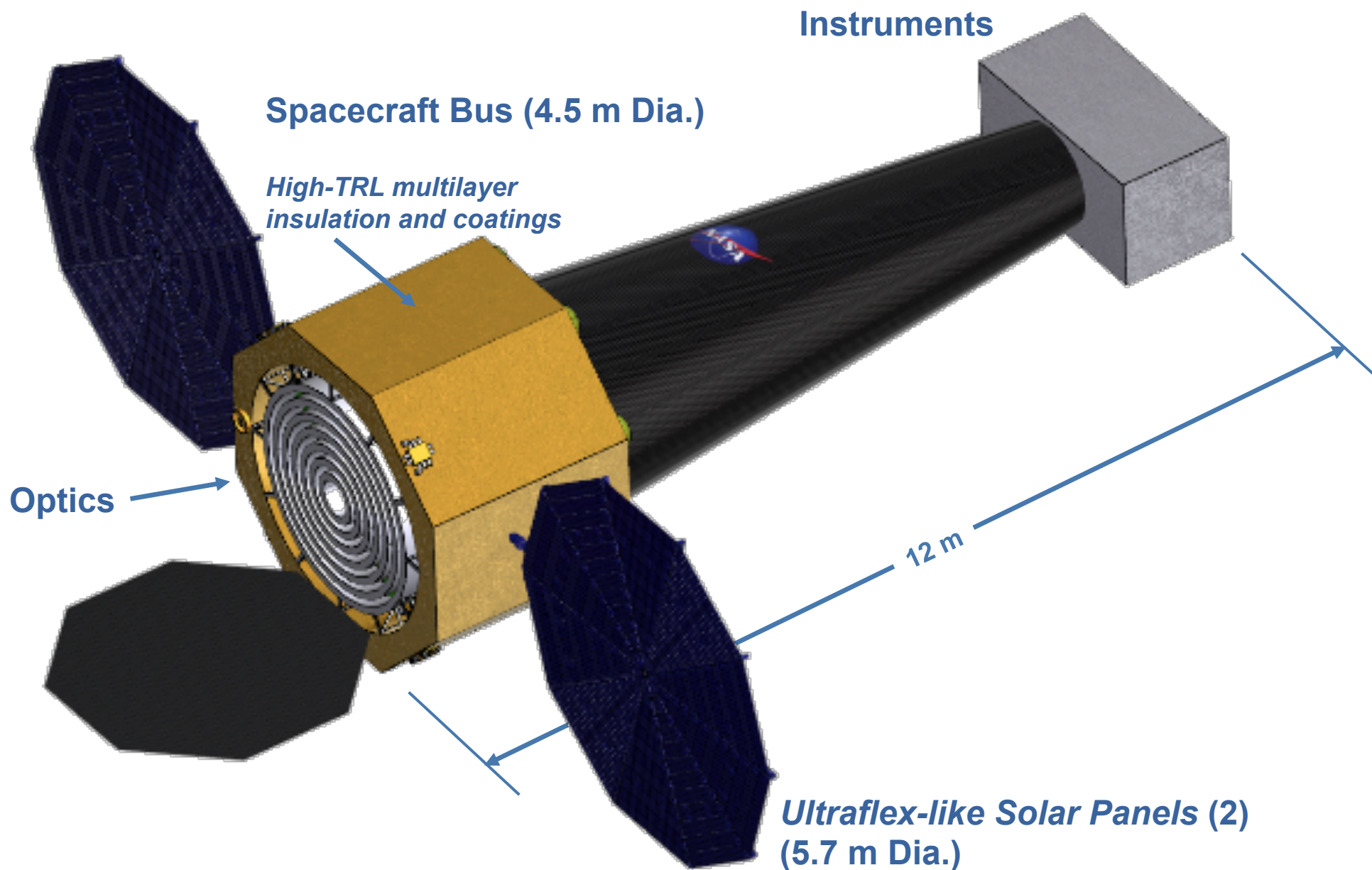


Mission Description

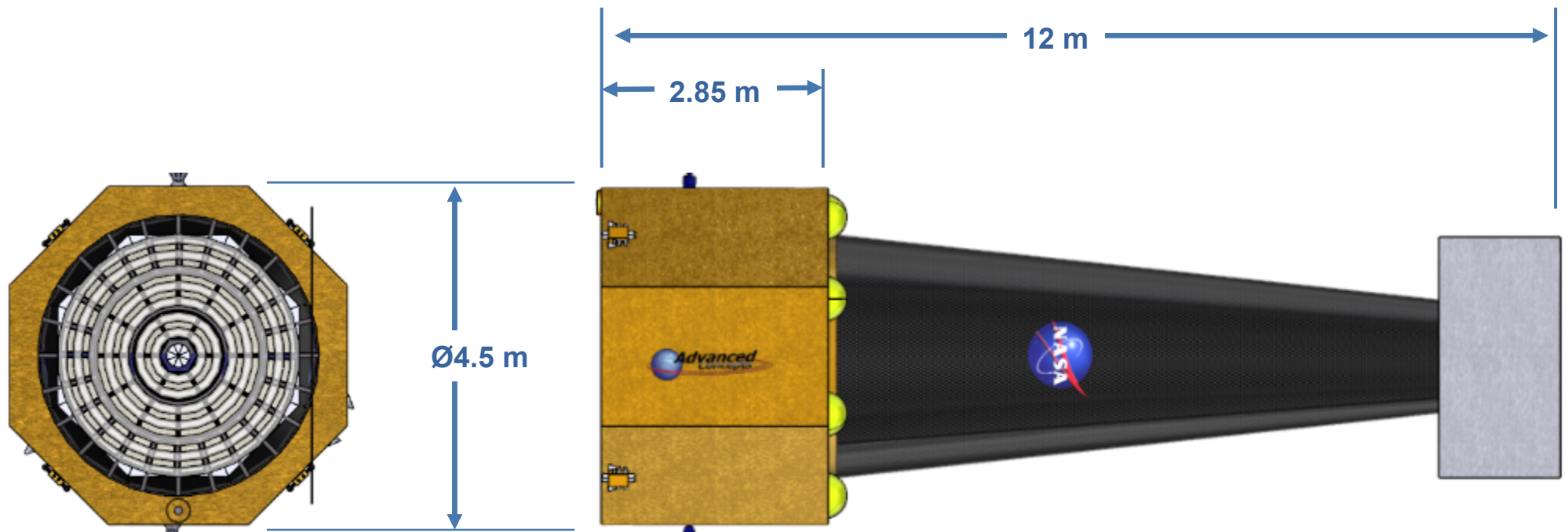
Launch	2030
Orbit	Several Options to be Evaluated
Duration	5 years (20 years consumables)

