



LISA

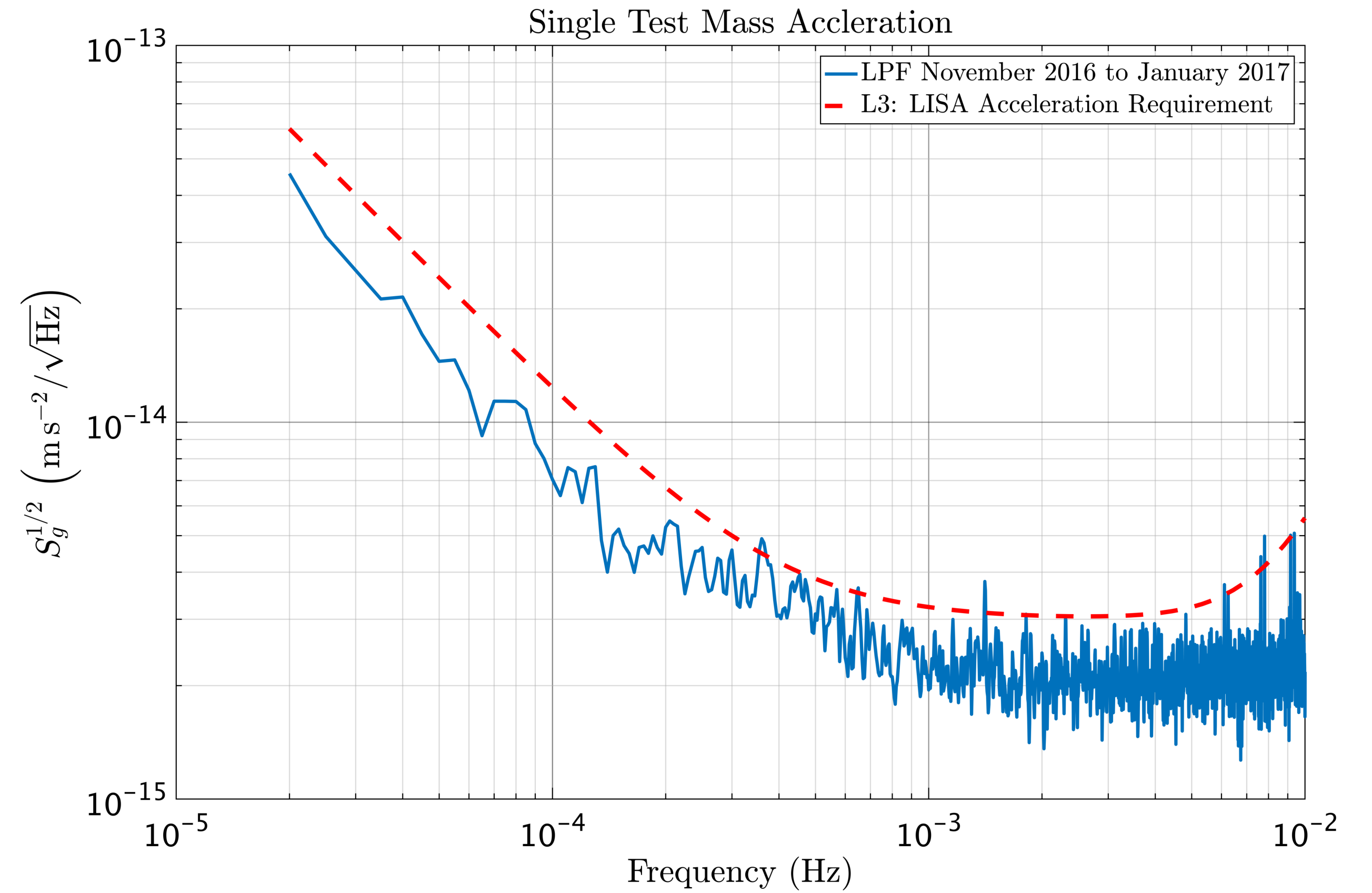
