CALL FOR LETTERS OF INTENT FOR SURVEYS WITH JAST80 AT OAJ

3250 h	5 years	2023A

Deadline: **30 September 2021, 14:00 CET**

Letters of Intent should be submitted in PDF format to the following email: *JAST80Surveys@cefca.es*

1. SUMMARY

The *Centro de Estudios de Física del Cosmos de Aragón* (CEFCA, *http://www.cefca.es*) is a research center located at the city of Teruel (Spain). Its main goal is to build and operate the ICTS *Observatorio Astrofísico de Javalambre* (OAJ, *http://oaj.cefca.es*) and to implement the Data Center "*Unidad de Procesado y Archivo de Datos*" (UPAD) with the necessary equipment to exploit scientifically and offering to the astronomical community the data provided by the OAJ telescopes.

The OAJ is located at the Sierra de Javalambre, in Teruel (Spain), is aimed to lead large-sky multi-filter surveys of the Northern hemisphere over the next years. The OAJ consists of two main telescopes of large field of view (FoV): the 2.55m Javalambre Survey Telescope (JST250) and the 83cm Javalambre Auxiliary Survey Telescope (JAST80), with polychromatic, seeing-limited images in their unobscured FoVs of 7 and 3 deg^2, respectively. Both telescopes are equipped with panoramic instrumentation: JPCam, with 1.2 Gpix distributed in a mosaic of 14 large-format CCDs covering 4.7 deg^2 at the JST250 focal plane and T80Cam, at the JAST80 telescope, providing a 2 deg^2 FoV at the focal plane.

JAST80 is currently mostly devoted to conduct the Javalambre Photometric Local Universe Survey (J-PLUS; *http://www.j-plus.es*) with a set of 12 narrow-, intermediate- and broad-band filters.

Following the survey spirit of the ICTS OAJ, and with the aim of maintaining the competitiveness of the facility in the next years, an open call for proposals will be made public early 2022 to define the second-generation Surveys with the JAST80 Telescope.

In this context, CEFCA issues a **Call for Letters of Intent** for Surveys with the JAST80 Telescope operating at the OAJ. Observations are expected to start in 2023A.

Eligible projects must be observed with the JAST80 telescope and its large field of view imager T80Cam. Available filters can be used, these include the J-PLUS and GALANTE (*https://galante.cab.inta-csic.es*) filter systems. Projects requiring a different set of filters and/or the development of new instrumentation are also welcomed. Projects must require **a minimum of 200 and a maximum of 650 hours per year and up to 5 years of observations**.

Letters of Intent are expected to be discussed in a public meeting at the end of 2021, prior to the formal Request for Proposals process.

The submission deadline for the Letters of Intent is **30 September 2021, 14:00 CET**, and should be submitted in PDF format to the following email: *JAST80Surveys@cefca.es*.

2. JAST80 AND T80Cam

The JAST80 telescope is an 83cm Ritchey-Chrétien-like telescope, with a German equatorial mount and a corrector of three spherical lenses. The secondary mirror (M2) is held by an hexapod, which is used to correct for optical aberrations during operation. This is done by wavefront curvature sensing techniques developed at CEFCA, making use of intra- and extra-focal images. Because of the large FoV and fast optics (F#4.5) of the telescope, this process is required to keep the optimal image quality all across the FoV over time. In normal operation, the position and tilt of M2 are fine-tuned according to an empirically calibrated control law for the hexapod, that takes into account the pointing coordinates and the temperature of the telescope.

A software limit is set at 25 deg elevation, below which observations cannot be performed. The absolute pointing accuracy is 4 arcsec (rms) in the whole sky. Differential pointing inside a radius of 2 deg can be performed with an accuracy of 0.6 arcsec (rms). Non-sidereal tracking capabilities are also available.

