



# **Announcement of Opportunity (AO) for Observing Time in the CHEOPS Guest Observers Programme**

**AO-1**

**Policies and Procedures  
CHEOPS-EST-SCI-TN-004 i1.0**

Prepared by Kate Isaak, CHEOPS Project Scientist

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## 1 PURPOSE AND SCHEDULE

The CHaracterising ExOPlanets Satellite (CHEOPS) is the first mission dedicated to the study of exoplanetary transits through high precision photometry of bright stars already known to host planets. It will provide the unique capability of determining accurate radii for a subset of those planets for which the mass has already been estimated from ground-based spectroscopic surveys. It will also provide precise radii for new planets discovered by the next generation of ground- or space-based transits surveys (Neptune-size and smaller). By unveiling transiting exoplanets with high potential for in-depth characterisation, CHEOPS will also provide prime targets for future instruments suited to the spectroscopic characterisation of exoplanetary atmospheres.

The CHEOPS payload consists of a single instrument - a space telescope with an effective diameter of 30 cm, which feeds a single CCD focal plane detector covering 330 – 1100 nm with a field of view of 0.32 deg<sup>2</sup>. The payload design and operation has been optimised to achieve ultra-high photometric stability, achieving a photometric precision of 20 parts per million on the light curve of a G5 dwarf star in 6 hours, over a minimum period of 48 hours. The point spread function of the payload is approximately 12" (90% encircled energy radius). These characteristics, together with the high-cadence (1 minute) sampling, offer the capability to measure high-precision, high-cadence, broad-band light curves covering the visible-near infrared waveband.

The nominal duration of the science operations phase is 3.5 years, with a goal of 5 years. 80% of the science time on CHEOPS is dedicated to an observing programme defined by the CHEOPS Science Team and referred to as the Guaranteed Time Observing (GTO) Programme or Core Observing Programme. The remaining 20% will be made available to the astronomical community through a Guest Observers (GO) Programme that is open to the science community as a whole, and that is the subject of this document.

CHEOPS will be launched from Kourou as a co-passenger on a Soyuz rocket. The launch is planned to take place during the so-called "launch slot" of 15 October – 14 November 2019. A more precise launch date will be known a few months in advance. The Launch and Early Operations Phase is followed by the In-orbit Commissioning Period, with a nominal duration of 2 months. Nominal science operations will start following the successful completion of the In-orbit Commissioning Review.

This first announcement, AO-1, covers the first year of nominal science operations. A launch date of 31 October 2019 will mean that nominal operations will start on 1 February 2020. This could change if the launch occurs earlier or later during the launch slot, or if the In-orbit Commissioning Period has to be extended. Therefore, potential observers are invited to submit proposals for targets that could be observed as early as mid-January 2020, on the understanding that there may not be an opportunity to schedule science observations until the end of February 2020. The same timeline will apply to the start of observations in the GTO programme of the Science Team.

Proposal submission is a two-stage process. Electronic submission of the first phase proposals will be required in response to this announcement. Observing time will be awarded by the ESA Director of Science, following peer review and recommendations by the CHEOPS Time Allocation Committee (CTAC), with all proposal principal investigators informed of the decision of the CTAC. Submission of the second phase input - observation

requests providing detailed scheduling information - will only be required from those awarded time.

The schedule for the AO-1 process is as follows:

<b>Event</b>	<b>Date</b>
Issue of AO-1	19 March 2019
Closing date for proposal submissions	16 May 2019 (midday GMT/UTC; 14:00 Central European Summer Time)
CTAC meeting	First week of July 2019
Announcement of the results of AO-1	By end July 2019
Phase II proposal submission opens (creation of observation requests)	14 August 2019
Submission deadline for Phase II input/ submission of Observation Requests	10 September 2019
Launch and Early Operations Phase	L, L+4 days
End of In-Orbit Commissioning and In-Orbit Commissioning review	L+2 months
Reference baseline date for the beginning of nominal science operations	1 February 2020

