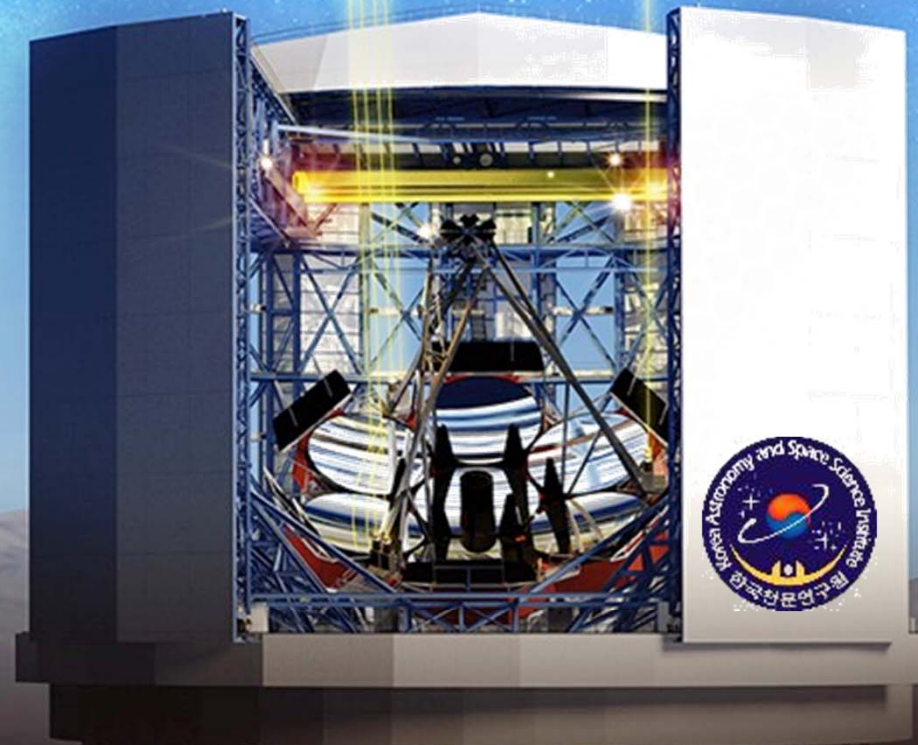


Giant Magellan Telescope Project and Korean Prospects

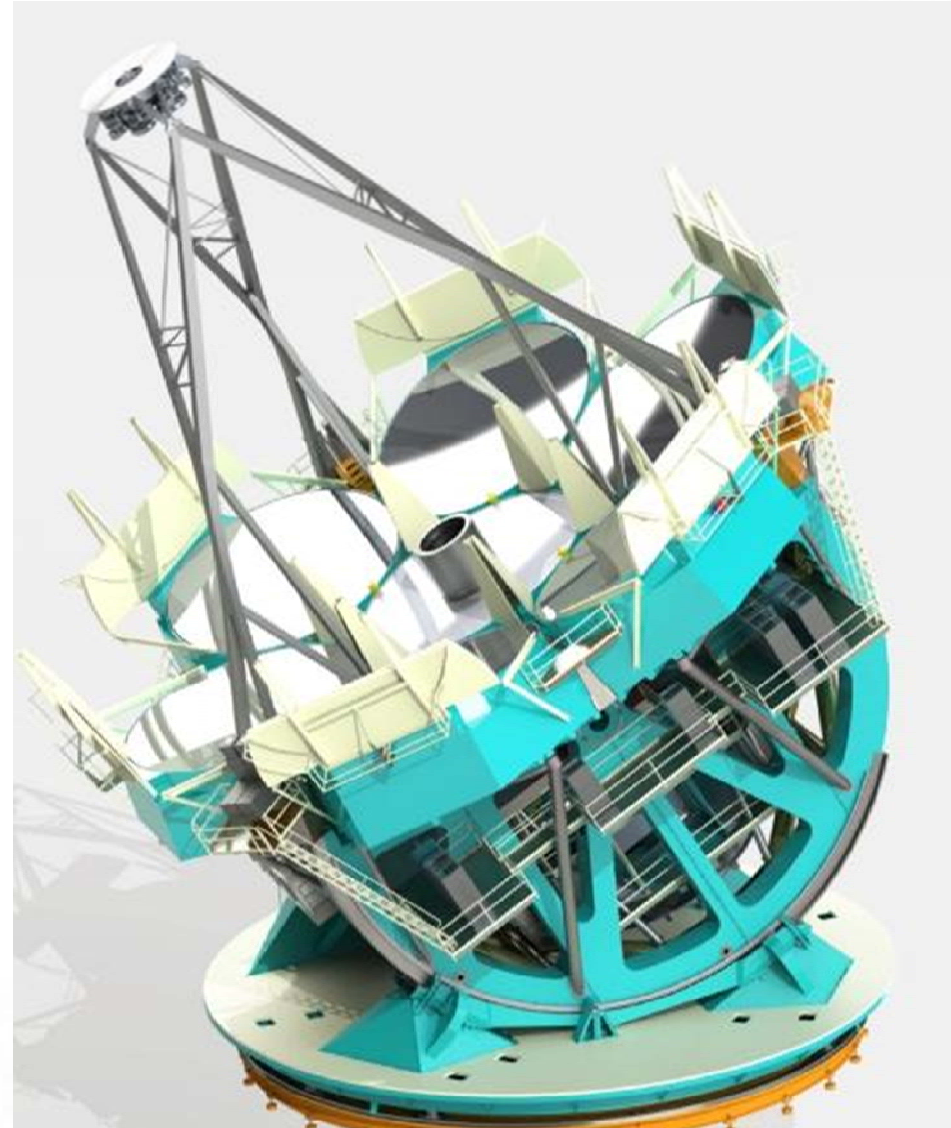


Byeong-Gon Park
Korea Astronomy and Space Science Institute



Telescope Design Overview

- Doubly segmented
 - M1 – 8.4m segments
 - M2 – 1.1m segments
 - Aplanatic Gregorian
 - M1/M2 segments are conjugate
 - f/0.7 primary
 - f/8 final focus – **1.0 mm/arcsec**
- Compact structure
- Optimized for stiffness
- High Throughput