T80Cam is the panoramic camera on the JAST80. It is a wide field camera with a 9.2k×9.2k pixels CCD, which provides a 2 deg^2 (unvignetted) FoV. The pixel scale is 0.55 arcsec/pixel. Table 1 shows default T80Cam read mode main characteristics. Other read mode alternatives may be available and, if required, shall be evaluated in a case-by-case basis. Please visit *http://www.cefca.es/observatory/t80cam* for more information.

For operational reasons, the longest integration time offered for a single exposure is 600 s.

T80Cam is equipped with the J-PLUS filters. These are 4 SDSS filters (g, r, i, z), the u_{Java}, and seven narrow band filters, as illustrated in figure 1. Tables 2 and 3 summarize the characteristics of the filters.

CCD format	9216×9232 pix
	$10\,\mu m\,pix^{-1}$
Pixel scale	0.55 arcsec pix^{-1}
FoV coverage	$2.0\,deg^2$
Read-out time	12 s
Read-out noise	$3.4\,e^-\,pix^{-1}$
Full well	$123\,000\,e^-$
CTE	0.99995
Dark current	$0.0008\,e^-\,pix^{-1}\,s^{-1}$
Number of filters	12

Table 1: T80Cam main characteristics (default read mode).

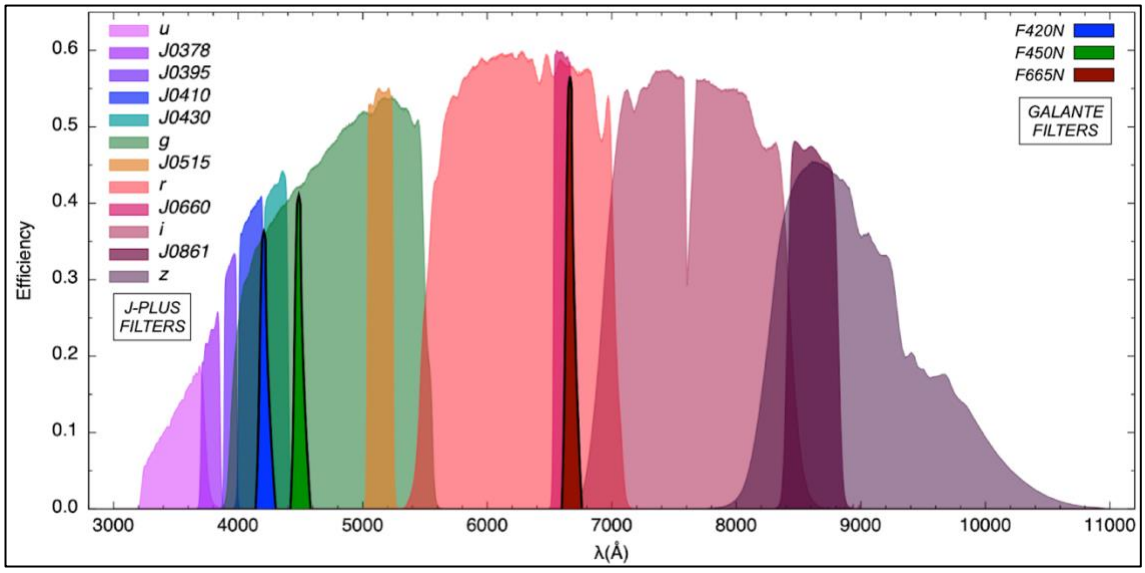

Figure 1: Transmission curves of the J-PLUS and GALANTE filter systems

Filter	Central Wavelenght [Å]	FWHM [Å]
u	3485	508
J0378	3785	168
J0395	3950	100
J0410	4100	200
J0430	4300	200
g	4803	1409
J0515	5150	200
r	6254	1388
J0660	6600	138
i	7668	1535
J0861	8610	400
z	9114	1409

Table 2: Main characteristics of the J-PLUS filter system.