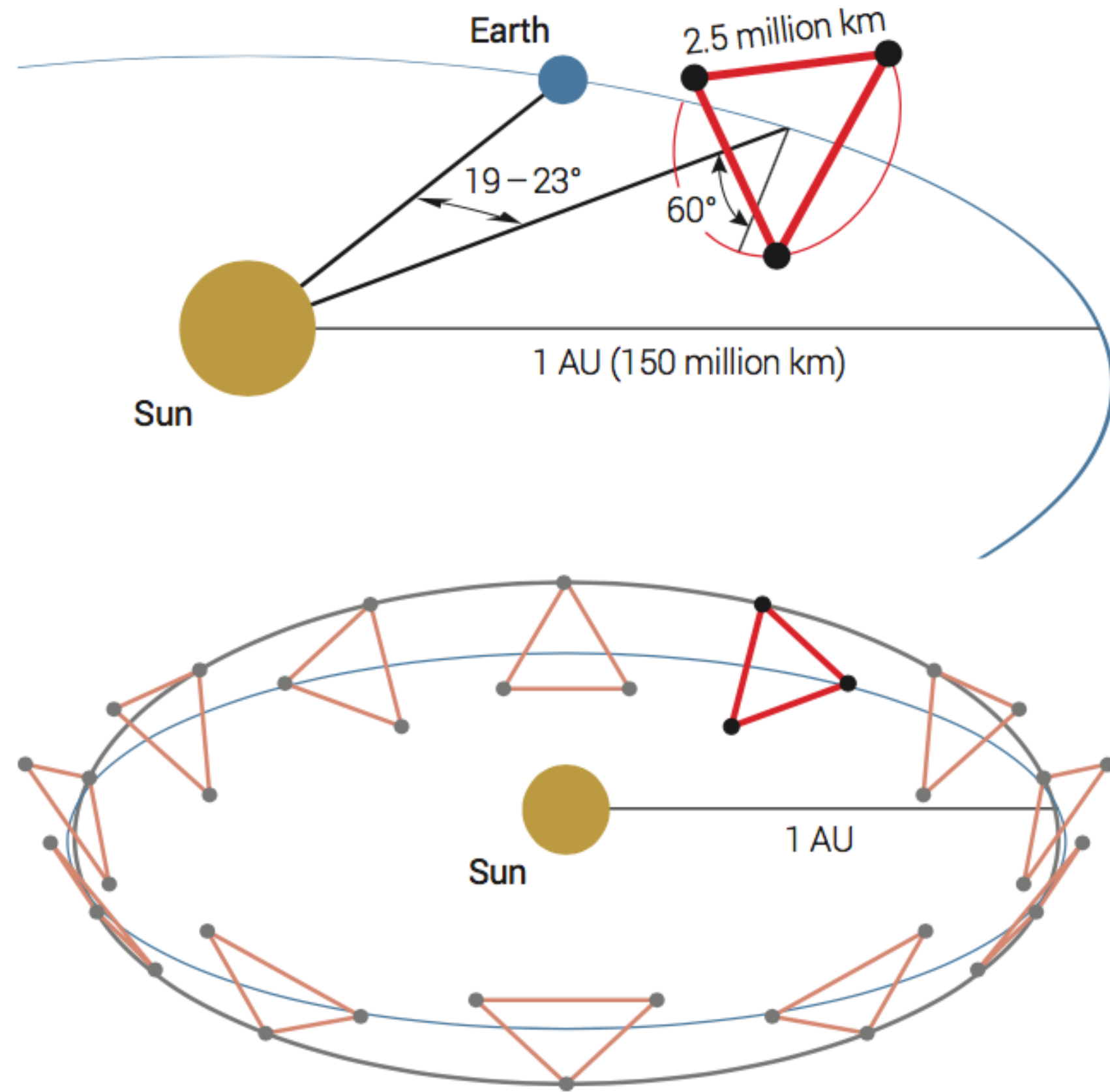
Laser Interferometer Space Antenna

