PROJECT MANAGEMENT OF DAG: EASTERN ANATOLIA OBSERVATORY

O. Keskin, C. Yesilyaprak, S. K. Yerli, L. Zago, T.Güver, S.Aliş

DAG Project – Big Picture

A. DAG – Doğu Anadolu Gözlemevi **2011:2012-2019**

0. Astronomy – Astrophysics – Engineering – Research - Development
1. Telescope
2. Enclosure
3. Buildings
4. Infrastructure

B. FPI – Focal Plane Instrumentation **2015:2016-2019**

1. AO System
2. Instrumentation (Imaging – Spectroscopy @ VIS & IR)
3. R&D Laboratories

C. MCU – Mirror Coating Unit **2018:2019-2021**

1. Mirror Coating (0.4 - 4.0 m)
2. Satellite and Space Tech. Coating

TURKEY'S **LARGEST & FIRST VIS + IR TELESCOPE** with

LARGEST COATING PLANT CAPACITY

DAG Project Timeline

- *2012:* Acceptance of Project
- *2013:* Personnel, Technical and Infrastructural Foundation
- *2014:* Groundworks, Superstructure and **Telescope Tender (AMOS)**
- 2015: Project Budget
  - Telescope Design (Optical – Mechanical – Electronics)
  - Mirror Production
  - Groundworks Competed (Road & Chairlift – Electricity – Water – Fiber – Geological Survey)
  - Site **Master Plan** & **Building Design Tender (GUNARDA)**
  - **Enclosure Tender (EIE)**
  - Telescope FDR
- **2016:**
  - Enclosure PDR
  - Building FDR
  - Enclosure FDR (July 2016)
  - M1 Blank Acceptance (August 2016)
  - Pier & Buildings Delivery (September 2016)
  - FPI Project Kick Off (August 2016)
  - SLODAR Kick Offf (2016)
- 2019: DAG (1. Phase) + FPI (2. Phase) = **FIRST LIGHT**

DAG Project & Major Criteria

Atatürk University : Administration, Technical, Financial, Academics Support

Erzurum : Konaklı - Karakaya Summit (*2.500 - 3.170 m altitude summits*)

Strategy : Latitudinal & Longitudinal observation gap

Opportunities : Multiple telescope locations on site (*2500 decares*)

Transportation : Main Road, Snowmobile, Cable Car (*~35 km - ~35 min.*)

Infrastructure : Universiade 2011 – Erzurum
(Electricity, Water, Roads, Cable Car)

Support : National Supports (Ministry of Development,
Governorship and Municipality of Erzurum; Public Corporations)

Compatibility : Geologically the most stiff rock formation (Basalt)

Atmosphere :

Clear : Clear Night Count (*>250 days*)
Dry : Low Humidity (as low as *% 2-10*)
Stable : Weighted Wind Direction (*N, NE*)
Cold : Low Temperatures (as low as *-35 ^{o}C*)
Ideal : Low Inversion Layer (*~2600 – 2800 m*)
Clean : No Light – Dust – Smoke – Electromagnetic Pollution
Consistent : Snow Level and Snow Season (*<1.5 m, November - April*)

Infrastructure(2012 - 2015):

Allocation: Site (2500 decares).

Buildings:

- ATASAM Building (1000 m2),
- Two Prefabricated (100 m^2 , 40 m^2),
- Energy Building & Garage (300 m^2),
- DIMM Tower (7 m, 25 m^2),
- Underground Water (40 m^2, 30 tons),
- ATA50 Telescope Building (20 m^2).

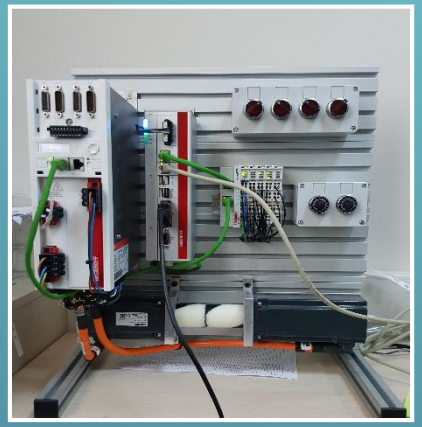
Surveys:

- Site Geological Survey (2013),
- Drilling Surveys (2012)
- Seismic Instrumentation (2013).

