

Zhuang-Yan Zhang

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Personal Information

- Date of Birth: 05.02.1995
- Sex: Female
- Nationality: Chinese

Education

M. Sc. | Sep. 2017 - Jul. 2020 | Delft University of Technology, The Netherlands

- Major: Materials Science and Engineering
 - Specialization: Materials in application and engineering

B. E. | Sep. 2012 - Jul. 2016 | Tian-Jin University, China

- Major: Functional Materials

Research Experience

Ph.D. Candidate | Oct 2020 – Present | Max-Born-Institute, Berlin

Dissertation: Soft x-ray spectroscopy of investigating charge transfer processes in push-pull chromophores

- Project: A1. Strong Field Processes at Extreme Wavelengths
- Project supervisor: Prof. Dr. M. Vrakking, Dr. A. Rouzee, Dr. Erik. T. J. Nibbering

Master graduation project | May 2019 – Jun. 2020 | ARCNL, Amsterdam

Institute: ARCNL (Advanced Research Center for Nanolithography), The Netherlands.

Thesis title: *Extreme-ultraviolet high-harmonic generation from structure silica.*

- Group: HHG and EUV science
- Project supervisor: Dr. Peter M. Kraus
 - Build a FROG setup to characterize ultrafast pulses.
 - Build an optical setup to generate high harmonics to 20 eV using a femtosecond laser.
 - Observed HHG from homemade structured silica samples.
 - Performed numerical simulation using MATLAB to simulate experimental results.
 - Performed two-color collinear measurement to retrieve structure from a complex diffraction pattern.
 - Demonstrate a directly spatial control of HHG and the potential for HHG lens-less imaging.

Internship | Oct. 2018 – Mar. 2019 | ABB, Baden

Company: ABB Power grids, Schweiz Ltd., Switzerland

- Group: Insulation and Polymer Technology
- Project supervisor: Dr. Saskia Scheel
 - Investigated electric, physical and chemical properties of a new, commercial insulation gas mixture (Air-plus).

- Performed experiments to simulate the real-life situation of the electrical breakdown and the degradation of Air-plus.
- Gas Chromatography-Mass Spectrometer (GCMS) and Fourier-Transform Infrared Spectroscopy were used to analyze the by-products of Air-plus.

Bachelor graduation project | Dec. 2015 – Jun. 2016 | Tian-Jin University, China

Thesis title: *Synthesization of P-MOFs/BiOCl composites as a photocatalyst for CO₂ photoreduction.*

- Project supervisor: Dr. Hua Xu
 - Synthesized thin film BiOCl with (011) crystal orientation and porphyrins-based metal organic frameworks (P-MOFs) with irregular laminar structures using hydrothermal method.
 - The samples are characterized with SEM, TEM and XRD
 - Varying the mass ratio between P-MOFs and BiOCl to optimize CO₂ photoreduction efficiency.
 - CO₂ photoreduction efficiency was analyzed by Atomic Absorption Spectroscopy (AAS) and GCMS.
 - Enhanced activity was observed for composites since P-MOFs serve as photosensitizer and BiOCl promoted charge separation efficiency. Not only CO but also CH₄ were detected as photoreduction products.

Skills & Abilities

Experimental

- Laser and Optics: Familiar working with femtosecond CPA laser (Astrella), FROG devices, Gas-phase High-harmonic generation setups, spectrometers, time-resolved two-color setups, vacuum systems.

Nanofabrication

- Proficiency with various fabrication methods: Reactive ion-etching, UV lithography, e-beam lithography, hydrothermal method and chemical vapor deposition.

Characterization

- Optical microscopy, scanning electron microscopy (SEM), transmission electron microscopy (TEM), X-ray diffraction (XRD), gas chromatography-mass spectrometer (GCMS), Fourier transform infrared spectroscopy (FTIR), atomic force microscopy (AFM), atomic absorption spectroscopy (AAS).

Software

- MATLAB, Latex, Origin, Blender.

Academic achievements

Research proposal

- Accepted a research student at University of Tokyo based on the research proposal submitted.
Title: *Tracking the electron dynamic of insulator-to-metal phase transition in VO₂ by time- and angle-resolved photoemission spectroscopy.*

Publications

- Sylvianne Roscam Abbing, **Zhuang-Yan Zhang**, et. al. and Peter M. Kraus, “Efficient Extreme-ultraviolet High-order Wave Mixing from Laser-dressed Silica,” *Submitted*

- Sylvianne Roscam Abbing, **Zhuang-Yan Zhang**, et al. Peter M. Kraus, “Extreme-Ultraviolet Shaping and Imaging by High-Harmonic Generation from Nanostructured Silica,” *Phys. Rev. Lett.* 128, 223902

International Experience

Human Academy Japanese Language School | Mar. 2016 – Jul. 2016 | Tokyo

- Full time student of Japanese language study.

Imperial Global Challenge Summer School | Jul. 2014 – Aug. 2014 | London

- Courses taken related to business innovation and marketing.

Berala Public School | Feb. 2014 | Sydney

- Volunteer work

Languages

- English - Professional working proficiency
- Chinese - Native proficiency
- Japanese - Elementary proficiency

Hobby

- Hiking, Singing, Reading, Gardening.