Training Programme

The central motivation and goal for the Multi-Partner ITN-RAPID is to combine the disciplines of physics, chemical engineering, chemistry, fluid dynamics, material science and plasma modeling into one consortium and to provide the next generation of scientists with a fundamental understanding and excellent education in these areas.

The research and training of **12 Early-Stage Researchers (ESR/PhD)** and **3 Experienced Researchers (ER/PostDocs)** in RAPID covers diverse fields ranging from theory and simulation to diagnostics and applications. An efficient transfer of knowledge, skills and methods across the project partners/fellows and, thus, disciplines, is established during the entire project.

The training activities of RAPID are based on 10 workshops starting with fundamentals and moving towards more specific workshops related to the research projects of the ESRs and ERs. The workshop lectures are offered by all partners combining the individual expertise in the different scientific disciplines.

A broad curriculum will be adopted for the training of RAPID fellows in theory, experimental methods, materials as well as transferable skills.

The RAPID network is designed to promote the career of the fellows actively and each fellow will be supervised by two principal mentors – an academic supervisor (from the academic institution) and an industry mentor (from an industry partner).

Job Announcements

RAPID offers Marie-Curie fellowships for 12 Early-Stage Researchers (ESR/PhDs; for 36 months) and 3 Experienced Researchers (ER/PostDocs; for 20-24 months). All details including conditions for recruitment, available positions, how to apply, research projects and training program are available at the network's web site: www.rapid-itn.eu

This network consisting of 10 full network and 10 associated partners from 8 different European countries:

Germany
The Netherlands
Belgium
France
United Kingdom
Ireland
Denmark
Finland

Starting Date: 1st October 2013

Duration: 48 months

Coordination
Ruhr-University Bochum
Universitätsstr. 150
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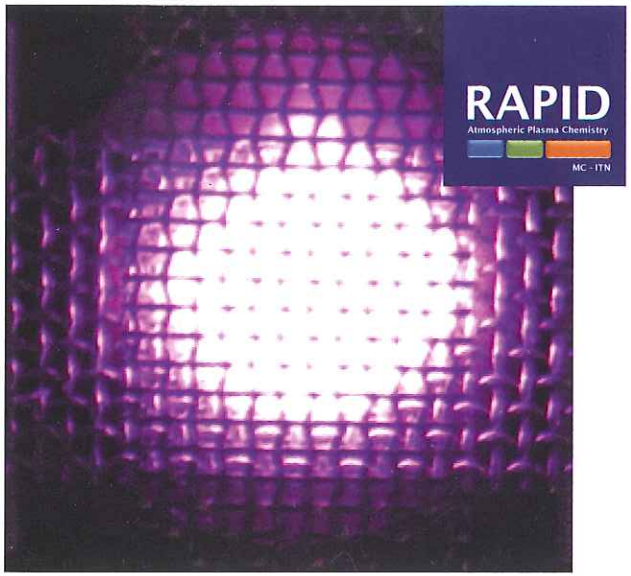

RAPID

Reactive Atmospheric Plasma ProcessIng EDucation Network

Marie-Curie Initial Training Network (MC-ITN)

Funded by the European Commission

PEOPLE
MARIE CURIE ACTIONS

www.rapid-itn.eu

RAPID Consortium

Ruhr-University Bochum, Germany
Faculty for Physics and Astronomy,
Faculty of Chemistry and Biochemistry

TU Eindhoven, The Netherlands
Department of Applied Physics, Group PMP

University Antwerp, Belgium
Department of Chemistry, Group PLASMANT

CNRS, France
PROMES Laboratory,
Processes, Materials, Solar Energy

FUJI, The Netherlands

University of Ulster, United Kingdom
School of Engineering

University of Manchester, United Kingdom
Department of Chemistry

VITO, Belgium

University College Cork, Ireland
Tyndall National Institute

Fraunhofer Gesellschaft, Germany
Institute of Surface Engineering and Thin Films

Associated Partners:

1. TNO, NL
2. SEMCO, FR
3. CPI, FR
4. Plasmawerk, DE
5. BOSCH, DE
6. Oxford Instr., UK
7. Tantec, DK
8. InnoPhysics, NL
9. Plasma Clean Ltd., UK
10. Picosun Oy, FI

Scientific Goal

Plasma Physics meets Plasma Chemistry

RAPID (Reactive Atmospheric Plasma processIng - eDucation network) is an interdisciplinary initial training network (ITN) at the intersection of chemistry, physics and engineering aimed particularly at the development of non-equilibrium reactive processes in atmospheric pressure plasmas. Thereby, the great success of low-pressure plasmas enabling a multitude of applications ranging from material synthesis, automotive and microelectronics can be expanded.

Atmospheric Pressure Plasma Processing

Atmospheric-pressure (AP) plasmas are in the focus of the current interest in plasma technology due to their ease of integration in many industrial processes. Emerging research topics and fields such as large area solar cells, barrier coatings to improve the permeation properties of polymers and plasma chemical gas conversion are selected within RAPID. Those applications can only be realized if the non equilibrium character of the plasmas can be preserved at high pressures. This is achieved either by a miniaturization of the plasma, by dielectric barriers and a pulsed operation, or by generating the plasma in high velocity gas flows. The generation of a stable and homogenous plasma, however, is extremely challenging and requires a thorough understanding of the fundamentals of these plasmas in modeling and simulation, in diagnostics, and in scale-up strategies of reactors.

Research Programme

The research and training in RAPID is structured into 10 work packages (research, training, outreach, management).
Research Work Packages:

1. Modeling and Simulation
Plasma chemistry modeling, combined with molecular dynamics, Monte Carlo and ab initio calculations for the plasma-surface interactions, will allow us to obtain a better understanding and hence to improve the applications envisaged in the other Work Packages.

2. 1D-systems - Plasma bulk processes
In reactive atmospheric plasma synthesis routes the plasma state itself is employed to overcome activation barriers for species conversion. To realize the desired energy efficiencies, in-depth knowledge of the plasma- surface/electrode interaction is paramount and will form an integral part of the research.

3. 2D-systems - Thin films
The inherent challenge in this area is the successful transport of excitation energy from the localized plasma to the surface to be treated or coated.

4. 3D-systems - Localized treatments
An interesting alternative to single precursor injection is the use of liquids or nanoparticles as more complex forms of precursors.