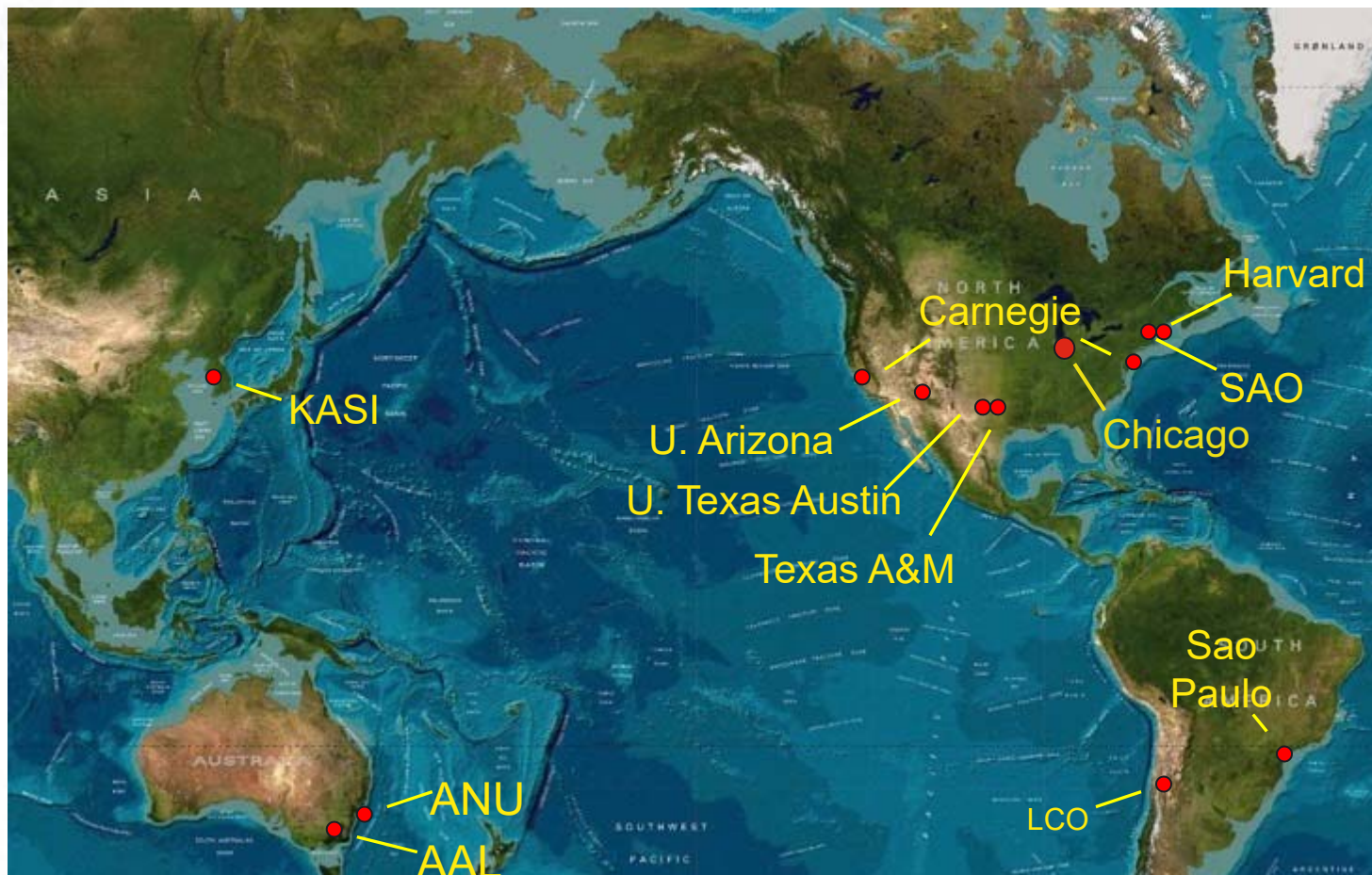


GMT Founder Institutions



New partners are welcome

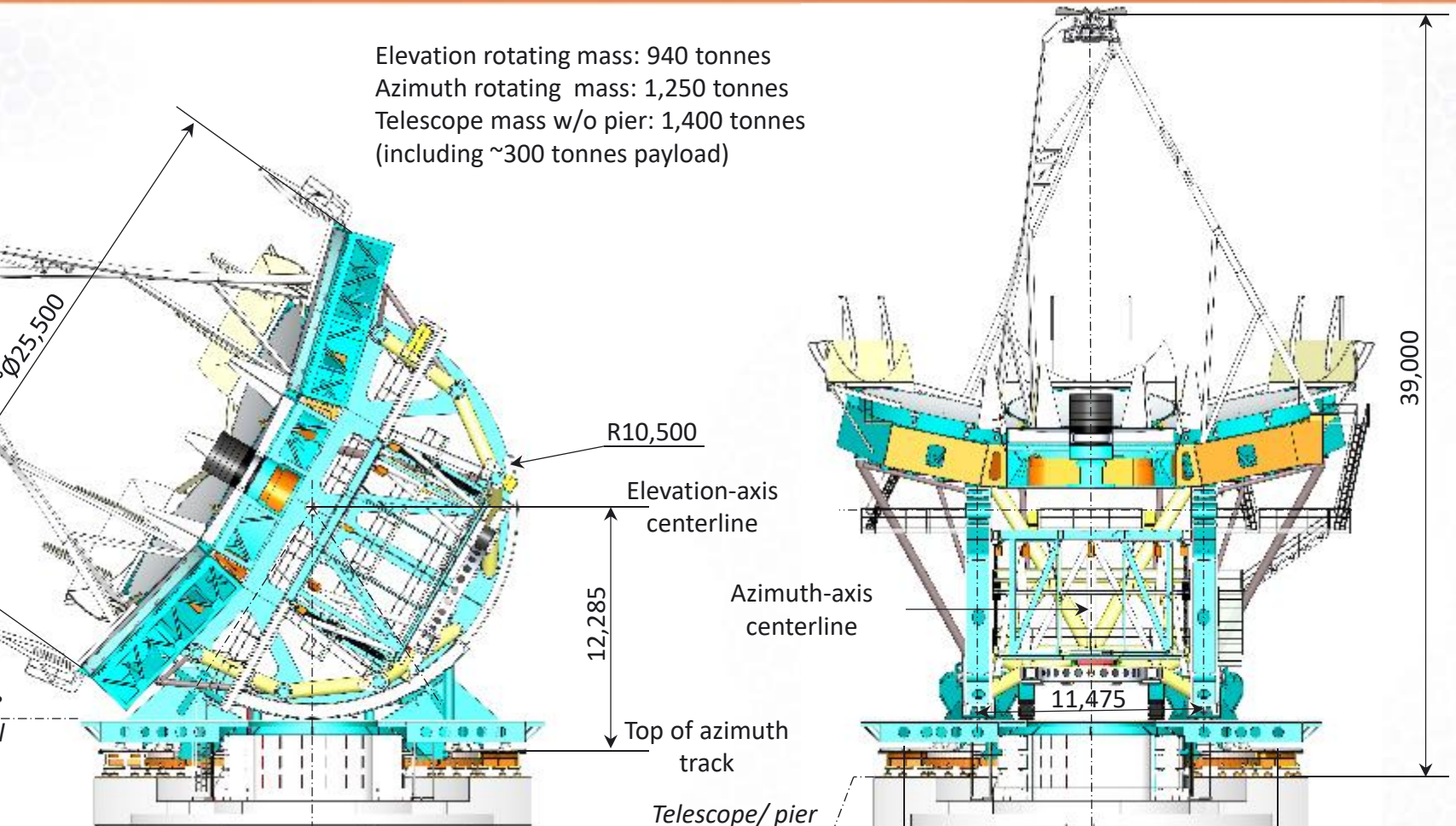
GMT Founder Institutions



Telescope Mount Procurement



Elevation rotating mass: 940 tonnes
Azimuth rotating mass: 1,250 tonnes
Telescope mass w/o pier: 1,400 tonnes
(including ~300 tonnes payload)



Telescope Mount Procurement



Telescope Mount Procurement Status

Global competitive procurement based on *best value* to GMTO

Two stage process:

Stage 1: Six month design studies

- Two vendor teams

- Leads to a fixed-price proposal

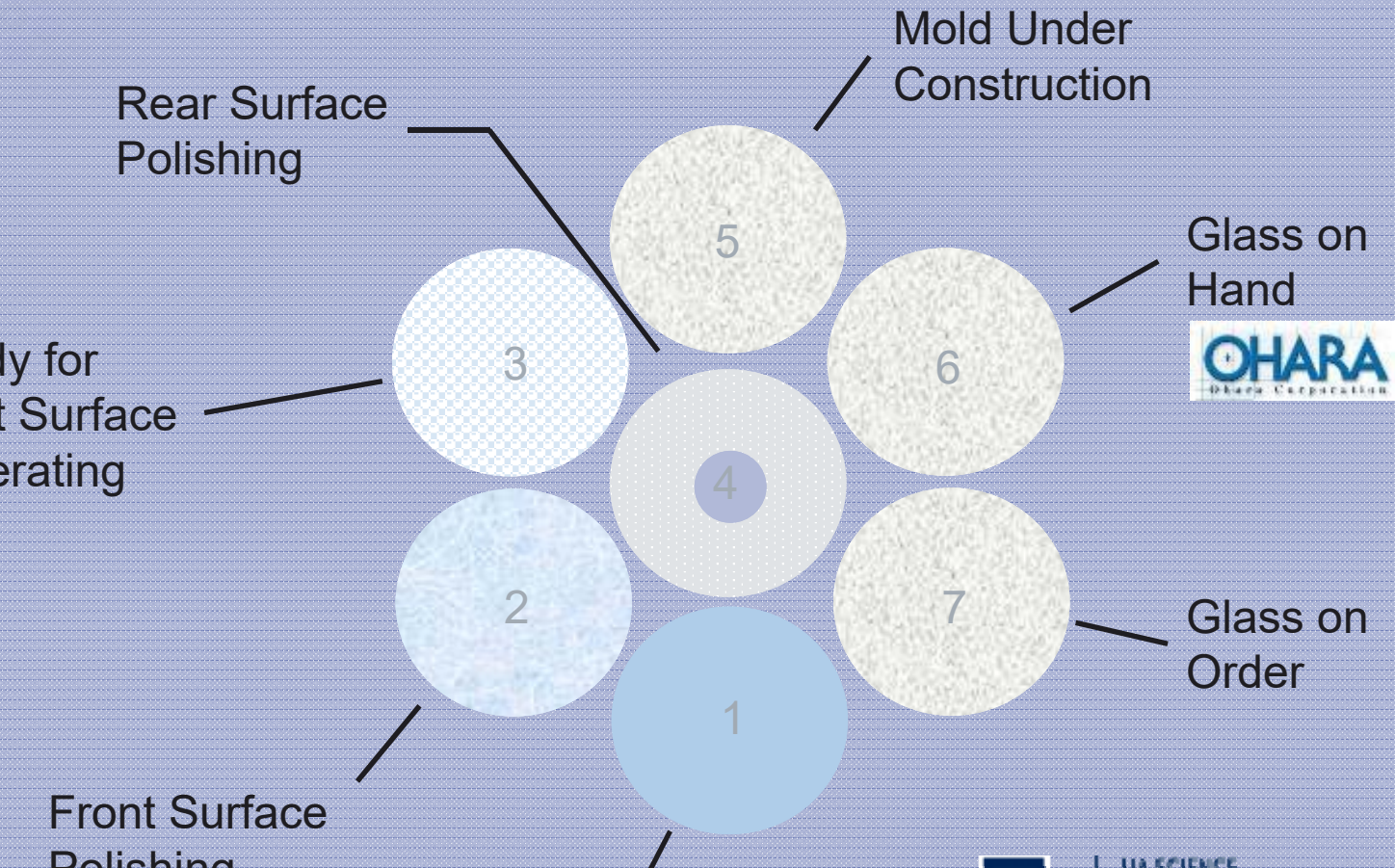
Stage 2: Design-Build contract

- Final design

- Fabrication

- Installation on site

Primary Mirror Production



Mirror #1

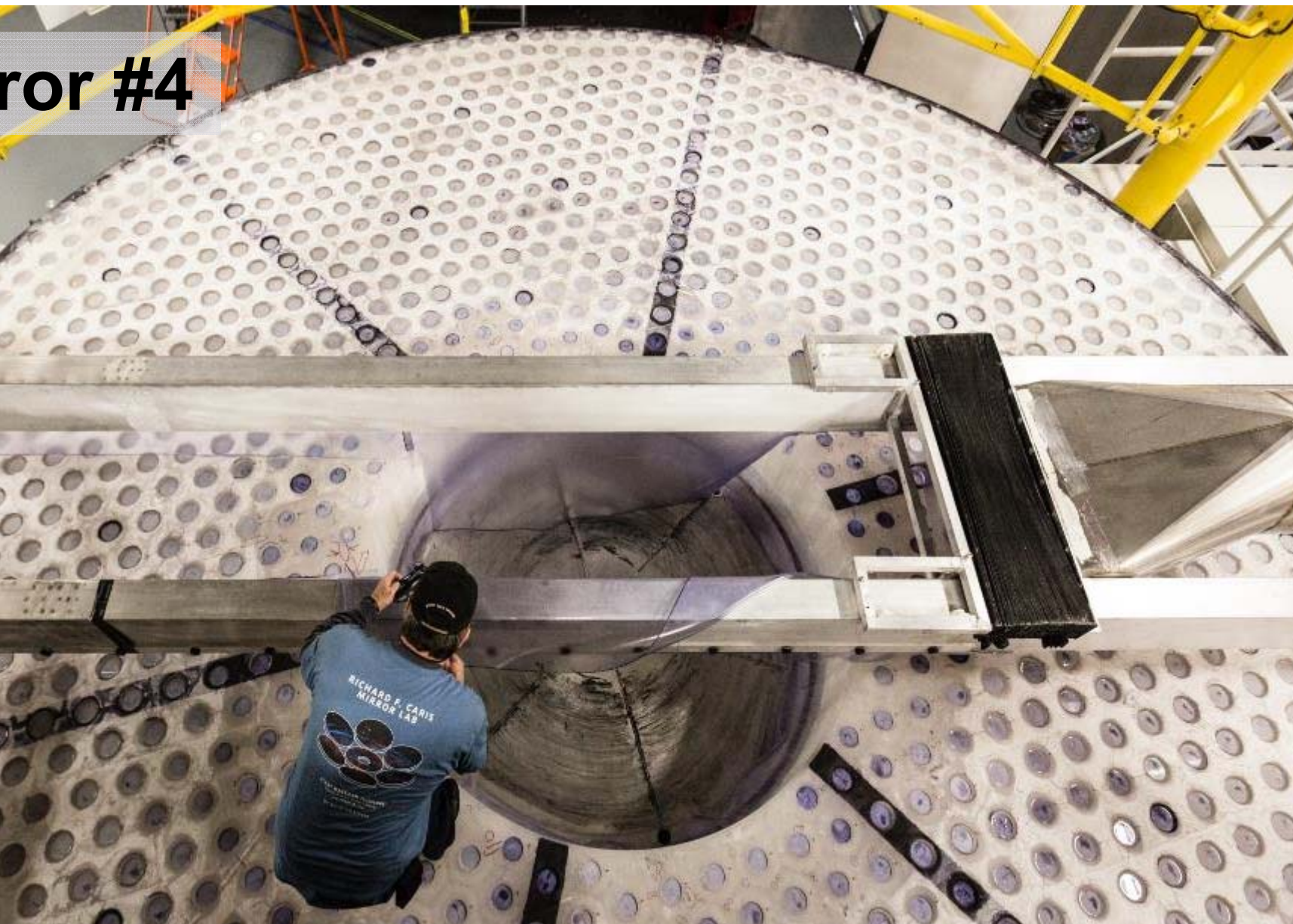
Mirror #3



ror #2



irror #4



Enclosure Overview