## 1.1 Acronyms

AO /AO-1/AO-2	Announcement of Opportunity/first AO/second AO
BJD	Barycentric Julian Date
CHEOPS	CHaracterising ExOPlanet Satellite
CST	CHEOPS Science Team
CTAC	CHEOPS Time Allocation Committee
CMC	CHEOPS Mission Consortium
DT	Discretionary Programme/Discretionary Time
ETC	Exposure Time Calculator
GO	Guest Observers
GTO	Guaranteed Time Observers
IOC(R)	In-Orbit Commissioning (Review)
MOC	Mission Operations Centre
MJD	Modified Julian Date
OR(s)	Observation Request(s)
PHT1	Phase I Proposal Handling Tool
PHT2	Phase II Proposal Handling Tool
PI	Principal Investigator
PS	Project Scientist
RTL	Reserved Target List
SOC	Science Operations Centre (University of Geneva)
UTC	Coordinated Universal Time

## 2 INTRODUCTION

This document informs potential proposers of CHEOPS observation programmes of the policies and procedures to be followed for the first CHEOPS Announcement of Opportunity, and provides an overview of the interactions foreseen between proposers, ESA and the CHEOPS Consortium.

The document is organised as follows:

- An overview of the different categories of observing time on CHEOPS is given in Section 3;
- An overview of the proposal preparation, submission and selection process is given in Section 4. This includes a table/description of the tools and documentation that are available to aid observers in their preparatory work, as well as details of the content required for the different elements of a Phase 1 proposal.
- A detailed description of the proposal submission and proposal evaluation/selection procedures is given in Sections 5 and 6 respectively;
- Section 7 provides a short description of the Phase II data entry that is required from PIs of proposals awarded CHEOPS observing time;
- Section 8 contains information on the data products, proprietary periods and data rights;
- Section 9 contains details of the persistence of proposals awarded observing time in AO-1;
- The document is concluded by Section 10 in which a short description of the Discretionary Programme is given.
- A list of useful documents and weblinks is provided as an appendix.

Prospective proposers are advised to read all sections of this document carefully. The reader's attention is drawn in particular to Section 4 in which the required content of proposals is detailed.

Prospective proposers are advised to check the call webpage (<https://www.cosmos.esa.int/web/cheops-guest-observers-programme/ao-1>) regularly for any updates relevant to the call.

The proposal submission and evaluation process has been devised to minimise the information exchange between the Guest Observers Programme and the CHEOPS Mission Consortium. All parties in the Consortium and at ESA that handle information relating to the GO programmes will be required to sign confidentiality agreements.

Access to the Phase I Proposal Handling Tool (PHT<sub>1</sub>) will require user credentials on the ESA Cosmos system, as will access to the scheduling feasibility checker software which is required to check the visibility of a given target with CHEOPS. Details on how to request credentials are provided in Section 5.

Prospective proposers are reminded that the team supporting the Guest Observers is very small – consistent with the small-class mission status of CHEOPS – and it is recommended to allow ample time for follow-up on any questions raised concerning proposal submission.

### 3 OBSERVING TIME

Nominal science operations will start following a successful In-orbit Commissioning Review (IOCR) at the end of the Commissioning Phase. The time following the IOCR will be split between three activities that are described in the subsections below.

#### 3.1 Calibration and Engineering Time

Up to 10% of the satellite time will be reserved for spacecraft- and instrument-related activities, such as satellite/instrument software maintenance and patching, satellite safe mode and recovery, and anomaly investigation. In addition, a dedicated monitoring and characterisation programme to establish and maintain the scientific performance and characteristics of the payload will be performed. An overview this programme can be found in the CHEOPS Observers Manual (available from the Documentation section of the AO webpage <https://cosmos.esa.int/web/cheops-guest-observers-programme/ao-1>)

The time remaining is for nominal science operations and will be divided into:

1. Guaranteed Observers Time
2. Guest Observers Time

#### 3.2 Guaranteed Observers Time

80% of the nominal science observing time on CHEOPS will be dedicated to execution of observations that are defined by the CHEOPS Science Team, and that are collectively referred to as Guaranteed Time Observing (GTO) or the Core Observing Programme. The GTO programme covers five broad scientific themes:

- Finding transits of known exoplanets;
- Improving radii of known transiting exoplanets;
- Exploring systems in search for new exoplanets;
- Characterising exoplanet atmospheres;
- Uncovering new exoplanetary features.

A description of the GTO programme can be found at the following link:

(<https://cosmos.esa.int/web/cheops-guest-observers-programme/CHEOPS-ScienceTeam-ObservingProgramme>).

