RawMaterials Copernicus [RawMATCop] Programme Call 1

Call for Applications for
Post-Doctoral Research Scholarship Projects

04 May 2017

Content

1. RawMATCop Post-Doctoral Scholarship Projects

This is a call for applications for **three (3)** to **four (4) post-doctoral research scholarship projects** as part of the new RawMATCop programme from EIT RawMaterials.

Based on its 'RawMATCop Programme' proposal to the European Commission [DG for Internal Market, Industry, Entrepreneurship and SMEs; Space Data and Societal Challenges and Growth/Space Policy, Copernicus and Defence] EIT RawMaterials have been awarded a grant for 'Building skills and earth observation related expertise through Copernicus'. With additional co-funding from the RawMaterials Academy, the European Commission grant will be used to fund post-doctoral research scholarship projects and a lifelong learning course.

The aim is to develop skills, expertise, demonstrations and applications at the intersection between Earth observation data, specifically Copernicus data, and the raw materials sector.

The RawMATCop programme Call no. 1 will focus on three 'Research & Application Areas' of the raw materials sector, explained in more detail in section 1.2. This call is specifically for the post-doctoral research scholarship projects mentioned below.

The Research & Application Areas are:

- Copernicus data and related data for raw material prospecting and exploration
- Copernicus data for raw material extraction and mining activities
- Copernicus data for secondary raw material resources

Recipients of the RawMATCop research scholarships will also disseminate the results of their post-doctoral research projects along with Copernicus data and services through a Lifelong Learning activity, tentatively entitled 'RawMATCop Short-Course' [tentative title]. The course will train raw materials practitioners, professionals and researchers in how to use Copernicus (Sentinels and contributing missions) data and other related data, tools and products in their respective industries and research ecosystems

What: Funding of post-doctoral research scholarship projects.

Aim: The overall aim of the post-doctoral research scholarship projects is to develop skills, expertise, demonstrations, and new applications and innovations at the intersection between Earth observation data, specifically Copernicus data, and the raw materials sector.

Duration: 12 months.

When: The post-doctoral researcher must be recruited and the post-doctoral research projects must **commence no later than 01/07/2017.** The projects must terminate 30/06/2018.

Research & Application Areas: The aim is to have at least one post-doctoral research scholarship project within each of the three Research & Application Areas (see section 1.2). In the case that there are no incoming proposals within one of the areas, or in case that the quality of proposals is too low within an area, could more than one scholarship projects be carried out within one or more of the areas.

Scholarship conditions: The conditions normally applicable to post-doctoral scholarships at the host Institution will apply.

Applicants and Host Institutions for the research projects:
It is preferable that the post-doctoral scholarship projects should be carried out in cooperation with/supported by two or more EIT RawMaterials Partners, preferably a combination of university/research institutions and industry partners, with one partner indicated in the proposal as the primary host institution. The indicated primary host institution will be the beneficiary of the grant from EIT RawMaterials. This primary host institution will be responsible for recruiting and employing the recipient of the post-doctoral scholarship and will physically host the post-doctoral scholarship researcher. All EIT RawMaterials partners, as well as external partners that are involved in the project) should be stated in the proposal.

Target groups for the call: Companies and institutions with expertise in the research and application of remote sensing data and services.

Cost of RawMATCop post-doctoral scholarships project: The value of each grant will be in line with the 2016-2017 Marie-Curie Work-Programme for 'Individual Fellowship'
(see http://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-msca_en.pdf).

The calculation of the total cost should include the 'Researcher Cost' (as an 'Individual Fellowship') and the 'Institutional Cost' according to Table 1 here below.

Table 1: Marie-Curie post-doctoral researcher and institutional costs for experienced researchers in the Individual Fellowship programme, recruited under an employment contract/ equivalent direct contract

Item	Post-Doctoral Researcher Costs ('Individual Fellowship' per month)			Institutional Costs (per month)	
	Living allowance*	Mobility allowance	Family allowance	Research, Training, Networking costs	Management and indirect costs
Individual fellowship	€ 4.650*	€ 600	€ 500	€ 800	€ 650

*The 'Living allowance' will be subject to the country correction co-efficients (CCC) to calculate final living allowances according to the country of the institution/company that physical will host the post-doctoral

researcher. The country correction co-efficients can be seen on page 71 in the 2016-2017 Marie-Curie Work-Programme (see link above).

