GMT Project in the Year 2023

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A Brief History (1)

- 1995 ~ 1997
  - A plan to build 6-m class telescope on Haleakala, Hawaii
  - Agreed by the Korean government, successful negotiation with UH IfA, but failed to get budget due to national financial crisis in 1997

- 2001 ~ 2005
  - Secured CFHT time, 14 nights per year for 5 years
  - First opportunity for Korean community to use large telescope for research
  - KASI Vision 21 in 2003; looking for 8-m class telescope in 21st century
  - KASI Science Working Group for Large Telescope in 2004

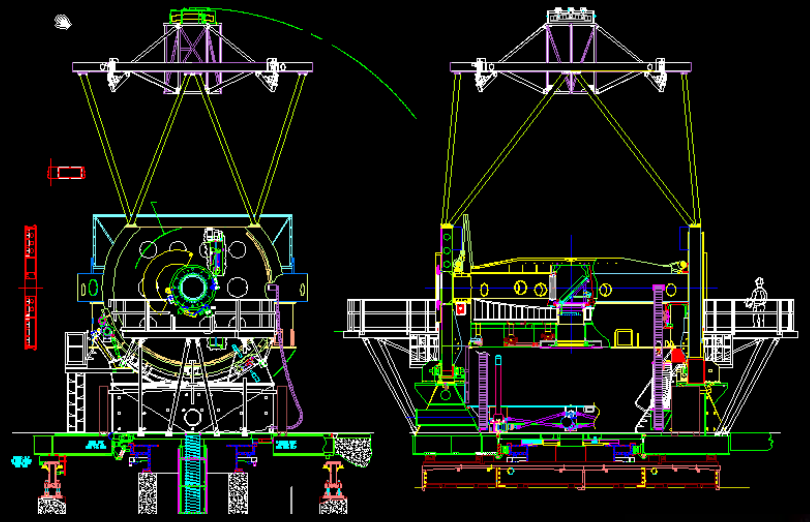
May. 31st. 2004.

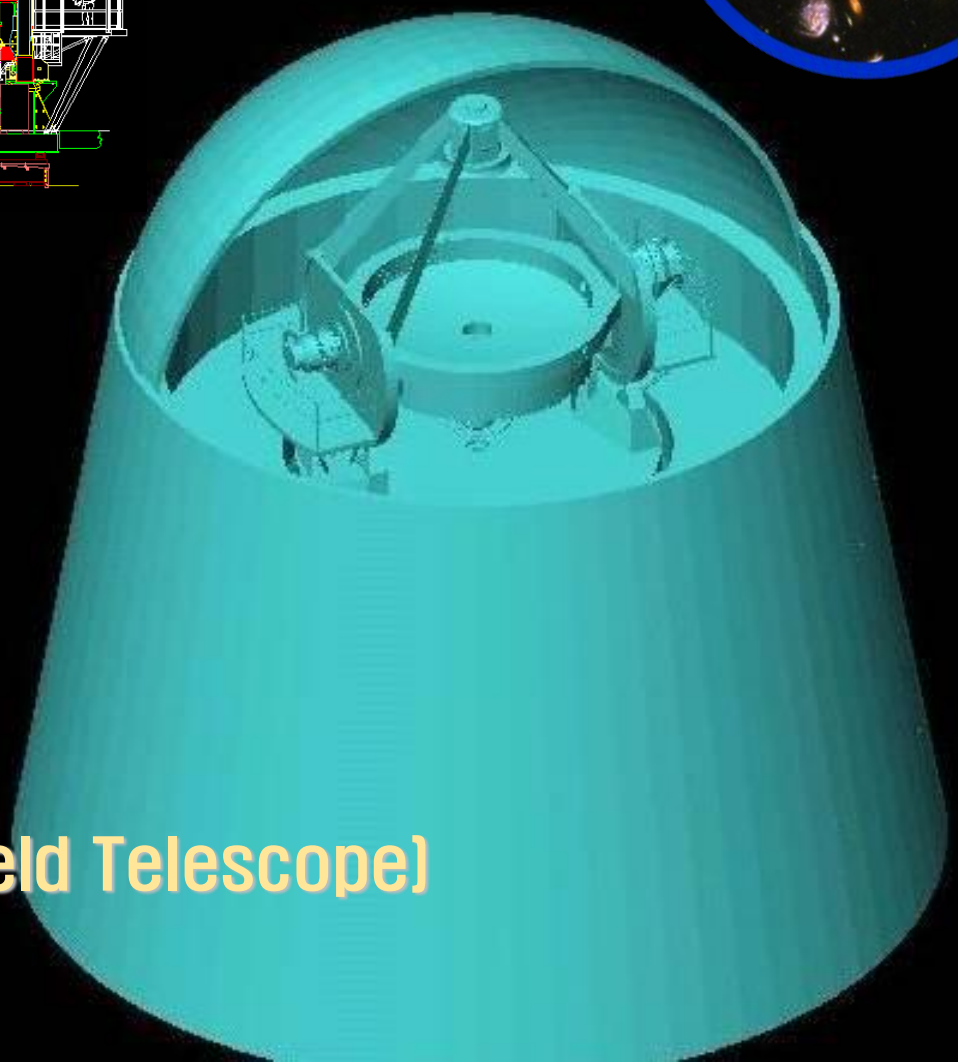
A Kick-Off Meeting of the Large Telescope Science Working Group

