



DISSEMINATION AND EXPLOITATION PLAN

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LIST OF ABBREVIATIONS AND DEFINITIONS

Abbreviation	Definition
COSPAR	Committee on Space Research
CSIC	Consejo Superior de Investigaciones Científicas
EKUT	Eberhard Karls Universität Tübingen
ESBO	European Stratospheric Balloon Observatory
ESBO <i>DS</i>	European Stratospheric Balloon Observatory <i>Design Study</i>
ESO	European Organisation for Astronomical Research in the Southern Hemisphere
FIR	Far Infrared
GROND	Gamma-Ray Burst Optical/Near-Infrared Detector
IPR	Intellectual Property Rights
LSW	Landessternwarte
MPE	Max Planck Institute for extraterrestrial Physics
MPG	Max Planck Society
MS	Milestone
NYRIA	Network for Young Researchers in Instrumentation for Astrophysics
SSC	Swedish Space Corporation
USTUTT	University of Stuttgart
UV	Ultraviolet
WP	Work Package

1 INTRODUCTION

This report details the strategy and activities foreseen to ensure optimal diffusion of the project results. It is an update of the Plan for the Dissemination and Exploitation of ESBO DS Results provided in the project proposal / Annex 1 to the Grant Agreement.

2 SCOPE AND APPROACH

Projects including technology development intrinsically have the potential for applications of their results beyond the originally foreseen scope. While a successful exploitation thus should remain open-minded about potential future applications, the ESBO *DS* team defines the following general objectives for the exploitation of the project results:

- To further develop and implement the ESBO infrastructure;
- To perform a test flight of the prototype hardware under third-party funding either towards the end of the ESBO *DS* project or shortly thereafter;
- To motivate and arrange for use of the prototype hardware after the project end for the benefit of science;
- To encourage the use and exploitation of technological achievements after the project;
- To prepare the participating institutes to support further exploitation of the technological achievements.

Dissemination of the project results is a key element to meet these objectives. Particularly the long-term success of ESBO *DS*, i.e. the implementation of ESBO, is critically dependent on the successful communication of the project goals and results to both the relevant scientific communities as well as potential funding bodies. The ESBO *DS* team thus defines the following objectives for its dissemination activities:

- To make the relevant scientific communities aware of the planned infrastructure and to create discussions on the shaping and use of the infrastructure;
- To identify additional concrete research opportunities in dialogue with the scientific communities, both for the ESBO infrastructure as well as for the prototype hardware;
- To make funding and policy bodies aware of the needs of the scientific community, the solution the ESBO project proposes, and the associated funding needs;
- To generate interest within the general public.

3 TARGET GROUPS

The following target groups will be addressed with appropriate means for each individual group:

- General and Informed Public

This target group includes the general public, including high school students, but also groups with existing particular interest in the project topic, such as university students of related disciplines or members of professional associations. The dissemination activities geared towards this group will be further described in the section “Communication Activities”.

- Involved Public and Educators

This group includes a particular subset of the general and informed public that is worthwhile to distinguish – individuals that are potential multipliers. It particularly includes educators that cover fields related to the project topic, but also the “next generation”, i.e. high school and university students with a potential connection to the

project topic. By motivating technically active educators and university student groups to conduct projects related to stratospheric/scientific ballooning, not only will the awareness of this topic be increased, but also more research opportunities will be created.

- Media

The media targeted includes both traditional media (national and local) as well as electronic and social media. Involvement of this group will also be described under “Communication Activities”.

- Scientific Community

The scientific communities identified as primary targets are: FIR astronomy community, UV astronomy community, planetary science community. Other astronomical, atmospheric, and Earth science communities are also included in this target group, however. The ESBO DS team is well connected within these scientific communities and this project results from needs expressed by these communities. *The scientific community is a target user of the ESBO DS results in form of the infrastructure.*

- Relevant Industry

The ESBO DS team considers industry with existing experience in scientific ballooning and astronomical equipment as relevant industry, but also related industries, such as manufacturers and suppliers of unmanned aerial vehicles and non-scientific ballooning industry. The ESBO DS team is well connected with parts of the relevant industry through past projects and at least aware of related industries through the ORISON project.

- Funding and Policy Bodies

This target group includes national, European, and international funding and policy bodies relevant in the context of research infrastructures. The focus of this target group is on public bodies. *Funding and policy bodies are target users of the ESBO DS results.*

Selected funding bodies will also be contacted early on during ESBO DS to secure funding for a first flight of the prototype hardware at the end of ESBO DS or shortly thereafter.