Each theme is divided into a number of individual, focused science programmes which, together with their associated target lists, will evolve over the course of the mission. **The targets associated with the programmes are reserved, and cannot be proposed or observed by Guest Observers.** A more detailed description of the target list and the policy regarding its update is given in Section 3.5.

#### 3.3 Guest Observers Time

20% of the nominal science observing time will be available to the general science community to conduct investigations of their choice, through the Guest Observers' (GO) Programme. The programme is administered by ESA, using tools and an observers manual

provided by the CHEOPS Consortium. Proposals are sought through Announcements of Opportunity. This document is applicable to the first call, which comes approximately 6 months before the start of the CHEOPS launch slot, and covers the first year of nominal science operations. Future calls are currently foreseen on an annual basis, not earlier than 6 months before the start of the applicable cycle.

### **3.3.1 Discretionary Programme (DT)**

25% of the time allocated to the Guest Observers Programme (5% of the CHEOPS nominal science observing time) may be allocated via the Discretionary Programme/Discretionary Time (DT). The DT will be open to the worldwide scientific community, including members of the CHEOPS Consortium, with proposal submission possible at any time. The Programme is foreseen to open no later than the completion of the IOCR. Further details on the DT can be found in Section 10.

### **3.3.2 Oversubscription and allocation**

The overall CHEOPS Observing Programme will comprise of a large number of time-critical observations. The observing schedule is optimised by means of a genetic algorithm and its associated merit function to promote high priority observations, timely completion of observing programmes and a high observing efficiency/filling factor. To facilitate this process, a factor of 0.32 more time than is physically available will be allocated to the GO programme. The same over-subscription factor is applied to the GTO target list.

### **3.3.3 Time available in AO-1**

A total of ~1580 hrs/~948 orbits (each of around 100 minutes) will be available to the Guest Observers Programme in the first year. The total time allocated to proposals submitted to AO-1 will differ from this number due to time that will be allocated through the DT described in Sections 3.3.1 and 10, together with the oversubscription term described in Section 3.3.2. Taking these factors into account, it is foreseen that a total of around ~1830 hrs/~1100 orbits will be allocated to proposals received during AO-1. The time will be split across three different priority levels – A (highest priority), B (medium priority) and C (low priority). The fraction of targets/observing time allocated to the different priorities will be set to maximise the chances of the observations highest priority targets being completed.

## **3.4 Start date of nominal science observations**

The baseline reference data for the start of nominal science operations is 1 February 2020, with AO-1 to run over the period of 12 calendar months. Given the uncertainty in the start date (see Section 1), observers are invited to submit proposals for targets that could be observed as early as 15 January 2020, on the clear understanding that there may not be any opportunity to schedule science observations until the middle to end of February 2020.

## **3.5 Update of the GTO Reserved Target List**

### **3.5.1 Procedure for AO-1**

The Target List for the GTO programme will be frozen no later than 6 hours before the call for the Announcement of Opportunity is made. During the period that the AO is open the Science Team will not be able to update their target list directly. Instead, requests will be

collected by the CHEOPS Mission Consortium PI. Only requests relating to targets that were either not known publicly (e.g., published on a recognised public website) before the AO opened, or were not declared to be of very high scientific interest before the AO opened, may be submitted at this time.

The list of targets (the CHEOPS Science Team Update Request List) will be sent to the ESA PS at the time the AO closes, and will be compared with the list of targets submitted by the Community to the AO. In the case of targets that are common to both lists the following will apply:

- If the relevant GO proposal from which the target is drawn is awarded time by the CTAC, then 50% of the total time requested will count against the GO allocation and 50% against that of GTO. A single set of observations will be scheduled according to a decision taken by the CTAC. Both parties will have proprietary access to the data, granted at the same time and with the same duration. Both the PI of the GO proposal and the CHEOPS Science Team will be informed that the data is shared.
- If the relevant GO proposal from which the target is drawn is not awarded time by the CTAC, then the target will be added to the GTO Target List. Existing targets on the GTO reserved target list may need to be removed in order that the time to observe all targets on the list is less than or equal to 80% of the remaining duration of the mission (modulo the oversubscription factor described in Section 3.3.2).

