

PHD POSITION IN THE CONTEXT OF AN INTERDISCIPLINARY RESEARCH PROJECT: “GREEN ATMOSPHERIC PLASMA GENERATED MONOATOMIC OXYGEN TECHNOLOGY FOR RESTORATION OF THE WORKS OF ART”

Belgium, Ghent University, Research Unit Plasma Technology;

We are looking for PhD candidate to develop and study contactless green technology of art objects cleaning based on plasma sources of atomic oxygen in the EU funded project at Research Unit Plasma Technology, of the Ghent University (Belgium).

CONTEXT:

While unsustainable development increasingly threatens Europe's cultural heritage (CH) assets, museums and conservators continue searching for green approaches and materials. In the preservation of tangible CH assets, carbon-based soiling is among the most significant deteriorations factors. Pollution, vandalism, smoke and fires can cause catastrophic carbon-based contamination to tangible CH assets, and cleaning is essential for their preservation. However, the currently available methods require hazardous chemicals, physical contact, and water, which can be too disruptive to many art materials. The urgent need for sustainable green approaches has been emphasized for over a decade, summarized in ICOM-CC's Melbourne 2014 declaration, but the actual progress in creating green solutions has been very slow. To kick-start a breakthrough, the European Commission has funded *Green Atmospheric Plasma Generated Monoatomic OXYgen Technology for Restoration of the Works of Art – MOXY* project 2022-2026, coordinated by Ghent University with a Horizon Europe grant in the call *Green Technologies and Materials for Cultural Heritage* to bring to fruition a radically new green approach to the cleaning of tangible cultural heritage assets. MOXY project rises to the challenge of cleaning and preserving extremely fragile artworks for the future based on the use of plasma source of atomic oxygen. The project will bring together plasma physics, heritage science and conservation to realize a radical green innovation - a non-contact approach, based on atomic oxygen, which will empower conservators removing soiling in non-mechanical, liquid-free action, without health or environmental concerns, residues, and waste. To achieve its transformative goals, MOXY will research fundamental aspects of atomic oxygen generation in non-thermal plasma discharge, develop and test a proof-of-concept system, and study interactions with ultra-sensitive art materials, propelling it to the emergent clean technologies in conservation.

JOB DESCRIPTION:

The Ph.D. position and work will focus on studying the plasma initiated processes leading to the generation of atomic oxygen in a non-thermal plasma environment and the effect of atomic oxygen beam on the surface of art objects. The student will work in close cooperation with plasma scientists, chemists, and cultural heritage experts.

PROFILE:

We are looking for candidates with MSc degree in chemistry, applied physics or materials science. A good background in chemistry, emission or laser spectroscopy or good experimental skills in lab environment are desirable. The Ph.D. student will be able to gain experience in areas of plasma chemistry, spectroscopy, and analytical methods of advanced surface characterization. Fluent in English is required.

BENEFITS:

Work for an interdisciplinary project on cutting edge of science; international team; very competitive scholarship; access to state of the art equipment

ABOUT THE RESEARCH UNIT PLASMA TECHNOLOGY

The Research Unit Plasma Technology (RUPT) has built up an internationally recognized expertise in the field of cold atmospheric pressure plasmas. The successful development of different plasma generation concepts has launched RUPT into numerous interdisciplinary collaborations exploring a wide range of applications in environmental technology and materials science. Atomic oxygen technology is considered a strategic extension for RUPT to explore new plasma physics. The different research tools, such as X-ray photoelectron spectroscopy (XPS), atomic force microscope (AFM), FTIR, SEM, microscopy systems, plasma chambers, various power generators, optical imaging systems and UV spectrometers are available at RUPT.

APPLICATION:

Through the contact person: Anton.Nikiforov@UGent.be