

Paramita Ghosh

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EDUCATION

PhD Chemistry

2012-till now

Indian Institute of Technology Kanpur

Thesis title: “Epitaxial growth of silicon and germanium on 2×1 reconstructed silicon (001) surface: A kinetic Monte Carlo study” (submitted)

Thesis advisor: Dr. Madhav Ranganathan

CPI: 9.33/10

M.Sc. Chemistry

2010-2012

University of Burdwan

Specialisation in Physical Chemistry

Marks: 82%

B.Sc.(Hons) Chemistry

2007-2010

University of Burdwan

Chemistry as honors subject, Mathematics, Physics

Marks: 60%

RESEARCH EXPERIENCE

- Theoretical Modeling and numerical analysis
- Multiscale simulation of materials
- Monte Carlo/kinetic Monte Carlo methods
- 3D modeling of growth specially for heteroepitaxial growth explicitly incorporating long-ranged elastic effects and surface reconstruction
- Simulation of self-organized quantum dots at higher coverages
- Understanding of growth – effect of growth parameter (temperature, flux etc) on initial growth, nucleation, spontaneous formation of quantum dots to gain control on the overall growth process.
- High Performance Computations, parallel programming, use of MPI, OpenMP to increase inter-node and intra-node performance

LIST OF PUBLICATIONS

Peer-Reviewed Journal Papers:

1. **P. Ghosh**, M. Ranganathan, “[Role of \$2\times 1\$ surface reconstruction on Stranski–Krastanov growth illustrated using a modified solid-on-solid model](#)”, *Journal of Crystal Growth* **457**, 98-103 (2017).
2. **P. Ghosh**, P. Nath, M. Ranganathan, “[Understanding the early stages of growth of Ge on Si \(001\) from lattice based simulations](#)”, *Surface Science* **639**, 96-101 (2015).
3. **P. Ghosh**, M. Ranganathan, “[Submonolayer growth study using a solid-on-solid model for \$2\times 1\$ reconstructed surfaces of diamond-like lattices](#)”, *Surface Science* **630**, 174-181 (2014).

Manuscripts Under Preparation:

1. **P. Ghosh**, M. Ranganathan “Simulation of self-organized Ge islands on Si(001)” to be submitted.

SKILLS

- Self-developed code, written in “C” language
- High Performance Computations, parallel programming (MPI, OpenMP)
- **Computational Packages:** Quantum Espresso, VASP, Matlab
- **Data analysis and visualization**
 - VMD (visual Molecular Dynamics)
 - Materials Studio
 - VESTA (Visualization of Electronic and Structural analysis)
 - XCrySDen ((X-Window) Crystalline Structures and Densities)
 - Molden
 - Xmgrace
 - Gnuplot (Data and function plotting program)
 - Xfig (An open source of vector graphic editor)
 - GIMP (GNU image manipulation program)
- **Text Editors:** M.S. Office, Open Office, Miktex, Latex
- **Operating System:** Linux (Fedora, Ubuntu, OS), Windows 7,8
- **Programming language:** FORTRAN, C, C++, html

TEACHING ASSISTANCE

- CHM-102A (“General Chemistry” for B. Tech. program, December 2014-May 2015), Department of Chemistry, IIT Kanpur.
- COM-200 (“Communication skills :Composition” for B. Tech. program, July 2015-December 2015), Department of COM, IIT Kanpur.

- CSO-202A (“Atoms, Molecules and Photons” for B. Tech. program, December 2015-May 2016), Department of Chemistry, IIT Kanpur.

POSTER/ORAL PRESENTATION

1. Frontiers in Molecular Spectroscopy: From Fundamentals to Applications on Material Science and Biology, IIT Kanpur, India, November 2016 (Poster Presentation).
2. Research Scholars’ Day, 2016, Department of Chemistry, IIT Kanpur, India February 2016 (Oral Presentation).
3. Fifth European Conference on crystal growth, Bologna, Italy, September 2015 (Poster Presentation).
4. Dynamics of Complex Chemical and Biological Systems (DCCBS), Indian Institute of Technology Kanpur, India, February 2014 (Poster Presentation) .

WORKSHOP/CONFERENCE/SCHOOL ATTENDED

1. ACS on Campus event by American Chemical Society, IIT Kanpur, India, January 2017.
2. Swiss Space Summer Camp organized by the Swiss Space Center, Lucerne University of Applied Sciences and Arts, Lucerne (HSLU), Switzerland, September 2016.
3. First European School on crystal growth, Bologna, Italy, September 2015.
4. Intel HPC Code Modernization (Parallelization) Workshop, IIT Kanpur, India, August 2015.
5. National seminar on International year of Chemistry: Chemistry in our lives under the thrust area “Design, Synthesis Interaction, Chemical, Biochemical Activities of Different Functional Molecule” organized by Department of Chemistry, Burdwan University, India, March 2011.

AWARD/SCHOLARSHIP

- Travel Grant from Dean, Resources and Alumni (DORA), IIT Kanpur in July 2015, to attend ECCG5-2015, Bologna, Italy.
- Awarded grant from International Union of Crystallography in September 2015 to attend the 1st European School on Crystal Growth, Italy.
- Qualified Graduate Aptitude Test in Engineering, 2012 (Chemistry).
- Qualified Joint Admission test for M.Sc 2010 of Indian Institute of Technology-Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Madras, Roorkee in Chemistry.

PERSONAL

- Nationality: Indian
- Date of Birth: 15th July 1990

- Gender: Female
- Marital Status: Married
- Languages Known: English, Hindi, Bengali

REFERENCES

1. Dr. Madhav Ranganathan

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3. Dr. Nisanth N. Nair

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