### **3.5.2 Procedure for AO-2 and beyond**

Updates of the Reserved Target List for the GTO during the periods for which AO-2, and subsequent AO calls, are open will be only be possible through submission of proposals to the DT programme. During this period, proposals will have to meet the criteria noted in Section 10, with the additional constraint that any target must have been discovered, published, or declared to be of high scientific interest, during the period that the AO is open.

Evaluation of proposals and the award of time will follow the procedure for DT described in Section 10. The names, coordinates and observing time awarded (including proprietary status) of all targets awarded time in the DT programme during the period that the AO is open will be published on the ESA CHEOPS webpages.

## **3.6 AO-1 proposal constraints**

For the first call, a maximum of 100 orbits can be requested in a single proposal. There is no restriction on the number of proposals that a PI can submit. A single pointing (known as a visit) must be between 1 orbit (around 100 minutes) and 100 orbits in duration (see the CHEOPS Observers Manual for the definition of a visit).

The projected photometric performances of CHEOPS are presented in the CHEOPS Observers manual, and can be explored further using the Exposure Time Calculator (see Table 1 for details of the software and associated documentation). Proposals for targets that are fainter than  $m_v = 12$  may be submitted, however may be deemed by the CTAC to high risk and therefore either rejected or assigned a lower priority.

Proposals for non-time critical observations that can be flexibly scheduled, broken up or extended to fill gaps between time-critical observations can also be submitted. In practise,

the start and end time of any such filler observations awarded time may be extended at the time of scheduling in order to keep the time that the satellite is idle to a minimum.

Observations that could be suitable for such scheduling could include e.g. programmes to monitor stellar variability. A short justification for the need for flexible scheduling, together with a proposed approach, should be included in the technical justification.

## 4 PROPOSAL PREPARATION

Proposals for the CHEOPS GO Programme shall be submitted via a two-phase process.

In Phase I, observers are requested to provide inputs that enable both a scientific and technical evaluation of the proposed observations to be made. Following evaluation by an independent Time Allocation Committee, PIs of successful proposals will be requested to provide inputs to Phase II, which include detailed information relevant to instrument setup, scheduling and execution of the observations.

All material submitted to the CHEOPS Guest Observers Programme must be written in English. A minimum font size of 10 pt must be used, with an A4 paper format and 1.5 line spacing. Page limits for the individual sections are given below. All documents need to be submitted to PHT1 in the form of pdfs, where the size of individual files shall not exceed 50 MB. Non-compliance with instructions noted in this section and associated subsections will result in rejection of the proposal on formal grounds.

### 4.1 Tools and aids for proposal preparation

A number of tools and documentation has been developed by the CHEOPS Mission Consortium (CMC) to aid the CHEOPS Science Team with their preparations for observing with CHEOPS. These have been made available to the community to enable the preparation of proposals for the Guest Observers programme. A summary of these, together with calibration files and visibility information that are available, is given in Table 1. Further details are given in the CHEOPS Observers Manual. All tools and associated manuals and instructions can be found via links from the AO-1 webpage <https://www.cosmos.esa.int/web/cheops-guest-observers-programme/ao-1>

**Table 1: Summary of the tools, documents and information provided by the CMC to support Guest Observers with their proposal preparations.**

<b>Tool/Aid</b>	<b>Description</b>
CHEOPS Observers Manual	This provides the point of reference for all aspects of the mission. It includes an overview of observing with CHEOPS (together with key performances), a detailed description of the instrument and operations, and CHEOPS data (including examples of simulated data). An overview of how to prepare an observing proposal, including a short description of the tools available to support the observer, is also included. The manual is available as a pdf file.
Reserved Target List Query Tool	This tool shall be used to check whether a target is already on the Reserved Target List – thus at the time of the first AO whether it is part of the GTO programme.  Screen capture (per target) shall be used as evidence that a check has been made, and needs to be included in the proposal submission.