4 DISSEMINATION TOOLS AND ACTIVITIES

General Dissemination Tools:

- A clear visual identity.
- A project website dedicated to all audiences. This may require both a public and a closed access web portal.

Dissemination activities aimed at individual target audiences:

Scientific Community

- Frequent participation in scientific and technical conferences.
- Involvement of senior scientists in the ESBO Advisory Board.
- Scientific and technical publications in journals and at conferences.
- Exploitation of the personal and institutional networks of the EBSO DS partners.
- Organization of splinter meetings at conferences and smaller workshops / brainstorming sessions during the project duration.
- Organization of an ESBO community workshop towards the end of ESBO DS.

Relevant Industry

- Direct contact.
- Participation in relevant trade fairs, roundtables, exhibitions, technology transfer events.¹

Funding and Policy Bodies

- Designation of an ESBO *DS* team member responsible for institutional affairs under WP13.
- Early identification and direct contact to relevant national contact points and relevant policy bodies.²
- Preparation of information material (such as the ESBO Development Roadmap and the ESBO Executive Summary) tailored towards funding and policy bodies.
- Presentation at relevant events.

ESBO Community Workshop

Towards the end of the ESBO *DS* project, an ESBO Community Workshop will be organised to disseminate project results, collect input from the scientific community, explore potential further exploitation of the prototype, and explore potential further development of the ESBO infrastructure together with the scientific community (see Milestone 6). If feasible, this workshop will be held in direct connection with or as a splinter meeting of a major meeting of the astronomical community, such as the Annual Meeting of the German Astronomical Society.

4.1 TIMELINE FOR DISSEMINATION ACTIVITIES

The following table shows the (non-exhaustive) timeline of planned dissemination activities, grouped by the target groups.

Scientific Community			
Date/Project Phase	Activity	Goal(s)	Involved partners
Spring 2018	Establish direct contact with identified key scientific players.		All
All throughout the project	Explore potential scientific applications through continuous dialogues with key scientific players and other members of the scientific community		All
June 2018	Presentation of ESBO <i>DS</i> at the SPIE Astronomical Telescopes + Instrumentation 2018 conference (Austin, USA)	Inform astronomical instrumentation groups internationally about the project	USTUTT

¹ Such as ESA Industry Days, National Space / Aerospace Industry Days,...

² E.g. for Germany: German Aerospace Center, Project Management Agency; Federal Ministry of Education and Research

July 2018	Communication about ESBO <i>DS</i> at the COSPAR Scientific Assembly 2018 (Pasadena, USA).	Inform scientific ballooning community about the ESBO initiative	SSC
September 2018	Presentation of ESBO <i>DS</i> at the European Planetary Science Congress 2018 (Berlin, Germany)	Inform planetary science community about the project	MPG
October 2018	Presentation of ESBO <i>DS</i> at the International Astronautical Congress 2018 (Bremen, Germany)	Inform instrumentation community, but also representatives of funding & policy bodies about the long-term plans of ESBO.	USTUTT
October 2018	Participation in the NYRIA annual workshop (Leiden, Netherlands)	Inform European astronomical instrumentation community about the project and establish communication	USTUTT
October 2018	Presentation of ESBO <i>DS</i> at a workshop on future instrumentation for ground based telescopes (Madrid, Spain)	Inform European astronomical instrumentation community and astronomical communities about the project and establish communication	CSIC
June 2019	Presentation of ESBO <i>DS</i> at the 24 th ESA Symposium on European Rocket and Balloon Programmes and related Research (Essen, Germany)	Inform European scientific ballooning community about the project	All
August 2020	Presentation of ESBO <i>DS</i> at the 43 rd COSPAR Scientific Assembly (Sydney, Australia)	Update scientific ballooning community about the ESBO initiative	All
Autumn 2020	Organization of ESBO Community Workshop	Create momentum and support base for further development of ESBO	All
Throughout the project	Initiate and maintain direct discussions with scientific groups potentially interested in flying instrumentation a) for further tests on the prototype b) on future ESBO platforms	Ensure exploitation and follow-up activities, explore potential collaborations	All

