

## RESEARCH EXPERIENCE

### PhD scholarship | November 2022 – in progress

My project is focused on the mechanistic study of the photocatalytic CO<sub>2</sub> reduction reaction into fuels on graphitic carbon nitride materials (g-C<sub>3</sub>N<sub>4</sub>). The operando X-ray absorption spectroscopy is used to investigate the surface reactivity of this catalyst involving the in-situ reaction cell use at APE-HE beamline at Elettra synchrotron facility. The experimental set up on beamline was specially upgraded to conduct photocatalysis experiments in operando and at ambient pressure. By acquiring NEXAS spectra at the N K edge and L<sub>2,3</sub> edge of the dopant transition metals, it will be possible to unravel the electronic structure of g-C<sub>3</sub>N<sub>4</sub> and study the mechanism of the photoreduction reaction at the solid/gas interface. Other characterization techniques will be used to gain greater insight into the chemical and physical properties of this material.

### Department of Chemistry | Università degli Studi di Pavia

Via Taramelli 12, 27100 Pavia

In cooperation with **Elettra-Sincrotrone |APE-HE Beamline**

Strada Statale 14, km 163,5 in AREA Science Park, 34149 Basovizza, Trieste, (IT)

### Research Fellowship | December 2021 – October 2022

My activity is focused on the study of heterogeneous catalysis. The operando X-ray absorption spectroscopy is used to investigate the surface reactivity of catalysts involving the in-situ reaction cell use at APE-HE beamline at Elettra synchrotron facility. Among the various materials investigated, my work is particularly focused on soft-XAS investigation of graphitic carbon nitrides g-C<sub>3</sub>N<sub>4</sub> as photocatalysts for sustainable CO<sub>2</sub> reduction into fuels.

<https://www.trieste.nffa.eu/people/nffa-people/sara-stolfi/>

**Istituto Officina dei Materiali (IOM) - CNR**

Strada Statale 14, km 163,5, 34149 Basovizza TS (IT)

**Elettra-Sincrotrone |APE-HE Beamline**

Strada Statale 14, km 163,5 in AREA Science Park, 34149 Basovizza, Trieste, (IT)

### Training Experience | February 2022

Beam time experience at ESRF. My work was based on obtaining electronic and structural insights of MIL-100(Fe) by using a combined in situ XAS/XES study targeting Fe(II) sites. By thermal activation, Fe<sup>3+</sup> sites are created through the elimination of water, and then Fe<sup>2+</sup> sites through the elimination of a monovalent anion. These iron sites are active towards Methane to Methanol reaction (MTM) in presence of N<sub>2</sub>O as the oxo-transfer agent. The synchrotron source at ESRF in combination with parallel soft-XAS studies was very useful to reach important spectroscopic details of this catalyst material.

### European Synchrotron Radiation Facility | ID26 Beamline

71, avenue des Martyrs, 38043 Grenoble, France

### Research Internship | July 2020 – May 2021

Master thesis internship focused on the hydrothermal synthesis of metal tungstates for the photocatalytic nitrogen fixation. The aim of the research was to demonstrate their character as catalysts under entirely sustainable conditions. They use solar photons as energy sources and water as reducing reagent. The work involved the use and experience of some important characterization techniques: X-ray diffraction (XRD), Raman spectroscopy, plasma atomic emission spectroscopy (ICP-AES), physisorption, scanning electron microscopy (SEM) and diffuse reflectance UV-Vis spectroscopy.

In cooperation with **Materials, Environment and Energy Research Group – MEE | Department of Chemical and Pharmaceutical Sciences**

<http://meersearch.weebly.com/team.html>

Università degli studi di Trieste

Via Licio Giorgieri, 1, Trieste

### Research Internship | October 2017 – January 2018

Research internship about laser deposition and characterization of hydroxyapatite thin films on silicon and titanium substrates for the coating of bone prostheses.

In this thesis work, the films were deposited using nanosecond pulses and then characterized using various investigative techniques: atomic force microscopy (AFM), scanning electron microscopy coupled with X-ray dispersive spectroscopy (SEM-EDS), X-ray photoelectron spectroscopy (XPS), Raman spectroscopy and X-ray diffraction (XRD).

### Laser Physical Chemistry Laboratory, Department of Science

Università degli studi della Basilicata

Via dell'Ateneo Lucano, 10, Potenza

## EDUCATION

21/05/2021

A.A. 2019/2020:

**Master of Science – MSc | Chemistry, Supramolecular and Nanostructured Systems – 110/110 Cum Laude**

Università degli Studi di Trieste

Via Licio Giorgieri, 1, 34127 Trieste (TS)

20/03/2018

A.A. 2016/2017:

**Bachelor of Science – BSc | Chemistry – 104/110**

Università degli Studi della Basilicata

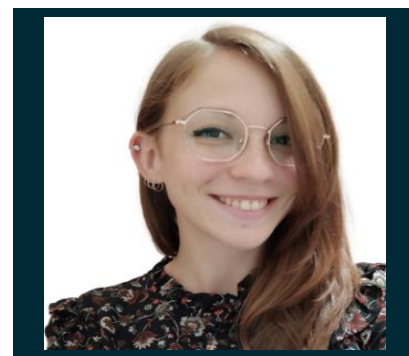
Via dell'Ateneo Lucano, 10, 85100

Potenza (PZ)

2013/2014:

**High School Diploma, Classical studies**

Via Vaccaro 36B, Potenza (PZ)



**STOLFI  
SARA**

## CONTACT



+39 342 1251864



[stolfi@iom.cnr.it](mailto:stolfi@iom.cnr.it)

[sarastolfi.94@gmail.com](mailto:sarastolfi.94@gmail.com)

[sara.stolfi01@universitadipavia.it](mailto:sara.stolfi01@universitadipavia.it)



Via Fabio Severo 73

34126, Trieste (IT)

## Language skills

- English language  
B1 CEFR level  
22/07/2015
- French language  
CECR level A2  
11/04/2008

## Software

Microsoft Office Package

Matlab Mathworks

OriginPro