Neil Cornish  
Montana State University

# Summary

- LISA is back!
- ESA-led, NASA as a major partner
- LIGO/Virgo have demonstrated the potential of GWs
- LISA Pathfinder has shown it can be done in space

# LISA Proposal 2017

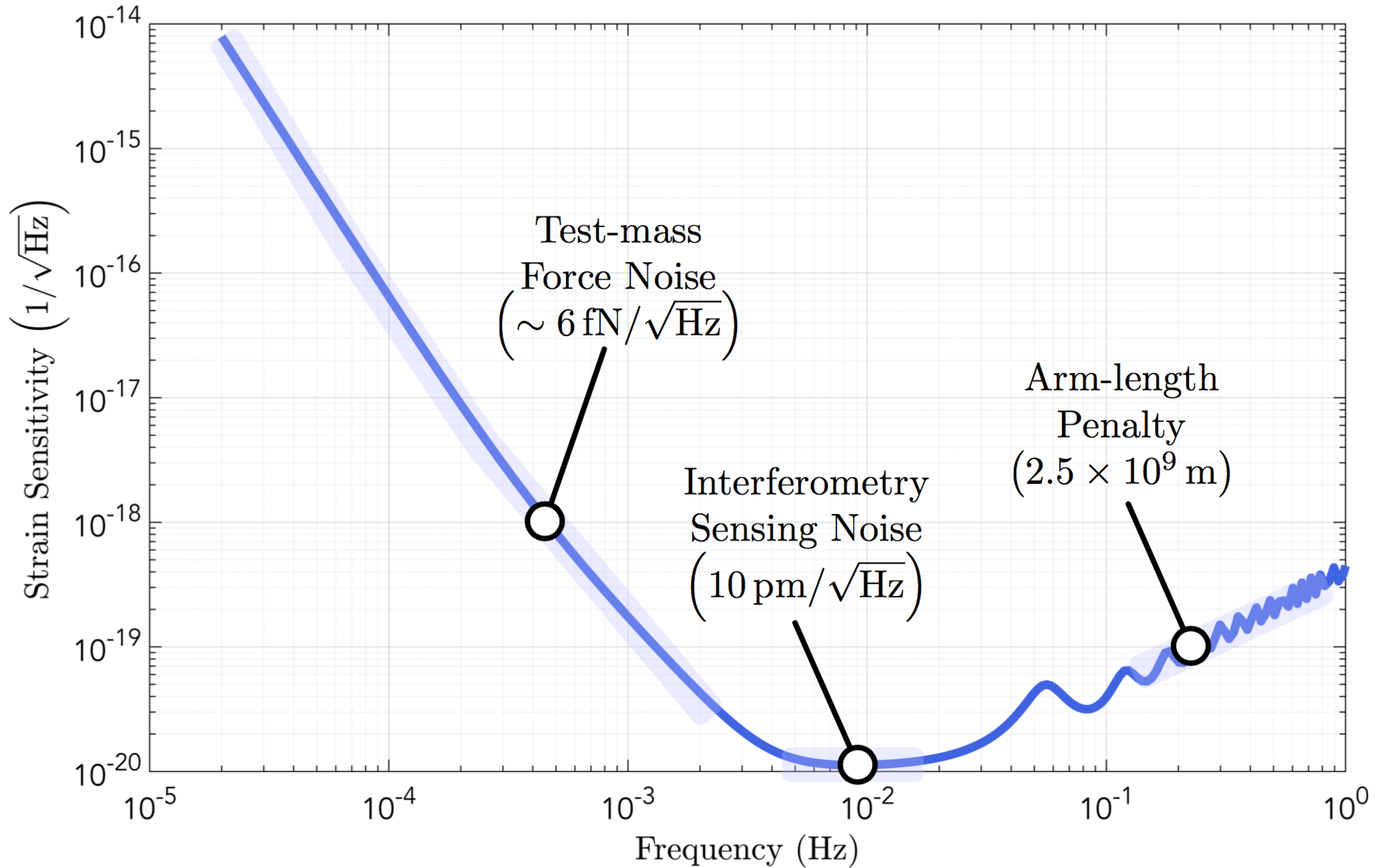


3-arms

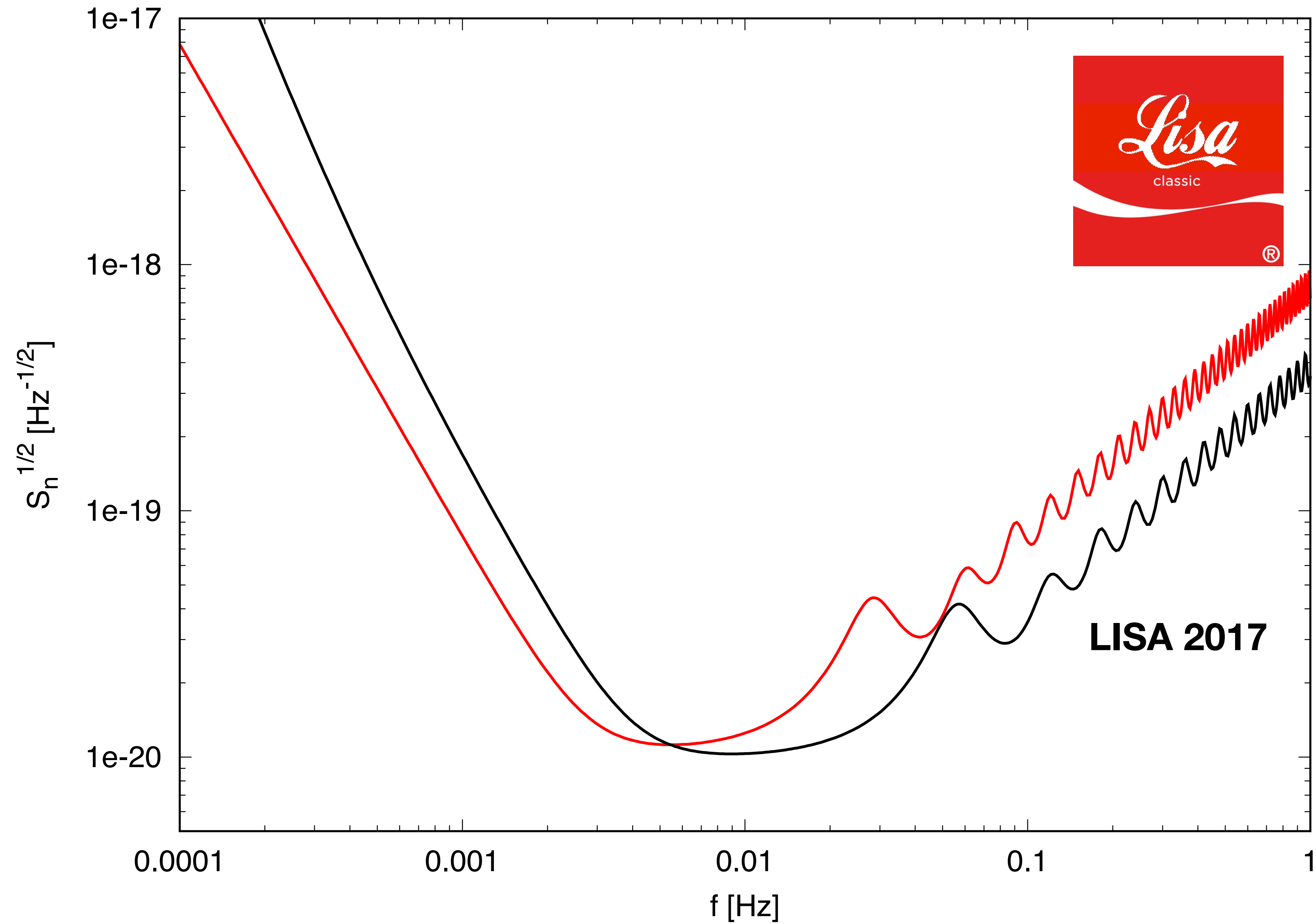