MS12	Alternative Concepts Review including ESBO Advisory Board	Steer technical concept development into the right direction	All
MS5	Operations and Governance Recommendations Review including ESBO Advisory Board	Steer operations and governance concept into the right direction	All
Relevant Industry			
Date/Project Phase	Activity	Goal(s)	Involved partners
2018	Direct contact to relevant industry to explore state of the art and commercially available solutions	Identify solutions to concrete challenges	All
Throughout the project	Direct contact to relevant industry to explore state of the art and available solutions for potential future application	Identify potential long-term solutions and likely product/market development in relevant fields	All
June 2018	Participation in the SPIE Astronomical Telescopes + Instrumentation 2018 conference	Contact and discussions with potential suppliers of instrumentation, telescopes, and components	USTUTT
July 2018	Participation in the 42 nd COSPAR Scientific Assembly	Contact and discussions with scientific ballooning industry	SSC
October 2018	Participation in the International Astronautical Congress 2018	Contact and discussions with potential suppliers from the space domain	USTUTT
June 2019	Participation in the 24 th ESA PAC Symposium	Contact and discussions with scientific ballooning industry	All
August 2020	Participation in the 43 rd COSPAR Scientific Assembly	Contact and discussions with scientific ballooning industry	All
Funding and Policy Bodies			
Date/Project Phase	Activity	Goal(s)	Involved partners
Spring/Summer 2018	Establish contact with local government to explore potential funding opportunities of elements for follow-on projects	Explore potential funding opportunities of elements for follow-on projects	All

2018	Strategically promote project with potential funding agencies	Explore and facilitate potential funding opportunities for test flight and further development	All
October 2018	Presentation of ESBO DS at the International Astronautical Congress 2018 (Bremen, Germany)	Inform representatives of funding & policy bodies about the long-term plans of ESBO.	USTUTT
2019	Prepare and submit proposals for test flight and follow-on activities	Ensure exploitation and follow-up activities	All

5 EXPLOITATION AND FOLLOW-UP

Following the general exploitation objectives outlined above, the exploitation of ESBO DS results currently foreseen is threefold: further development of the ESBO infrastructure (requiring direct follow-up activities), test flight of the ESBO DS prototype/test article under third-party funding; the use of the prototype for scientific benefit (within or external to direct follow-up activities), and the exploitation of technology developments (within or external to direct follow-up activities). Each element will be shortly addressed in the following. The following general dispositions will apply:

- An Exploitation Agreement will be defined among the consortium members to define the rules for use of results. The Exploitation Agreement will follow the principles for the management of intellectual property rights (IPR) as defined below.
- The partners will undertake the exploitation of the project outcomes by continuing the scientific research and directing efforts towards a sustainable implementation of the new astronomical instrumentation.

5.1 FURTHER DEVELOPMENT OF THE ESBO INFRASTRUCTURE

Paths to further develop the ESBO infrastructure will be assessed in detail and taken into account during WP6 as well as in WP13. Dissemination planning activities, including targeted dissemination to funding and policy bodies, will take place early on during the EBSO DS project in order to allow sufficient time to identify suitable opportunities to organise and fund further development and operation. A special emphasize will be on the ESBO intermediate size platform.

5.2 STRATOSPHERIC TEST FLIGHT OF THE PROTOTYPE

One of the main objectives for the exploitation of ESBO DS will be to ensure a test flight of the developed prototype/test article. This will be of critical importance to maintain traction within the addressed scientific communities, to convince potential funding entities, and also to test the prototype in an operational environment.

The ESBO *DS* team has identified and maintains relationships with potential third-parties³ to fund a launch, so that a successful funding of a launch towards the end of ESBO *DS* or shortly thereafter can be considered very likely.

5.3 USE OF THE PROTOTYPE

One of the objectives of ESBO *DS* is to provide the prototype hardware for scientific use after the project. This could be done either through the consortium (or a subset of the consortium partners) further operating the hardware, or by making the hardware available for other scientific projects. The consortium partners of ESBO *DS* have own strong interest in continuing to use the hardware for scientific applications. The consortium has already identified other scientific groups for which the use of prototype hardware would be interesting, both for observations with the instruments envisioned under ESBO *DS* and with instruments under development by external groups. This includes in particular ongoing miniaturisation activities of the GROND instrument⁴ at MPE/ESO/LSW Tautenburg. Potential collaboration with this group will be closely followed, while also collaborations with other research groups will be actively searched. Optimally, value-adding activities, such as the adaptation of other instruments to be used on the ESBO prototype will be carried out in parallel to ESBO *DS*.

5.4 USE OF THE TECHNOLOGY (EFFICIENT GONDOLA ETC.)

The further exploitation of technology developed during ESBO *DS* will, while benefiting scientific applications, likely be of commercial interest. The consortium partners will decide upon the appropriate exploitation rules, protection, and dissemination of the results in scientific and technical publications. It will be the pronounced goal of the ESBO *DS* team to also disseminate the results via the established scientific and technical channels after securing relevant protection. Since the work on modularity of systems will inevitably include work on standardisation of interfaces, the results will likely be exploited in ongoing and proposed harmonisation activities.

