Telescope for a Space GW Mission

PI: Jeff Livas/GSFC

Objectives and Key Challenges:

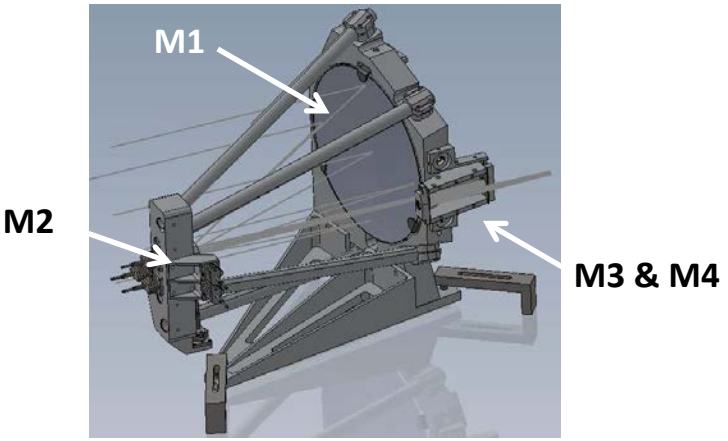
- Establish a complete telescope design meeting optical, mechanical, thermal, and manufacturability NGO requirements for US contribution to L2 mission
- Fabricate and test a prototype

Significance of Work:

Conflicting requirements:

- On-axis design more stable for thermal environment but higher scatter
- Off-axis design lower scatter but more difficult to build (hence expensive)
- Can an on-axis design meet requirements? Or
- Can an off-axis design be manufactured? **YES**

Off-axis Design Prototype in Process



Approach:

- Use SGO-Mid reference and the ESA eLISA
- "Yellow Book" to generate requirements
- L3/SSG for basic design (off-axis SiC recommended)
- Fabricate a prototype from the design
- Verify for compliance with specifications
- **Concentrate on stray light model validation**

Key Collaborators:

- Code 551: Joe Howard/Garrett West/Peter Blake/Len Seals/Ron Shiri/
- Code 543: John Crow/Justin Ward

Current Funded Period of Performance:

- Oct 2012 – Sept 2014
- Oct 2014 – Sept 2015 no cost extension

Recent Accomplishments and Next Milestones:

- Nov 2013: Telescope RFP terminated: no award
- Dec 2013: Simplified telescope model
- Apr 2014: Telescope mirror specs completed
- Jun 2014: Prototype model contract signed
- Oct 2014: Prototype CDR
- Mar 2014: Prototype Telescope delivery to GSFC
- Apr 2014: Prototype Telescope aligned
- Sep 2015: System-level scattered light model validated

Application:

- Flagship gravitational wave missions (eLISA)
- Laser ranging; precision metrology applications
- Laser communications

TRLin = 3 ***TRLcurrent est. by PI = 3*** ***TRLtarget = 3+***