2.5 million km separation

Pathfinder heritage

# LISA sensitivity

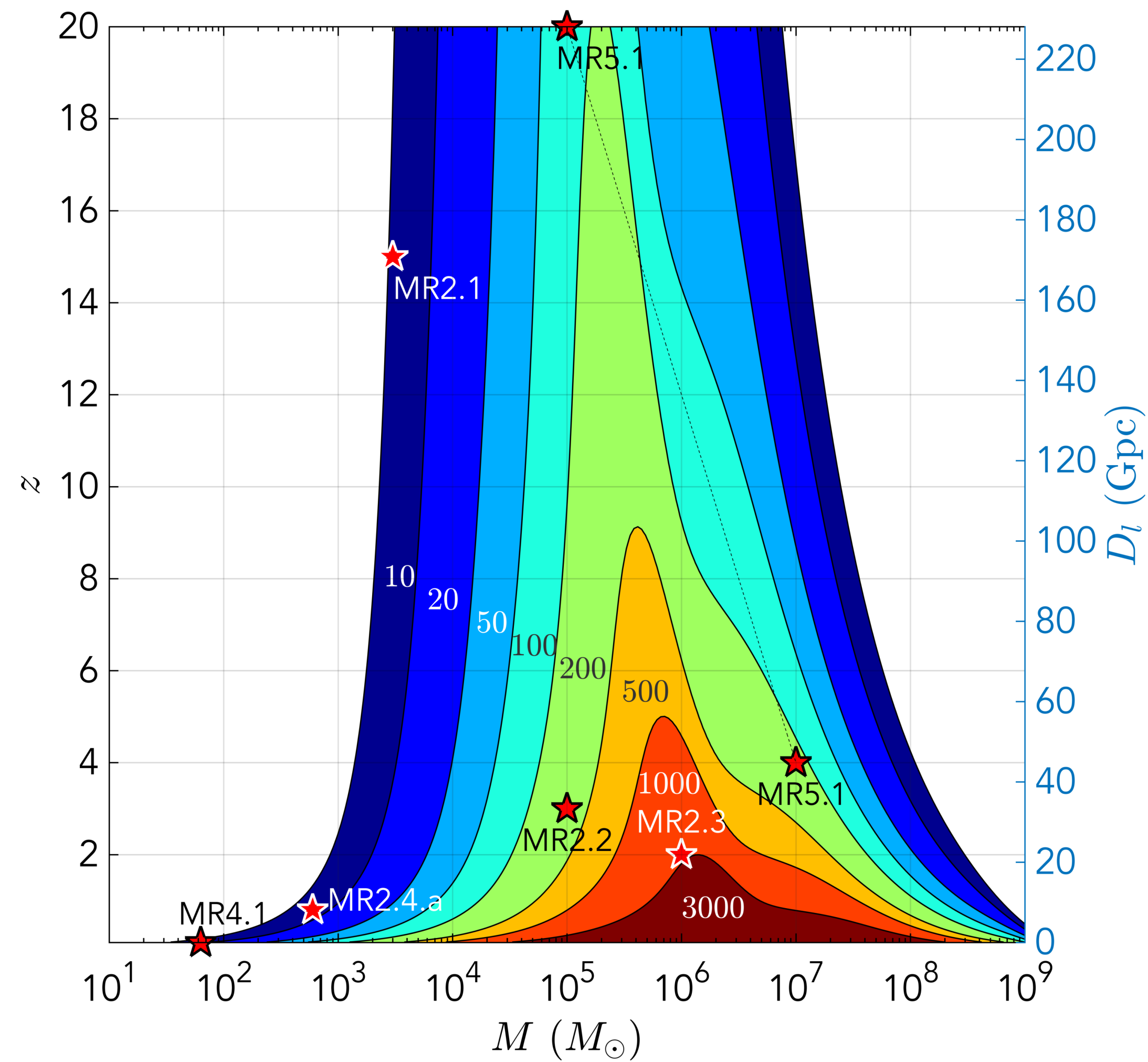
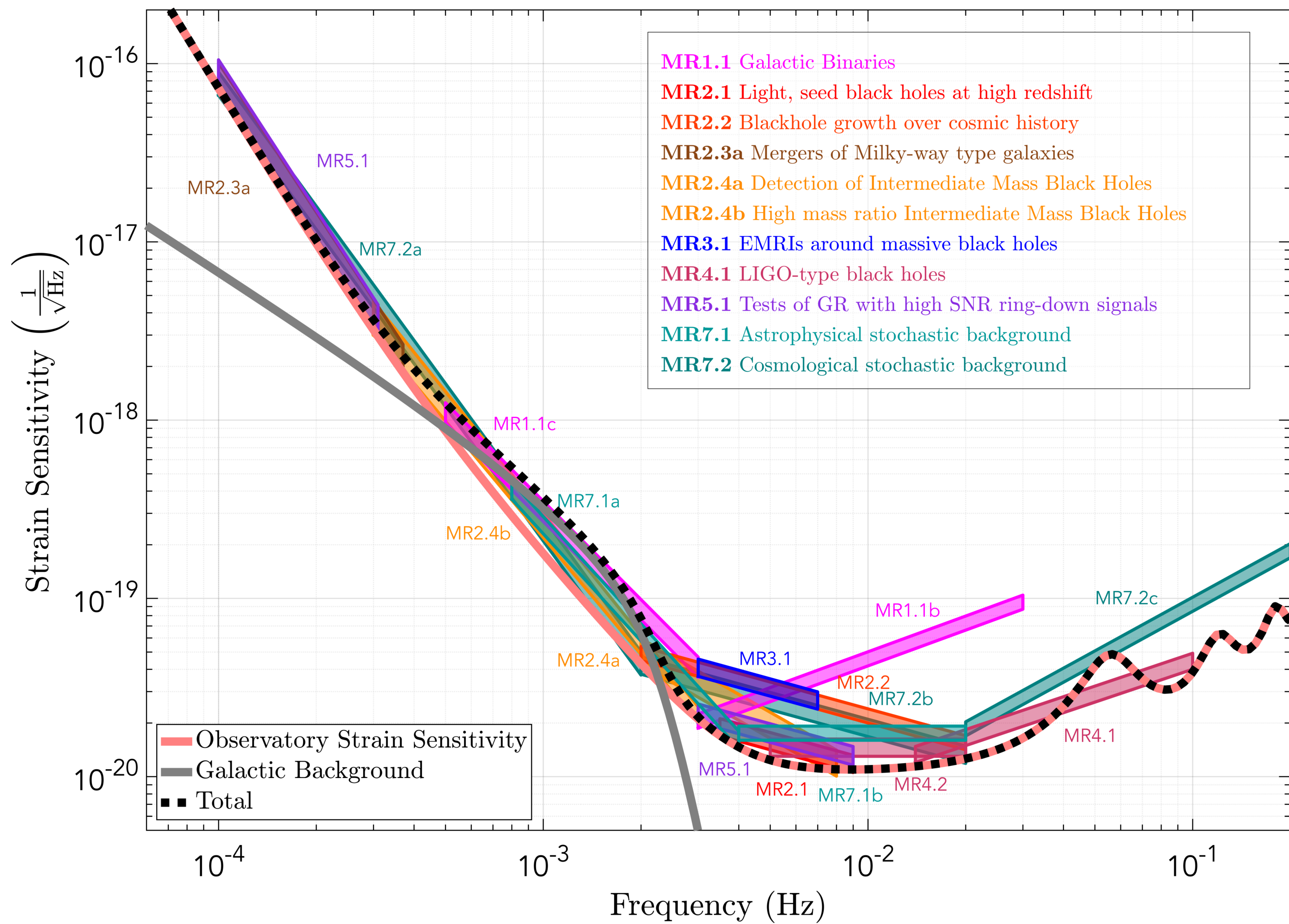