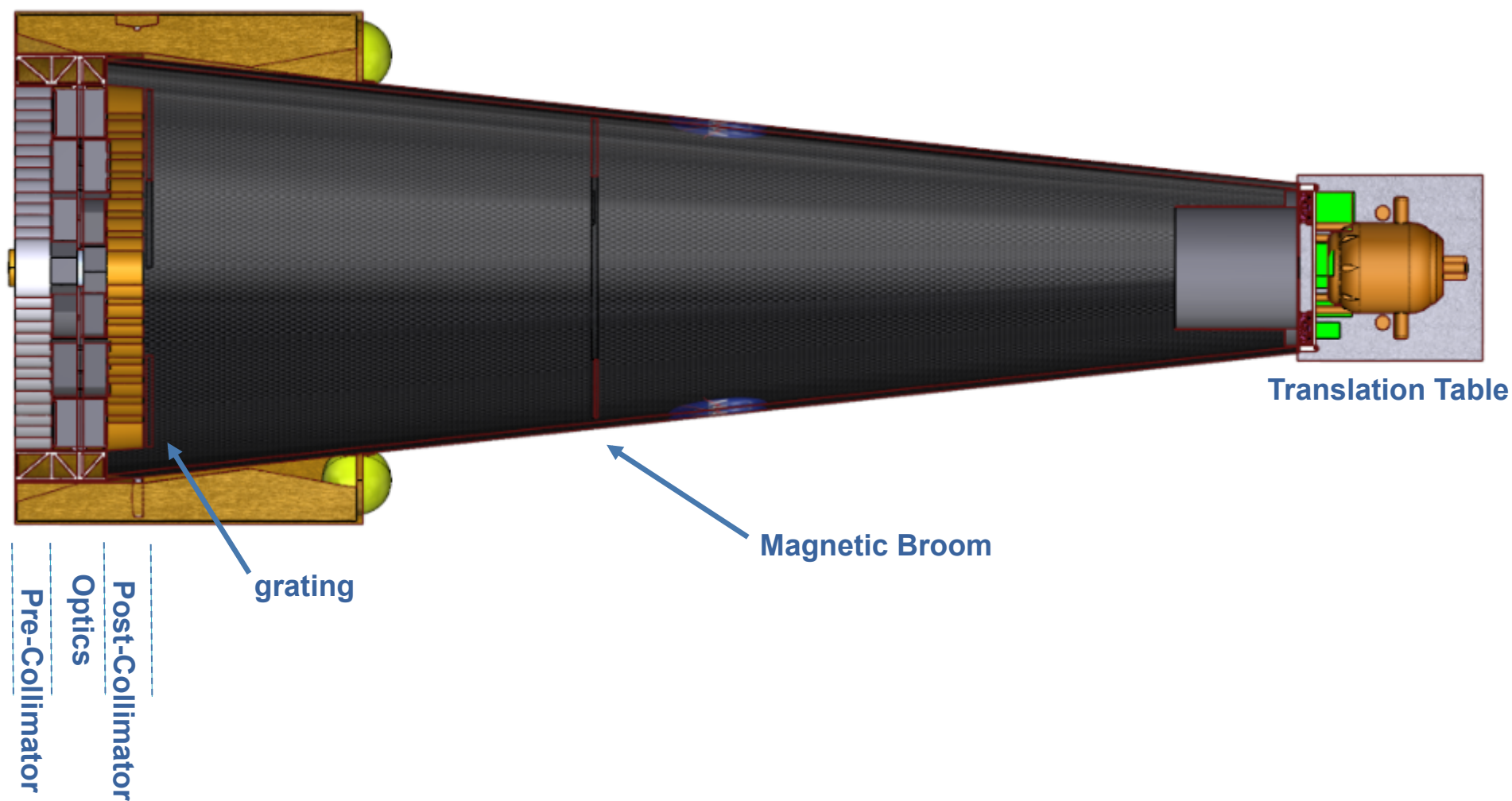


Configuration – 2015 Study

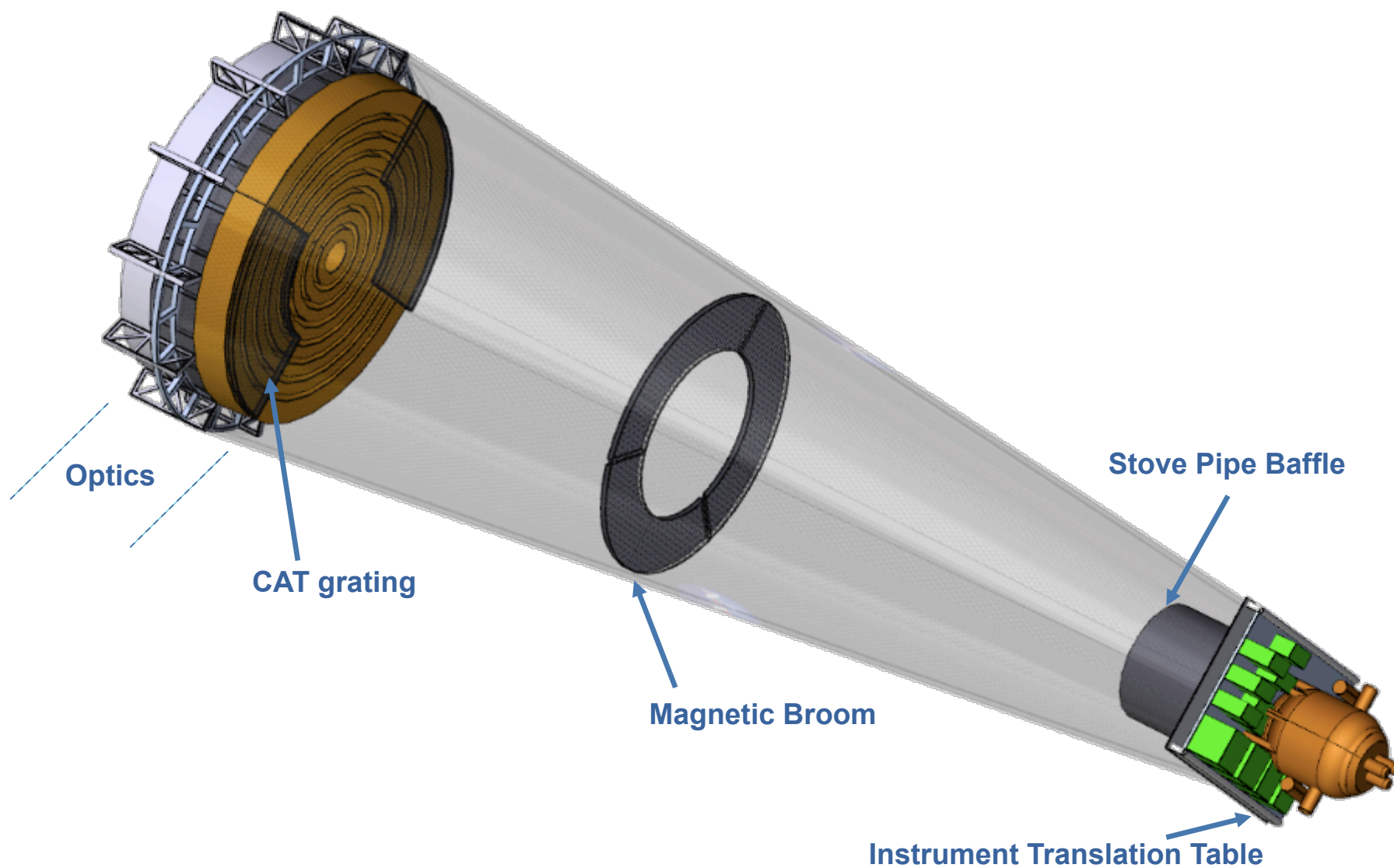


Configuration – 2015 Study