Please note, the calculation in the proposal should include the familial allowance. If a recruited candidate for the post-doctoral scholarship is not eligible to receive family allowance this will be subtracted from the grant when the project is initiated. In this context 'family' is defined as persons linked to the researcher by (i) marriage, or (ii) a relationship with equivalent status to a marriage recognized by the legislation of the country or region where this relationship was formalized; or (iii) dependent children who are being maintained by the researcher.

Reporting of cost: All costs must be eligible and proven according to EIT RawMaterials standards if host institutions of the RawMATCop post-doctoral scholarships are accounted.

Grant Payment Scheme: The primary host institution of the RawMATCop post-doctoral scholarships will receive pre-financing based on existing guidelines for KAVA projects.

1.1.   Who can apply

KIC partners of the EIT RawMaterials can apply to host and run a post-doctoral scholarship project. Partners must submit a detailed description of the post-doctoral research project to be carried out over the 12-month scholarship period (see Annex 1).

It is preferable that the post-doctoral scholarship projects should be carried out in cooperation with/supported by two or more EIT RawMaterials Partners, preferably a combination of university/research institutions and industry partners, with one partner indicated in the proposal as the primary host institution.

The indicated primary host institution will be the beneficiary of the grant from EIT RawMaterials. This primary host institution will be responsible for recruiting and employing the recipient of the post-doctoral scholarship and will physically host the post-doctoral scholarship researcher.

Partners may suggest several post-doctoral research projects within the different 'Research & Applications Areas'; and partners may participate in multiple combinations of host institutions.

1.2. RawMATCop Post-Doctoral Research & Application Areas

EIT RawMaterials' partners are invited to propose content related to the three Research & Application Areas described here.

Research & Application Area 1
Copernicus data and related data for raw material prospecting and exploration

Aim: To develop new, efficient and innovative methods and applications or detecting raw material deposits or targeting areas with high mineral potential using Copernicus data.

Accessible and high-grade deposits in Europe are mostly exhausted or currently mined, meaning exploration must focus on remaining, more remote locations or penetrate much deeper into the Earth's crust. Sustaining mining activities in Europe would allow both the development of key technologies and the sustainable and ethical resource exploitation.

Space-borne data enables large-scale studies in prospecting, vegetation and land-use (change). However, new methods are needed for geological applications because the development of space-borne sensors with adequate spectral and spatial resolution has stagnated and/or there are none available. Hyperspectral mapping, currently the tool of choice in mineral exploration, cannot be used in Europe until the EnMap satellite is launched in a few years. Airborne data acquisition provides a much higher resolution and better signal-to-noise ratios, but is long and complex in terms of preparation and data processing. There is also a gap between the scales of airborne and ground-based data in terms of spatial resolution. Unmanned Aerial Systems (UAS) are flexible, easy to use, and can overcome this gap and provide multi-temporal data at cm-scale resolution. However, they are not yet used in exploration.

Suggested topics (not exhaustive):

- Advances in multi-scale and multi-sensor remote sensing-based Earth integration techniques. Scale should range from satellite to air- and drone-borne systems and include ground validation. The successful proposal should demonstrate that the integration of different sensors, at different scales and including data provided by Copernicus, allows the accurate detection of potential zones with critical raw materials (as defined by the EU).
- Multi-sensor downscaling methods involving SAR and optical data are particularly in demand, but any initiatives within the scope of this call are welcome.
- Integration with other sensors and or measures such as geophysical/geochemical data are of interest, as well as non-conventional uses of remote sensing data content (texture, geometry, geomorphometry etc.).

Research & Application Area 2
Copernicus data for raw material extraction and mining activities

Aim: to concentrate on the innovative use and application of Copernicus data in connection with other relevant datasets in already identified deposits and/or in current or abandoned mine sites.

Copernicus data and services allow users to plan, delineate, monitor and evaluate various factors associated with the mining and extraction of raw materials. The data provides cost-effective solutions to complex and important issues which have a significant impact on extraction and the optimization of mining.