5.5 INTELLECTUAL PROPERTY AND CONFIDENTIAL INFORMATION

The ESBO *DS* partners intend to protect the commercially significant innovations resulting from ESBO *DS*. The detailed provisions regarding confidential information and IPR for the ESBO *DS* project will be included and formally agreed upon in the ESBO *DS* Consortium Agreement. The following principles will be followed for the design of the detailed provisions:

- Ownership of results and related IPR will be with the partner that created them. In case several partners jointly create results, they will jointly own the results and the related IPR. The terms of joint ownership will be defined by the joint owners in writing.
- Each ESBO *DS* partner will grant the other consortium members access rights to the results created during the ESBO *DS* project, throughout the duration of the project and for at least three years after the termination of the project.

³ German Aerospace Center, state department for science, research, and art Baden Württemberg, German Research Foundation, several private foundations

⁴ <http://www.mpe.mpg.de/~jcg/GROND/>

- All results required to be treated as confidential for reasons of competitiveness must be marked and declared so when first shared within the consortium and must remain marked as such. All partners must take appropriate measures to ensure the confidentiality of respective information shared with them.
- Commercially significant results may be protected through copyright and/or patents.
- Licensing of results will be allowed, however maintaining the access rights by the consortium as mentioned above. Exclusive licensing will only be possible if all other ESBO DS partners wave their access rights.
- In case of operational indemnity in favour of the EU, such indemnity will be borne by the defaulting partner.
- Throughout the project, the project coordinator and the ESBO DS team will stay informed about the Horizon 2020 intellectual property policy and act in line with it.

Data Management

The aim is to facilitate knowledge transfer to the research domain at the science/society interface, to the industry, and beyond academia. ESBO DS will be completely in line with the terms foreseen within Horizon 2020, Article 43- of the “H2020 Participation Rules⁵” giving open access to research output. Hence, ESBO DS’ rationale will be to give open access to all scientific publications. This open access only applies for scientific articles and it cannot interfere with the protection of the IPR of ESBO DS partners.

Nevertheless, a complete analysis of the types of data and access is detailed hereafter.

- Types of Data. We foresee the following types of data:
 - Type 1: General-purpose publications (Project Brochure; Newsletters; Press releases...)
 - Type 2: Scientific publications.
 - Type 3: Deliverable Reports.
 - Type 4: Generated Project Data
- Access. According to the types of data identified above, the Data will be treated as follows:
 - Type 1: ESBO DS will permit free access to this type of data through the Project Website, emailing and printed versions.
 - Type 2: Open access to research and scientific outputs developed will be guaranteed within an "embargo period" of 6 months between original paper publication and the release of the information contained in the paper.
 - Type 3: The availability of this kind of data is shown in (Table 3.1c: List of Deliverables). ESBO DS’ criterion is to make the deliverables as accessible as possible.
 - Type 4: ESBO DS also foresees access to generated data following publication, though this will always be evaluated on a case-by-case basis.

Besides the ESBO DS Website, other infrastructures (particularly arXiv⁶) will be considered to provide access to the output of the project (*This will be properly defined in the article 29.3 of the Grant Agreement*).

⁵ REGULATION (EU) No 1290/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013

⁶ <http://arxiv.org>

6 COMMUNICATION TOOLS AND ACTIVITIES

Communication activities will be targeted at all audiences/target groups described in the Dissemination and Exploitation Plan. All dissemination activities mentioned for the individual target groups will also be applied for communication about the project in general. Only some additional measures, particularly for reaching the general and informed public, the involved public/educators, as well as the media, will be presented in the following.

The ESBO *DS* team understands it as its responsibility to inform the European public about the use of public funds and to provide educational benefits. It sets itself the following objectives for communication with the public:

- To inform the general public transparently about the activities of the project;
- To support the public education on science, particularly on astronomy, and to use the project topic to inspire interest for science.

The following activities aiming at the public and media are therefore foreseen:

General Public:

- Frequent public presentations, for example at open days, at specifically organised outreach events, or in schools.
- Use of project related material to inspire (e.g. launches of small camera-equipped balloons at outreach events).
- Preparation of online outreach and educational material, like infographics and videos about project activities.⁷
- Explicit presence on social media like Facebook, Twitter, and Youtube, for public outreach and educational purposes. Considerable experience on these activities was gained during ORISON. The ESBO *DS* activities will build upon this experience.