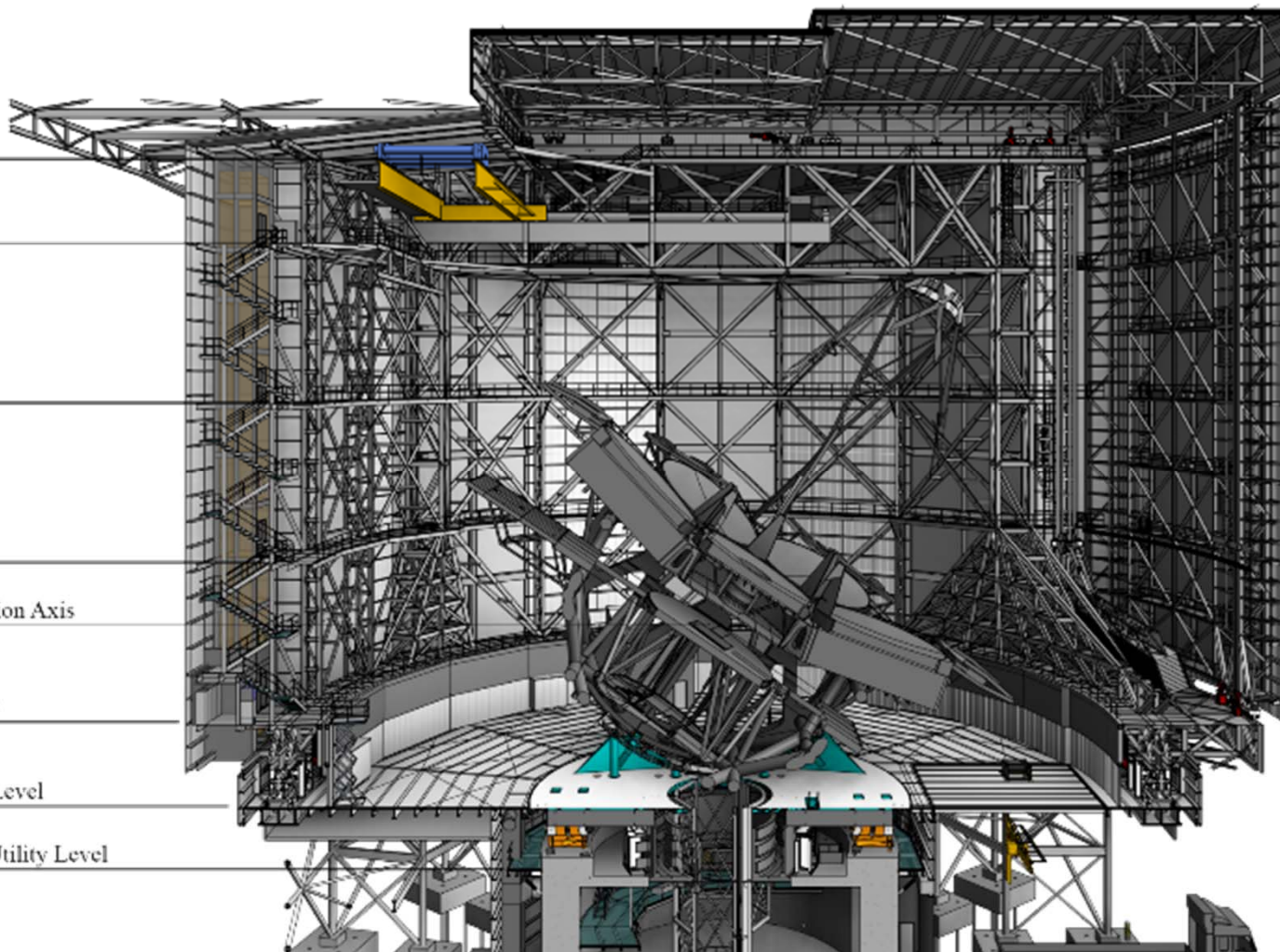
Enclosure Overview



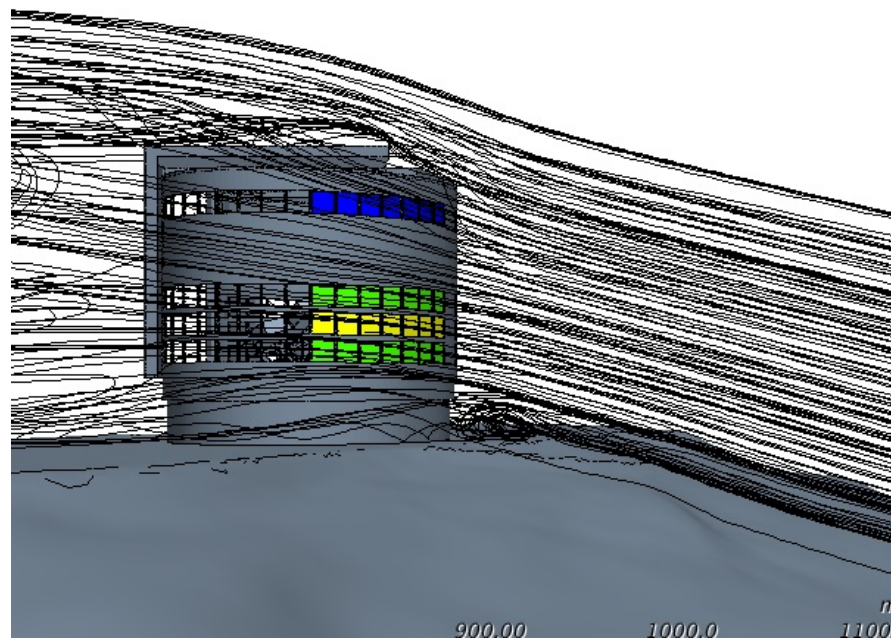
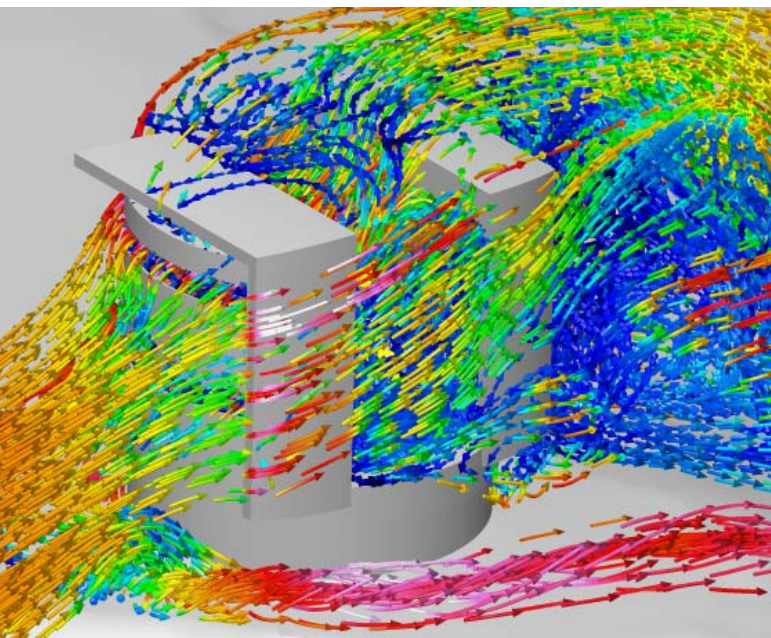
GMT

Enclosure
Height
60.5m
(VE=61.8m)

Walk
0m
Walk
0m
Walk
2m
Walk
6m
S Elevation Axis
6m
g Girder
6m
erving Level
6m
lescope Utility Level
n



Modeling the Airflow Over the Site



computing division

optimize
