



ROADMAP FOR THE EARLY RELEASE OBJECTS PROGRAM

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Document Type	PL - Plan
Reference	EUCL-EST-PL-8-005
Issue/Revision	1 . 2
Date of Issue	02/02/2023
Status	N/A

APPROVAL

Title	Roadmap for the Early Release Objects program		
Issue Number	1	Revision Number	2
Author	R. Laureijs - custodian	Date	02/02/2023
Approved By	Date of Approval		

CHANGE LOG

Reason for change	Issue Nr	Revision Number	Date
Draft for agreement with management: <ul style="list-style-type: none"> K. Noeske – Science Programme Comms Y. Mellier – EC G. Racca – Euclid Project 	0	2	22/11/2022
EST release	1	0	14/11/2022
Release for PC members	1	2	02/02/2023

CHANGE RECORD

Issue Number	1	Revision Number	1	2	
Reason for change	Date	Pages	Paragraph(s)		
Comments by J.-C Cuillandre	8/12/2022		Section 2, reqs. 4, 6 Removed examples of criteria in Section 3.1 bullet 2.		
Comments by Y. Mellier	22/12/2022		Introduced the “Euclid science collaboration”, to indicate that industry is not involved		
			Section 3.2: Included the (non-committed) role of the SGS		
			Section 2: extended item 6		
Comments by R. Scaramella	22/12/2022		Section 3.4: further clarification of program scientist role.		
			Section 4.1: stress that not all PV targets will be selectable.		
Issue Number	1	Revision Number	2		
Reason for change	Date	Pages	Paragraph(s)		
Comments by R. Kohley	18/01/2023		Section 4.1: updated the timeline for scheduling based on envisaged PV planning		

DISTRIBUTION

Name/Organisational Unit
EST, Euclid Collaboration



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1. INTRODUCTION

1.1. Scope of the document

This document provides a roadmap for the implementation of the Early Release Objects (ERO) program, which is given in AD01. A launch date of 1 July 2023 is taken as baseline.

1.2. References

AD1: EUCL-EST-ME-8-010 v1.0 Euclid ERO Outreach Programme, 2022-10-31

2. ERO PROGRAM REQUIREMENTS

1. ESA shall make available up to 24 hours wall clock time to allow dedicated observations of one or more astronomical objects for early Euclid communications and outreach.
2. ERO dedicated observations shall be obtained during the Performance Verification Phase before the start of the nominal survey.
3. ERO dedicated observations shall be scheduled by the PV coordinator, who shall decide on the allocation of the observing period(s).
4. ESA shall solicit from the Euclid Science Collaboration communication and outreach programs accompanied by suitable astronomical objects acting as showcases with the understanding that outreach merit would take precedence over scientific merit. The Euclid Science Collaboration includes ESA EC and the Independent Legacy Scientists (ILSs).
5. The Call for proposals will be issued by the ERO Program Committee (PC).
6. The programs leading to a Euclid showcase shall be selected by the PC based on criteria defined by this committee. These criteria take into consideration the aesthetic impact of the showcase, its communications value, the science content of the associated observation, and the uniqueness of the Euclid space telescope and its instruments.
7. The scheduling of the ERO dedicated objects shall be constrained by their visibility during the PV phase, their observability using the Reference Observing Sequence (ROS) and their absence of disturbances to the PV program. Observing constraints identified for the PV phase are applicable to the ERO program as well.
8. Besides the dedicated ERO objects, the Call shall allow programmes using objects or calibration fields that are observed as part of the PV program.
9. Each ERO programme is led by a program scientist overseeing the observations and processing of the data such that the resulting data are suitable for communication purposes as well as scientific analysis.
10. ESA communications shall provide the communications plan in which the release of the EROs is scheduled.

11. ERO press-kits shall provide information how the Euclid capabilities demonstrated by the ERO showcase are used to achieve various mission objectives, especially the 3D cartography of the visible Universe and the invisible dark matter.
12. An ERO release shall include a press kit and the Euclid data of the observations used to prepare the press kit.
13. ERO data obtained by Euclid shall be proprietary to the Euclid science collaboration until the release date of the press kit.

3. ACTORS AND STAKEHOLDERS

3.1. ERO Program Committee

The ERO Program Committee (PC) is responsible for:

- Preparing the Call for the ERO programs including the definition of criteria for the selection of programs.
- Defining criteria of representative/demonstration sources that suites to communicate what the Euclid mission is aiming to achieve and how.
- Executing the Call.
- Creating a ranked list of selected programs. For the assessment of the technical feasibility of the programs, the PC shall be supported by the technical implementation group. Each entry in the list shall include the name of the program scientist identified by the PC, object description, scientific objective, and showcase communication.
- Monitoring the preparation and execution of the ERO programs in close coordination with the program scientists.
- Proposing and maintaining a detailed timeline for the ERO release according to the Euclid communication plan. This includes possible topics and plans for outreach/communications events
- Facilitating and monitoring the preparation of the final products for release.

The PC is co-chaired by the Project Scientist (or his/her representative) and the ESA science communication officer (or his/her representative) consists of the following members:

- Two ESA science communications representatives nominated by the ESA science communication officer
- Two EC Science communications representatives nominated by the EC Lead.
- ESA PV Coordinator
- Euclid science and communications advisor nominated jointly by the project scientist and the EC lead and drawn from the Euclid science collaboration (see Section 3.3).
- Two EC SWG representatives drawn from the pool of SWG coordinators, one for cosmology and one for legacy. They are nominated by the EC lead.

