

## **Faculty Profile**

**Name:** Dr. Smita Mukherjee

**Designation:**

*Assistant Professor  
&  
Head of the Department  
Department of Physics  
Gobardanga Hindu College  
West Bengal*

**Email:**

[smita.mukherjee08@gmail.com](mailto:smita.mukherjee08@gmail.com)

**Qualifications:**

B. Sc. M.Sc., Post M.Sc., NET, PhD.

**Awards:**

**Young Scientist Award** 2009 (Material Research Society of India)

**Best PhD Thesis Award** 2012 (Department of Atomic Energy, Govt. of India)

**'Mairie de Paris' Fellowship** 2014 (Govt. of France)

**Woman Scientist Award** 2015 (DST, Govt. of India)

**Experience:**

14 years (Full Time Research) +6 years (Full Time Teaching)

**Assistant Professor**, Gobardanga Hindu College, Khatura, West Bengal, 2020

**Assistant Professor**, The Heritage College, Kolkata, 2017

**CSIR-Pool Scientist**, Central Glass & Ceramic Research Institute, Kolkata 2015

**Post Doctoral Fellow**, Institut de Nanoscience des Paris, France 2014

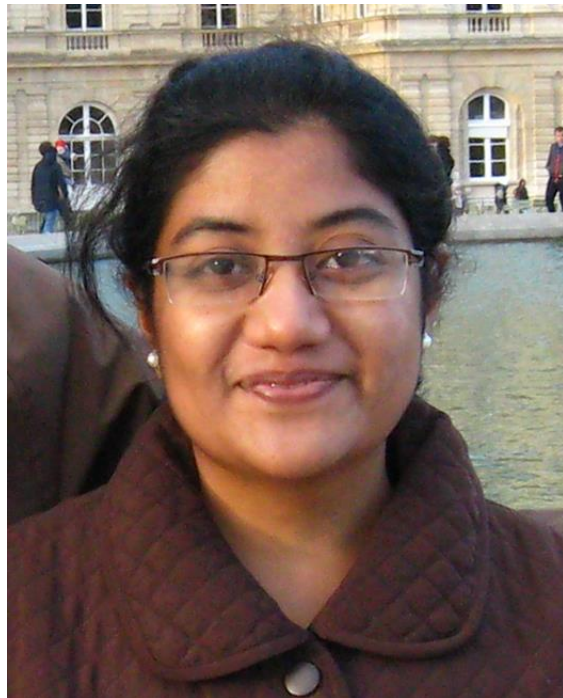
**Research Scientist**, IIT Bombay, Mumbai 2012

**Research Fellow**, Saha Institute of Nuclear Physics, Kolkata 2004

**Principal Investigator (PI)/Co-PI of Funded Projects:**

**International Funded Projects:**

- PI, Mairie De Paris Project (**Government of France**), February 2014-February 2015
- Co-PI, DST-ICTP (**Indo-Italian Program of Co-operation** (No. 20155172), 19 April 2016-24 April 2016



### National Funded Projects:

- PI, CSIR-SRA Project (No.8818-A), December 2015-December 2018
- PI, DST WOS A Project (No. SR/WOS-A/PM-1027/2015), Project Sanctioned, Not Taken.

### Supervision/Co-Supervision of Students:

- Co-Supervisor: Mr. Smarak Rath, B.Tech 4<sup>th</sup> Year, Metallurgical and Materials Engineering, NIT-Rourkella, May 2017-July 2017

### Research Interests:

- *Material Science, Nanomaterials, 2-Dimensional Systems, Metal-Organic Thin Films*
- *Polymers and organic-inorganic composites for opto-electronic applications*
- *Metal-organic thin films as bio-mimetic systems*
- *X-ray scattering, absorption spectroscopy, microscopy*

### Courses Taught:

- *Solid State Physics*
- *Statistical Mechanics*
- *Electronics*
- *Thermodynamics*
- *Thermal Physics*
- *Electricity*
- *Fluid Mechanics*
- *Vector Analysis, Viscosity, Surface Tension*

### Research Publications:

*25 Journal publications, 1 Patent and 1 book published till date.*

#### **Patent:**

"A Novel Process to get Highly Conducting and Highly Transparent Thin Films and its Applications as Transparent Conductor"

Anil Kumar, [Smita Mukherjee](#), Indian Patent Application No 783/MUM/2014, Filed on 7 March 2014.

