

I-STEM Software Request - Guide Approval Form

User Details

- **Name of Researcher:** Ruchir Gupta
- **User Type:** ☒ Ph.D. Scholar ☐ Postdoctoral Researcher ☐ Bachelor's ☐ Masters
- **Institution Name** : Indian Institute of Science Education and Research (IISER) Bhopal
- **Institutional Contact No:** +917552691364
- **Research Topic:** Spectroscopy, Physical Chemistry

Software Request Details

- **Software Name:** COMSOL Multiphysics
- **Justification for Software Request:** Our current research focuses on simulating and analysing the Localised Surface Plasmon Resonance (LSPR) spectra of metal nanoparticles. This involves:
 1. Modelling the interaction of electromagnetic waves (light) with metal nanoparticles.
 2. Accurately solving Maxwell's equations in the frequency domain for spherical and elongated geometries of metal nanoparticles.
 3. Calculating optical properties such as scattering cross-sections, absorption cross-sections, and near-field enhancements to understand and predict the SPR behaviour of real world systems.COMSOL Multiphysics® provides a robust, versatile, and validated platform for simulating the complex electromagnetic and potentially coupled multiphysics phenomena relevant to our research area. Its comprehensive suite of tools, physics interfaces, specialized boundary conditions, and material modelling capabilities are essential for accurately simulating systems like LSPR in metal nanoparticles. Access to COMSOL through the I-STEM portal is crucial for advancing this research, enabling detailed theoretical investigation and design optimization of plasmonic nanoparticles, which would otherwise be limited by software accessibility.

Guide/Supervisor Approval

I, Dr. Sachin Dev Verma (Guide/Supervisor Name),

- Confirm that the above-mentioned researcher is affiliated with our institution
- Have reviewed the software request and its relevance to the researcher's academic work
- Approve the software request for research purposes

Approval Confirmation

- I approve the software request
- The software aligns with the researcher's research objectives
- The request meets the institutional research guidelines

Guide/Supervisor Signature: 

Date: 24/04/2025

Official Stamp/Seal:

Dr. Sachin Dev Verma
Assistant Professor, Department of Chemistry
Indian Institute of Science Education and Research Bhopal
Bhopal-462066, Madhya Pradesh, India

Important Notes

1. This form must be signed and scanned
2. The scanned copy must be uploaded with the software request
3. Electronic signatures are acceptable if from an official institutional email

Dr. Sachin Dev Vermani
Assistant Professor, Department of Chemistry
Indian Institute of Science Education and Research
Bhopal-462066, Madhya Pradesh, India