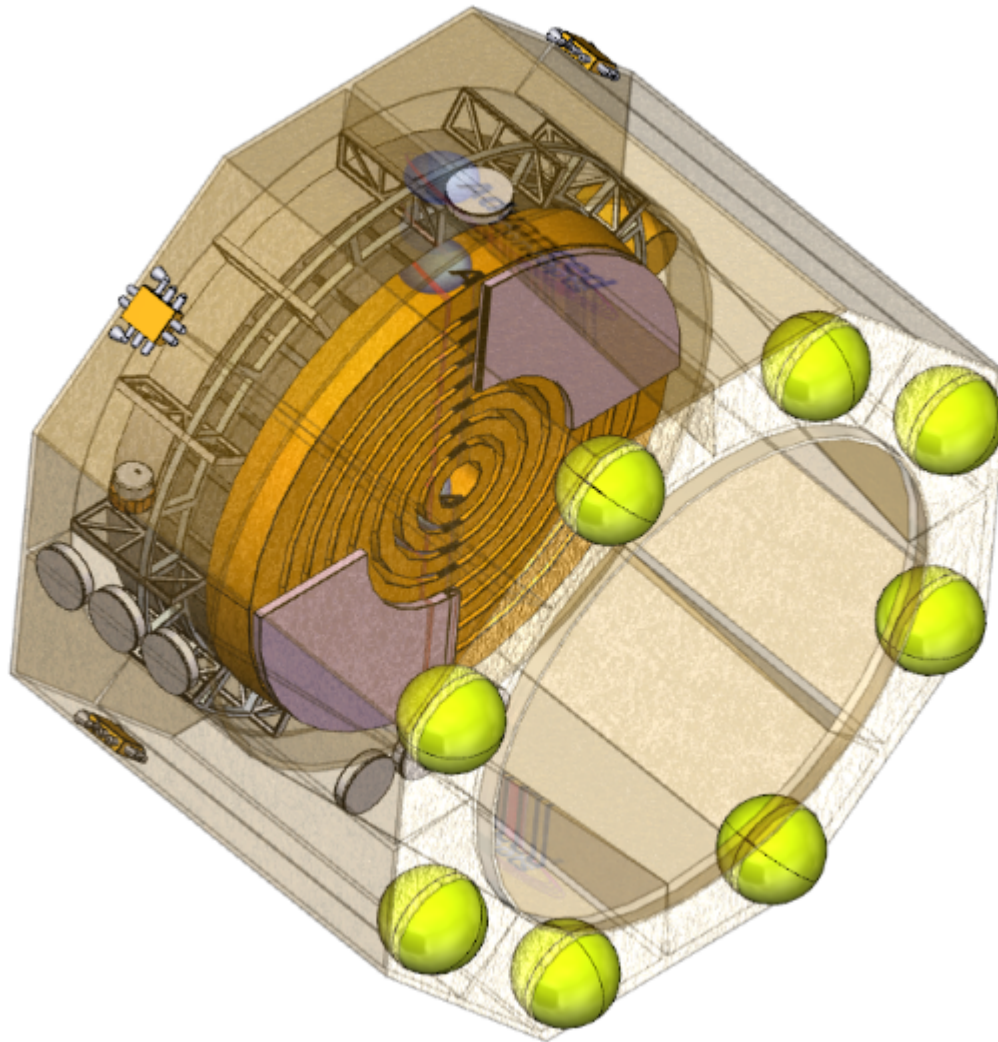




Internal Configuration – 2015 Study



Bus Configuration – 2015 Study

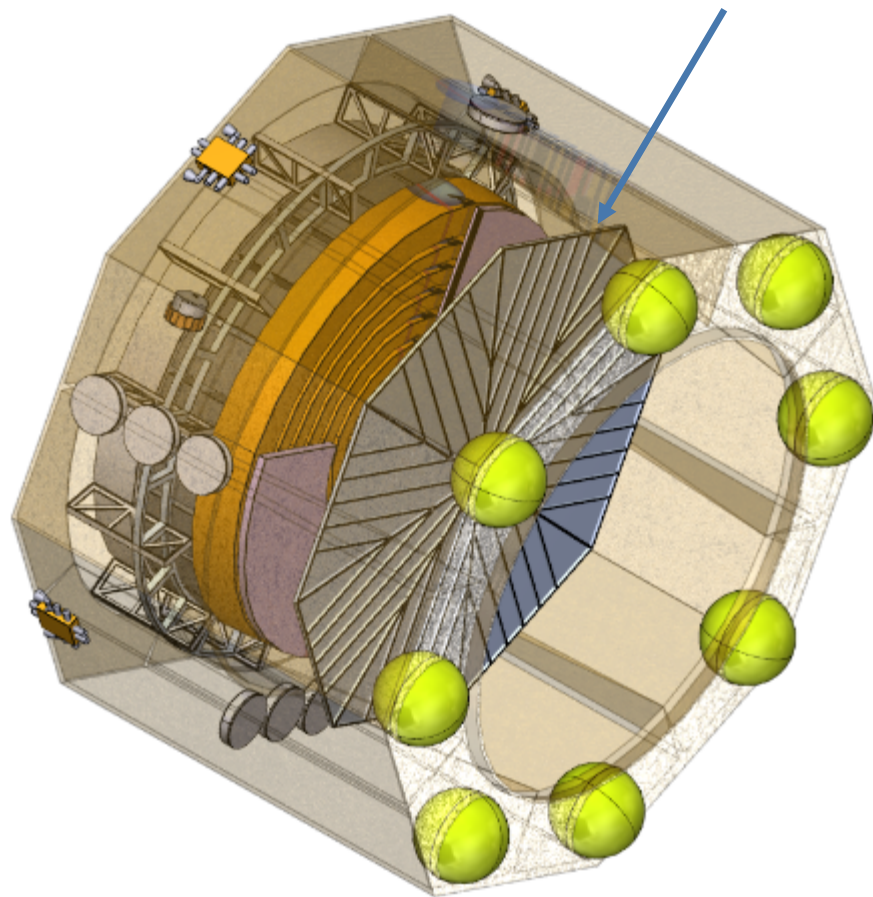