#### **Book:**

Structural and Morphological Evolution in Organic Films and Multilayers

A. Datta and [S. Mukherjee](#), CRC-Press, Taylor and Francis Group, 2015

**Peer-reviewed journals:**

1. **Multilayer Ceramic-Polymer Microcomposite with Improved Optical Tunability and Nanomechanical Integrity**  
[Smita Mukherjee](#), Smarak Rath, Manjima Bhattacharya, Anoop K. Mukhopadhyay  
**Ceramics International**, 46, 15438–15446 (2020).
2. **Tuning the Band Gap in Titanium Dioxide Thin Films by Surfactant Mediated Confinement and Patterning of Gold Nanoparticles**  
[S. Mukherjee](#), Pradip Sekhar Das, Madhumita Choudhuri, Alokmay Datta, J. Ghosh, Biswajit Saha, Konstantin Koshmak, Stefano Nannarone and Anoop Kr. Mukhopadhyay  
**J. Phys. Chem. C**, 121, 21311 – 21323 (2017).
3. **Band Gap Tuning in Au-TiO<sub>2</sub> Composite Films: Effect of Au Concentration**  
[S. Mukherjee](#), S. Chakraborty, A. Samanta, J. Ghosh and A.K. Mukhopadhyay  
**Materials Research Express** 4, 065016 (2017).
4. **Structural and Optical Properties of Two-dimensional Magnetic Gadolinium Stearate Langmuir monolayer**  
Santanu Maiti, Milan Sanyal, Mrinmay Mukhopadhyay, Arnab Singh, [S. Mukherjee](#), Alokmay Datta, and Philippe Fontaine  
**Chem. Phys. Lett.**, 712, 177-183 (2018).
5. **Study of Short range Structure of Amorphous Silica by NEXAFS, RAMAN and Pair Distribution Function using Ag Radiations in Laboratory X-ray Diffractometer**  
R. K. Biswas, P. Khan, [S. Mukherjee](#), A. K. Mukhopadhyay, J. Ghosh, K. Muraleedharan  
**Journal of Non-Crystalline Solids** 488, 1–9, 2018.
6. **Transparent Al<sup>+3</sup> doped MgO thin films for functional applications**  
P. Maiti, P. S. Das, M. Bhattacharya, [S. Mukherjee](#), B. Saha, A. K. Mullick and A. K. Mukhopadhyay,  
**Materials Research Express**, <https://doi.org/10.1088/2053-1591/aa8279>.
7. **Gold Nanoparticle Patterning on Titanium Dioxide Thin Films by Hydrophilic and Hydrophobic Interactions: Effect on Band Gap**  
[S. Mukherjee](#), Madhumita Choudhuri, Alokmay Datta, Konstantin Koshmak, Stefano Nannarone and Anoop Kr. Mukhopadhyay, **IEEE, IEMENTech**.
8. **Surfactant Assisted Au Nanoparticle Layering in Titanium Oxide Thin Films**  
[S. Mukherjee](#), P. S. Das, M. Choudhuri, A. Datta, J. Ghosh and A.K. Mukhopadhyay  
**AIP Conf. Proc.** 1832, 080034 (2017).
9. **Two step formation of metal aggregates by surface X-ray radiolysis under Langmuir monolayers: 2D followed by 3D growth**  
[S. Mukherjee](#), Marie-Claude Fauré, Michel Goldmann and Philippe Fontaine  
**Beilstein J. Nanotechnol.** 6, 2406 (2015). **Impact Factor: 2.7**
10. **Solution Processed Poly (3,4-ethylenedioxythiophene) Thin Films as Transparent Conductor: Effect of p-Toluenesulphonic Acid in Dimethyl Sulfoxide**  
[S. Mukherjee](#), R. Singh, S. Gopinathan, S. Murugan, S. Gawali, B. Saha, J. Biswas, S. Lodha and A. Kumar, **ACS Applied Materials and Interfaces**, 6, 17792 (2014). **Impact Factor: 6.7**
11. **How Langmuir–Blodgett trilayers act as templates for directed self-assembly of nanoparticles**  
[S. Mukherjee](#), N. Biswas, A. Datta, A. Giglia, and S. Nannarone, **Materials Research Express**, 1, 025006 (2014).  
**Impact Factor: 0.9**