# You win some, you lose some



# LISA science highlights

- Seed Black Hole mergers to  $z > 20$
- Extremely high SNR for SMBH mergers at  $z < 5$  - EM counterparts
- 100's of Extreme Mass Ratio Captures informing galactic cusp structure
- 10,000's Galactic White Dwarf binaries - EM counterparts
- 100's of LIGO progenitors (NS, BH) and precursors (BH-BH)
- Phase transitions at the TeV - PeV scale
- High precision tests of GR (orders of magnitude beyond LIGO)

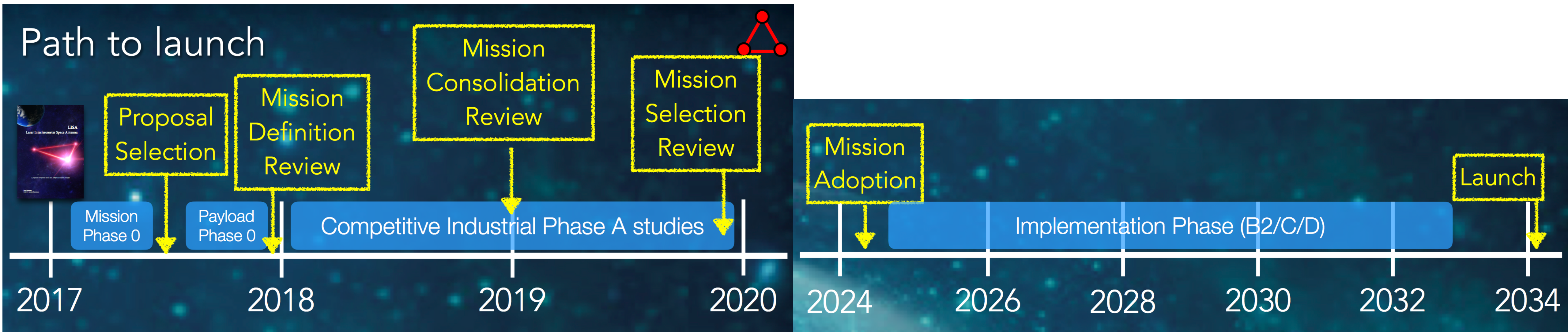


# ESA - NASA Partnership

- ESA led with NASA as an agency partner and “member state”
- NASA has established a LISA Study Office
- Call is out for membership of LISA Study Team (L3ST disbanded)
- NASA studying 7 potential technology contributions (including data analysis)



# Timeline to Launch - Mind the Gap



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