

# → THE LIVING PLANET FELLOWSHIP

Call for research proposals 2019



#E04SOCIETY

## 1. Introduction

Today, a new age in ESA's Earth Observation (EO) is becoming a reality with the successful fleet of dedicated ESA scientific satellites, the Earth Explorers (GOCE, SMOS, Cryosat-2, Swarm, Aeolus), the continuity of the well-established meteorological missions and the advent of the Sentinel series, the EU operational missions serving a wide range of European environmental information priorities.

This increasing multi-mission observational capacity together with the increasing number of long-term EO-based data records addressing an increasing number of biophysical variables (e.g., ECVs), as well as the long-term ESA data archives and the 3<sup>rd</sup> party missions offer unique opportunities for science and innovation in the areas of Earth Observation and Earth System Science.

The full scientific exploitation of this capacity is far from being reached and requires significant research efforts to be undertaken by the new generation of scientists starting their careers in the different fields of Earth Observation and Earth System Science.

As a direct response to this need, ESA launched the Living Planet Fellowship, to support young researchers in ESA Member States to undertake cutting edge scientific activities advancing our capability to observe and better understand our planet, its processes, and interactions with human activities.

This document is a call for proposals fully dedicated to the new generation of Scientists in ESA Member States. With this call ESA plans to **support research projects (supported by ESA with a ceiling price of 99KEuro per 2-years under a co-funding scheme) proposed and implemented by young researchers at post-doctoral level.**

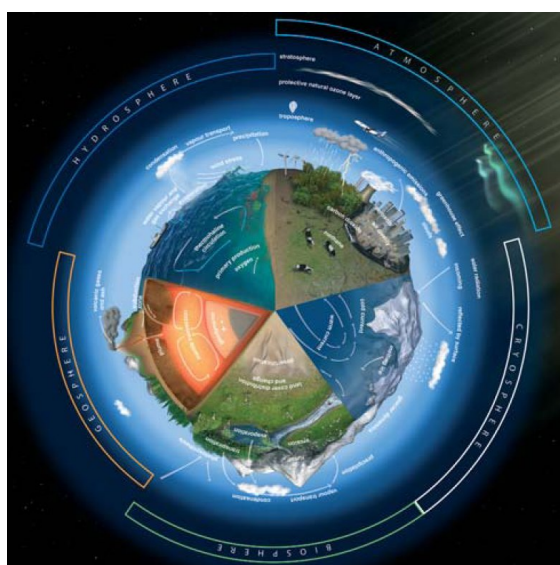


### 2. THE LIVING PLANET FELLOWSHIP

The main objective of the Living Planet Fellowship is to engage young scientists in ESA Member States pursuing a scientific career in Earth Observation, Earth System Science or Climate Research into ESA scientific exploitation activities.

The initiative will support young scientists, at post-doctoral level, to undertake cutting-edge research maximising the scientific return of ESA EO missions and datasets through the development of novel methods, new products and fostering new scientific results in the areas of Earth System Science. This includes the scientific exploitation of the Earth Explorer missions, the long-term ESA archives, the new Sentinel missions and the long-term data records generated under different ESA activities, as well as synergies with additional non-ESA missions and data.

In this context, the Living Planet Fellowship Scheme aims at:



- Engaging the young generation of Earth Observation and Earth System scientists in ESA scientific activities;

- Contributing to the scientific excellence and innovation in Member States by addressing the main scientific priorities of the [ESA Living Planet Programme](#).

- Maximizing the scientific return of ESA EO missions in terms of innovative methods, novel products and new Earth System Science results;

- Preparing for the future by fostering the development of a dynamic research network of excellence and

innovation, involving young scientists in ESA Member States addressing key areas of research relevant for ESA missions and the ESA science strategy;

- Enhancing interactions, exchanging know-how and allowing cross fertilisation between ESA and Earth science laboratories, research centres and universities.





## → THE LIVING PLANET FELLOWSHIP

### Call for research proposals 2019

#### 2.1 Implementation

The initiative will be implemented through a number of dedicated research projects proposed and carried out by young scientists, at post-doctoral level, hosted by universities, laboratories and technical centres in ESA Member States.

