The PLASyntH2 project granted in the framework of the Belgian Excellence of Science (EOS) program of FWO-FNRS is looking for 10 PhD students and 4 post-docs in the field of plasma chemistry, plasma technology or plasma physics.

**PLASyntH2: Plasma-based green hydrogen synthesis from hydrocarbons**

**Project description**

**Plasma-based H₂ synthesis from hydrocarbons** is an interesting complementary approach to water electrolysis, because it also uses renewable electricity and has no CO₂ emission, and in addition, it can valorize CH₄ and plastic waste, generate high value C-materials as side-product, and is thermodynamically more favorable. However, before exploiting this application, it is crucial to gain a better fundamental understanding of the plasma processes.

This is exactly addressed in our project. We will perform green H₂ synthesis experiments from various hydrocarbons and in several plasma types, in gas-phase and in contact with liquids, and develop a multi-diagnostics platform for time- and spatially-resolved characterization, as well as novel multi-dimensional, multi-scale models, to study the underlying mechanisms in all plasma systems. We will start with simple molecules, i.e., CH₄ (gas-phase) and (m)ethanol (liquid-phase), and subsequently develop our methodologies to study H₂ synthesis from alkenes (C₃-CS and higher) and styrene, as model systems for (both gas-phase and liquid-phase) pyrolysis products of plastic waste. Besides determining the H₂ yield and energy consumption for all systems, and the detailed plasma diagnostics and modelling, we will also characterize the synthesized C, and target the latter as extra value-added product. The project outcomes will lay the basis for green H₂ synthesis by plasma technology and will open up a new area in the field of plastic waste recycling.

**Consortium**

PLASyntH2 is a collaboration between the following PI’s and universities in Belgium:

- BOGAERTS Annemie, Coordinator – University of Antwerp (www.uantwerpen.be/plasmant)
- RENIERS François – Université Libre de Bruxelles (http://chemsin.ulb.be/)
- SNYDERS Rony – University of Mons (https://chips.umons.ac.be/index.php/fr/)

**Profile of envisaged PhD students**

- You should have a master degree in one of the following fields: chemistry, physics, physical chemistry, material science, engineering physics, chemical engineering, material engineering, or equivalent.
- Candidates graduating this summer are also encouraged to apply.
- You should have excellent qualifications at bachelor and master levels.
- You should have an independent and well-organized working style, demanding a high standard for your own work.
- You should have well-developed social skills directed towards working in an interdisciplinary team as well as excellent interpersonal and communicative skills.
- You should have very good to excellent English language skills (verbally and written).

**We offer to PhD students**

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• A full-time (100%) PhD student position as a bursary. The scholarship is initially offered for a period of one year and will be renewed up-to four years upon positive evaluation.
• A competitive salary for doctoral students.
• A challenging, versatile and carefully designed project.
• A dynamic, multi-disciplinary and ambitious research consortium with a wide international network.
• Full access to expertise, state-of-the-art research infrastructure and user training.
• Access to a Doctoral Training Program.
• An opportunity to earn the highest academic degree.
• Envisaged starting date: as soon as possible.
• All PhD students will work in two of the above-mentioned research groups, co-supervised by 2 PI’s, and will obtain a joint or double PhD diploma.

Profile of envisaged post-doctoral fellows

• You should have a PhD diploma or should be expecting to obtain a PhD in the near future in the field of plasma physics, plasma chemistry or plasma technology.
• Specific experience in either atmospheric plasma technology, plasma engineering, plasma diagnostics or plasma computational fluid dynamics modeling is mandatory.
• You should show an excellent track record of publications in one of these requested research fields.
• You are a team player, you have a strong personality and you work in a result-oriented manner.
• You are creative and willing to work in a multidisciplinary context.
• You are proficient in oral and written English and have strong communication skills.

We offer to postdoctoral fellows:

• A full-time position, initially offered for one year, but it could be renewed up to maximum four years upon positive evaluation.
• You will be directly embedded in a research consortium composed of plasma-oriented international research teams of different Belgian universities.
• You will have access to state-of-the-art tools and facilities, a rich training environment and the possibility to collaborate with many other groups within excellence-based universities.
• Envisaged starting date: as soon as possible.

How to apply:

Applications must contain the following documents in English:

• Personal (motivation) letter
• Curriculum vitae (an official proof of English language skills is an added value)
• List of publications (if available)
• Transcripts of B.Sc. and M.Sc. courses and grades
• Copy of your diplomas (if already available)
• Indication of your preference for experiments or modelling or a combination of both
• Indication of your preference of university/research group where you want to apply (see websites above); PhD students should indicate two research groups or their preferred research topics

The requested documents should be sent to Prof. dr. Annemie Bogaerts (PLASyntH2@uantwerpen.be) before February 28th, 2022, entering as subject of your mail: PLASyntH2_your name