Dr. Himanshu MAHESHWARI

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EDUCATION

2017 – 2020 **Doctor of Chemistry**
Chemistry-Electrochemistry
Université de Lorraine, Nancy, FRANCE

JUNE 2019 **Summer School- Managing Engineering**
Entrepreneurship Course
MOOC

2008–2014 **Bachelors + Master in Nanotechnology**
Amity Institute of Nanotechnology
Amity University, Noida, INDIA

2008 **High School**
FIRST CLASS (HONORS)
Science(with Mathematics)
General Raj's School, Delhi, INDIA

EXPERIMENTAL SKILLS

- Electrochemical methods including cyclic voltammetry, chrono methods, flow injection, etc. and their detailed result analysis.
- Synthesis of mesoporous silica, and various types of nanoparticles, nanocomposites, nanorods and nanotubes.
- Electrochemical Simulations using Comsol.
- Lithography based on AFM (dip-pen nanolithography) and UV light source.
- Successful deposition of thin films using electrochemistry, thermal evaporation method, sputtering, pulse laser deposition, spin coating, CVD, etc.
- Synthesis of polymers using various routes.
- Operational knowledge of various characterization techniques like AFM, SEM, TEM, STM, XRD, EDX, Infrared spectroscopy, RAMAN spectroscopy, UV-Vis Spectrophotometer, DLS (Dynamic Light Scattering), optical microscopy.
- Qualitative & Quantitative analysis of organic and inorganic substances.
- Isolation of microbes and slide preparation. DNA isolation.
- Chromatographic techniques.

WORK EXPERIENCE

(OCT 2017 – DEC 2020)

PhD Student (Chemistry)

"Functional 1D mesochannels for Electrochemical Sensors"
My research focused on understanding the diffusion of molecules at mesoporous silica thin films and the electrocatalysis of molecules. I was motivated to conduct this doctoral research due to my passion for understanding complicated mechanisms taking place at interfaces of materials. Electrochemistry allows to study these mechanisms with a high degree of precision while being relatively simpler to other methods.
(Published Work [1])

Dr. Grégoire HERZOG, Dr. Neus VILÁ & Prof. Alain WALCARIUS
Laboratoire de Chimie, Physique et Microbiologie pour les Matériaux et l'Environnement (LCPME)
UMR 7564, CNRS / Université de Lorraine, Nancy, FRANCE

FEB 2015 – SEP 2017 (PART-TIME)

High School Tutor

Private tutor for High School Students
Subjects taught: Mathematics, Physics and Chemistry

OCT 2014 – FEB 2015 (FULL-TIME)

Research Assistant

Dr. Julia SYURIK, Institute of Microstructure Technology
Karlsruhe Institute of Technology, Karlsruhe, GERMANY

Localization of metallic centers for controlled growth of Carbon Nanotubes using Electrochemical dip-pen nanolithography.
AFM (studying surface morphology in air and fluid mode, studying surface adhesion and *dip-pen nanolithography*), optical microscopy.

FEB 2014 – SEP 2014 (FULL-TIME)

Master's Thesis Student

Dr. Pavel LEVKIN, Institute of Toxicology and Genetics,
Karlsruhe Institute of Technology, Karlsruhe, GERMANY

Synthesis of localized shape and size defined HKUST- 1 (Metal organic framework of Cu and benzene tricarboxylic acid) thin sheets using patterned superhydrophobic polymer surfaces.
Synthesis of the polymer surfaces, growth of HKUST-1 array, control of parameters, characterization using RAMAN spectroscopy, SEM, XRD, AFM, TEM and optical microscopy.
(Published Work [2])

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ACHIEVEMENTS

2018 **Member – Organizing Committee**
Intl. Electrochemistry Conf. ElecNano8

2018 **Best Poster Award – Spring Day**
Doctoral School – SESAMES

2010 **Volunteer – Protocol Assistant**
Delhi Commonwealth Games - 2010

2009 **Co-founder of Dramatics Club "Awaaz"**
Amity University

2003–2008 **Best in Mathematics**
General Raj's School

2007 **First Runner-up – The Green Olympiad**
The Energy and Research Initiative, India

COMMUNICATIONS

POSTER "Cysteine oxidation mediated by ferrocene derivative at electrodes modified with mesoporous silica thin films"
* ElecNANO '18
29–31 May 2018 Nancy France

POSTER "Oxidation of thiol containing molecules mediated by ferrocene derivative at electrodes modified with mesoporous silica thin film"
* N4S '18 (Nanomaterials for Sensors)
28 Sep 2018 Nancy France.

LANGUAGES

NATIVE/EXPERT English, Hindi

INTERMEDIATE French, Sanskrit

BEGINNER German

COMPUTER SKILLS

EXPERT Microsoft office suite, Nova (Metrohm), PStrace (Palmsens)

INTERMEDIATE OriginPro, Comsol, LaTeX, Tally.ERP(Accouting)

BEGINNER C++, VHDL, GIMP, HTML

Research Trainee (Summer)

MAY 2012 – JULY 2012 (FULL-TIME)
Dr. Rajendra SINGH, Department of Physics
Indian Institute of Technology-Delhi, INDIA

Synthesis of self-catalyzed Ga_2O_3 nanostructures on Si substrate using Chemical Vapor Deposition and its characterization using XRD, SEM and EDX.
Analysis of the results and estimation of the responsible mechanism.

MAY 2011 – JULY 2011 (FULL-TIME)
Dr. Rajendra SINGH, Department of Physics
Indian Institute of Technology-Delhi, INDIA

Synthesis of ZnO nanorods using chemical route and its characterization using XRD and SEM. Analysis of the results

MAY 2010 – JULY 2010 (FULL-TIME)
Prof. Vinay GUPTA, Department - Physics and Astrophysics
Delhi University, Delhi, INDIA

Synthesis of Si@Au core-shell nanoparticle composite and its characterization using DLS and UV-Vis spectroscopy.

MAY 2010 (PART-TIME)
Prof. Subhasis GHOSH, School of Physical Sciences,
Jawahal Lal Nehru University, Delhi, INDIA

Hands-on training on STM and AFM.
Micrography of different type of samples.

MAY 2009 – JULY 2009 (FULL-TIME)
Prof. Vinay GUPTA and Prof. V.K. DWIVEDI,
Department–Physics And Astrophysics,
Delhi University, Delhi, INDIA

Synthesis of Si membrane using wet etching process.
Cleaning process of the silicon wafer, spin coating, masking, exposure with UV, development and wet etching.

PUBLICATIONS

1. **Maheshwari, H.**, Vilà, Neus, Herzog, Grégoire, et al. "Selective detection of cysteine at a mesoporous silica film electrode functionalized with ferrocene in the presence of glutathione." *ChemElectroChem*, 2020, vol. 7, no 9, p. 2095-2101.

2. Tsotsalas, Manuel, **Maheshwari, Himanshu**, Schmitt, Sophia, et al. "Freestanding MOF microsheets with defined size and geometry using superhydrophobic–superhydrophilic arrays." *Advanced Materials Interfaces*, 2016, vol. 3, no 1, p. 1500392.