With this call for proposals, ESA will select and **co-finance a number of post-doctoral projects** (See details in **Conditions and contract with the Host Organisation** below) proposed by new scientists through their Host Organisation responding to the following principles:

##### **Candidate Eligibility:**

- Candidates must have received a Ph.D. research degree in Earth science, physics, engineering, Earth observation or a related discipline after the 1<sup>st</sup> January 2014 or providing proof of having defended the thesis positively before the proposal submission deadline.
- Candidates must have a nationality from an ESA Member State (**see Cover Letter for Host Organisation country eligibility**).

##### **Host Organisation:**

- The initiative will be implemented through 2-year contracts placed with selected Host Organisations (e.g., university, technical centre, laboratory, company) from ESA Member States participating to EOEP-5 (**Please, see Cover Letter for Host Organisation country eligibility**).
- The Host Organisations shall co-fund the research position of the Candidate (as an standard post-doctoral research contract) for the entire duration of the project. Co-funding shall cover a minimum of 30% of the overall cost of the post-doctoral activity and may include cost associated to overheads, travel support, cost of publications, contributions in kind, data and part of the candidate salary and emoluments, if needed (purchase of computers, equipment, software or any other material beyond data cannot be included in the costs).
- The Host Organisation shall confirm (via the required letter of support) the availability of the Candidate and the possibility of the Host Organisation administration to initiate the project within the 1<sup>st</sup> quarter 2020.
- **Only one Candidate** will be selected for any single organisation (understood as a Faculty or Institute inside large research institutions or universities) to maximise the geographical distribution and avoid a concentration of candidates in the same centre.
- Selected candidates will be the Principal Investigators of the research project, while a representative of the Host Organisation (e.g. a full professor, faculty member or a member of the scientific staff of the Host Organisation) shall serve as the principal ESA contact for administrative and contractual matters.



## → THE LIVING PLANET FELLOWSHIP

### Call for research proposals 2019

- Selected candidates will work full-time on the research projects proposed in their applications and will be based at the proposed Host Organisation during the entire period of the research contract, except for the **OPTIONAL** research periods in an ESA centre or temporal visits to other research laboratory.

#### **Programmatic Areas:**

Candidates shall propose a 2-year research plan, in one of the following areas:

#### **A. Advancing Novel Methods and Techniques**

Targeted research projects aimed at developing innovative methods, novel algorithms and new EO products and datasets expanding the scientific use of the Sentinel missions, the Earth Explorers or the ESA long-term data archives into new scientific areas and application domains. Activities shall establish a solid basis to expand the missions' product portfolio and stimulate novel science results and innovative applications. Priority will be given to develop and validate novel algorithms, data processing techniques, advanced methodologies and new EO-based products that may maximise the novel capabilities offered by the Sentinel missions, the unique data offered by the Earth Explorers, the long-term series of ESA data archives, and its synergies also in combination with meteorological and non-ESA missions.

#### **B. Advancing Earth System Science**

Cutting-edge scientific activities aimed at maximizing the scientific impact of ESA and European missions in terms of new discoveries and advances in Earth system science addressing the challenges of the ESA EO Science Strategy (Section 3). Projects shall contribute to answer major open questions in Earth system science, address global scientific challenges and community priorities posed by international Earth System Science communities and international science groups (e.g., WCRP, SOLAS, GCP, etc...). Priority will be given to activities that maximise the scientific return (in terms of scientific results and publications) of ESA and European EO assets including Sentinel, Earth Explorers and Meteo mission data, the long-term ESA archive and existing EO-based long-term datasets (e.g., ESA project results).

#### **Scientific proposal:**

- Proposals shall be submitted to ESA using the template provided in ANNEX A. Each proposal shall include a CV of the candidate, a list of publications and 3 letters of support;
- The project results in terms of final reports, scientific results, algorithm, geo-information products, etc., shall be publicly available through the relevant ESA web sites. In addition, proposals shall include a plan for publications in international peer review journals as well as a travel plan to key international conferences;
- The projects shall explicitly acknowledge ESA's Living Planet Fellowship funding scheme in any single journal paper and conference proceedings containing results obtained in this framework.



## → THE LIVING PLANET FELLOWSHIP

### Call for research proposals 2019

#### **Data access:**

- Selected candidates will be responsible for accessing the required ESA and non-ESA data.
- In case of need for Third Party Missions products and other ESA products requiring an ESA approval, product quotas will be decided following standard ESA procedures.