12. **Surfactant-Monomer Interactions: Towards Oxidative Surface Polymerization of Transparent Conducting Polymers**  
S. Mukherjee, Anshu Kumar, Bikash K. Sikder, and Anil Kumar, *AIP Conf. Proc.*, 1512, 150 (2013). **Impact Factor: NA**
13. **Evolution of Nanoparticle-Induced Distortion on Viral Polyhedra**  
S. Das, A. Datta, S. Mukherjee, N. Biswas, A. Goswami, *J. Biol. Phys.*, 39, 173 (2013). **Impact Factor: 1.2**
14. **Xylene-Capped Luminescent Silicon Nanocrystals: Evidence of Supramolecular Bonding**  
A. K. Mandal, M. Ray, I. Rajapaksa, S. Mukherjee and A. Datta, *J. Phy. Chem. C*, 116, 14644 (2012). **Impact Factor: 4.8**
15. **Langmuir-Blodgett Deposition Selects Carboxylate Headgroup Co-ordination**  
S. Mukherjee and A. Datta, *Phys. Rev. E*, 84, 041601 (2011). **Impact Factor: 2.3**
16. **'Solid' and 'liquid' like behavior in monolayers and multilayers of metal-bearing amphiphiles**  
S. Mukherjee, A. Datta, A. Giglia, N. Mahne and S. Nannarone, *Phys. Rev. E* 84, 021606 (2011). **Impact Factor: 2.3**
17. **Crossover from layering to island formation in Langmuir-Blodgett growth: Role of long-range intermolecular forces**  
S. Mukherjee and A. Datta, *Phys. Rev. E* 83, 041604 (2011) **Impact Factor: 2.3**
18. **Chemistry at air/water interface versus reaction in a flask: tuning molecular conformation in thin films**  
S. Mukherjee, A. Datta, A. Giglia, N. Mahne and S. Nannarone, *Langmuir* 25, 3519 (2009). **Impact Factor: 4.4**
19. **Dependence of mesoscopic growth on molecular configuration in Langmuir-Blodgett multilayers**  
S. Mukherjee and A. Datta, *Appl. Surf. Sci.* 256, 380 (2009). **Impact Factor: 2.5**
20. **Morphology and Structural Evolution in Cobalt Stearate Langmuir-Blodgett Films**  
S. Mukherjee and A. Datta, *J. Nanosci. Nanotechnol.* 9, 5237 (2009). **Impact Factor:1.3**
21. **Relating structure with morphology: A comparative study of perfect Langmuir-Blodgett multilayers**  
S. Mukherjee, A. Datta, A. Giglia, N. Mahne and S. Nannarone, *Chemical Physics Letters* 451, 80 (2008). **Impact Factor: 2.1**
22. **Role of Interfaces in Growth Dynamics of Nanostructures**  
A. Datta, N. Iguchi, K. Yoshikawa, S. Mukherjee and S. Chattopadhyay, *Proceedings of IEEE, MHS*, 42 (2008). **Impact Factor: 5.5**

*Conference Proceedings:*

23. **Morphological evolution of metal stearate Langmuir-Blodgett films**  
S. Mukherjee and A. Datta, *Proceedings of DAE-Solid State Physics Symposium 2008*
24. **Structural evolution of defect-free cobalt stearate multilayers**  
S. Mukherjee and A. Datta, *Proceedings of DAE-Solid State Physics Symposium 2007*
25. **Pinholes in Langmuir-Blodgett Films: Effect of metal ions**  
S. Mukherjee and A. Datta, *Proceedings of DAE-Solid State Physics Symposium 2006*