Suggested focus topics (not exhaustive):

- Optimisation of mining activities in specific mine site(s), monitoring water quality around and/or at mine site(s), monitoring ground movement (subsidence and uplift) due to underground mining or vegetation changes during mining /post mining.
- Monitoring of mine dumps and tailings concerning slope and dam stability, movements, erosion, vegetation changes and water management.
- Development of new applications or instrumentation that applies Copernicus data for raw material extraction and mining.

Research & Application Area 3
Copernicus data for secondary raw material resources

Aim: to explore innovative use and application of Copernicus Sentinel-2 data or higher resolution data from Copernicus contributing missions in the field of secondary raw materials.

Copernicus data can be used to evaluate the environmental impact of waste and residue management activities. Knowledge collected on the basis of mine tailings etc. can be applied to residue stocks of (metal) production and processing industries.

Suggested focus topics (not exhaustive):

- Historical and new tailings from mining operations, residues from industrial processes, or stocks and flows of waste and (used) products (landfill mining and urban mining). New applications may be developed to evaluate and track materials through the value chain and the assessment of demand-supply scenarios.
- Vegetation indices derived from Earth Observation data can indicate plant health by showing spectral differences caused by changes in leaf pigments and internal leaf structure because of vegetation stress.
- Uncontrolled landfills and dumpsites of municipal solid waste are considered a main threat to public health in many countries. Impacts on drinking water bodies, air pollution through

uncontrolled fires and direct exposure to hazardous compounds cause high risks to the surrounding communities. Earth observation data may be applied to investigate the causes, impacts and effects of landfills.

- A sustainable circular economy requires information about material and product volumes and movements, both in the use and waste phases. Earth observation can be used to inventory solar panels, air coolers, car stocks, oil reserves, etc., which typically requires the use of high resolution images. New applications can be developed to support elements for a circular economy: the study of socio-economic trends and the evaluation of material use and supply.
- If airborne hyperspectral images of the same test site are also available, they can be compared to Sentinel-2 MSI images to determine their potential for the assessment of waste and residue management activities. This could lead to recommendations for future satellite missions.

2. *Lifelong Learning activity – The RawMATCop Short-Course*

The results of the three post-doctoral research projects, along with Copernicus data and services, will be disseminated through a Lifelong Learning activity, tentatively entitled the 'RawMATCop Short-Course'. The post-doctoral researchers will play an active role in developing the material for the short-course including results from their research projects. The post-doctoral researchers will also be responsible for delivering the short course at the conclusion of their scholarship.

When: Month 11 of the RawMATCop post-doctoral research projects

Duration: 4 days

Organised and managed by: EIT RawMaterials via the RawMaterials Academy

Target group: Raw materials professionals and PhD candidates. This group will be defined more precisely depending on the results of the RawMATCop post-doctoral research projects, but is likely to include geologists, geophysicists, geotechnical staff, geodata and satellite data users, geotechnical engineers, etc. from authorities, industry and academia.

Course development: EIT RawMaterials staff members, the RawMATCop post-doctoral researchers and supporting experts from the host institutions of the post-doctoral projects will convert the results of the post-doctoral research programs into the course content.

Content and delivery: Teaching, lectures and hands-on exercises will focus on the application of Copernicus Earth observation data. Recipients of the RawMATCop scholarships and experts from their host-institutions will deliver the course with support from the RawMaterials Academy. Experts from other EIT RM partners or external sources will also contribute if required.

Recruitment of participant in the short-course: via EIT RM partner network and public announcements.

3. *Organisation*

3.1. RawMaterials Copernicus Committee

EIT RawMaterials will form a RawMaterials Copernicus Committee (RMCC), consisting of EIT RawMaterials staff and representatives from the European Commission and Copernicus.

The Committee will manage and administer the RawMATCop Programme and initiate **three** workshops internally. These will be used to monitor progress and ensure dialogue between the different RawMATCop post-doctoral research projects whilst also sharing interim and final results to enable the 'RawMATCop Short-Course' to be developed, iteratively and in parallel. Workshops should also ensure that the projects are delivering wanted end-user products/services and disseminating the results to a wider user group.