<https://earth.esa.int/web/guest/data-access>

- Candidates shall detail in their proposals the complete list of ESA data (including ESA 3<sup>rd</sup> party missions) that will be required to carry out the project.
- Candidates are encouraged to make use of additional data sources, especially non-ESA datasets and in-situ data. The Candidate or the Host Organisation shall demonstrate in the proposal the availability of all the required data sets to accomplish the proposed work.

#### **Conditions and contract with the Host Organisation:**

- For selected project proposals, ESA will place a contract (see Annex C of this call for proposals) with the Host Organisation for a maximum budget of 99KEuro per 2-years, as a co-funding contribution to a standard post-doctoral position. ESA funding shall contribute to cover costs associated to the salary, travel and publications of the Candidate.
- ESA funding can be exclusively dedicated to cover the cost associated to the candidate salary and emoluments, travel to conferences and workshops and publication costs.
- The Host Organisation shall provide a post-doctoral contract to the selected candidate to undertake the research activity proposed for the 2-year period of the project.
- The Host Organisation shall contribute with, as a minimum, 30% of the overall cost for the two years. This contribution may cover: e.g., overheads, travel support, cost of publications, material, contributions in kind and/or part of the candidate salary and emoluments, if needed.
- A preliminary travel cost plan shall be provided in the proposal (see requirements related to meetings and workshops participation in the Section below).



## → THE LIVING PLANET FELLOWSHIP

### Call for research proposals 2019

#### Managing and reporting:

- The Candidate shall participate (mandatory) to the following review meetings (to be included in the work and travel plan):
  - **1<sup>st</sup> Kick-off Meeting** to be organised by teleconference at T0;
  - **Mid Term Review** at the end of the first year of activity (T0+12);
  - **Final Review** at the end of the activity (T0+24).

When possible, meetings will be organised in the format of workshops involving all participants to the initiative. In principle the workshops will be organised in an ESA establishment (normally in ESRIN). Specific details on the venue will be communicated in due time to the selected candidates.

- Reporting shall be done following the minimum requirements below:
  - **Bi-monthly Progress Report:** short management document describing the main progress and status of the project, problem areas and proposed solutions;
  - **Technical Notes 1 and 2** (to be delivered at T0+6 and T0+18, respectively): Scientific and technical reports detailing the main technical developments and scientific results achieved.
  - **Mid-term report:** Scientific report (due at T0+12) describing in detail the work carried out and scientific results obtained during the first year of activity.
  - **Final report:** Scientific report to be publicly available describing in detail the overall activity, methods developed and final scientific results obtained throughout the project. This should include a list of publications produced.

#### **2.2. Research periods in centres other than the Host [OPTIONAL]**

The initiative incorporates as an option the possibility to carry out a research period (of duration from 3 to 6 months) in ESA establishments or other scientific organisations in ESA Member States as visiting scientists. During this period, selected candidates will work in close collaboration with the relevant nominated staff to complete part of the proposed work.

Candidates shall point out in their proposals the preference (or not) for this option as well as tentative dates for the visiting period. A short description of the proposed work to be carried out in this visit shall also be included in the proposal.

ESA may provide additional economic support to the selected candidates during the visiting scientist period to be negotiated with ESA in a case by case basis as a Change Contract Notice.

Proposal evaluations will be independent of this option. In addition, ESA reserves the right to consider or not this option depending on ESA priorities.





### 2.3. Proposal Submission:

- Proposals shall be submitted **before November the 1<sup>st</sup> (at 24:00 CET) 2019** via e-mail to [EOScience@esa.int](mailto:EOScience@esa.int), including:
  - The research proposal (using the template in ANNEX A);
  - A letter of support from the Host Organisation supporting the candidate and his/her project proposal;
    - The letter shall include a statement from the Host Organisation **accepting without reservations the conditions of the draft partnership agreement** (please, see Annex C of the present call). **Offers without such a statement or with reservations to the Partnership Agreement will not be considered for evaluation;**
    - **Only in case national laws do not allow to accept conditions in the partnership agreement, this should be clearly pointed out in the letter.**
  - Two additional letters of support from senior scientists in the relevant field, supporting the candidate and the scientific proposal;
  - A CV of the candidate including a list of publications;
  - The PSS form provided in ANNEX B including the financial information (Please, note that this form is common to all ESA activities and therefore includes information that are not relevant for this type of scientific projects. Main information required include:
    - Direct Labour cost centres or categories (for the candidate)
    - Travel (include also publication costs and conference fees)
    - General & Admin. Expenses
    - Other (To be specified, e.g., data)
    - Reduction for company contribution
- Submissions shall include in the e-mail subject: "Living Planet Fellowship 2019 – Candidate name and surname"
- Any additional questions shall be submitted to [EOScience@esa.int](mailto:EOScience@esa.int).





