
Interferometer Workshop

Cost Modeling for Arrays

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Interferometer Workshop

Cost Modeling for Arrays

Three Models to Examine

1. Classical Array

- **24 4m Telescopes 1-2.5 micron w AO**
- **1000m baseline**

2. ELT Alternative

- **16 8m Telescopes 1-2.5 micron w AO**
- **100m baseline**

3. 20-20

- **2 20m Telescopes 1-2.5 micron w AO**
- **20m baseline**

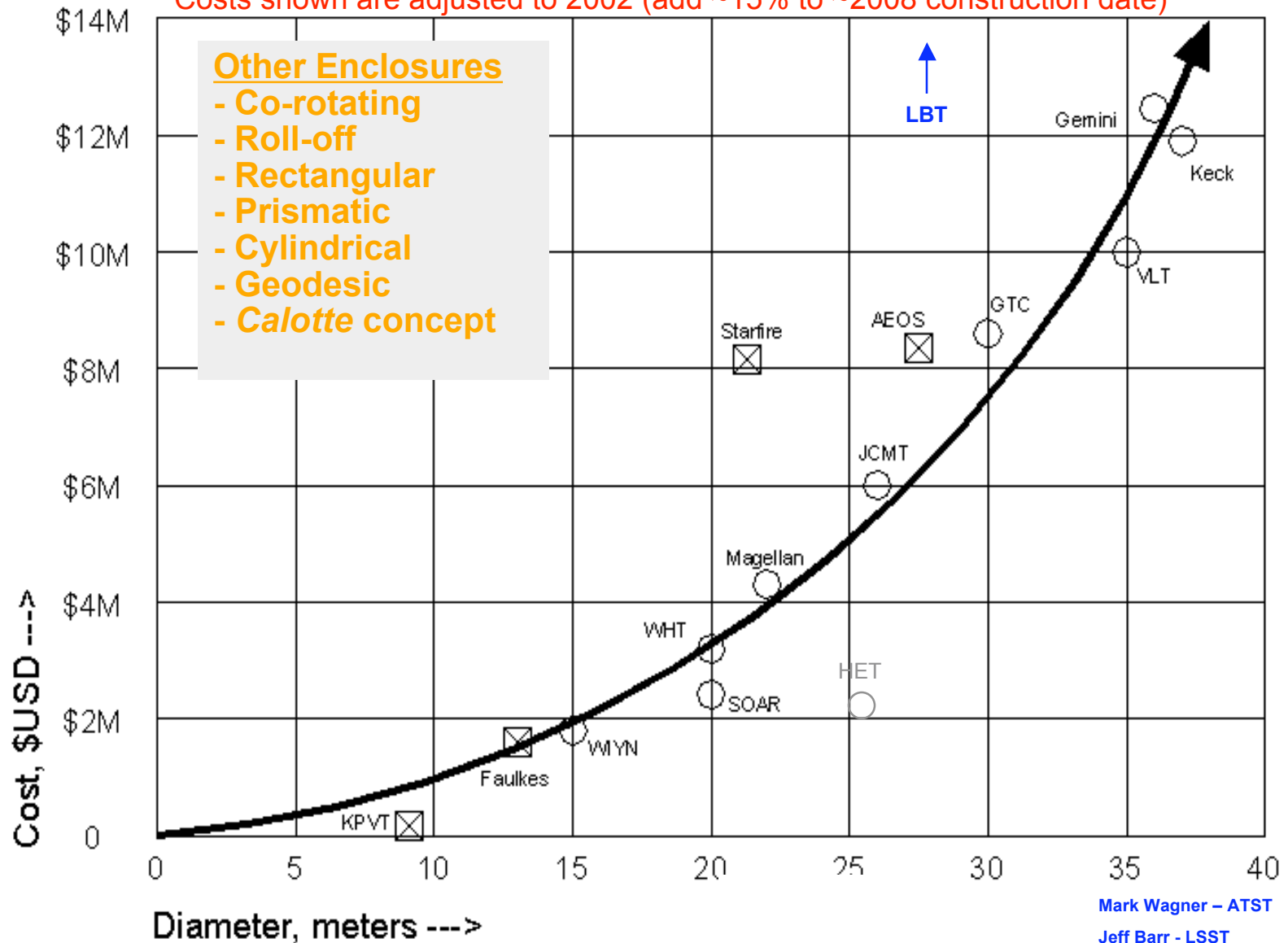
Interferometer Workshop

Costs to Consider

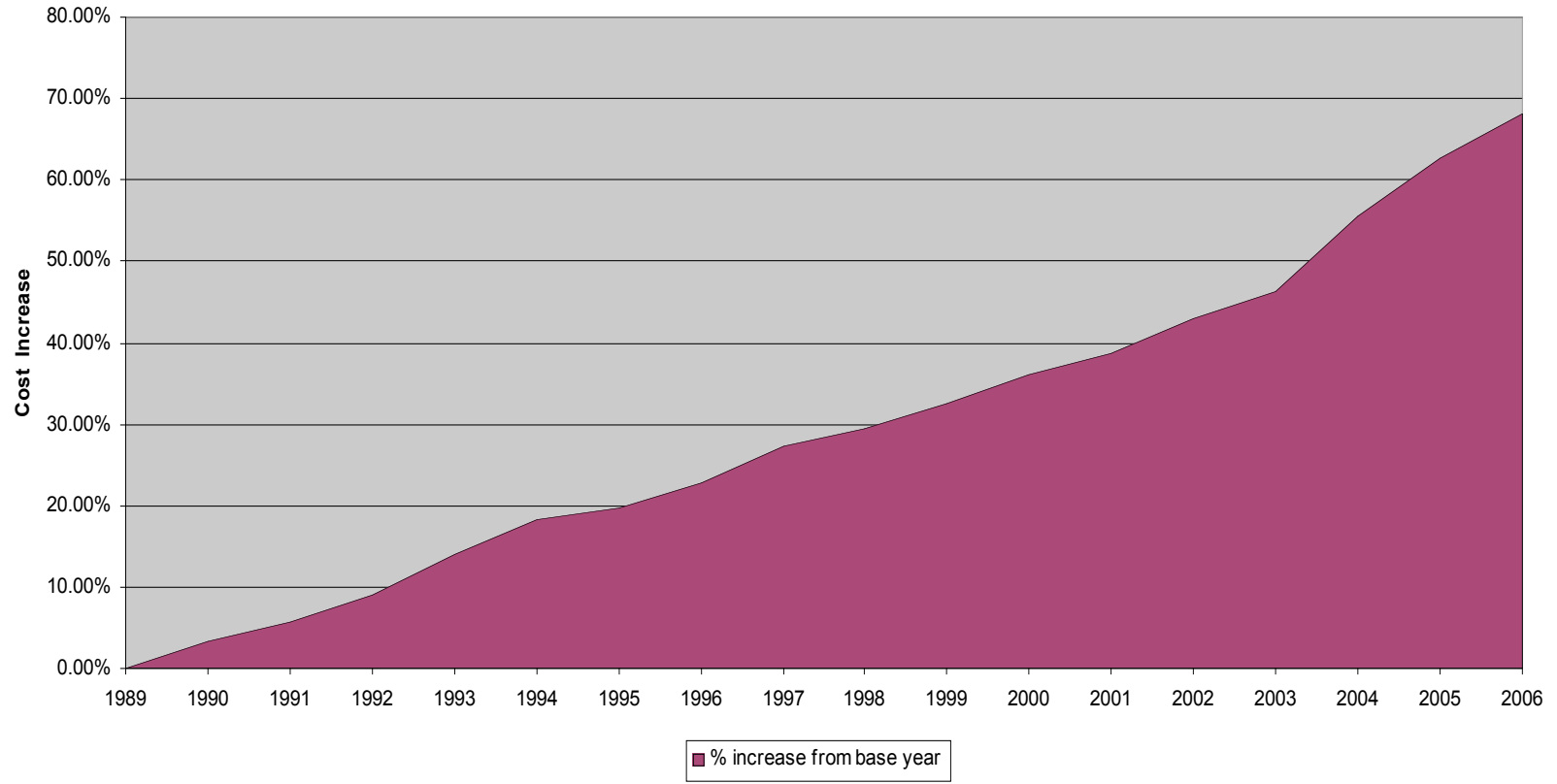
- 1. Number of Telescopes**
- 2. Diameter**
- 3. Maximum Separation 1 km**
- 4. Wavelength of Operation**
- 5. Adaptive Optics - yes**
- 6. LGS – yes**
- 7. Optical Fiber Beam Transport**
- 8. Moveable Telescopes**

Enclosure Cost vs. Nominal Diameter

Costs shown are adjusted to 2002 (add ~15% to ~2008 construction date)



Construction Cost Index



SOAR Site & Facility Cost Breakdown

