

## EASTERN ANATOLIA OBSERVATORY (DAG)

Eastern Anatolia Observatory (DAG) is an international observatory that is being established in Erzurum within Atatürk University Astrophysics Research and Application Center (ATASAM, 2012) with the supports of the Ministry of Development and Atatürk University and that will have the biggest (mirror diameter of 4 m) and the first infrared (IR) telescope of Turkey. In this context; the projects that will be completed in three stages were developed: Eastern Anatolia Observatory (DAG) Project (2012 - 2020), Focal Plane Instruments (ODA) Project (2016 - 2020) and Mirror Coating System (AKS) Project (2020 - 2021). Within DAG Project, the purchasing and installation of telescope and enclosure, the construction of observatory building with its surrounding units and the establishment of infrastructures and superstructures of DAG Site were planned. Within ODA Project, it has been planned to design and purchase focal plane instruments (Adaptive Optics, Derotator, Cameras, Spectrometers etc.) that could make observations in both visual (VIS) and near infrared (NIR,  $<3 \mu\text{m}$ ) regions and to establish an optical laboratory (OPAL: Optomechatronics Research Laboratory) to be equipped with maintenance-repair-test facilities that will also ensure doing research and development (R&D). AKS Project, on the other hand, is the project that a coating unit (will be the biggest coating system in Europe) will be established for the coating of all mirrors and satellite equipments up to 4 m belonging to both DAG Telescope and to others in the region. ATASAM is the application, research and development (R&D) center in which these projects are being carried out and the center implements the establishment of observatory infrastructures and organizing the administrative-technical-financial-staff issues that are necessary.

A land of about 2500 decares in Erzurum, Konaklı - Karakaya Hills (DAG Site, at an altitude of 3170 m,  $39^{\circ}47'N$  /  $41^{\circ}14'E$ , about 35 km away from Erzurum) was allocated for DAG; the infrastructure of DAG Site in full was completed between 2013 and 2018. The atmospheric conditions (number of clear nights, low humidity and temperature, low atmospheric conversion layer, suitable wind speed and seeing values) of DAG Site in particular, has a high potential in terms of astronomy. DAG will fill a large observational gap over the World thanks to its location.

The 4 m mirror (M1) of DAG Telescope was produced by SCHOTT (Germany), the mechanical and optical parts by AMOS (Belgium) and EIE (Italy), and the enclosure by EIE (Italy). The building design of DAG was made by GÜNARDA (Turkey). DAG Telescope is the unique telescope in its class optically due to having Nasmyth focuses (VIS, NIR), Ritchey-Chrétien (RC), Active Optics (AO), Adaptive Optics (AO) and Derotator (DR) systems at the same time. Of DAG Telescope, the AO System (TROIA: Turkish adaptive Optics system for Infrared Astronomy) and DR System, were designed by OPAM (FMV Işık University Optomechatronics Research and Application Center, Turkey) whereas all the infrastructure of DAG Site (electric, fiber internet, water, transportation, communication etc.) and Observatory Control System (OCS) were designed and being completed by ATASAM and DAG Team (Turkey).

With its defined vision, mission and values together with technological characteristics and focal plane instruments it has, DAG will open a new window into not only national but also international astronomy. DAG, due to its surrounding units (ODA, AKS, OPAL) that will become operational and to its site characteristics that have high astronomical potential and powerful infrastructure, is ready and open to make partnership-cooperation with national and international institutions and organizations in every kind of scientific, technological and R&D areas and topics (astronomy, space sciences technologies, optics, instrument, atmosphere, coating, software and control, etc.) within the body of ATASAM.