Filter	Central Wavelenght [Å]	FWHM [Å]
F420N	4200	100
F450N	4500	100
F665N	6650	50

Table 3: Main characteristics of the GALANTE filters

3. OFFERED OBSERVING TIME

CEFCA issues a **Call for Letters of Intent** for Surveys with the JAST80 Telescope operating at the OAJ. A maximum of 650 hours per year during a 5-year period will be offered.

Eligible projects must fulfill the next set of requirements:

- Carried out with the JAST80 telescope (*https://www.cefca.es/observatory/jast-t80*) and its large field of view imager T80Cam (*https://www.cefca.es/observatory/t80cam*). Projects requiring the development of new instrumentation are also welcomed. In this

case, the Letter of Intent shall include a sketch of the proposed instrument design and characteristics.

- Available filters can be used, these include the J-PLUS (*http://www.j-plus.es*) and GALANTE (*https://galante.cab.inta-csic.es*) filter systems. Projects requiring a different set of filters are also welcomed. In this case, the Letter of Intent shall include a description of the proposed filters characteristics.

- Projects shall require a **minimum of 200 and a maximum of 650 hours per year**. The observation of a minimum of 75% of the TAC awarded time will be guaranteed by CEFCA.

- The length of the project shall be up to **5 years**.

- Available observing time includes dark, grey and bright nights, both photometric and not photometric. Projects covering the different observing conditions are encouraged.

- At no time there will be more than 2 active surveys covering the same RA range, and two active surveys will be possible only if they do not require similar observing conditions (dark time, excellent seeing, etc.).

- Observations are expected to start in **2023A**. If the Survey requires new filters and/or new instrumentation, the starting date will be accommodated to adjust to required filters and/or instrumentation availability.

4. DATA REDUCTION

CEFCA provides access to raw and/or reduced and calibrated (using the standard procedures developed for the J-PLUS project) OAJ data through the UPAD/TAC-Data web service (https://tacdata.cefca.es/login). Additional developments in the reduction process and the calibration of the data shall be evaluated in a case-by-case basis.

Access to the project data, including images and catalogues, can be offered through the UPAD data access web portal (http://archive.cefca.es/catalogues) and via protocols of the Virtual Observatory. This possibility depends on the project details (filters, observational strategy…) and shall be evaluated in a case-by-case basis.

Additionally, web frontend services can be offered by CEFCA. This possibility also depends on the project details and shall be evaluated in a case-by-case basis.

5. DATA RELEASES

Given the expected Legacy Value of the awarded projects, a proposal for the Data Release Strategy and Data Proprietary Period will be required in the formal request for proposals.

6. RESEARCH GROUP REQUIREMENTS

Scientific exploitation of the awarded project/s shall be guaranteed. With this aim, the following requirements shall be fulfilled by the Research Group leading a project at the time of submitting a formal observing time proposal:

- The groups shall have access to the required computing and storage facilities to handle the project data. This may include UPAD services upon discussion with CEFCA.
- The groups shall have access to the required scientific and technical human resources to process and analyze the project data.

7. LETTERS OF INTENT FOR NEW JAST80 LARGE PROJECTS

Letters of Intent shall include the scientific rationale, emphasizing the *Legacy Value* of the data, and an overall description of the observing strategy and filter system. In the case of new filters and/or instrumentation is needed, brief technical description will be welcomed.

8. NEXT STEPS

The expected main steps to start observations with the JAST80 are:

- Letters of Intent submission deadline: **30 September 2021, 14:00 CET**.
- Open meeting to present JAST80 Survey Mode and to discuss potential projects. Identification of Synergies: **November 2021**
- Call for Proposals OPEN: **February 2022**
- Call for Proposals CLOSED: **May 2022**
- Awarded Surveys announcement: **July 2022**
- Agreements and Survey implementation: **July - December 2022**
- Beginning of observations: **January 2023**(*)

(*) *If the Survey requires new filters and/or new instrumentation the starting date will be accommodated.*