# The JAST80 telescope will carry out four new surveys led by top astrophysical institutions

***Mini-HAWKs, J-ALFIN, MUDEHaR and North-PHASE have been chosen for their "legacy" character to use the 3,250 hours of observation time offered by CEFCA in the next five years***

**December 21st, 2022.-** The JAST80 telescope of the Observatorio Astrofísico de Javalambre located in Arcos de las Salinas (Teruel, Spain) will begin the observations of four new surveys in January: Mini-HAWKs, J-ALFIN, MUDEHaR and North-PHASE. These initiatives have been selected for their "legacy for Astrophysics" character among the eight that were received in the call made in March by the Centro de Estudios de Física del Cosmos de Aragón, CEFCA, offering a total of 3,250 hours in the next 5 years.

With this commitment made by CEFCA with these surveys, the Observatorio Astrofísico de Javalambre strengthens its international position as an ideal facility for carrying out the observations of that type. The OAJ, as a Spanish en Unique Science and Technology Infrastructure, ICTS, must offer the scientific community at least 20 percent of its observation time.

On this occasion, the Time Allocation Committee, TAC, consisting of five experts in different areas of astrophysics from institutions different from CEFCA and two internal staff researchers, had made the selection between eight projects of extraordinary level led by different national and international (including the United Kingdom and China) institutions, since the observation time requested has been more than 10,200 hours, a factor of three larger than the offered time.

The observing time allocation for those four second-generation surveys is the culmination of a process that began more than a year ago, aiming at making the most efficient use of the JAST80 telescope and instrumentation. In November last year, a dedicated meeting was held where the features of the telescope and its instrumentation were exposed to different scientific groups from around the world, who presented their initial ideas and their needs in order to develop projects with the JAST80. Later in March 2022 the official call for proposals was opened to receive applications and over the last few months the most suitable projects have been chosen, due to their scientific excellence, their feasibility and their potential impact on Astrophysics.

The JAST80 has a large field of view, which makes it optimal for observing large areas of sky in a short time, in addition to having a set of optical filters that allows to study in detail relevant features of the physics of celestial objects, by selecting particular ranges of the electromagnetic radiation that reaches us from them.

## Diverse astrophysical goals to get the most out of the JAST80

The mini-HAWKs project is led by the Instituto de Astrofísica de Canarias and will focus on the search for dormant black holes in the Milky Way. On the other hand, the J-ALFIN project, presented by the Instituto de Astrofísica de Andalucía-Consejo Superior de Investigaciones Científicas (IAA-CSIC), will reveal the extended diffuse emission of nebulae around stars in advanced stages of their evolution. The MUDEHaR survey, from the Centro de Astrobiología (CAB), CSIC-Instituto Nacional de Técnica Aeroespacial (INTA), will investigate the temporal evolution of stars, most of them massive, with emission along the Hα hydrogen line and will monitor time variations in the infrared range. And finally, the North-PHASE project, led by the University of Dundee (United Kingdom), will study the physics of young stars and the formation processes of protoplanetary disks around them through brightness variability measurements. In total, there will be fifty researchers directly participating in the research teams of these projects.

The MUDEHaR and North-PHASE surveys will use filters that are already available for the J-PLUS project, while J-ALFIN will use three narrow filters used in the CEFCA's main survey carried out, J-PAS, carried out with the JST250 telescope and the JPCam instrument. Finally, three new specific filters will be specifically designed and manufactured for the mini-HAWKs project, covering different spectral widths centered on the Hα line to apply their black hole detection method to our galaxy.

## A legacy for science

These surveys are projects that permit~~s~~ its further use by the international scientific community~~,~~ since, although they are defined to achieve a specific goal for each of the research teams, they can later be used in variety of Astrophysics fields, ~~and~~ hence its "legacy" character. The research team of each project will release the data periodically. CEFCA will be in charge of data collection and it will offer the standard processing and the necessary calibrations to the research teams so that the data can be scientifically exploited.

With these legacy projects for JAST80, the proper use and exploitation of the telescope and instrumentation is guaranteed for the next five years through cutting-edge research whose results are expected to have a great impact in different fields of astrophysics, in addition to leaving a set of data with high scientific interest for its exploitation.

These projects will share time with CEFCA's main survey with JAST80, J-PLUS, which will continue increasing its area coverage on the sky. On the other hand, regular call for proposals are issued to the community offering 40 hours of observation per semester for projects that require a quick response ("Targets of Opportunity"), as well as 40 hours per semester for the Director's Discretionary Time (DDT) that is dedicated to feasibility tests and observations that can potentially lead to an impact result with limited observing time dedication.

**Images:**

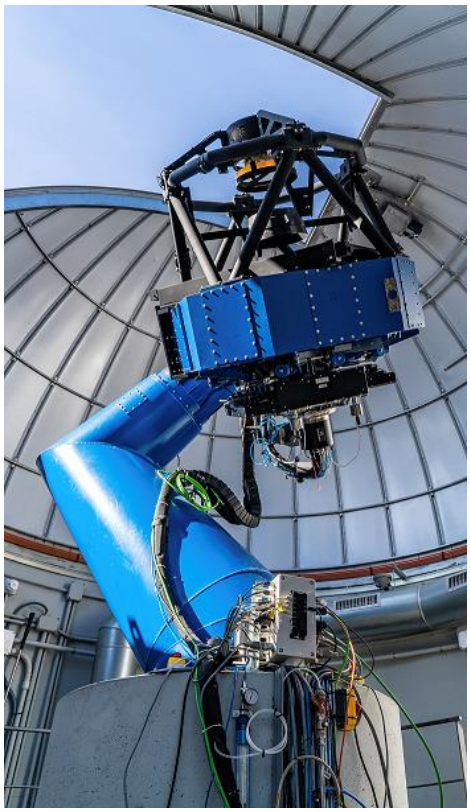

*Image of the JAST80 telescope of the Observatorio Astrofísico de Javalambre/CEFCA with which the observations of these projects will be made*


*From top left, composition of the four legacy projects to be they are going to execute: image of sleeping black hole, main objective of Mini-HAWKs (credit: Gabriel Pérez Díaz), and J-ALFIN logos (credit: Marjan Akbari and Edgar I Santamaría), MUDEHaR and North-PHASE.*