Lines:

- Underground Electricity (3 Phase, 3.5 km) (2014)
- Underground Fiber (48 cores, 100 Gb, 26 km) (2014)
- Radiolink İnternet (25 Mbit, 20 km) (2012).

Infrastructure(2012 - 2015):



Energy: 3 Phase MV ve LV Project-Design

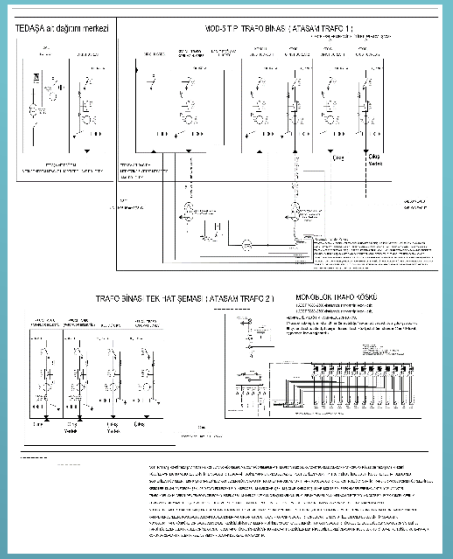
Atmospherical Survey Systems

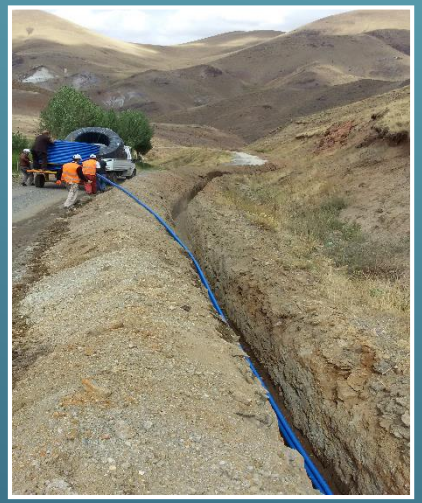
(*AWOS, Meteosat, Davis, Boltwood*)

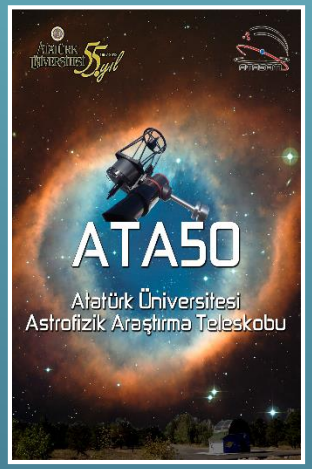
Astronomical Observation Systems:

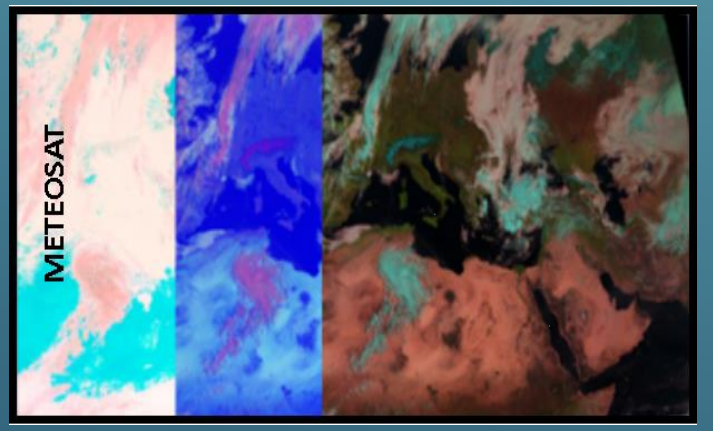
(*All Sky Cam, SQM, SM, MASS-DIMM*)

ATA50 Telescope (2012)









Infrastructure(2012 - 2015):

Laboratories: Main Optical ve Atmospheric Emulation Laboratory (*2015*)

Vehicles: 4x4 Off-road(2), Snowmobile (1), ATV (1),
Tracked Personnel Transport & Charge Carrier (1).