### 2.4. Selection process

Proposals will be selected on the basis of a peer review process by a Scientific Committee including members of Scientific Advisory Bodies to ESA and ESA senior staff. The selection process will be carried out on the basis of the following criteria:

1. Scientific background and experience of the candidate as well as the Host Organisation, including the adequacy of the proposed laboratory facilities, data sets availability and required EO data.
2. Relevance of the proposed work with respect to the specific areas of interest;
3. Excellence of scientific proposal demonstrating a contribution to science beyond the state of the art and providing a significant advancement with respect to the specific objectives of the programmatic areas of interest;
4. Adequacy of the proposed methodology, work plan, scientific approach, proposed EO data procurement and available data sets;
5. Impacts of concrete project outputs in terms of scientific results, data sets, products, models and target publications and potential further developments;

After the selection process, ESA will send an e-mail to all candidates informing them about the outcome of their application.

### 2.5. Planned Scheduling

Description	Date
Open call	September 2019
Submission of Proposals	01 <sup>st</sup> November 2019
Communication of Results (tentative)	December 2019
Beginning of Activities (tentative)	1 <sup>st</sup> quarter 2020



## → THE LIVING PLANET FELLOWSHIP

### Call for research proposals 2019

#### 2.6. Application Requirements, Summary and Checklist

Requirement	Description
Budget per study	ESA will support the selected projects under a co-funding scheme for a maximum budget of 99KEuro per 2 years.
Candidate	Candidates must have received a Ph.D. research degree in Earth science, physics, engineering, Earth observation or a related discipline after the 1 <sup>st</sup> January 2014. If the diploma is not yet available at the time of submission, the candidate must provide proof of having defended the thesis positively before the proposal submission deadline. The Candidate must provide a copy of the diploma once received.
Host Organisations	Host Organisations from the Member States participating to EOEP-5 (see cover letter) are eligible to submit an offer in answer to this Call for Research Proposal. Required co-funding contribution from the Host Organisation shall be, at least, the 30% of the overall cost of the project.
Duration	Projects shall have a duration of 2 years (24 months) from the start date (kick-off date).
Project objectives	Project objectives shall clearly contribute to one of the Earth System Science Priority areas identified in this call and listed in section 3.
Use of ESA data	Projects shall maximise the use of ESA data.
Participation to Conferences	ESA funding should also cover both cost of publications and the participation of the Candidate to review meetings, international conferences and symposiums to present the research work.
Outputs and results	Proposals shall clearly specify the project outputs in terms of assets: scientific results, data sets, products, models and targeted publications.
Visiting Scientist periods	The candidate can include as an option in the proposal the possibility to carry out a research period in an ESA centre or another institution (as a visiting scientist) for a continuous and maximum period from 3 to 6 months during the entire duration of the project.
Proposal documentation	<p><i>Proposals shall include:</i></p> <ul style="list-style-type: none"> <li>• The research proposal (see template in ANNEX A);</li> <li>• A letter of support from the Host Organisation supporting the candidate, his/her project proposal</li> <li>• A statement from the Host Organisation <b>accepting the conditions of the draft partnership agreement <u>without reservations</u></b> (see ANNEX C). <b>Offers without such a statement or with reservations to the Partnership Agreement will not be considered for evaluation;</b></li> <li>• Two additional letters of support from senior scientists in the relevant field, supporting the candidate and the scientific proposal;</li> <li>• A CV of the candidate including a list of publications.</li> <li>• The financial information in the PSS form (ANNEX B).</li> </ul>
Reporting	<p>Reporting shall include as a minimum:</p> <ul style="list-style-type: none"> <li>• Bi-monthly progress report;</li> <li>• Technical notes 1 and 2;</li> <li>• Mid-term report;</li> <li>• Final report (extended version and executive summary).</li> </ul>
Review meetings	Participation at the review meetings (at T0+12, at the end of the first year and at the end of the project) is mandatory and shall be included in the travel plan.



