

Trapping and Removal of X-ray Contrast Medium agents from water resource and stream Sediments- New Concepts in Trapping, Recycling and Management.

MSCA-ITN-EID
REMEDI

4 Marie Curie European Industrial Doctorate PhD fellowships for Early Stage Researchers EID

Project REMEDI

ORGANISATION/COMPANY

Politecnico di Milano

RESEARCH FIELD

Engineering › Biomedical engineering

Engineering › Chemical engineering

Engineering › Civil engineering

Engineering › Water resources engineering

Physics

RESEARCHER PROFILE

First Stage Researcher (R1)

APPLICATION DEADLINE

22/08/2021 23:00 - Europe/Brussels

LOCATION

Italy › Milan

United Kingdom › Warwick

TYPE OF CONTRACT

Temporary

JOB STATUS

Full-time

HOURS PER WEEK

36/40

OFFER STARTING DATE

01/11/2021

EU RESEARCH FRAMEWORK PROGRAMME

H2020 / Marie Skłodowska-Curie Actions

MARIE CURIE GRANT AGREEMENT NUMBER

956384

OFFER DESCRIPTION

Applications are welcome for the opening of 4 Early Stage Researchers (ESRs) positions associated with PhD-level research activities as part of the Marie Skłodowska-Curie European Industrial Doctorate (EID) programme related to the Consortium "REMEDI" (Trapping and Removal of X-ray Contrast Medium agents from water resource and stream Sediments New Concepts in Trapping, Recycling and Management). The latter leverages on a partnership between Politecnico di Milano (Italy), the University of Warwick (United Kingdom) and TAUW GMBH (Germany).

We offer 4 full-time Marie Skłodowska-Curie scholarships, each for a period of 36 months, with strong career perspectives in academic and industrial sectors.

The Marie Skłodowska-Curie project REMEDI

REMEDI is keyed towards a multidisciplinary, cross-sectoral approach to investigate and characterize dynamics and feedbacks across the water-soil system and relevant categories of pharmaceutical compounds. Salient aspects related to the assessment of the distribution of these compounds in groundwater will be analyzed from a water resource management perspective and considering the effects of multiple sources of uncertainty (including structural and parametric uncertainties, i.e., uncertainty about a given conceptual and mathematical model and the embedded parameters and driving forces) on predictive uncertainty.





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List of available PhD / ESR positions

ESR 1 - Host: The University of Warwick (United Kingdom)

Assessing the potential of Fe containing (geo)materials as filter-stable sorbent materials for removal of Contrasting Media Agents (CMA)

Objectives: Assessment of: (a) the sorption capacity of selected Contrasting Media Agents, including characterization of the kinetic behavior associated with sorbents (with ESR 2, 5) and (b) the influence of environmental variables on sorption capacity and kinetics (with ESR 2, 3); development of design criteria for a CMA-removal system based on selected sorbent materials (with ESR 4); optimization of the properties of the selected sorbents in view of recycling or application of recovered agent as contrast media (with ESR 5).

ESR 2 - Host: The University of Warwick (United Kingdom)

Appraisal of the main environmental effects of Fe supplementation on Contrasting Media Agents (CMA) dynamics in soil-water systems

Objectives: Experimental and modeling investigations of the long-term effect of Fe supplementation to soil-water systems (including lakes and rivers) on the speciation of CM agents in sediments; assessment of the possibility of binding of dissolved CMA onto Fe-containing geo-materials under various flow conditions (with ESR 1, 4); investigation of the effect of adding Fe-containing materials to the system on seasonal CMA dynamics (with ESR 1, 4) and quantitative characterization of impacts on environmental variables of the water body quality (with ESR 3, 5).

ESR 3 - Host: Politecnico di Milano (Italy)

Design of a system to intercept Contrasting Media Agents (CMA) fluxes in and out of a drained region

Objectives: Concept and design of a CMA removal system based on Fe-containing sorbent geomaterials; experimental activities to test the application of the system in an industrially relevant context (with ESR 5); derive hydrological/hydrogeological theoretical and operational criteria for the design of CMA-removal systems (based on, e.g., temporal changes in permeability or other system attributes, under uncertainty associated with natural heterogeneity; with ESR 1, 4); study the bonding of CMA in exemplary (heterogeneous) natural settings and ensuing geochemical alterations upon exposure to geochemical field conditions, including uncertainty quantification in a stochastic framework of analysis (with ESR 2); assessment about the long-term stability of Fe-containing sorbents under realistic conditions.

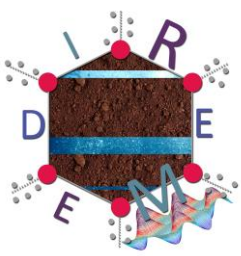
ESR 5 - Host: Politecnico di Milano (Italy)

Mechanistic studies on Contrasting Media Agents (CMA) dynamics in natural and engineered porous media

Objectives: Study the effects of inorganic and organic solutes on the structure, colloidal behavior, and uptake of Fe oxidation products (laboratory experiments; theoretical and modeling activities; field studies with ESR1, 2); study (theoretical, modeling, and experimental approaches) transformations and dynamics associated with CMA-containing porous (geo)materials as a function of solution and/or soil chemistry (with ESR 2); quantification of uptake in CMAs by fresh precipitates and retention/release during aging under typical environmental conditions (ESR 1, 2).