Transportation: Main Road – Snowmobile – Cable Car (2)

Erzurum Airport– ATAÜNİ: 12 km - Asphalt

ATAÜNİ– Konaklı Ski Center: 25 km - Asphalt

Konaklı Ski Center – DAG Site/Summit: 7 km - Stabilized

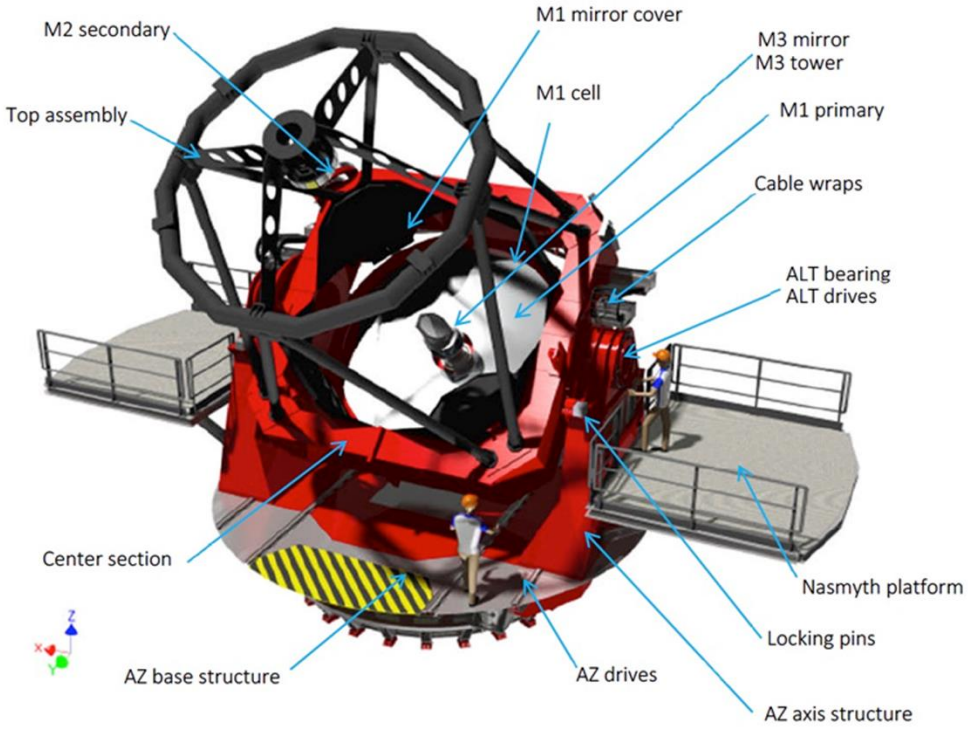


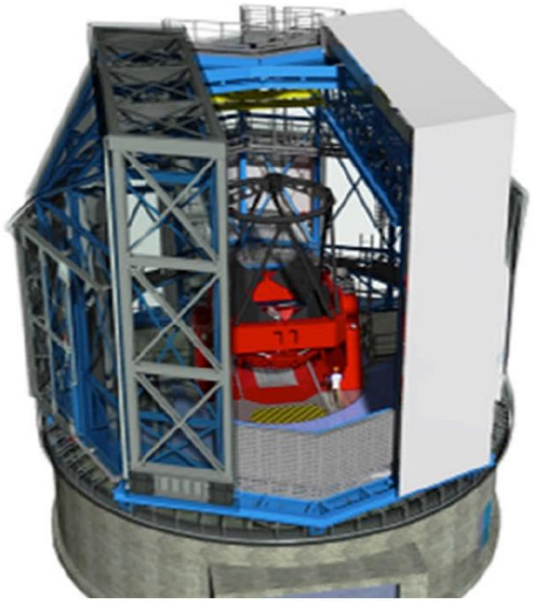



DAG - 2019

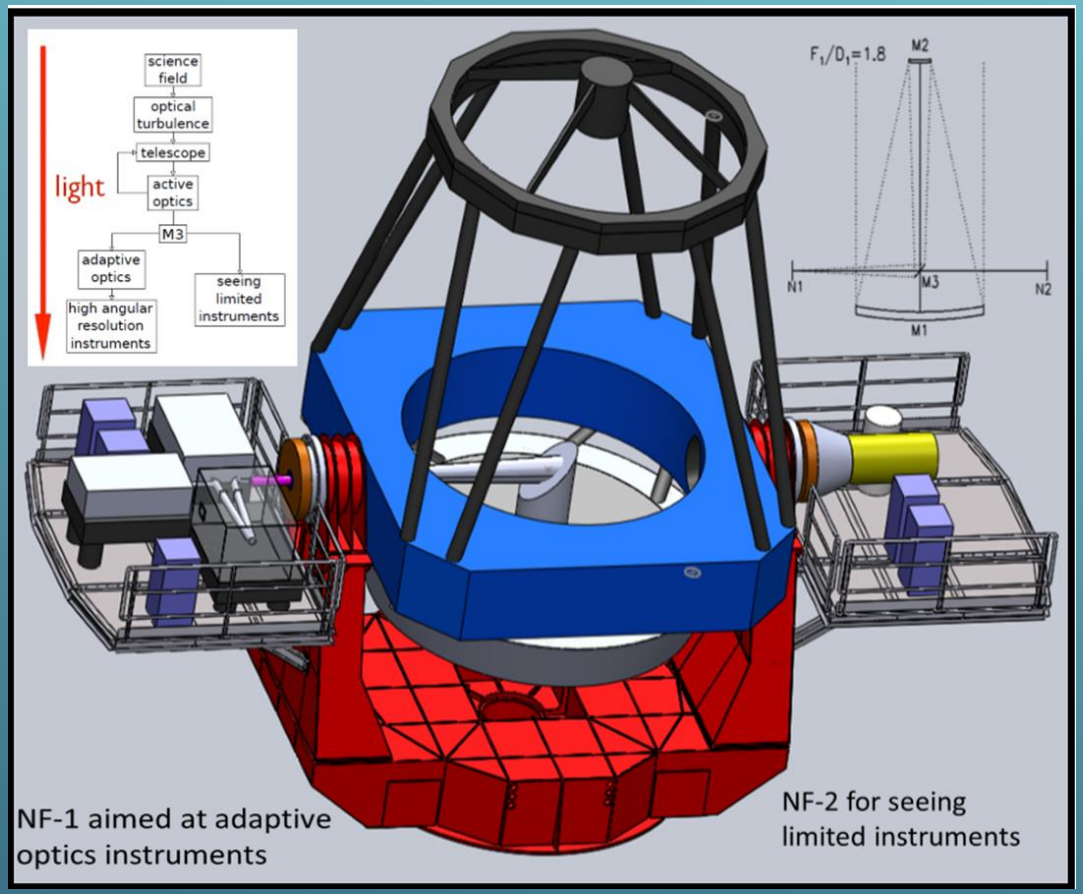
Telescope AMOS (Belgium)
Enclosure EIE (Italy)

THE DAG TELESCOPE





DAG Telescope Optics – Mechanical Preliminary Design:



Primary mirror clear aperture (D1):	4.0 m
Primary mirror focal ratio (f1):	1.8
Configuration:	Ritchey-Chretien (RC) M1 and M2 are hyperboloids with conic constants matched to cancel off-axis coma and spherical aberration.
Focal Planes	Two Nasmyth foci. No Cassegrain focus
Effective focal length:	56 m
Operational waveband:	350 to 3000 nm
Unvigneted FOV (diameter):	30 arcmin available at the Nasmyth foci
Primary science FOV:	10 arcmin
Number, location of Nasmyth foci:	Two foci, located 4.2 m after M3

Optical Design (In House):