Informed Public:

- Participation in academic and technical public events, such as open days, lecture series, events of professional associations.

Involved Public and Educators

- Targeted lectures for involved educators (high school, potentially also University level).
- University courses on scientific ballooning
- Support and motivation of stratospheric ballooning activities with active University student groups.

Media

- Issue of press releases at project milestones.
- Invitation of local media to outreach events and publically attractive project events, e.g. outdoor tests.

⁷ As an example, see the ORISON Youtube channel at <https://www.youtube.com/channel/UC9Pt1-e2v45OzCFficYMuGw> that features videos of the ORISON pathfinder missions or the SSC Youtube channel at <https://www.youtube.com/user/SwedishSpace>,

Furthermore, the following general communication tools will be established early on in the project:

- A clear visual identity. A substantial amount of work on this topic has been done during the ORISON project. ESBO DS will maintain the ORISON visual brand and base its communication and branding upon it.
- A project website dedicated to all audiences.
- A general project presentation template, to be used for coherent communication about the project to the general and informed public, the scientific and technical community, as well as to funding and policy bodies.

6.1 TIMELINE FOR COMMUNICATION ACTIVITIES

The following table provides a non-exhaustive list of concretely planned communication activities, grouped by target groups.

General Public			
Date/Project Phase	Activity	Goal(s)	Involved partners
March 2018	Visual identity established	Establishment of visual brand	USTUTT
March 2018	Provision of templates for communication	Establishment of visual brand	USTUTT
March 2018	Press release about the project start	General communication.	All
June 2018	Release of public website	General communication.	All
Latest: Spring 2019	Preparation of outreach material for public events (including 3D-printed prototype mock-up, poster(s))	Efficient communication	All
Summer 2019	Presentation of ESBO DS at the USTUTT open day	General communication.	USTUTT
Summer/Fall 2019	Presentation of ESBO DS at the MPE open day	General communication	MPG
Latest: Summer/Fall 2019	Creation of a project Facebook page, Twitter account, Instagram account	General communication, partly based on visual material of first hardware	All
Spring 2020	Creation of a blog on the ESBO DS public webpage to report on the testing and integration activities	Efficient communication	USTUTT, All
Summer 2020	Presentation of ESBO DS at the USTUTT open day	General communication.	USTUTT
Other open days and public events	Presentation of ESBO DS	General communication	All

Informed Public			
Date/Project Phase	Activity	Goal(s)	Involved partners
Spring 2018	Article about ESBO DS in USTUTT research magazine	General communication. Raise awareness about project among other institutes/faculties for potential collaboration.	USTUTT
Spring 2018	Article about ESBO DS kick-off in USTUTT aeronautical/astronautical engineering & geodesy faculty newsletter	Raise awareness about project among other institutes and students of faculty 6	USTUTT
Spring/Summer 2018	Article about ESBO DS kick-off in EKUT newsletter	General communication	EKUT
Fall 2018	Longer article about ESBO DS in USTUTT aeronautical/astronautical engineering & geodesy faculty newsletter	Lay ground for involvement of interested students & potential collaboration with other institutes	USTUTT
Involved Public and Educators			
Date/Project Phase	Activity	Goal(s)	Involved partners
Spring 2018	Encouragement and support of student group(s) at USTUTT to establish regular scientific balloon experiments	General communication. Create multipliers. Create further research opportunities. Widen base of professional expertise in scientific ballooning in Europe.	
Winter semester 2017/2018 and onward	University lectures on scientific ballooning for astronomy within the lecture series "Astronomiemiissionen"	General communication. Establishment of a base of inspired students as multipliers, to conduct practical work in student groups, and to become involved in the project via master & bachelor thesis. Widen base of professional expertise in	USTUTT

		scientific ballooning in Europe.	
Winter semester 2017/2018 and onward	Lectures and practical support to high school teachers within the existing teacher ambassadors programme at IRS/USTUTT	General communication. Motivate and support teachers to conduct scientific ballooning activities.	USTUTT
Media			
Date/Project Phase	Activity	Goal(s)	Involved partners
March 2018	Press release about project start	General communication	All
April 2018	Media invitation & presence at small mission launch with student group at TU Munich	General communication	MPE, USTUTT
October 2018	Media invitation & presence at small mission launch with student group at USTUTT	General communication	USTUTT
Other small mission launches	Media invitation & presence at small mission launch with student groups	General communication	All
MS5	Press release about gondola & payload integration	General communication	All
MS7	Press release about ESBO Community Workshop	General communication	All
Outdoor tests	Invitation of local media	General communication	All