

IDOM IN ASTRONOMY





Full engineering and complete procurement, construction and commissioning services for astronomy PROJECTS.

IDOM is an international firm specializing in Engineering, Architecture and Consulting. IDOM operates globally in areas such as power generation, oil & gas, renewable and alternative energies, manufacturing industry, civil infrastructures, nuclear plants, large technological and scientific facilities, architecture and unique challenging engineering projects.

IDOM ADA leads the company activity in technologically advanced and challenging projects involving applied mechanics, structural design, electronics & control.

Our portfolio of clients and collaborators include ESO, AURA, IAC, GTC, EHU-UPV, SNS/ORNL, GANIL, ESS-Bilbao, ESS, F4E / ITER, CENER, TMT Observatory Corporation, Clemson University, NaREC, Fraunhofer Institute and others.

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Fully integrated in Idom Group

TELESCOPE ENCLOSURES

Idom has fully developed the enclosure of some of the most challenging telescopes and has provided the world's largest tracking enclosure.

THE DANIEL K. INOUE SOLAR TELESCOPE (DKIST, FORMERLY THE ATST)

Idom has delivered the world's largest tracking Enclosure for the Daniel K. Inouye Solar Telescope, which has been erected at Haleakala Observatory on the island of Maui.

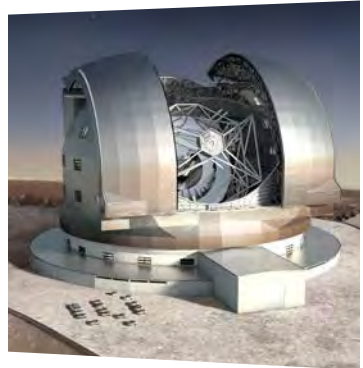
The DKIST Enclosure is unique in that it positions the optical system's first aperture stop and tracks the sun's motion with millimeter-level accuracy.

The enclosure is driven by mechanisms especially designed to perform smooth operations at solar tracking speeds, as it is the case of the innovative "crawler" mechanism.

Since 2010, IDOM has successfully completed the Design phase of the DKIST Enclosure, as well as the Manufacturing, Factory Assembly, and Factory Test phases. IDOM has also been responsible for Technical Assistance during Site Assembly, which was completed in 2016.

THE EUROPEAN EXTREMELY LARGE TELESCOPE ENCLOSURE

With a 39-m diameter primary mirror, the E.ELT will be the largest optical/infrared telescope in the world. IDOM developed the concept for the Enclosure and performed the integral detail design of the enclosure in the frame of a FEED Study.



OTHER ENCLOSURE PROJECTS

Among other contributions to the QUIJOTE CMB project, Idom designed and supervised the construction of the Enclosure, aimed to protect the two QUIJOTE telescopes and featuring a fully removable roof. Idom has also provided an upgrade design, for

improving the underperformance of the GIL Dome Shutter System, whose original design and construction did not pertain to Idom. Moreover, Idom performed a cost estimate for the TMT Calotte Enclosure Construction and carried out a baseline design review.



TELESCOPE SYSTEMS

Idom develops and supplies complete telescope systems for astronomical observatories.

FIRST AND SECOND TELESCOPE OF THE QUIJOTE CMB EXPERIMENT

Customized designs are produced for an optimum fulfillment of technical, schedule and budgetary needs of the project.

Leaded by the IAC, the QUIJOTE CMB Experiment, aimed at measuring the polarization of the Cosmic Microwave Background (CMB).

Following the successful delivery of the first telescope, Idom delivered on a turnkey supply basis the second telescope unit with enhanced opto-mechanical performance and maintainability. Both telescopes have been operative since 2012 and 2014 respectively, and the facility was officially opened on June 2015 by His Majesty the King Felipe VI.

E-ELT MAIN STRUCTURE DESIGN

As part of the tender for the Construction phase of the E-ELT, Idom developed an alternative design concept of the Main Structure of the Telescope. Amongst the concept studies developed by IDOM on the E-ELT Main Structure, IDOM also envisaged a Base Control System for protection of the E-ELT Main Structure against the effect of high level earthquakes. The proposed seismic isolation design performance was successfully validated.



TMT MAIN STRUCTURE FABRICATION, ERECTION AND COST ANALYSIS

Following a systems engineering approach, IDOM performed on 2013 a comprehensive Cost Analysis of the Thirty Meter Telescope (TMT) Mount that involved a thorough review of the baseline design and detailed studies about how

to fabricate, factory assemble, transport and erect the different subsystems in order to determine the cost of said phases, including an evaluation of the impact on cost of other design alternatives.

INSTRUMENTATION

Idom is active in the design and fabrication of instrumentation for astronomy

FOLDED CASSEGRAIN SETS FOR THE GRAN TELESCOPIO CANARIAS (GTC)

The GTC FC-Sets are multipurpose systems that include an Instrument Rotator, a Cable Rotator for the instrument and the Acquisition and Guiding (AG) and Wavefront Sensing (WS) System. IDOM developed, manufactured and tested a customized design for the FC-Sets, based on a compact layout of the mechanical system and enhanced by an innovative cable wrap design.

The conceptual design of the FC-Sets for the GTC was driven by the need for integration, reduced weight and minimum impact on the telescope tube.

WIDE FASTCAM, PLANETCAM AND FASTCAM

Idom provides robust designs that ensure the required mechanical and thermal stability, and the optical performance of the instruments.

Based on a close collaboration with the scientific team from the early stages of the project, we design, manufacture, assemble and commission complete opto-mechanical systems.



Wide FastCam is a wide-field imaging camera for the (TCS) conceived for obtaining extremely high temporal and spatial resolution images.

PlanetCam and FastCam are state-of-the-art instruments for 1-4m class telescopes, in which images are acquired and processed using the "lucky imaging" technique.

THE QUIJOTE CMB EXPERIMENT FIRST INSTRUMENT

The first of the three instruments of the QUIJOTE CMB Experiment had five separate polarimeters with a novel cryogenic on-axis rotating polar modulator system. IDOM performed the integration of the system and carried out thorough

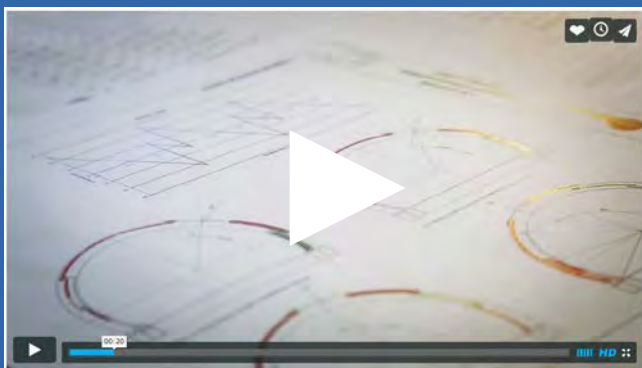
functional tests (including mechanics, vacuum and cryogenics) for each of the polarimeters and the whole instrument at its laboratories in Bilbao, prior to delivering the instrument to the IAC.

FILMS

IDOM ADA - Integrated Solutions



DKIST Solar Telescope - Enclosure Documentary



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