re venting and

Enclosure final design underway
Procurement to be launched in mid/late 2017

Open bidding – potential vendors in



Enclosure Procurement Status

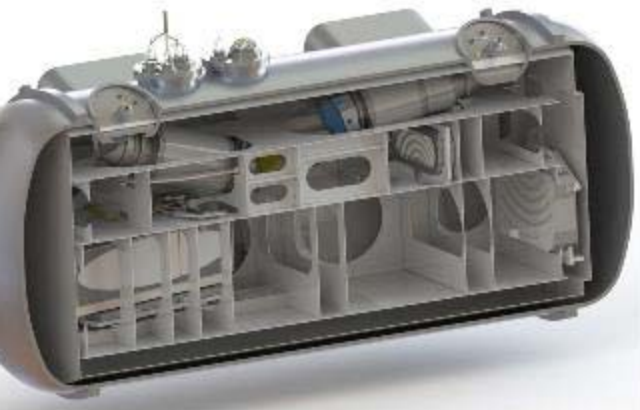
Global competitive procurement based on *best value* to GMTO

Several Construction Packages:

- Site excavation
- Concrete foundations and telescope pier
- Fixed enclosure base and rotating structure
- Enclosure mechanisms (motors, wheels, doors)
- Enclosure finishing work (panels, power, controls)
- Support buildings

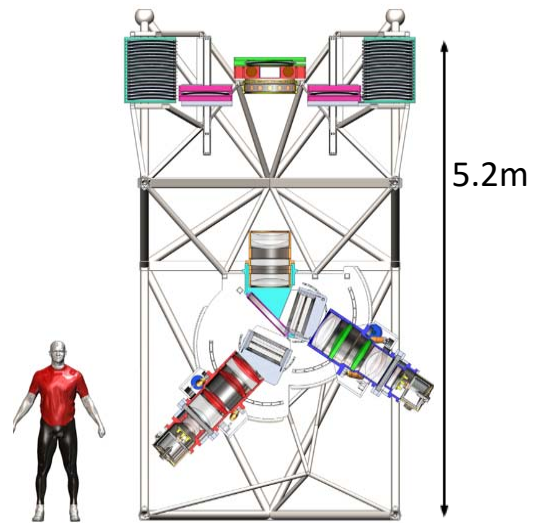
This work will begin in late 2017

en. Science Instruments



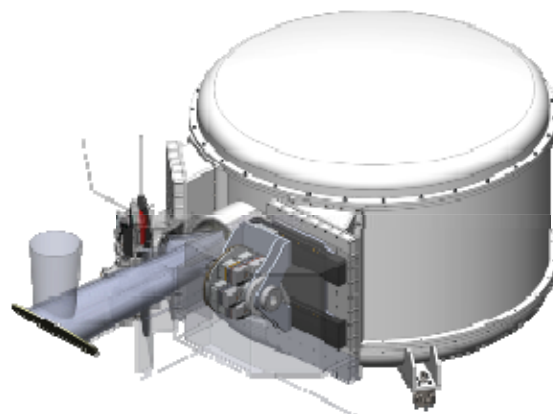
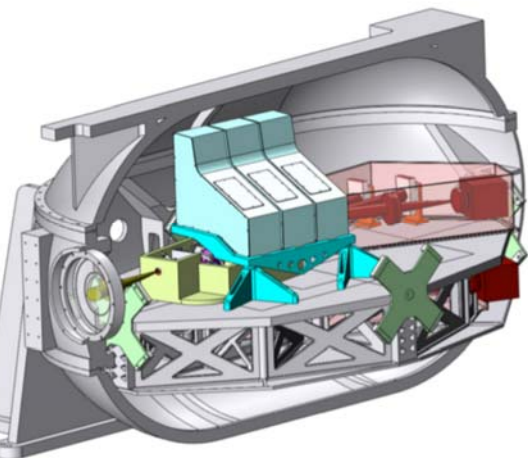
G-CLEF