- Three EST representatives, one for cosmology and one for legacy. They are nominated by the project scientist. The third EST representative is the survey scientist.

The ESA project manager, ESA mission manager and the EC lead have a standing invitation to the PC.

3.2. Observing EROs and product generation

During the PV phase the planning and execution of science observations as well as the generation of the associated data products will be the result of non-standard operations. This requires timely support from experts familiar with the PV operations and acquisition and early analysis of science data while the instrument calibrations are in progress. The following support structures can be considered, but the choice is to be approved by the PC:

Option 1: the program scientist leads a dedicated team composed of scientists and mission experts supporting the scheduling and execution of the observations and the processing of the data.

Option 2: the program scientist leads a dedicated group of scientists. In close collaboration with the program scientist, a separate technical implementation group of mission experts will take care of the scheduling and execution of the observations and delivering an agreed set of data products for validation by the program scientist.

In case there is only one program the two options become identical. In case of several programs option 2 would be advantageous as all programs have the same interfaces.

The technical implementation group consists of experts who shall cover the following areas:

- **instrument operations and performance:** understanding the limitations and instrumental constraints affecting the communications merit and/or science merit of the program.
- **scheduling and execution of the observations:** understanding the PV plan such that the ERO program does not disturb the PV plan.
- **data processing and product generation:** understanding the processing needed to optimise the communications merit, and advice on timely science products for a given ERO program.

Support from the Euclid Science Ground Segment (SGS) for data processing and product generation would be helpful, but it is recognized that the ERO cases could involve non-standard (cosmology) processing. There is no commitment by the SGS, and advices/support by the SGS would be on a best effort basis.

The members of the technical implementation group are proposed by the PC, with endorsement of the ECL and PM.

3.3. Euclid science and communications advisor

The Euclid science and communications advisor is an active scientist with an outstanding experience in using Euclid-like astronomical data (e.g. CCD and H2RG imaging) for communications. This person has hands-on experience in the processing of astronomical objects for communications and outreach and is also able to assess the scientific merit of the data. This person is a member of the PC and can give technical advice to the communications and the science members in the PC.

3.4. ERO Program Scientist

The program scientist leads a proposed program, which could consist of one or more targets, and is closely involved in the planning of the observation and the processing of the data. The program scientist shall decide which data are ready for both communication and science purposes. The program scientist overlooks the preparation of the data products for early release. He/she is involved in the definition of scientific projects, manages the immediate scientific exploitation of the data, and - if feasible - leads a group preparing the early Euclid publication(s).

4. ERO PROGRAM ROADMAP

4.1. Solicitation of ERO programs, creation of the ERO catalogue

In 2020, the EC Survey Scientist, R. Scaramella, took the initiative to solicit “glamorous” targets. The EC science working groups were asked to propose feasible cases with a one-page justification. The ECSURV group was tasked collecting the proposals, compiled a target list, and checked for observing and scheduling feasibility during PV phase. For the ERO program, the proposers are encouraged to resubmit their proposals according to the proposal template in the ERO call.

The call for the ERO program includes the solicitation of proposals using pre-selected set of calibration targets or fields which are scheduled for PV using the survey ROS.

The Call will be sent to the ESA, EC and ILSs. Before the final selection by the PC, the proposals are assessed by a for operational feasibility, conflicts of interests, and for a compilation of the target catalogue. The PC will appoint a technical implementation support team who will help with the feasibility assessment.

Timescale assuming a July 2023 launch:

Issue Call: February 2023

Deadline proposals: March 2023

4.2. Selection of targets.

Based on the PC selection criteria, the PC will create ranked list of objects that must be scheduled during the PV phase. The PC will inform the program scientist associated with each proposed object about the selection.

The PV coordinator is responsible for the inclusion of the selected targets in the PV plan. The program scientist will support the PV coordinator in the planning and execution of the observation.

Timescale assuming a July 2023 launch:

May 2023:

- Definition of the ERO communication plan by the PC, based on the ESA communication plan.
- Selection of PV targets and identification of the program scientists by PC

Freeze the scheduling of the selected targets in PV program: June/July

4.3. Preparation of press kits and micro-data releases

Guided by the ESA communications plan and ERO release events timeline defined by the PC, a press kit and a micro data release will be prepared.

The proposed contents of the press kit are evaluated by the PC, who will advise on the Euclid showcase data, the accompanying story, and the release details. The PC shall approve the presentation of the Euclid showcase to the public.

The content of the data package for the data release is decided by the PC and approved by the EST. By default, the raw science data obtained by the ROS will be released with essential (and initial) calibration data in case no products from higher level processing functions can be released. The program scientists shall deliver to the SOC Archive Scientist with copy to the Project Scientist the product descriptions and references to the publications based on the ERO observations.

The data package will be made available to the public in the Euclid Science Archive System.

Define: date of micro-release = muDR

muDR - 14 Days: Completion of the communications showcase, agreement by PC

muDR – 14 Days: Approval of dataset by EST

muDR: release press kit and data products in Archive

4.4. Further usage of the ERO catalogue for communications

The ERO catalogue contains more objects than the ERO program will observe. The objects situated inside the Euclid Region of Interest (ROI) will likely be observed during the nominal mission and for a given Reference Survey Definition (RSD) the observation date of the target and associated program can be determined. This could become part of the communications



plan covering the nominal part of the mission, giving special attention to the objects in the ERO catalogue.