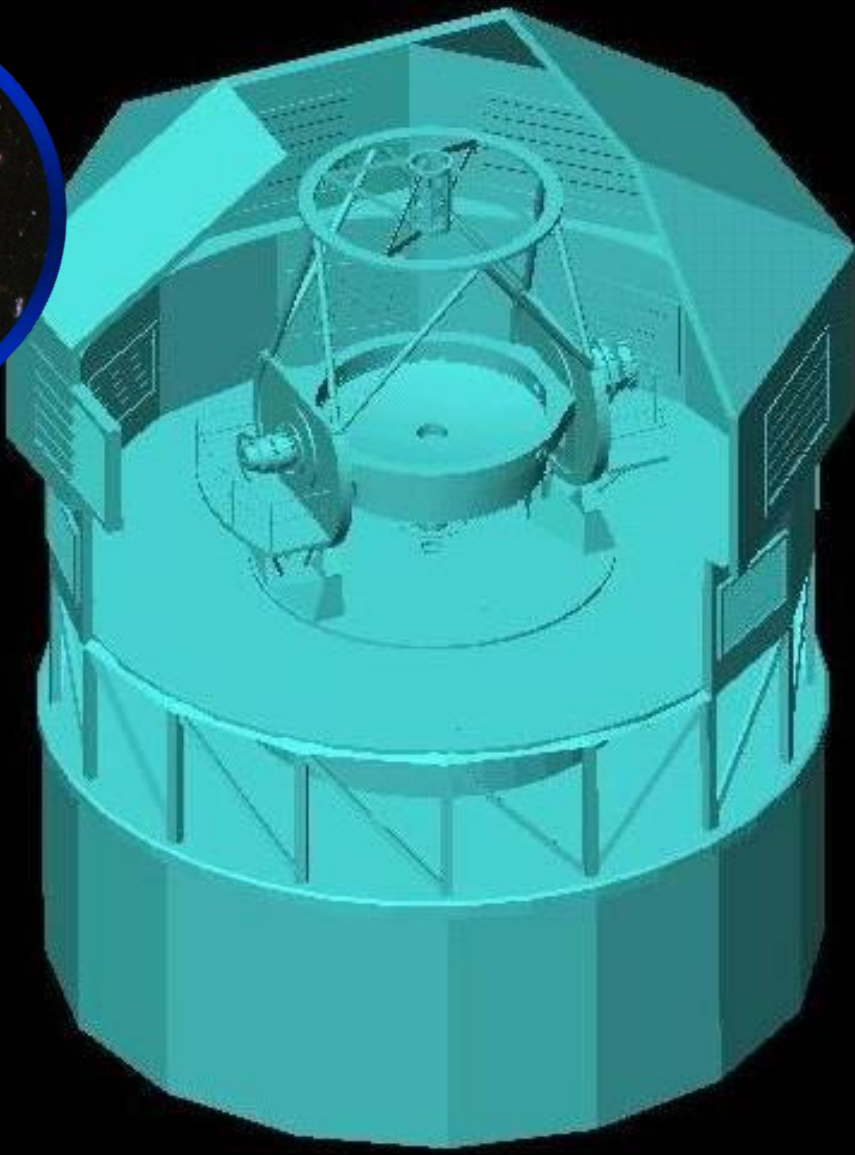
A Brief History (2)

- "SPM Twin" International Collaboration in 2005
  - Construction of twin 6.5m telescope based on Magellan telescopes
    - ✓SFT : Standard Field Telescope – High resolution Infrared telescope
    - ✓WFT : Wide Field Telescope – Wide filed Spectroscopic telescope
  - Partner Countries : Korea, USA, UK, Mexico
  - Location : San Pedro Matir in Baja California, Mexico

- The plan : Submitted to the government in 2006
  - Total budget requested : KRW 80B (50% of total construction cost est.)
  - Accepted for "Preliminary Feasibility Study" (사전타당성 조사) by KISTEP
  - The first project under the new government regulation for R&D project with total budget over KRW50B