Custom spacecraft bus

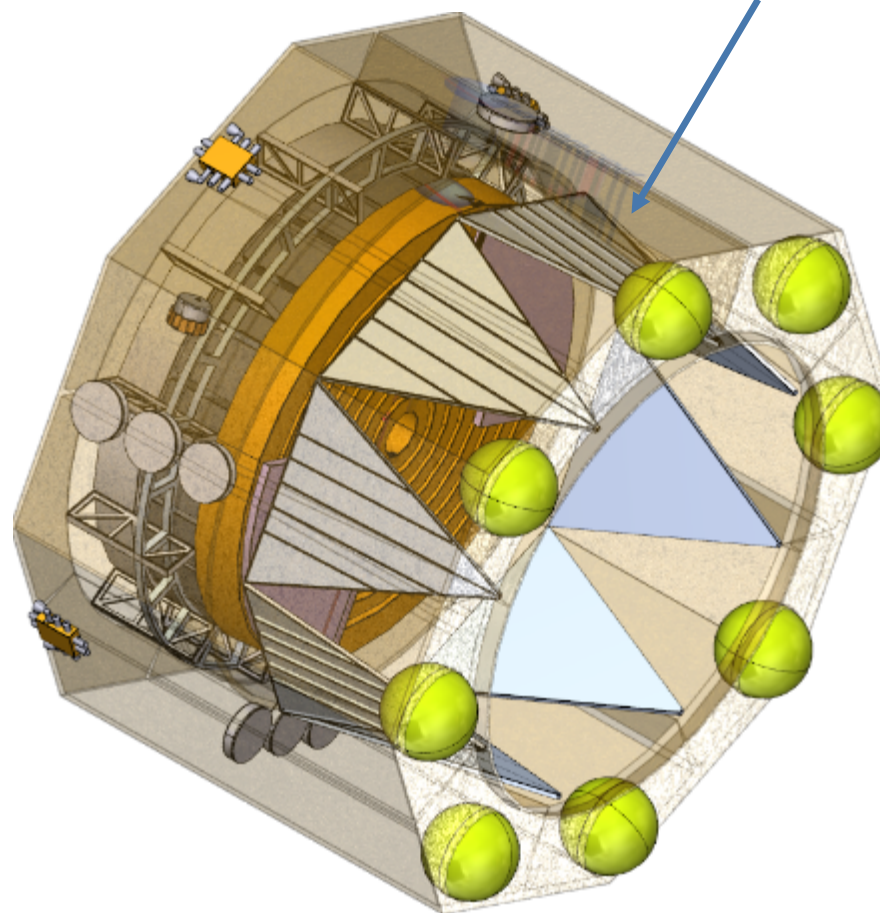
- *COTS mono-prop propellant propulsion system*
- *COTS Reaction wheels and isolation system*
- *High-TRL mechanisms*
- *High-TRL communications system*
- *High-TRL command and data handling system*