ALREADY SELECTED (Euraxess Job offer ID 629536)

ESR 4 - Host: Politecnico di Milano (Italy) - Analysis of the effect of Fe addition to sediments on the target geochemical processes



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ADDITIONAL INFORMATION

Benefits

The PhD scholarship salary is strongly competitive, all contracts being compliant with salary and benefits rules of Marie Skłodowska-Curie Actions. Exact salary will be confirmed upon appointment [Living Allowance= €39.240,00/year (amount is then adjusted through the application of a [country correction coefficient](#) see pp. 99-100) + Monthly mobility allowance = €600]. An additional monthly allowance of €500 is applicable depending on family situation.

Please refer to the following document (section 5) for more details:

https://ec.europa.eu/research/participants/data/ref/h2020/other/guides_for_applicants/h2020-guide-appl-msca-itn_en.pdf

Eligibility criteria

All candidates will have to comply with the eligibility requirements of Marie Skłodowska-Curie Actions

Please refer to the following document (page 20; Section 3.4):

https://ec.europa.eu/research/participants/data/ref/h2020/other/guides_for_applicants/h2020-guide-appl-msca-itn_en.pdf

Selection process

Applicants will be evaluated and ranked by the future joint academic and non-academic mentors based on the eligibility criteria stated in the MSCA rules. Top-ranked applicants will be invited for interview. Candidates will be evaluated through the following scoring system: quality of S&T (40%), career plan (30%), motivation (20%), overall impression (evaluation of relevant soft skills for research: communication, problem solving, teamwork, decision making) (10%).

TO APPLY FOR ESR 1-2: application documents shall be submitted to

<https://warwick.ac.uk/fac/sci/eng/postgraduate/funding/appcv>

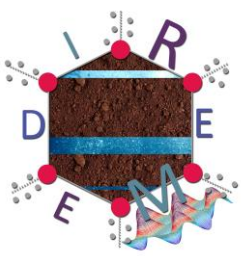
TO APPLY FOR ESR 3-5: application documents shall be sent to remedi-dica@polimi.it, with in the object of the mail a clear reference to the ESR position(s) you apply for. The mail needs to be addressed to the REMEDI Project Coordinator: Prof. Alberto Guadagnini, Politecnico di Milano.

PLEASE SUBMIT

- A complete CV with up to 2 recommendation letters. The CV must be signed by the candidate and has to bear the following sentence concerning the management of candidate's personal data: "The undersigned Name and Surname authorizes the management of his/her personal data contained in the application documents as foreseen by the European Regulation 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data and declares to be aware of the rights of the data subject as listed in Chapter III of the aforementioned European Regulation".
- A motivation letter specifying the PhD topic (or topics) which the candidate would be most interested in.
- Transcripts with grades for all Bachelor and Master level exams, including final graduation grades if available.
- A copy of the bachelor degree certificate.
- A copy of the Master Degree certificate if already available.
- All candidates need to prove that they are eligible according to eligibility requirements of MSCA.

Additional comments

Recruitment will comply with the equal opportunities policy of the host organization, with emphasis on equality in terms of gender, geographical distribution, and the employment law of the Country of the host organization. To encourage



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cross-fertilization and diversity, applications will be encouraged from individuals from a variety of backgrounds and disciplines with the aim of diversifying and developing careers in water science related disciplines where the need for skilled engineers and scientists is critical. Concerning working conditions, transparency of the process and career development, the partnership will follow the principles outlined in the European Charter for Researchers and in the Code of Conduct for the Recruitment of Researchers.

REQUIREMENTS

Required educational level

Engineering: Master Degree or equivalent

Chemistry: Master Degree or equivalent

Physics: Master Degree or equivalent

Environmental science: Master Degree or equivalent

Geosciences: Master Degree or equivalent

Required languages

ENGLISH: Excellent

Skills/Qualifications

The selection will be based on excellence and profile fit.

Candidates with MSc backgrounds in Chemistry, Civil Engineering, Physics, and/or Hydrology are particularly suited for the project.

Specific requirements

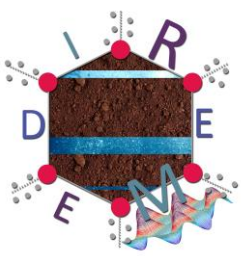
Prior to enrolment in the PhD program all candidates will be required to:

1. have a MSc degree (i.e., 2° level title, as defined by the Bologna Process), issued by an officially recognized academic institution, which grants admission to PhD programmes in the country of issuance. In order to evaluate the University career, the candidate should provide: Master Degree and transcript of records of the Master Degree, Bachelor Degree and transcript of records of the Bachelor Degree. The documents shall be issued by the relevant university in English language.

Degrees will be verified by Politecnico di Milano and Warwick's Doctoral Schools before the interviews. The original diploma and transcript will be required upon enrolment.

2. Have one of the following certificates of English language knowledge, regardless of the date of obtainment:
CAMBRIDGE \geq FCE – GRADE B
CAMBRIDGE IELTS (International English Language Testing System) all types \geq 6*
*Positions ESR1-2 (IELTS 6.5 with no component less than 6.0)
ETS - TOEFL (Test of English as a Foreign Language) paper based (total score) \geq 547
ETS - TOEFL (Test of English as a Foreign Language) computer based (total score) \geq 210
ETS - TOEFL (Test of English as a Foreign Language) internet based (total score) \geq 78
ETS - TOEIC (Test of English for International Communication -Listening and Reading Test) \geq 720
TRINITY COLLEGE LONDON \geq ISE II





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Citizens of Countries in which English is an official language are not required to certify their knowledge of English; the same applies to applicants who have been awarded academic qualifications by an institute where all teaching activities are performed in English.