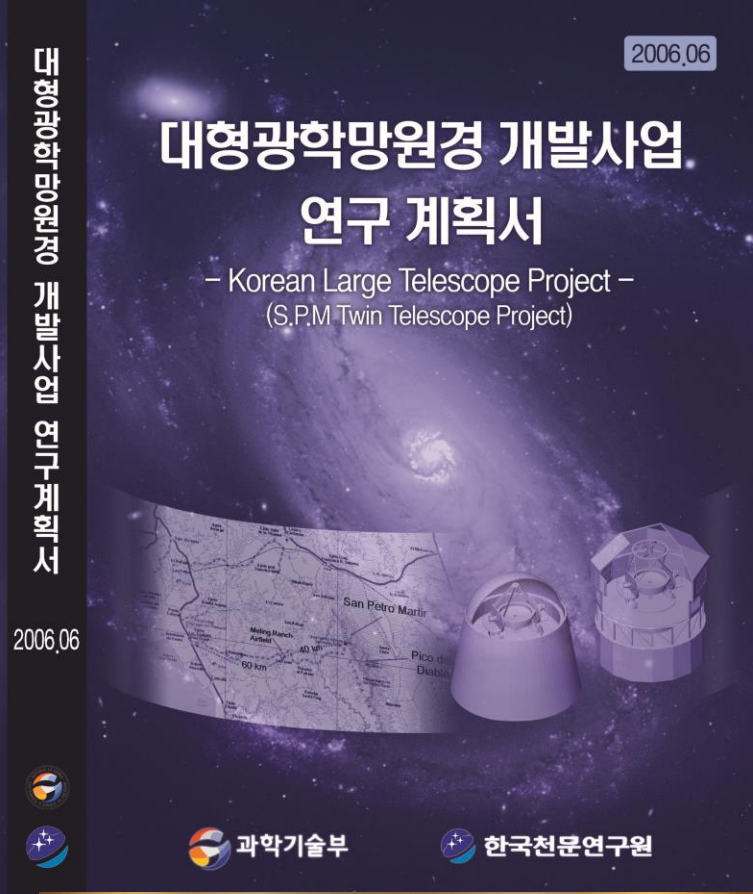
SFT (Standard Field Telescope)

WFT (Wide Field Telescope)

SPM Twin…and afterwards…

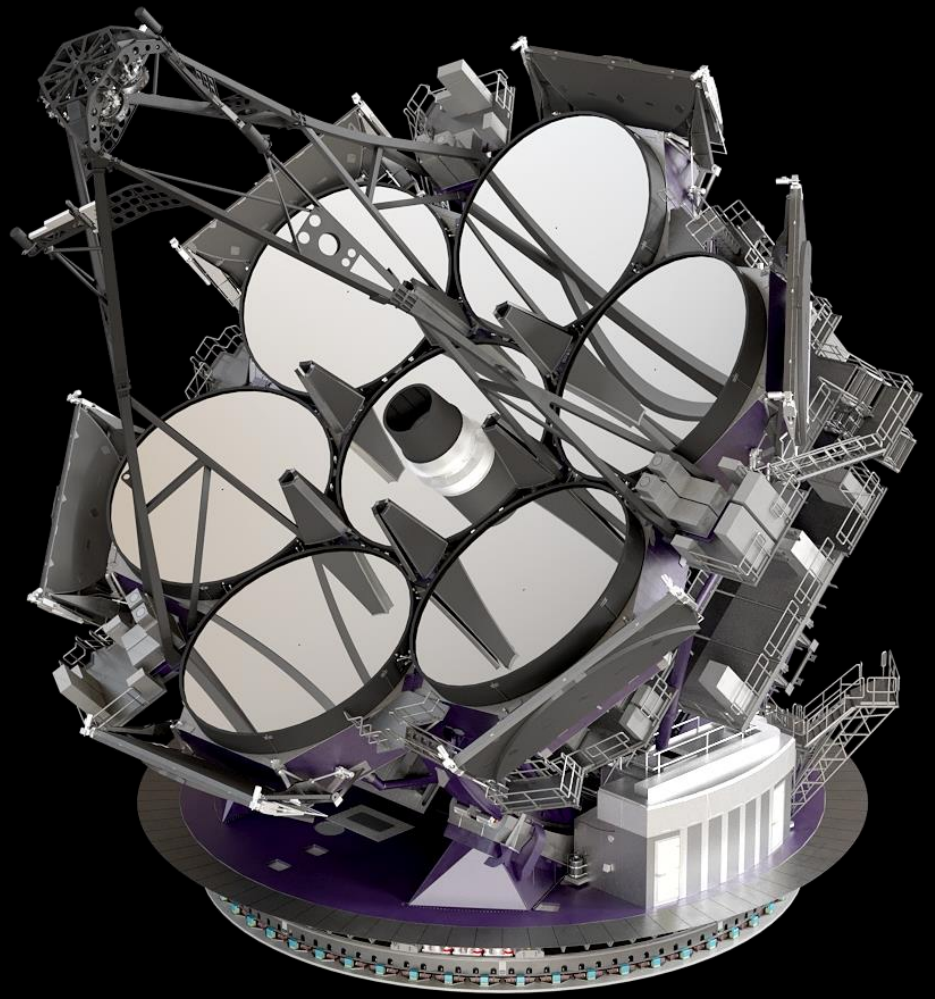
- 2006 Preliminary Feasibility Study
  - the plan was conditionally approved(!), but
  - the budget request was not approved.
  - project team tried to improve the plan according to the government request, but eventually failed and discarded the SPM twin concept
  - A big cornerstone to success (conditional approval) !!