Researchers who receive the RawMATCop post-doctoral scholarships should participate in all three workshops. Additionally, virtual meetings will be planned, especially to establish an ongoing cooperation with the RawMaterials Academy.

Initial Phase Workshop: Planning and initiation of RawMATCop post-doctoral scholarship activities. It will provide a platform to discuss the needs of potential end-users/key target groups within the RM sector to develop viable products and services. 'RawMATCop Short-Course' curriculum and potential participants will be addressed, based on results of the Initial Phase Workshop and building on expected end-users/target groups indicated in the awarded proposals.

Middle Phase Workshop: Focus on the exchange of experiences and preliminary results of the RawMATCop post-doctoral scholarships. Experts in Earth observation data who are not directly involved in the RawMATCop Programme will be invited to support this workshop. At this stage, the 'RawMATCop Short-Course' curriculum will be further developed, complemented by programme structure, short-list of expert speakers and definition of group work activities.

Final Phase Workshop: Focus on summarising the results and ensuring dissemination of the new applications and services produced by the RawMATCop Programme. It will also be used to finalise the programme and logistics for the 'RawMATCop Short-Course'.

Participants in workshops:

- Members of the RawMaterials Copernicus Committee (RMCC)
- Representatives from the RawMaterials Academy
- Recipients of the RawMATCop post-doctoral scholarships
- Other senior experts from the host-institutions

3.2. How to apply

The proposals for the RawMATCop post-doctoral research projects **should be sent as pdf-file to eleanor.stephenson@eitrawmaterials.eu. Deadline for proposals are no later than 28/05/2017 at 16:00 CET**.

The proposals should be written according to the template/headings and guidance provided in Annex 1 of the Call.

The proposal should include a cost calculation according to the earlier stated rules for the post-doctoral research project including travel, accommodation and subsistence costs.

The evaluation of results of the proposal evaluations carried out by an external Evaluation Panel will be

3.3. Evaluation and awarding of proposals

Proposals for this call will be evaluated by an external expert Evaluation Panel. EIT RawMaterials will, based on the results from the Evaluation Panel, award the RawMATCop post-doctoral research scholarships to the, in the proposal, indicated primary host- institutions.

The outcome of announced directly to the contact persons at the primary host-institution stated in the proposals. The **outcome of the evaluation is planned to be announced by the end of May**.

A Project Agreement between EIT RawMaterials GmbH and the beneficiary KIC partner of EIT RawMateirals, the in the proposal indicated primary host institution of the project, will have to be signed when a project is awarded.

The Evaluation Panel is appointed and established by EIT RawMaterials and will consist of relevant available experts from non-EIT RM partners.

Award criteria, scores and weighting.

1. Proposals will be evaluated by the Evaluation Panel, on the basis of the award criteria 'excellence', 'impact' and 'quality and efficiency of the implementation'. The aspects to be considered and the weighting is as set out in the table here below.

2. Evaluation scores will be awarded for each of the criteria, and not their individual elements. Each criterion will be scored from 0 to 5. Scores with a resolution of one decimal place may be awarded. The total score will be subject to a threshold of 70%.

3. If necessary, the panel will determine a priority order for proposals which have been awarded the same score within a ranked list. When the total scores are equal, priority will be based on scores for individual award criteria. For each action the priority order of the criteria is detailed in the table below.

4. If necessary, any further prioritisation will be based on other appropriate characteristics, to be decided by the panel, by the RMCC and the management team at EIT RawMaterials. Further prioritisation will be related to e.g. the contribution of the proposal to the objectives and scope of the EIT RawMaterials, thematic balance, diversity of partners/location of execution, etc.

