

PIONEER hosts 15 PhD positions (“Early Stage Researchers”) funded by the Marie-Skłodowska-Curie Innovative Training Network (ITN) of the European Union H2020 programme.

PIONEER - Plasma catalysis for CO₂ recycling and green chemistry- is a **European Joint Doctorate** programme aimed to train a new generation of research leaders for a successful implementation of plasma-catalytic CO₂ valorization technologies in Europe.

PIONEER is a consortium of 15 Universities and Institutes together with 6 industrial partners, based in Belgium, France, Italy, Poland, Portugal, Romania, Spain, The Netherlands and United Kingdom.

Each of the 15 ESRs will be working towards a **double PhD degree** awarded by two of the 12 European Universities involved. Each academic institution will host the ESR 18 months and receive an ESR from abroad for 18 months as well. In addition, short secondments of 1 or 2 months will be completed either at an industrial or academic partner.

Each ESR will be advised by a supervisory team that maximizes both scientific excellence as well as interdisciplinary and inter-sectoral collaboration. The 15 PIONEER ESRs will not only receive state-of-the-art science/technology training but will also benefit from a unique soft-skills training programme (Project management, Business development and marketing, Scientific Communication).

Project tasks and objectives

Recycling waste CO₂ is a major environmental, economic and societal priority. In fact, CO₂ could become a raw material for a “green” organic chemistry or fuel production.

The use of plasma-catalysis to achieve efficient CO₂ conversion is an innovative and ambitious approach, requiring multidisciplinary expertise.

The PIONEER network join together world experts of plasma physics, catalysis, chemical engineering and numerical modeling to provide the most complete environment to educate a new generation of plasma-catalysis experts, capable of conceiving and realizing innovative processes based on CO₂ recycling. Please visit the website of the project: www.co2pioneer.eu

3 research work packages within PIONEER:

- To gain deeper knowledge on the ***fundamentals and mechanisms of CO₂ plasmas interacting with surfaces*** and the physicochemical phenomena involved, including CO₂ dissociation
- To develop ***advanced, active, selective and robust catalytic systems*** specially formulated for plasma-catalytic coupling to optimize CO₂ valorization
- To explore ***innovative routes for plasma-catalyst interaction***, study novel reactor designs involving various types of exposure of the catalytic materials to different kinds of plasmas of diverse energy density

Project partners :

France: **Sorbonne Université**

The Netherlands: **Eindhoven University of Technology**

United Kingdom: **University of York**

The Netherlands: **Dutch Institute for Fundamental Energy Research – NWO-I** (Eindhoven University of Technology)

Portugal : **Instituto Superior Tecnico**

France : **CNRS- LCS ; Normandie Université**

Poland: **AGH University of Science Technology**

Spain: **Consejo Superior de Investigaciones Científicas (CSIC); University of Zaragoza**

Romania: **University of Bucharest**

Italy: **University of Trento**

Belgium: **University of Antwerp**

United Kingdom: **University of Liverpool**

France: **Ecole Polytechnique ; Université Paris-Saclay**

The full description of each position is available at the Pioneer website: www.co2pioneer.eu

We are looking for candidates to fill the 7 following projects (out of 15):

ESR 1: Electric fields on catalyst covered dielectric surfaces under plasma exposure

Host institution: Eindhoven University of Technology (TU/e – EPG)

Joint institution: Ecole Polytechnique, Université Paris-Saclay (CNRS-LPP),

ESR 2: CO₂ dissociation for value-added products at atmospheric pressure using tailored radio-frequency and nanosecond pulsed power input

Host institution: University of York

Joint institution: Eindhoven University of Technology (TU/e – EPG)

ESR 3: Improving the energy efficiency of CO₂ conversion and activation in a microwave plasma by a combination of experiments and modeling

Host institution: University of Antwerp

Joint institution: Dutch Institute for Fundamental Energy Research (Eindhoven University of Technology)

ESR 4: Energy input and relaxation in atmospheric pressure CO₂ plasmas

Host institution: Instituto Superior Tecnico -IPFN (Técnico Lisboa)

Joint institution: University of York

ESR 5: Valorization and optimization of plasma assisted CO₂ catalytic reduction of CO₂ methanation

Host institution: Instituto Superior Tecnico - CATHPRO (Técnico Lisboa)