20,000 < R < 100,000 Echelle



GMACS

Visible Wide-Field MOS



GMT Site in Chile



*GMT is one degree North of LSST
Same Longitude
Six degrees S. of ALMA*



Legal Standing in Chile

We will operate in Chile under agreement with the University of Chile

The agreement is recognized by the Foreign Ministry

Chilean Astronomers get 10% of the observing time

NO: En caso de disputas de la interpretación de este acuerdo, primará la interpretación basada en el idioma del acuerdo en Español.

NINTH: In case of disputes over the interpretation of this agreement, the interpretation based on the Spanish version of the agreement will prevail.

UNIVERSIDAD DE CHILE

Por:



Victor Pérez V.
Rector

GMT Corporation

By:

Wendy L. Freedman
Chair
GMT

GMT

REPÚBLICA DE CHILE
MINISTERIO DE RELACIONES EXTERIORES
Dirección de Asuntos Jurídicos
Departamento de Derecho Nacional e Internacional Privado

CONCEDE PREROGATIVAS Y FACILIDADES A GMT CORPORATION.

Nº 74 Santiago, 26 de marzo de 2014.

VISTOS:

Lo dispuesto en los artículos 24 y 32 Nº 6 de la Constitución Política de la República, la ley Nº 15.172, artículo único, inciso tercero, cuyo texto vigente se encuentra fijado por ley Nº 17.318, artículo 48 y el Decreto con Fuerza de Ley Nº 161, de 1978, del Ministerio de Relaciones Exteriores.

CONSIDERANDO:

Que GMTO Corporation con residencia en el Estado de Delaware, Estados Unidos de América con fechas 15 y 25 de enero de 2013, celebró con la Universidad de Chile un Convenio de Colaboración Científica en Investigaciones Astronómicas, destinado a colaborar con el desarrollo científico y técnico de la astronomía y astrofísica a través de la instalación y operación del "Telescopio GMT", en Chile.

Que GMTO Corporation, en virtud de dicho Convenio ha solicitado acogerse a los beneficios de la ley Nº 15.172

DECRETO

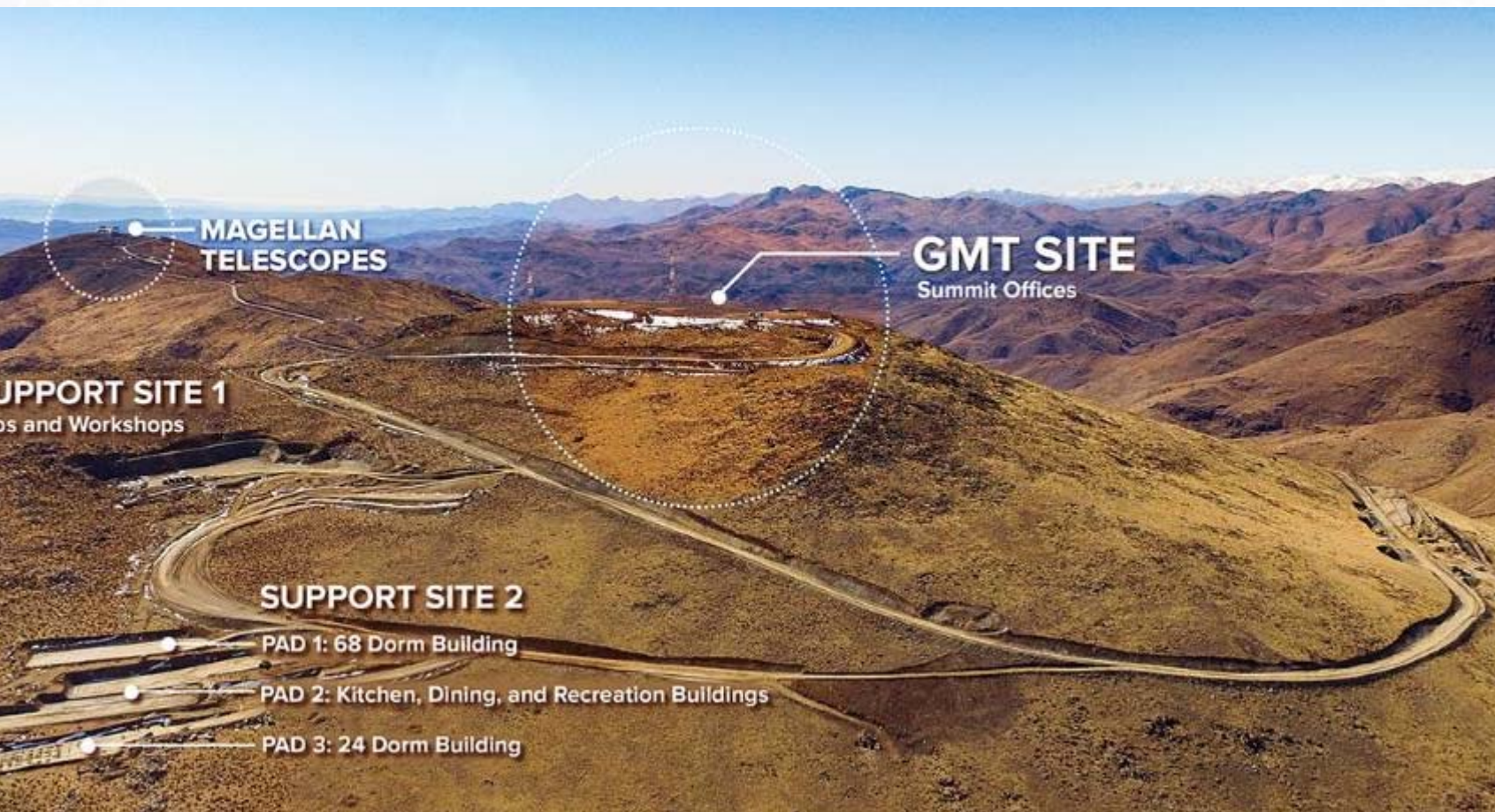
Artículo único: La GMTO Corporation, con residencia en el Estado de Delaware, Estados Unidos de América, y los científicos, astrónomos, ingenieros, técnicos y empleados que ingresen al país en funciones relacionadas con el proyecto denominado "Telescopio GMT", según el Convenio de Colaboración Científica en Investigaciones Astronómicas suscrito entre la GMTO Corporation y la Universidad de Chile, estarán sujetos al mismo régimen y gozarán de iguales prerrogativas y facilidades que las establecidas en el Convenio vigente de fecha de 6 de noviembre de 1963, celebrado entre el Gobierno de Chile y la Organización Europea para la Investigación Astronómica del Hemisferio Austral (ESO).