For Photos  
and Videos:



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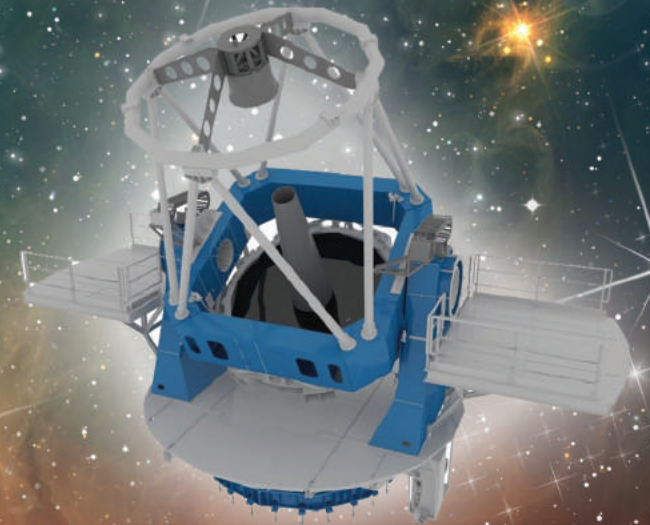
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Eastern Anatolia Observatory



Turkey's  
The Biggest and The First IR  
Telescope  
on The Summit of Anatolia

Atatürk University  
Astrophysics  
Research and Application Center  
(ATASAM)





## EASTERN ANATOLIA OBSERVATORY

Turkey's  
Biggest (4 m) and  
First Infrared (IR)  
Telescope and  
Observatory

Observatory Site  
of 2500 Decares at  
3170 m Altitude  
and Powerfull  
Infrastructure

Enclosure with  
Cooling System,  
Wind Curtain and  
Double Wing  
Door

Transfer  
Channel Closed to  
Outdoor  
Environment from  
Telescope Floor to  
Mirror Coating  
Unit

DAG Site:  
Turkey,  
Erzurum - Konaklı,  
Karakaya Hills  
39° 47' N  
41° 14' E

Observatory  
Building with  
Active - Passive  
Solar Energy,  
Barrier-Free and  
Integrated

Suitable  
Atmospheric,  
Astronomical and  
Observational  
Conditions

Nasmyth  
Instrument Capacity:  
2000 kg/Platform  
Platform: 0.3 - 3.0  $\mu$   
VIS (Seeing Limited)  
NIR (AO Limited)

DM1: 4 m  
DM2: 764 mm  
DM3: 890 - 648 mm  
Effective F: 56 m  
Effective f#: 14.0  
M1 f#: 1.8

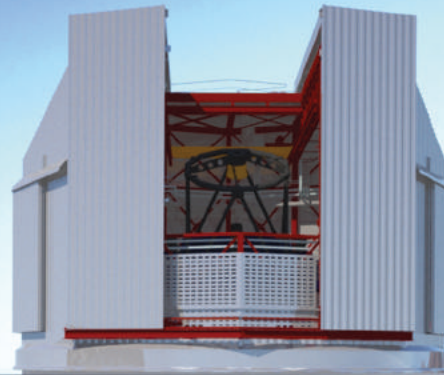
aO:  
Lateral: 24 p + 3 d  
Axial: 66 p + 9 d  
AO: SCAO (PWFS)  
Alpao (468 act.)  
DR: K-Mirror  
FoV: 7'

Clear Night:  
~240 d/yr  
Median Seeing: 1"  
Min. Seeing: 0.4"  
Wind Vmean: ~6 m/s  
Humidity Hmin: %1

FoV (VIS): 24'  
FoV (NIR): 7'  
Plate Scale:  
3.6833"/mm  
Diff. Limit (1  $\mu$ ):  
0.05"

Slew Speed: 2°/s  
Accuracy (RMS):  
Pointing <1.85"  
Tracking <0.10"  
Settling Time (AL-AZ):  
13.8 s - 3.2 s

Performance:  
RC + aO + AO + DR  
Active Optics  
Ritchey-Chrétien  
Derotator  
Adaptive Optics



**Vision**  
To be a leader  
observatory that is  
preferred and competitive  
at national and  
international levels, and  
that directs space  
sciences.

**Mission**  
To make competitive  
observations at  
international level,  
to offer opportunity to  
innovative technologies  
and support the  
development of  
current science.

**DAG**  
DOĞU ANADOLU GÖZLEMEVİ