### 3. ADVANCING EARTH SYSTEM SCIENCE PRIORITIES: THE NEW CHALLENGES OF THE LIVING PLANET

#### The Challenges of the Oceans:

- *Challenge O1: Evolution of coastal ocean systems including the interactions with land in response to natural and human-induced environmental perturbations.*
- *Challenge O2: Mesoscale and submesoscale circulation and the role of the vertical ocean pump and its impact on energy transport and biogeochemical cycles.*
- *Challenge O3: Response of the marine ecosystem and associated ecosystem services to natural and anthropogenic changes.*
- *Challenge O4: Physical and biogeochemical air-sea interaction processes on different spatiotemporal scales and their fundamental role in weather and climate.*
- *Challenge O5: Sea level changes from global to coastal scales and from days (e.g. storm surges) to centuries (e.g. climate change).*

#### The Challenges of the Atmosphere:

- *Challenge A1: Water vapour, cloud, aerosol and radiation processes and the consequences of their effects on the radiation budget and the hydrological cycle.*
- *Challenge A2: Interactions between the atmosphere and Earth's surface involving natural and anthropogenic feedback processes for water, energy and atmospheric composition.*
- *Challenge A3: Changes in atmospheric composition and air quality, including interactions with climate.*
- *Challenge A4: Interactions between changes in large-scale atmospheric circulation and regional weather and climate.*
- *Challenge A5: Impact of transient solar events on Earth's atmosphere.*

#### The Challenges of the Solid Earth

- *Challenge G1: Physical processes associated with volcanoes, earthquakes, tsunamis and landslides in order to better assess natural hazards.*
- *Challenge G2: Individual sources of mass transport in the Earth system at various spatiotemporal scales.*
- *Challenge G3: Physical properties of the Earth crust and its relation with natural resources.*
- *Challenge G4: Physical properties in the deep interior, and their relationship to deep and shallow geodynamic processes.*
- *Challenge G5: Different components of the Earth magnetic field and their relation to the dynamics of the charged particles in the outer atmosphere and ionosphere for space weather research.*





### The Challenges of the Cryosphere

- *Challenge C1: Regional and seasonal distribution of sea-ice mass and the coupling between sea ice, climate, marine ecosystems and biogeochemical cycling in the ocean.*
- *Challenge C2: Mass balance of grounded ice sheets, ice caps and glaciers, their relative contributions to global sea-level change, their current stability and their sensitivity to climate change.*
- *Challenge C3: Seasonal snow, lake/river ice and land ice, their effects on the climate system, water resources, energy and carbon cycles; the representation of the terrestrial cryosphere in land surface, atmosphere and climate models.*
- *Challenge C4: Effects of changes in the cryosphere on the global oceanic and atmospheric circulation*
- *Challenge C5: Changes taking place in permafrost and frozen-ground regimes their feedback to climate system and terrestrial ecosystems (e.g. carbon dioxide and methane fluxes).*

### The Challenges of Land

- *Challenge L1: Natural processes and human activities and their interactions on the land surface.*
- *Challenge L2: Interactions and feedbacks between global change drivers and biogeochemical cycles, water cycles, including rivers and lakes, biodiversity and productivity.*
- *Challenge L3: Structural and functional characteristics of land use systems to manage sustainably food, water and energy supplies.*
- *Challenge L4: Land resource utilisation and resource conflicts between urbanisation, food and energy production and ecosystem services.*
- *Challenge L5: How limiting factors (e.g. freshwater availability) affect processes on the land surface and how this can adequately be represented in prediction models.*



**ANNEX A – Proposal Template**  
(see ANNEX A.doc)  
**ANNEX B – PSS Form**  
(see ANNEX B.xls)  
**ANNEX C – Draft Partnership Agreement**  
(see ANNEX C.pdf)

#### For Additional Information:

For additional information, please, contact us through the following e-mail: **EOScience@esa.int**