Bus Configuration – 2015 Study

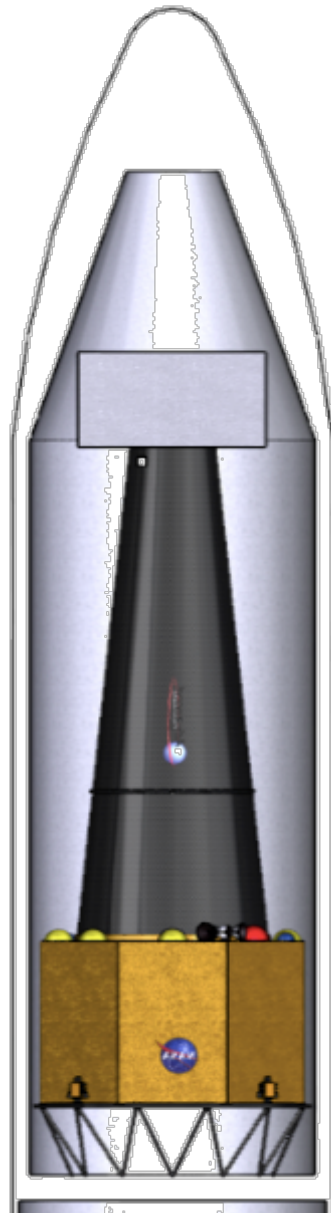
Aft door closed



Aft door open



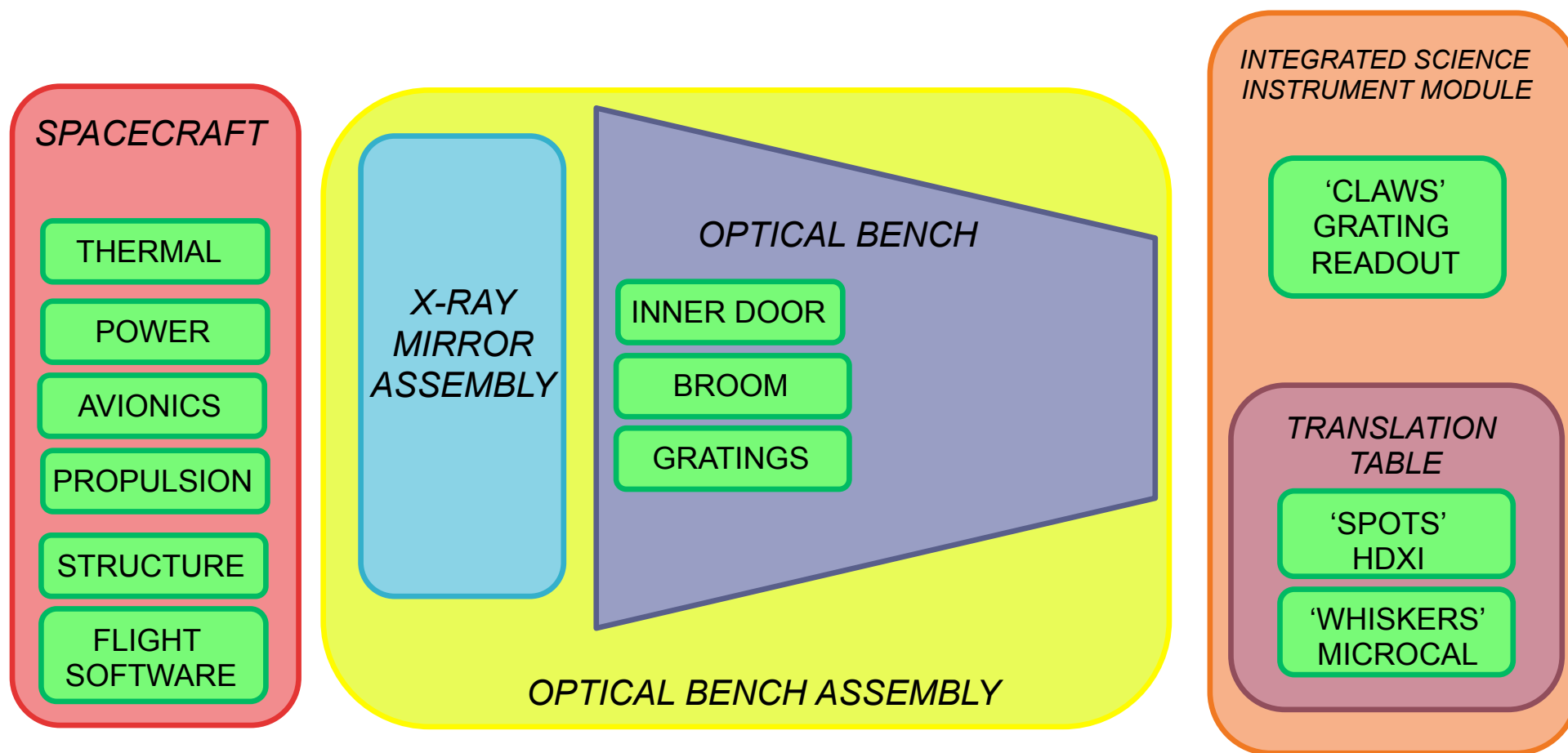
Launch Configuration – 2015 Study



5m Launch Shroud

- *Several launch vehicle options under consideration*
- *Custom payload adapter may be necessary*

Lynx Spacecraft Interface Diagram



Starting Assumptions

1.0	Property	Value
General GR&A	Mission	X-Ray Telescope
	Orbit	Study Output
	Mission Duration	Five years, with 20 years of consumables
	Maximum Time from Launch to Full Capability	Assume 90 min
	Risk Class	Class B
	Servicing interval	Assume no servicing
	Fault Tolerance	Single Fault
	Configuration	'Similar' to Chandra
	Instrument Location	Study Output
	Payload Envelope	Tied to launch vehicle
	Mass allocation	Study Output

Starting and Assumptions

2.0	Property	Value
Mission Analysis GR&A	Orbit	SE-L2 halo (JWST-like), TESS type orbit, LDRO.
	Maximum eclipse period	If SE-L2 is chosen, will use value from LUVOIR/JWST; for TESS or LDRO, will calculate.
	Delta-V Margin	10% on deterministic maneuvers; 25% on all others
	End-of-life disposal	Will perform maneuvers to meet NASA standards for limiting risk of orbital debris as necessary. Will include maneuver to force observatory into safe disposal at end of mission.
	Risk of Human Casualty/EOL Disposal	If atmospheric reentry is required for EOL disposal, we will assume that a controlled reentry is required. No analysis is needed.
	Ground station contact times	Will be determined using STK.
	Orbit Lifetime	20 years

FY16-17 Lynx Concept Study Plans

Task	FY16		FY17											
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Study Schedule														
Non-Payload Specific Trade Studies														
Spacecraft Concept Definition														
Instrument Concept Design														
Concept Trades														