- 2007 Looking for alternative paths
  - Various ways were sought –
  - Finally, decided to participate in the Giant Magellan Project
    - 10% share & KRW95B
  - in 2008, the budget request was approved with total budget KRW 90.9B (Final success to start the project from 2009!!)



Korean GMT Project in 2009

Giant Magellan Telescope

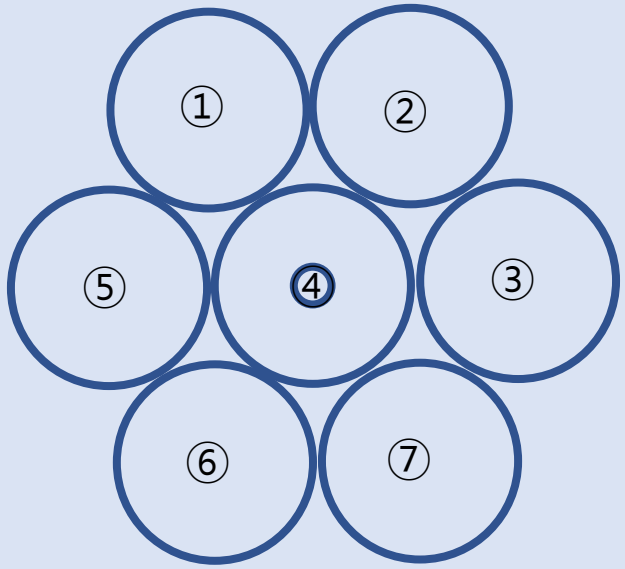



Weizmann Institute of Science
Korea Astronomy and Space Science Institute
Australian National University
Astronomy Australia Limited
The University of Chicago
Harvard University
Arizona State University
University of Arizona
Carnegie Institution for Science
University of Texas at Austin
Smithsonian Institution
Texas A&M University
The São Paulo Research Foundation – FAPESP
Giant Megellan Telescope

Korean Delegates to the GMT Project

- Founder Representative
  - Byeong-Gon Park
- Board of Directors
  - Byeong-Gon Park
  - Chan Park
- Science Advisory Committee
  - Yujin Yang
- Finance Committee
  - Soyoung Hong