Design & Consulting	– M3 Engineering	\$U.S. 265 K	<div style="background-color: blue; color: yellow; padding: 5px; width: fit-content;"> Final cost for the building is ~\$230/ sq.ft. (based on the standard method of calculation). This is on the low side for observatory facility construction. </div>	
	– Geotécnica Consultores	155		
	– Site Testing	28		
Early Site Work	– Leveling platform	155		
	– Extend Utilities from Gemini	38		
	– Foundation Excavation	26		
PUMA Contracts	– Original Contract (civil)	851		These were ~50% higher than expected
	– Electrical	130		
	– Mechanical	101		
	– Change Orders	96		— 46 to date, ~50 pending
	– U.S. procured materials	340		
	– Shipping	40		
AOSS	– Management & support ~120		— Based on adjusted early estimates by E. Figueroa	
	– Construction & purchases	~60		
		\$U.S. 2,405 K	not including SOAR labor	

Scaled cost of 1 4m telescope	27.4
20 4m telescopes at .7 cost	383.6
AO - 300k 1st + 19*200k	4.1
Continuous Delay Lines - \$2k/m *500m	1.0
2km of Vacuum Pipes * 500k/km	1.0
Beam Compressors/Optics - 20@100k	2.0
BCL	2.0
Site Development	10.0
	403.7