<p>Scheduling Feasibility Checker</p>	<p>The tool shall be used to check whether and when a target is visible to CHEOPS, and to help assess the impact that interruptions due to passage through the South Atlantic Anomaly and Earth occultations have on target visibility and observing efficiency.</p> <p>The tool comes in two parts, and requires the download of a virtual machine and client interface. Instructions on how to install and use the tool are provided. The page detailing the password needed to download the software requires the user to be logged in to the Guest Observers Webpage and to be a member of the Guest Observers Group.</p> <p>A short statement confirming the use of the feasibility checker during proposal preparation together with the feasibility of the proposed observations is required in the technical justification.</p>
<p>Exposure Time Calculators (ETC)</p>	<p>The tool used to calculate the predicted photometric precision that can be achieved in a given integration time, based on details of the target and a number of other user-specified parameters.</p> <p>The results of the ETC can be exported to pdf, which is required as input to the PHT1 tool.</p>
<p>Phase II Proposal Handling Tool (PHT2)</p>	<p>The Phase II proposal handling tool is used to generate and submit detailed observation requests by <u>PIs of proposals that are awarded time</u>. The tool will be available shortly after the announcement of successful CHEOPS proposals has been made, and will be accessed via a link on the ESA CHEOPS Guest Observer Programme webpage.</p> <p>Documentation to support the use of the tool will be provided by the SOC and will be made available via the same means.</p>
<p>Simulated data from CHEOPSim</p>	<p>Data files containing simulations of CHEOPS observations that have been generated by the CHEOPS Consortium using a purpose-built simulation tool. The data format is that of input files to the data reduction pipeline. Also included are the data products produced by the pipeline. A short description of each file is provided in the CHEOPS Observers Manual. The Data Product Description Document describes the formats of CHEOPS data that will be available in the archive. Note: the simulation tool itself is not provided.</p>
<p>Calibration files</p>	<p>Selected data from the on-ground payload calibration campaign, including:</p> <ul style="list-style-type: none"> <li>• CHEOPS Point Spread Function (ascii data file as well as colour scale images)</li> <li>• Table of hot/dead pixels.</li> <li>• The CHEOPS bandpass</li> </ul>

CHEOPS visibility maps	Monthly and annual visibility plots showing the sky accessible with CHEOPS. These are provided in the CHEOPS Observers Manual in graphic form, as well as in electronic form/raw data.
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## 4.2 Phase I observing proposal components

There are three components to a Phase I CHEOPS observing proposal:

1. Inputs to the on-line proposal submission tool (detailed in Section 5);
2. The scientific justification
3. The technical justification and implementation

These latter two items are detailed below.

### 4.2.1 Scientific justification

This section must not exceed 4 pages in total. The justification shall include the following sections:

Description of the proposed programme (maximum 2 pages) excluding figures and tables (additional 1/2 page maximum):

- Title of the proposal\*
- Name of PI and institute\*
- Science goals: questions to be addressed by the observations proposed, to include a clear description of how CHEOPS observations will advance the state of knowledge in the area covered by the proposal.
- Why CHEOPS?: to include a clear description and justification for the functionality and performances of CHEOPS that will enable the science goals of the programme to be achieved.

Methods - Data analysis/processing plan (maximum 1 page)

- Short explanation of the data reduction strategy/analysis

Management plan and outreach activities (maximum 1/2 page)

- Team background: List of co-Is (including name, institution, country) together with a short description of the competences of members of the team.
- Team roles: description of the tasks to successfully complete the science objectives, together with assignment of team roles and responsibilities.
- Outreach: short description of publication plans, both towards the scientific community and to the wider public.

The completed file shall be uploaded into the PHT1 tool in the form of a pdf with a size no larger than 50 MB (strictly enforced). All items marked with an asterisk (\*) should match and duplicate inputs that are entered into PHT1. Files should be named according to the convention: CHEOPS-AO1-ProposalNumber-UserNameOfPI-Science-v#.pdf. E.g., CHEOPS-AO1-07-kisaak-Science-v1.pdf

Proposals will be assigned a number when the first input is saved within the Proposal Handling Tool. This number will be visible in emails that the proposal PI will receive and can also be seen within the PHT1.

Note that proposals exceeding the limits noted above will be rejected on formal grounds and will not be sent to the CTAC.

#### **4.2.2 Technical justification and implementation**

The technical justification and implementation is made up of three individual components listed below, each based on a single pdf to be named according to the conventions noted below.

The three individual files need to be uploaded into the PHT1 tool in the form of pdf, each with a size no larger than 50 MB (files larger than this will be rejected by the tool). All items marked with an asterisk (\*) should match and duplicate inputs requested by the PHT1.