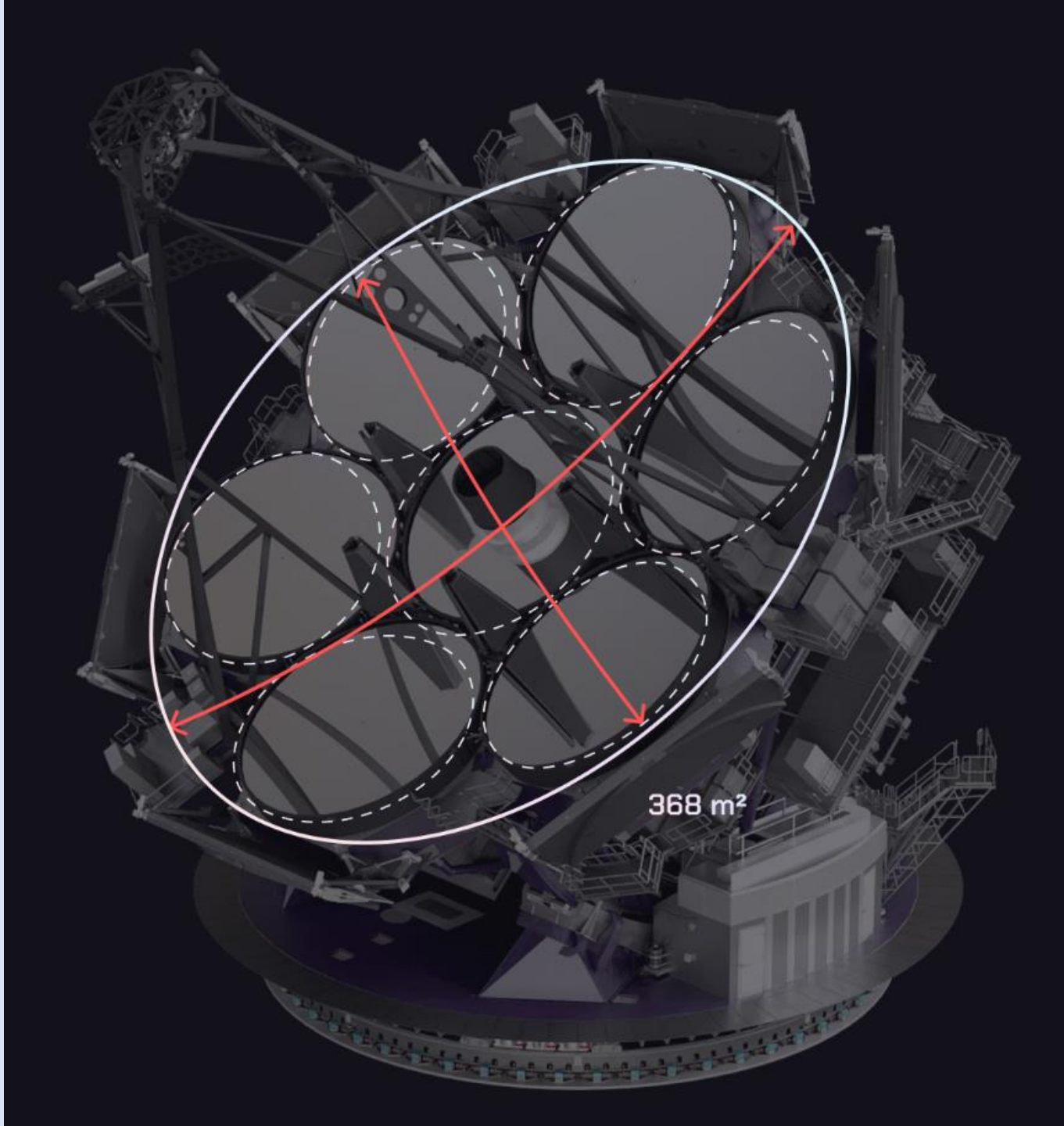


Segment Production Status

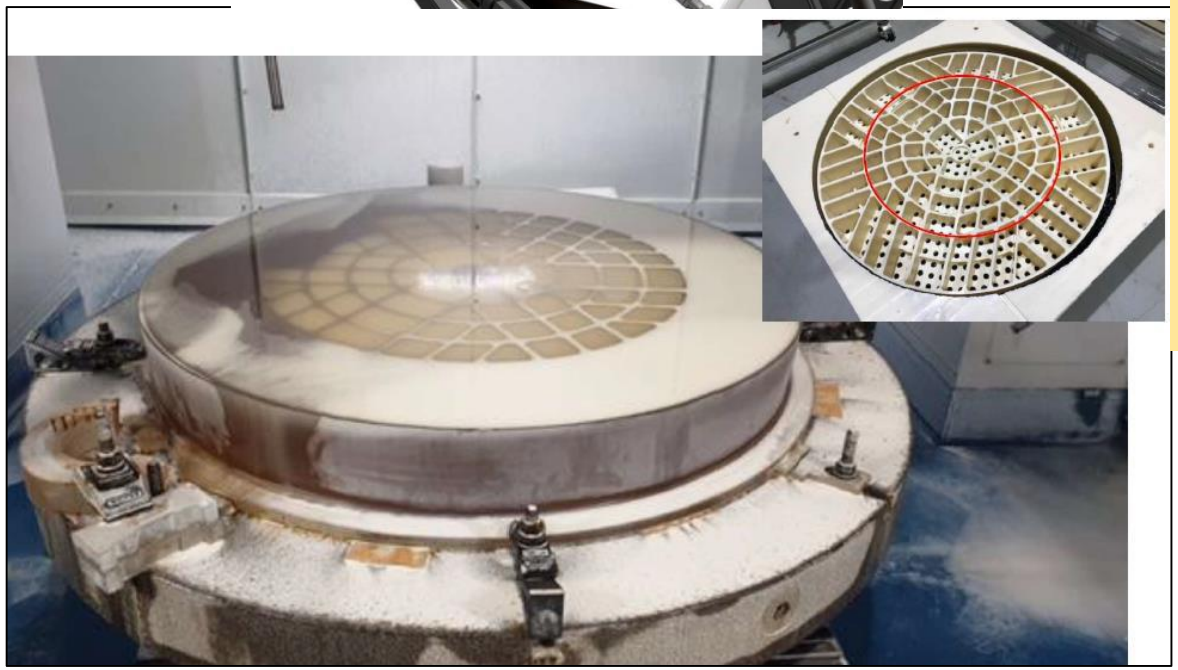
S1: completed and stored, 2012
S2: completed and stored, 2019
S3: completed and will test Cell and Subsystem in 2024
S4,S5,S6 : waiting in queue
S7 : cast in 2023 (High-Fire on Oct. 7)