ANÓTESE, TÓMESE RAZÓN, REGÍSTRESE Y PUBLÍQUESE.

MICHELLE BACHELET JERIA
PRESIDENTA DE LA REPÚBLICA

MINISTERIO DE HACIENDA OFICINA DE PARTES	
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REP. FISC.	
REP. FODR.	
REP. FISC.	
REP. FISC.	

Site Layout



Construction Infrastructure



ing to support 250 construction workers on the site

Commit Construction Offices



Summary Schedule (schedule margin included)



Upcoming Schedule Milestones

Telescope Design/Build Contract Award	Aug 2017
Enclosure Bid Packages Released	Sep 2017
Start of Summit Concrete work	Late 2017
Enclosure Closed to Weather	Mid 2020
Delivery of telescope to site	Early 2021
Installation of First Primary Mirrors	Mid 2022
Engineering First-Light with Subset of Mirrors	2023

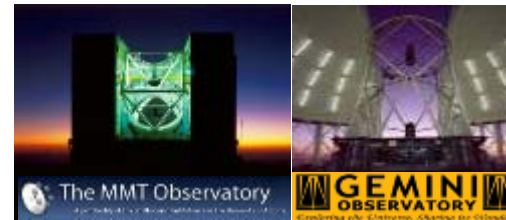


Scientific Activities



GMT Science and Instrument Working Group

Bridge between K-GMT project team and Korean community
Composed of 15 members from the project and universities
Current chair : Prof. Youngwook Lee (Yonsei Univ.)



Usage of 6m-8m Telescopes

MoU for MMT/Magellan with Univ. of Arizona
Limited term partnership for Gemini

Postdoctoral Fellowship

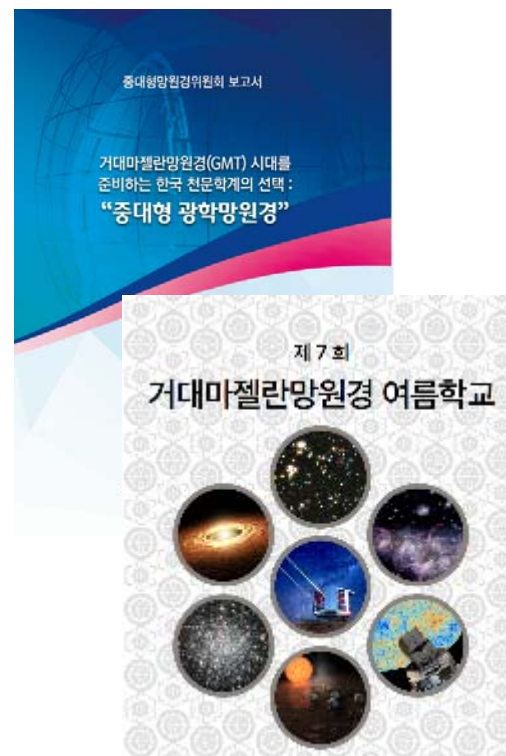
Past program : KASI-Carnegie fellowship
Current Program : KASI-UA fellowship

Participation in Survey Projects

Continued participation in SDSS4, DESI
MOA signed with LSSTC for science operation of the LSST

Promotion and Publication of the Korean GMT Science book

Science cases with G-CLEF & GMACS



Technical Activities



Development of the GMT Secondary Mirror System (FSM)

- KASI team is developing FSM system in collaboration with GMTO M2 team
- Phase 0 – Project definition study completed in 2016
- Phase 1 – delta PDR study is being conducted



Development of G-CLEF

- KASI in collaboration with SAO
- KASI role – guider, calibration, dichroic
- Critical design study under progress



Development of GMTNIRS

- Based on the success of IGRINS development
- KASI in collaboration with Univ. of Texas at Austin
- Large Immersion Grating development done
- KASI role – spectrograph, detector, calibration
- Preliminary Design Study will follow



Engage with various industries in GMT development

Thank You