##### **4.2.2.1 Technical justification and implementation case**

The maximum size is 1 page (excluding the target table) to provide the following information:

- PI name (for identification) and title of proposal\*.
- Observing strategy: to include overall strategy, as well as criteria used for target selection.
- List of targets, to include for each target: the target name\*, coordinates (J2000) in decimal degrees\*, v band magnitude\*, spectral type (where applicable), number of orbits per visit\*, number of visits per target\*, total time per target\*, visibility periods between 15 January 2020 and 31 January 2021.
- Time request: Total time request\*, together with a justification for the time requested, to include evaluation of sensitivity requirements, number of visits. Time requests should allow for time lost due to interruptions (see ETC documentation).
- Special requirements/constraints: justification for levels of interruptions that have been assumed in time requests, criticality of start and stop times of observation requests.
- Justification in the case of a proposal needing to run over more than one AO cycle.

The input should be provided as a single file, named according to the convention: CHEOPS-AO1- ProposalNumber-UserNameOfPI-Technical-v#.pdf. E.g., CHEOPS-AO1-07-kisaak-Technical-v3.pdf

A short statement that the Scheduling Feasibility Checker has been used to check the feasibility of each proposed target is required.

##### **4.2.2.2 Time estimates**

The on-line ETC calculator has the option to produce a pdf of the webpage, which includes both input parameters and output observing times for a single target. A file containing the pdfs for each target in a proposal needs to be produced (e.g., by concatenation) and

uploaded to PHTI. The file should be named according to the convention: CHEOPS-AO1-ProposalNumber-UserNameOfPI-ETC-v#.pdf. E.g., CHEOPS-AO1-07-kisaak-ETC-v4.pdf

#### **4.2.2.3 Target duplication checks**

The proposer is required to confirm that targets included in a proposal have not already been reserved by the GTO programme. This is done using the Reserved Target List Query Tool (see Table 1). Screen shots of the checks made for each target in a proposal need to be collated in a single pdf. The file should be named according to the convention: CHEOPS-AO1-ProposalNumber-UserNameOfPI-RTL-v#.pdf. E.g., CHEOPS-AO1-07-kisaak-RTL-v1.pdf

## 5 PROPOSAL SUBMISSION

Phase I proposals must be submitted to ESA using the Phase I Proposal Handling Tool (PHT1). The tool can be found at: <https://cosmos.esa.int/web/cheops-guest-observers-programme/pht1> and is the only way in which proposals with CHEOPS can be submitted. The tool calls for a combination of on-line input and the upload of pdf files: the detailed content and format of the uploaded files must be in line with the guidelines provided in Section 4.2, which will be strictly enforced.

Access to the Phase I proposal handling tool will require user credentials on the ESA Cosmos system, together with registration to the CHEOPS Guest Observers Programme group. Users can check at <https://www.cosmos.esa.int/web/cheops-guest-observers-programme/register> to see whether they already have an ESA Cosmos account, also whether they are already members of the CHEOPS Guest Observers Programme group. Details of how to apply for credentials/to register are provided at the same URL in case not.

The following mandatory information needs to be input for each Phase 1 proposal:

- Principle Investigator contact details;
- Equivalent details of an additional contact;
- Title (maximum of 200 characters);
- Abstract (maximum of 1500 characters);
- Classification of proposal science (Exoplanet Science, Stellar Science, Other);
- Scientific justification (pdf file) – see Section 4.2.1;
- Technical justification and implementation (pdf file) – see Section 4.2.2.1;
- A single pdf containing pdfs generated by the ETC tool for each target in the target list – see Section 4.2.2.2;
- A single pdf including a collation of the screenshots of checks of the reserved target list made for each target in the proposal target list– see Section 4.2.2.3;
- Target name, RA (J2000) and Dec (J2000) in either decimal or sexagesimal format, v-band magnitude, confirmation that it is not on the GTO RTL, whether an observation is time-critical or non-time-critical, the number of CHEOPS orbits requested per target visit and the total number of visits per target.

The observing time requested to observe each target needs to be provided in units of orbits and visits, and shall include time for interruptions due to passage through the South Atlantic Anomaly and Earth occultation. A minimum of one orbit per visit is required. The time to slew to, to point and to acquire targets should not need be included in the time request.