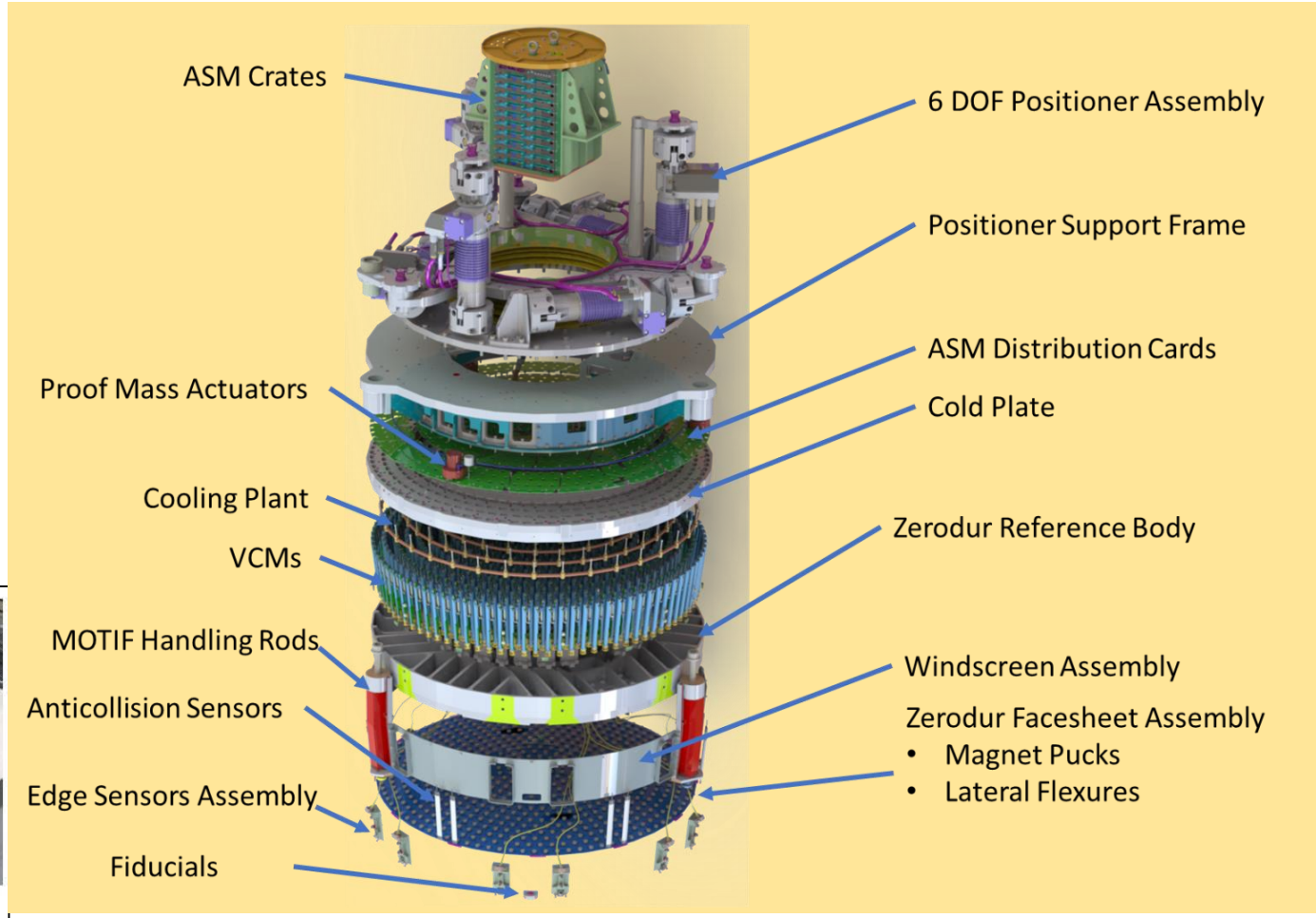
Note: All segments are either completed or in the production queue!!