Joint institution: CNRS-LCS, Normandie Université

ESR 13: Investigating methods to vibrationally excite CO₂ with plasma

Host institution: Eindhoven University of Technology (TU/e –PMP)

Joint institution: Instituto Superior Tecnico -IPFN (Técnico Lisboa)

ESR15: Role of vibrationally excited molecules on catalytic surfaces

Host institution: Ecole Polytechnique, Université Paris-Saclay (CNRS-LPP)

Joint institution: University of Bucarest

How to apply:

Applicants must first prepare all requested documents and complete the on-line application on the Pioneer website: www.co2pioneer.eu/applications/

The applicants must select **two** ESR positions in order of preference. If the applicant is selected for more than one position, the order of preference in the application will be taken into account.

The deadline to submit the required documentation on-line is July 31st, 2019.

Selection process

The recruitment will be in accordance with the European Charter and Code of Conduct for the Recruitment of Researchers. It will follow an open, transparent, impartial, equitable and merit-based procedure.

Deadline to apply: July 31st, 2019

Pre-selection: once the eligibility criteria are validated, the first selection will be based on CV, academic achievements, experiences, skills and motivation letter.

Interviews: short-listed candidates will be interviewed (July to September 2019)

Eligibility criteria: please check carefully that you are eligible; all conditions below are compulsory

- **Transnational mobility:** The ESR is required to undertake transnational mobility (i.e. move from one country to another) when taking up their appointment. Nationality is not a criterion.

The candidate must not have resided or carried out their main activity (work, studies, etc.) in the country of the host organization (employer) for more than **12 months in the 3 years immediately prior to the start date** (recruitment in September 2019). *Note: the mobility rule applies to the **first** institution where the ESR is recruited, and not to the second institution to which the ESR is sent.*

- **Early-Stage Researchers (ESRs)/fresh MSc graduates:** All candidates to be recruited in PIONEER must have worked no more than 4 years as researcher and have not been awarded any doctoral degree at the date of the employment.

Requirements

- **Background requirements:** the applicant must be in possession of a Master of Science (MSc) or equivalent diploma in a relevant field, such as: physics, Applied Physics, Physical Chemistry, Chemistry, Chemical engineering, Catalysis, Process engineering, Spectroscopy, etc.

- **English language requirements:** the candidate must be in possession of an English certificate with good level according to the regulations of the two universities involved in the double PhD degree
- The candidates must submit through the project website: www.co2pioneer.eu/applications the followings
 - **Bachelor and master's degree certificate and official transcript (grades)** with translations into English (if the original documents are in a language other than English, French, Romanian, Portuguese, Italian, Dutch, or Spanish).
 - **English language proficiency**
 - IELTS Academic (min. score 6.5)
 - TOEFL (min. score 90)
 - BULATS (B2 - C1 preferable)
 - Equivalent certificate
 - (!) **If no English certificate is available at the time of the application**, the candidate must add a signed statement that, in case he/she is pre-selected he/she commits to acquire in a timely manner all the compulsory English certificates for the universities where he/she will enroll as PhD student
 - **Curriculum Vitae/CV** (with List of publications - if any)
 - **Reference Letter:** Two reference letters with the detailed contact information of the recommending persons.
 - **Motivation letter:** maximum 1 page where you introduce yourself and present your qualifications; you may include also your previous research fields and main research results. Please emphasize your future goals career-wise
 - **Proof of residence:** Statement and certificates/documents demonstrating your residence(s) in the last 3 years

Benefits

The ESR will receive a Living Allowance and a Mobility allowance (i.e., gross salary) in accordance with H2020 MSCA ITN rules. ESRs who qualify regarding family, will receive a family allowance. Details about the approximate gross salary per country are given at each position. We emphasize that the salary of each ESR is very competitive. The salaries are adjusted to the living costs in the countries of each of the participant units, according to H2020 MSCA rules.

More information at : <https://ec.europa.eu/research/mariecurieactions/>

Additional benefits: participation to network events, conferences, and workshops; acquiring industrial expertise during the industrial secondment; business and hands-on training; large degree of cross-country academic and industrial mobility; acquiring high competence in terms of innovation, autonomy, integrity, and ethics; benefiting from the interdisciplinary nature of the partnerships.

For information, please contact: pioneer-itn@listes.upmc.fr