Additional information - including orbital period, transit duration and mid-transit time – is requested for time-critical observations (relevant in particular to exoplanet observations) to facilitate the technical evaluation of proposals, however is not mandatory (in which case the input NA can be provided).

Bulk upload of targets is possible via a csv file that can be downloaded from the CHEOPS Guest Observers Programme webpage. It is important that coordinates are only given in degrees and not sexagesimal: ignoring this will result in incorrect transformation of coordinate values and storage of incorrect information.

An email will be sent to the PI to acknowledge the first submission and any subsequent resubmission of a given proposal. This contains the number of your proposal. Proposals can be updated and resubmitted up to the time of the close of the Call.

The tool is self-explanatory, with concise on-line help available by hovering over the requested inputs. A walk-through of how to use the tool is provided in a pdf presentation that can be found on the AO-1 webpage.

## 6 PROPOSAL EVALUATION

Phase I proposals submitted to the Phase I Proposal Handling Tool by the close of the call will be evaluated by the CHEOPS Time Allocation Committee (CTAC). The CTAC and CTAC Chair are scientists appointed by ESA in consultation with the CHEOPS PI. Additional scientists may be called upon in case of need. The ESA Project Scientist will be the secretary to the CTAC.

The technical feasibility for each proposal will be reviewed by the ESA Project Scientist using inputs provided in the submitted technical justification and output from the Exposure Time Calculator tools. The following points will be considered:

- Overall feasibility and technical merit;
- Appropriate determination of the observing time requested, per target and per proposal;
- Any target duplication with other proposals submitted to AO-1;
- Confirmation that none of the targets in a given proposal are on the Reserved Target List.

A short summary of the assessment will be provided to the CTAC before their meeting.

The TAC members will individually evaluate proposals and rank them according to:

- Scientific excellence and relevance of the proposed observations;
- The uniqueness and applicability of CHEOPS to achieve the proposed scientific objectives of the proposal;
- Technical feasibility and robustness of the proposed observations and data analysis.

The management plan will also be taken into consideration in the overall evaluation.

The TAC will meet in the first week of July to evaluate the proposals. Targets in proposals that are recommended for the award of time will be given a priority of A, B or C (see Section 3.3.3). The ranking will be used to prioritise the scheduling of observations.

The SOC will check the proposals recommended for execution and any found to be unfeasible will be rejected. It should be noted that establishing the technical feasibility of a proposal is the responsibility of the PI of the proposal, and it is not foreseen that many (if any) proposals will be rejected at this stage.

The ESA Director of Science will receive the recommendations of the CTAC and will take the final decision on the award of observing time.

PIs of all proposals – including those not awarded time – will be informed of the results of the proposal evaluation process by e-mail. A list of successful proposals, including the title of the proposal, the abstract (potentially shortened) and the total time awarded, will be made available on the ESA CHEOPS mission webpages. All targets from successful GO proposals will be added to the Reserved Target List. No target information will be published, and details of accepted targets will only be available by querying the Reserved Target List.

**Observers are reminded that whilst every attempt will be made to schedule observations of accepted proposals, for operational reasons there is no guarantee that this will be possible.**

## 7 PHASE II DATA ENTRY

The PIs of accepted proposals will be requested to perform Phase II of the proposal preparation. The activity is foreseen to start on 14 August 2019 and is to be completed by 10 September 2019. The purpose of Phase II is to provide the detailed information required to schedule observations, in the form of observation requests (ORs). Target information (including coordinates) together with the time awarded for each target will be sent by ESA to the SOC, based on the inputs given to Phase I and the time awarded by the TAC. This will be used to pre-populate the ORs, and will not be changeable by the observer. Access to the tool will require user credentials, which will be provided to the proposal PI and the additional contact (if any) only and will be based on inputs provided in Phase I.

Observation requests will be consolidated by the SOC and the associated targets added to the CHEOPS Reserved Target List. The ORs from the Guest Observers Programme together with those from the GTO programme will be used as input to the mission planning tool which will generate a long-term observing schedule for the first year of science operations.

A brief overview of the Phase II tool is provided in the Observers Manual supporting this call – a more detailed description will be provided in an updated manual that will be issued in the weeks leading up to the announcement of time awarded in AO-1.