RawMATCop post-doctoral scholarship projects Award criteria		
Excellence	Impact	Quality and efficiency of the implementation
Quality and credibility of the research/innovation project; level of novelty, appropriate consideration of inter/multidisciplinary aspects	Relevance and impact for the Research & Application area; enhancing the potential and future career prospects of the researcher	Coherence and effectiveness of the work plan
Quality and appropriateness of the training and of the two-way transfer of knowledge between the researcher and the host	Quality of the proposed measures to exploit and disseminate the project results; relevance for the RawMATCop Short-Course and for EIT RawMaterials' vision, mission and objectives (see EIT RawMaterials Strategy)	Appropriateness of the allocation of tasks and resources
Quality of the supervision and of the integration in the team/institution	Quality of the proposed measures to communicate the project activities to different target audiences	Appropriateness of the management structure and procedures, including risk management
Capacity of the researcher to reach or re-enforce a position of professional maturity/independence	Potential for new innovative applications/products/services created from the project. Entrepreneurial components included/potential in the project.	Appropriateness of the institutional environment (infrastructure)
50%	30%	20%
Weighting		
1	2	3
Priority in case of ex aequo		

Contact details

For more information about the RawMATCop Programme and the Call for RawMATCop post-doctoral scholarship projects, please contact:

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Annex 1
Template for RawMATCop Post-Doctoral Research Project Proposals

The proposal for the RawMATCop post-doctoral research projects should contain the following sections.

Project Title [max ca 20 words]
- The title of your project must reflect the content.

Executive summary [max 300 words]
- A short, general summary of the proposed project.

Aims and Objectives [max 1 page]
- Supply an overall aim and objectives that the research will address.

Relevance to 'Research & Application Area' [max 1 page]
- Should include relevance to the research area, the development of new applications/use of remote sensing/Copernicus data/services and relevance for the business and industrial sector related to the area.

Previous research and development related to the project [max 1 page]
- How the proposed research addresses the existing body of academic knowledge and practice in the professional field.
- How the research project will enhance knowledge or contribute to new understanding in the subject

Research Approach and Methodology [max 1 page]
- Describe the approaches and methods that will be used to achieve the objectives, including appropriate consideration of multi/interdisciplinary aspects.
- Short outline of planed research/developments

Expected impact [max 2 pages]
- Exploitation and dissemination of project results, including target groups addressed by dissemination activities
- Communication to external stakeholders
- Impact of the research results and the applicability of Copernicus data and services in corresponding raw materials sectors, including follow up actions and recommendations
- Potential for the creation of new innovative applications, products and services from the project.

- Entrepreneurial opportunities or potential arising from the project.

Expected Outcomes [max 1 page]
- Summarise the expected outcomes from the project.

Potential Risks and Issues [max 1 page]
- Identify possible risks/issues that could adversely impact the project and mitigation/ remediation strategies to address them accordingly

Relation to the RawMATCop Short-Course and relation to EIT RawMaterials[max 1 page]
- Summarise the expected deliverables/teaching activities that the project can provide to the RawMATCop Short Course.
- Summaries the relation to EIT RawMaterials' vision, mission and objectives.

Organisation of the project [max 1 page]
- Contact person for the proposal.
- Which EIT RawMaterials partner is hosting the post-doctoral research project?
- Specify the primary host institution (beneficiary of the grant) and roles of partners (partner organisations) involved.
- Specify individuals from host institutions who will support the project/the post-doctoral researcher [name, position, short description of the support/cooperation, max 100 words per individual] as well as describe the two-way knowledge transfer between the researcher and primary host institution and partner organizations

Calculation of cost of the proposed RawMATCop post-doctoral research project [max 2 pages]
- See also Table 1 in section 1, page 4, of the Call.
- The proposal should include a cost calculation for the post-doctoral research project. The cost calculation of each post-doctoral research project should be in line with the 2016-2017 Marie-Curie Work-Programme for 'Individual Fellowship' (see (http://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-msca_en.pdf).
- Value of the grant should include the 'Researcher Cost' (as an 'Individual Fellowship') and the 'Institutional Cost' according to Table 1 in this document and found in the Marie-Curie 2016-2017 Work-Programme link above.
- Cost calculation should contain the researcher full-time equivalent person month costs as well as his/her foreseen travel/accommodation/subsistence costs related to the monthly mobility allowance.
- The travel and related accommodation/subsistence costs should consider the three 1-day workshops/review meetings and the 4-day RawMATCop short-course.
- The workshops/review meetings and the RawMATCop short-course will, most likely, be held at EIT RawMaterials GmbH in Berlin, at participating host-institutions and/or in Brussels (Copernicus facilities).