Primary Mirror Support System : Test Cell with Actuators and Surrogate Mirror test completed, Test with Segment 3 planned in 2024.

Adaptive Secondary Mirror System : ASM Sheet 1 (Gen 4 ASM) completed





Enclosure: IDOM completed 60% maturity review and manufacturability review in April 2023.

Site : Support facilities are ready to accept telescope and enclosure on site.

Mount: OHB-Direct & IMT Consortium fabricates Azimuth track and structures

Rockford company to help giant telescope reach for the stars

Ken DeCoster
Rockford Register Star

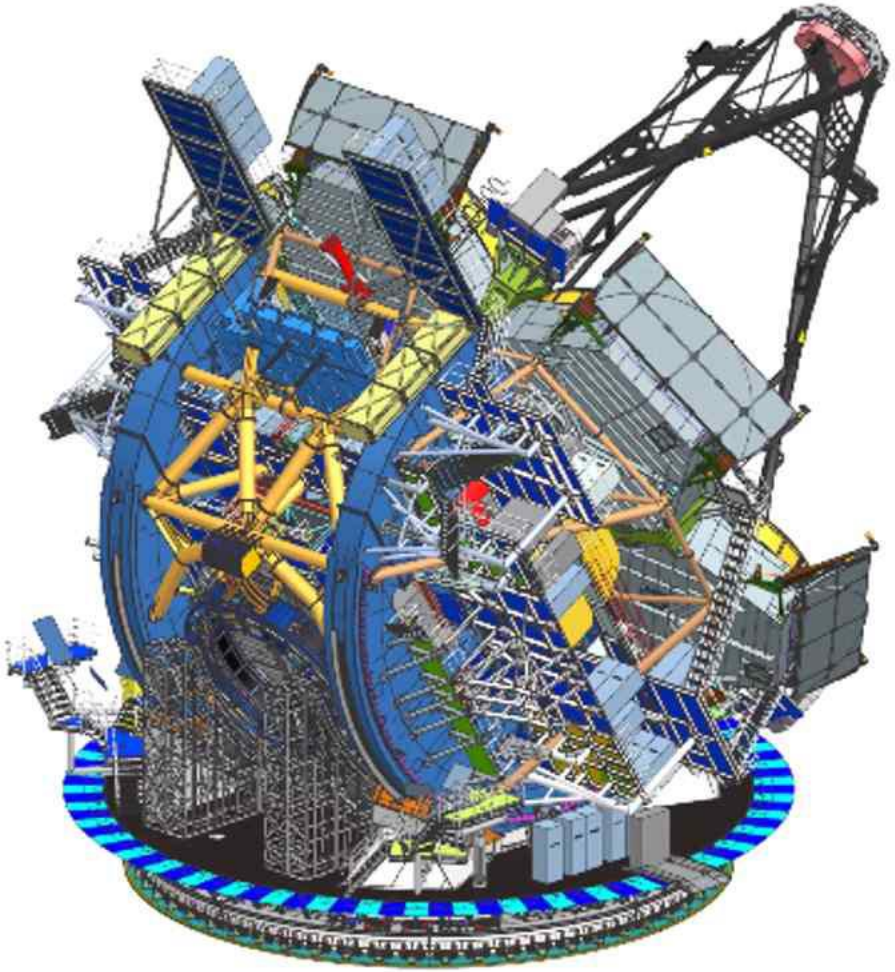
Published 5:13 p.m. CT July 21, 2022

Mastermill, a machine that will produce high tolerance parts, is seen on Thursday, July 21, 2022, at Ingersoll Machine Tools in Rockford. *CHRIS NIEVES/ROCKFORD REGISTER STAR*

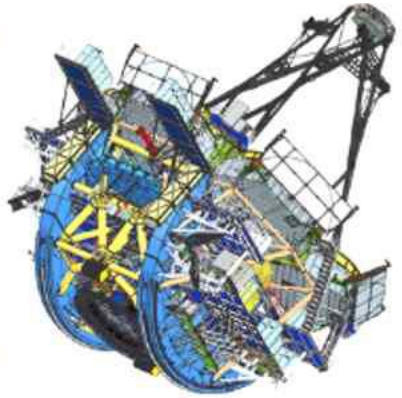
ROCKFORD — What is billed as North America's newest, largest and most advanced five axis mill machine was unveiled Thursday at Ingersoll Machine Tools, 707 Fulton Ave., on the Rockford's northwest side.

The company's MasterMill will manufacture large components, including an 1,800-ton mount, for the Giant Magellan Telescope, which is heralded as a next-generation giant optical infrared observatory capable of altering the history of space exploration.