High Performance

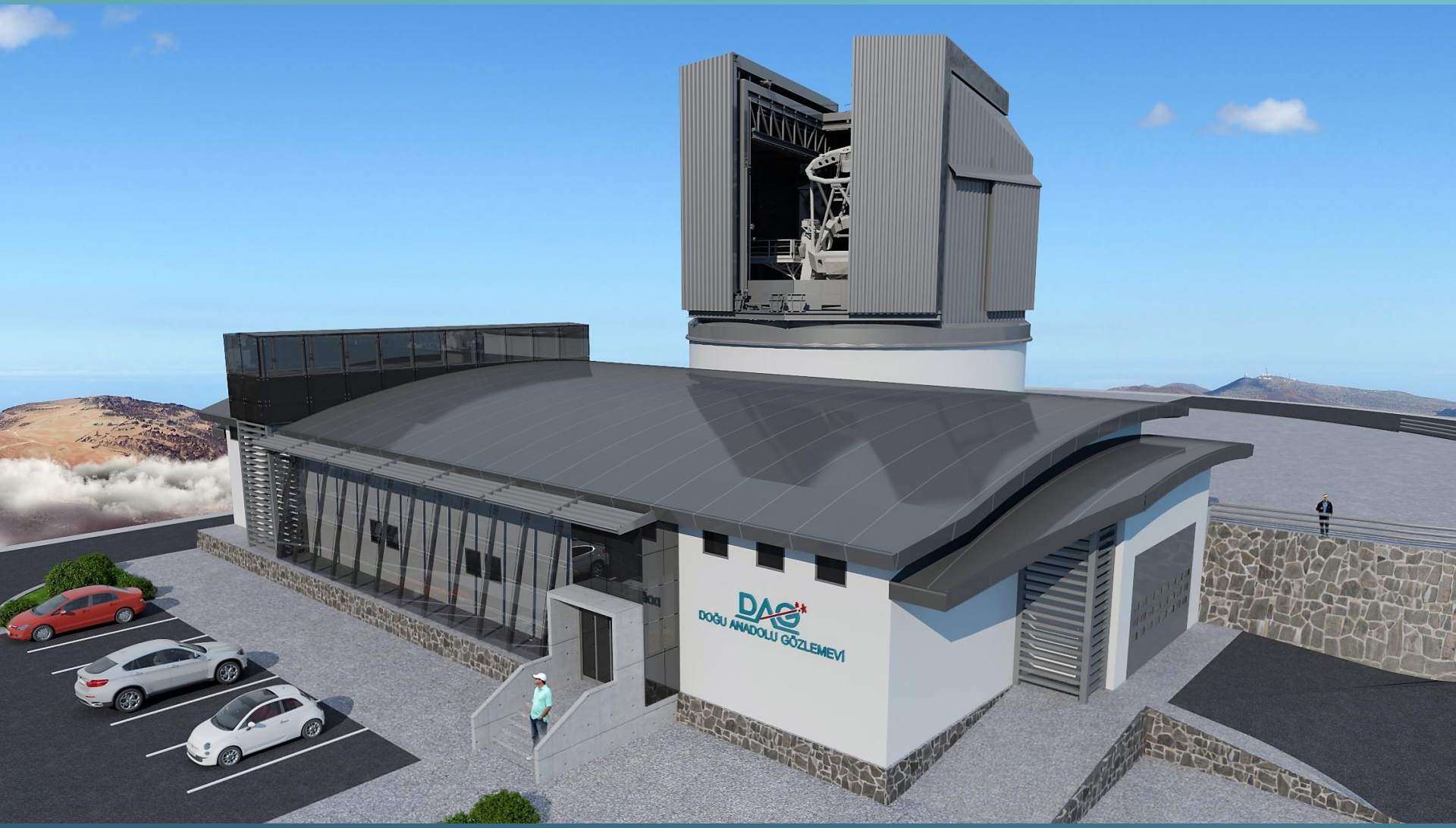
aO + AO + RC

2 Nasmyth Focus

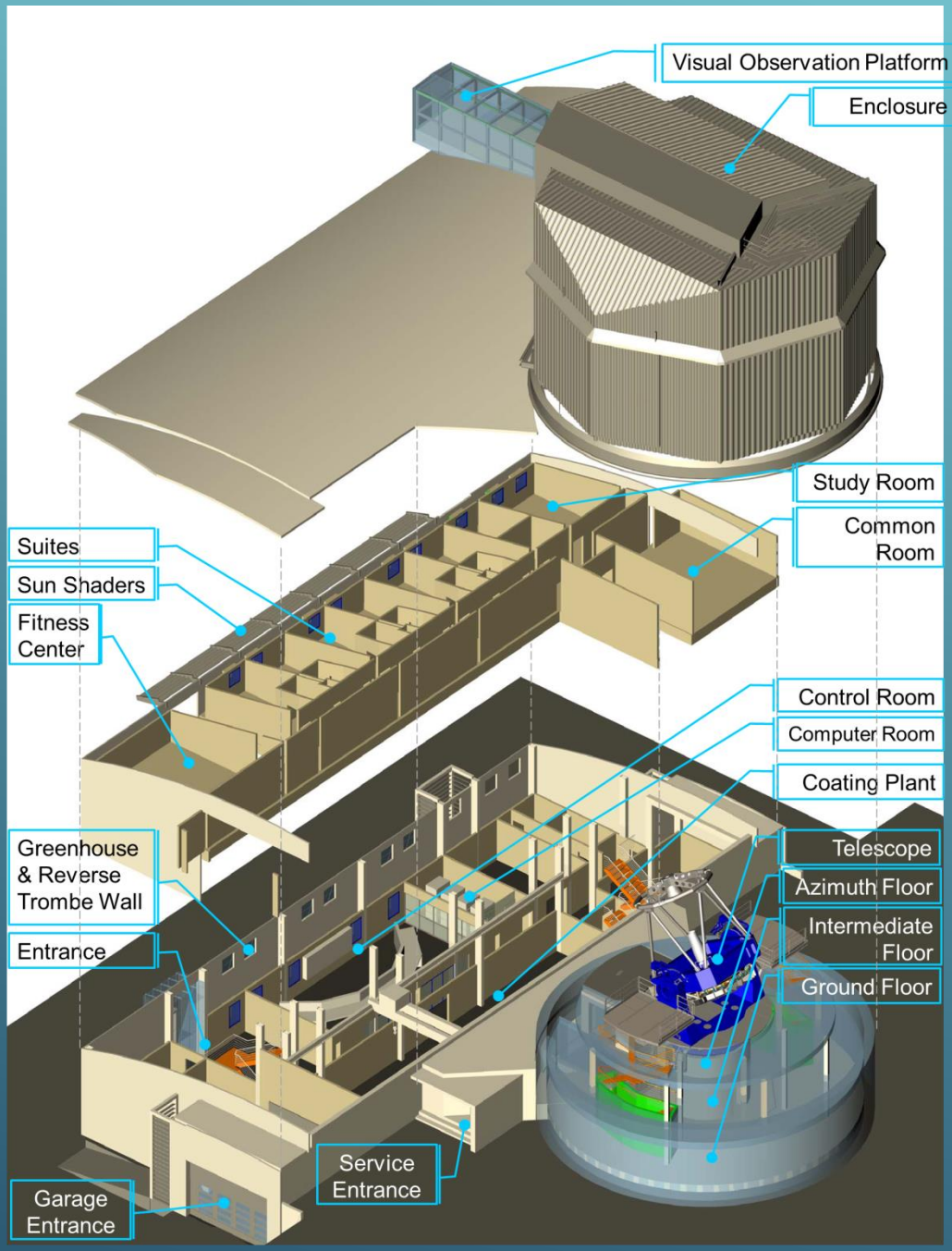
4 m Diameter

VIS + IR

DAG Building Design GUNARDA (Turkey)



DAG Building Design GUNARDA (Turkey)

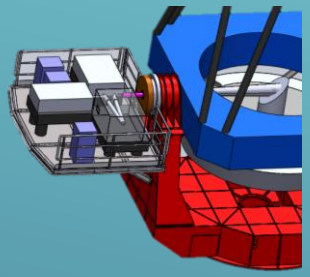


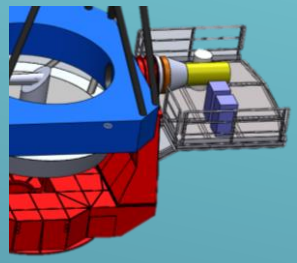
DAG FPI

Collaboration:

Ataturk University
FMV Isik University
Orta Doğu Teknik University
Istanbul University

N1 (AO)





N2

Optical	*Derotator*	*Derotator*
	Narrow FoV	*Large FoV*
VIS	*Imaging + Spectroscopy*	*MOS + New Technologies + Other*
NIR	*Imaging + Spectroscopy*	

DAG Current Collaborations

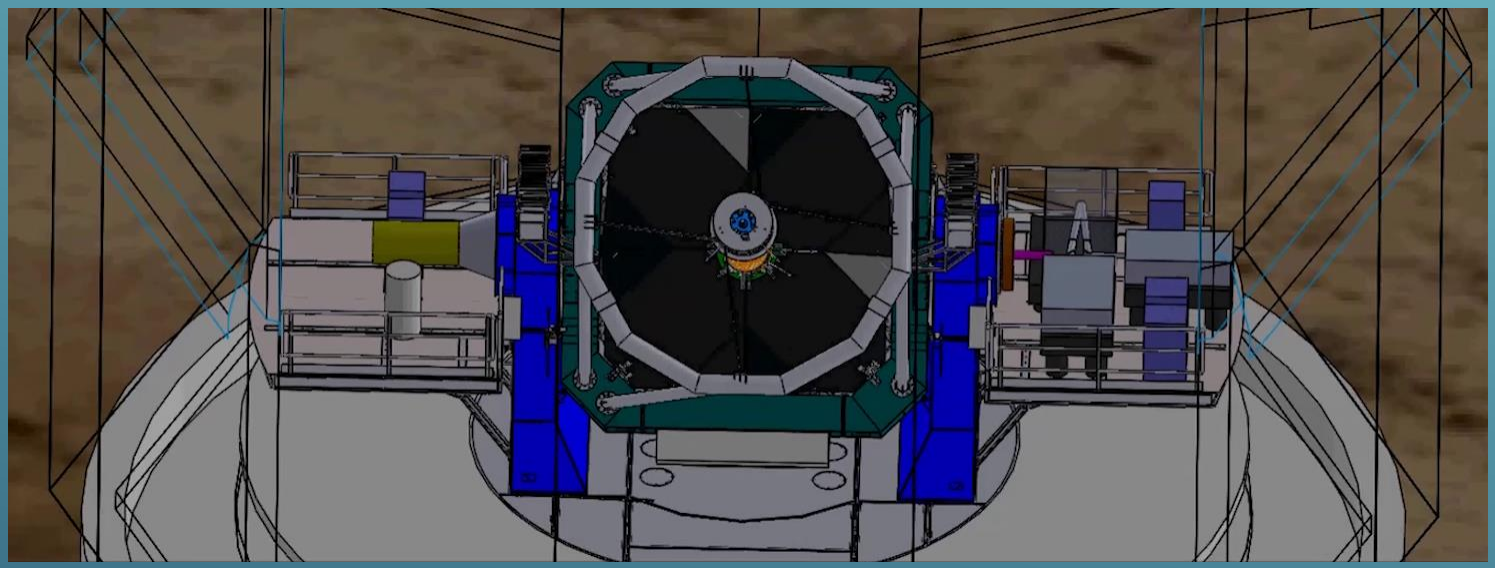
FLAMINGOS-I – Multi-Object NIR Spectrometer (*Univ. of Florida*)

MKIDs – Microwave Kinetic Inductance Detectors (*Univ. of California*)

MASS-DIMM – Installation of DIMM System (*Moscow State Univ.-SAI*)

DAG Collaboration Strategy

- DAG site can host mid/small telescopes within its (2500 decare) area:
  - Use Site – Provide observation time
  - Bring Instrument – Request observation time
- DAG welcomes ALL TYPES of scientific and technical collaborations.



Thanks