## 8 DATA PRODUCTS AND PROPRIETARY RIGHTS

CHEOPS has the following level data products:

Level-0	Received at the SOC from the Mission Operations Centre (MOC). Includes science data, as well as housekeeping and auxiliary data. The data format is either telemetry packets (as downlinked from the spacecraft) or XML or plain ascii files as produced by the MOC.
Level-0.5	Output of the pre-processing step at SOC. All data are time-tagged with UTC and MJD. Telemetry, science and housekeeping data are converted into FITS files at the level of visits and passes, and housekeeping data are converted into physical values.
Level-1	Calibrated and corrected science images (full-array images as well as sub-array images) as produced by the Data Reduction Pipeline. Engineering meta-data are associated to the science data. Data are time tagged with UTC, MJD and BJD
Level-2	Photometric time series (light curves) and associated meta-data resulting from processing of the Level 1 images.

All data products, together with calibration and reference files used in the data reduction pipeline, will be ingested into the CHEOPS archive, as will automatically generated reports documenting the results of the data processing produced by the data reduction pipeline and other instrument-related analysis tools.

Access to CHEOPS data is via the CHEOPS archive at the SOC. Data from all GTO programmes and GO observations granted time through AOs will be subject to an initial proprietary period of 1 year. The proprietary period will be set at the level of observation requests: it will begin after the last visit of a given observation request has been made and declared complete following quality checks of the data at SOC. The proprietary period will not exceed a period of 1.5 years that starts from the time of successful completion of the first visit of the observation request. During the proprietary period, only the PI of the proposal associated with the observation request, together with the additional contact detailed in the Phase 1 proposal, will be able to access the data and associated reports.

## **9 PERSISTENCE AND RESUBMISSION OF AO-1 PROPOSALS**

Targets for which observing time is awarded in AO-1 will remain on the Reserved Target List until the end of the AO cycle or until it is completed, whichever comes first. All priority A observations will automatically roll over into the subsequent cycle, as will any observation requests for which some, but not all, visits have been executed.

The PIs of all priority B and C proposals which have not started at the time of the opening of AO-2 are invited to resubmit their proposals (updated or otherwise) for re-evaluation by the CTAC.

## 10 DISCRETIONARY PROGRAMME OVERVIEW

The Discretionary Programme (Discretionary Time, DT) is open to the worldwide scientific community. It is currently foreseen that the programme will open no later than the time of the In-Orbit Commissioning Review (January 2020). Once the programme has opened, proposals can be submitted at any time. Evaluation of the proposals and the award of time is coordinated by the ESA PS, in consultation with the CTAC chair and the CHEOPS PI.

To qualify for DT, a proposal must meet the following criteria:

1. Contain a single target of high scientific interest.
2. Demonstrate that the target has been discovered, or declared to be of high interest, since the time of the close of the last call.
3. Contain a target that is observable by the date foreseen for the end of the following AO cycle. This date will be given in the policy and procedures describing the Discretionary Programme at the time it opens.

The same proposal submission process as used for the annual AOs (PHT1 and PHT2) will be used for DT proposal submission, with the link to be provided shortly before the Programme opens. Prospective observers will be required to consult the current reserved target list to confirm that the proposed target is not already the subject of a similar proposal from either the CST or the scientific community, and to document that this has been done as part of their proposal submission.

The proprietary period for data taken as part of the DT programme will not exceed that for GTO and GO observations as given in Section 8.

Further details on the Discretionary Programme, including an elaboration of the proprietary period, will be provided in the policies and procedures document that will be issued when the programme opens.

## 11 APPENDIX

### Useful references and weblinks

- Webpage of the CHEOPS Guest Observers Programme:  
<https://cosmos.esa.int/web/cheops-guest-observers-programme>
- Webpage of AO-1, the first call in the CHEOPS Guest Observers Programme:  
<https://cosmos.esa.int/web/cheops-guest-observers-programme>
- CHEOPS Observers Manual- available for download from the AO-1 webpage.
- An Overview of the CHEOPS Guaranteed Time Observing Programme – the science of CHEOPS, and what the remaining 80% of CHEOPS Science Observing Time will be used for:  
<https://cosmos.esa.int/web/cheops-guest-observers-programme/CHEOPS-ScienceTeam-ObservingProgramme>)