GMT Mount Fabrication – Phase 5A



NSF Construction Scope Phase 5B

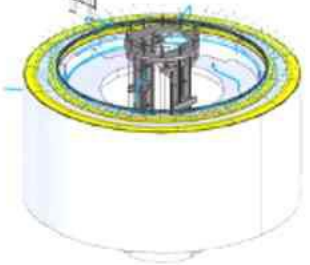


Optical Support Structure

GMTO Private Construction Scope Phase 5A

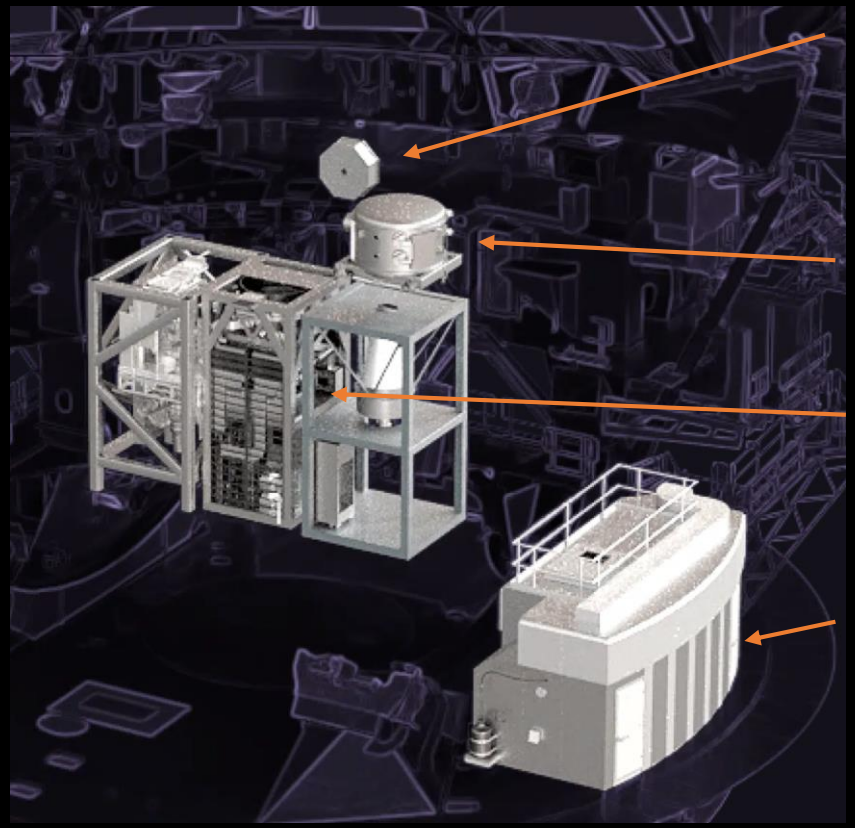
Azimuth Structure

Azimuth Track



Pier (SEF Scope)

Instruments



GMTNIRS(GMT Near InfraRed Spectrograph)

- PDR completed
- Will visit Magellan telescope until GMT is completed

GMTIFS(GMT Integral-Field Spectrograph)

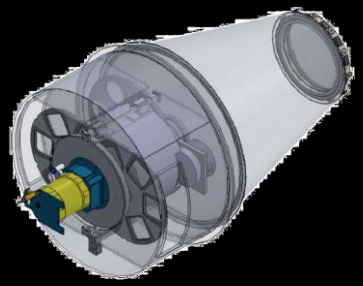
- Conceptual Design in progress

GMACS(GMT Multi-object Astronomical and Cosmological Spectrograph)

- Conceptual Design 2 in progress

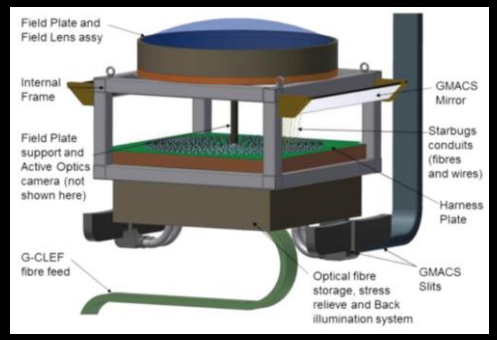
G-CLEF(GMT Consortium Large Earth Finder)

- First light instrument
- FDR completed
- Will visit Magellan telescope until GMT is completed



Commissioning Camera

- Conceptual Design in progress



MANIFEST

- Conceptual Design 2 in progress

GMT 2024-2026

- Seek construction fund from NSF as a member of the US-ELT Program
  - Final Design Phase of the whole GMT system / FDR
  - Major Research Equipment and Facilities Construction (MREFC)