DR. MONALISA GARAI

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Experience

Feb 2020 – Present	**Institute of Applied Physics, Johannes Kepler University (JKU), Austria** University Assistant
Jan 2018 – July 2018	**Department of Chemistry, National University of Singapore, Singapore** Research Associate
Jun 2014 – Jan 2018	**Department of Chemistry, National University of Singapore, Singapore** Laboratory Safety Leader
Dec 2011 – Jan 2013	**Institute of Biological Science, Nanyang Technological University, Singapore** Project Officer

Education

Jan 2014 – Jan 2018	**Department of Chemistry, National University of Singapore** PhD in Physical Chemistry Thesis Title: "Plasmon Enhanced Photoluminescence of Metal Nanoparticles and Monolayer Molybdenum Disulfide Studied by Single Particle Spectroscopy" Advisor: Assoc. Prof. Xu Qing-Hua
Jan 2013 – Jan 2014	**Department of Chemistry, National University of Singapore** MSc in Material Chemistry
July 2009 – June 2011	**Department of Chemistry, University of Calcutta, India** MSc in Organic Chemistry
July 2006 – June 2009	**Department of Chemistry, University of Calcutta, India** BSc in Chemistry

Skills

Optomechanical design and alignment, Laser optics and spectroscopy (linear and nonlinear), Femtosecond/CW laser spectroscopy, Nanofabrication and characterization

Techniques

Fluorescence microscopy (single- & multi-photon), Dark-field scattering microscopy (DFS), Near-field scanning optical microscopy (NSOM), UV-vis and Raman spectroscopy, Atomic force microscope (AFM), Electron microscopes (TEM, SEM-EDX), Time correlated single photon counting (TCSPC), Chromatography (GC, HPLC), Electrochemistry

Honors and Awards

1. Best Poster Award, IUMRS-ICEM-2016 (Given to 1 out of 40 participants).
2. Received "Award of Excellence" in Chemistry Graduate Symposium 2016, NUS, Singapore.

3. Winner of International Conference Travel Grant, NUS, 2016 (given to 5 out of 71 PhD students).
4. NUS PhD research scholarship, 2014
5. First class first in MSc, University of Calcutta, India, 2011

Teaching and Mentoring

Feb. 2020 – Present	**Institute of Applied Physics, Johannes Kepler University (JKU), Austria** University Assistant Teaching BSc and MSc students, and mentoring junior research students
Jan 2014 – Jan 2018	**Department of Chemistry, National University of Singapore** Teaching Assistant Taught undergraduate physical chemistry labs courses and supervised undergraduate and junior Ph.D. students.

List of Publications

1. **Garai,M.**; Diethör, S.; Mayr, F.; Scharber, MC.; Sariciftci, NS.; Klar, TK. Redox-Chemical Electron Storage on Sub-5 nm Gold Nanoparticles Compromised by Coulomb Repulsion. J. Phys. Chem. C **2025**. https://pubs.acs.org/doi/10.1021/acs.jpcc.5c01200
2. **Garai, M.**; Zhu, Z.; Shi, J.; Li, S.; Xu, Q.-H. Single-Particle Studies on Plasmon Enhanced Photoluminescence of Monolayer MoS2 by Gold Nanoparticles of Different Shapes. *J. Chem. Phys.* **2021**, *155* (23), 234201. https://doi.org/10.1063/5.0073754.
3. **Garai, M.**; Gao, N.; Xu, Q.-H. Single-Particle Spectroscopic Studies on Two-Photon Photoluminescence of Coupled Au Nanorod Dimers. *J. Phys. Chem. C* **2018**, *122* (40), 23102–23110. https://doi.org/10.1021/acs.jpcc.8b07094.
4. **Garai, M.**; Zhang, T.; Gao, N.; Zhu, H.; Xu, Q.-H. Single Particle Studies on Two-Photon Photoluminescence of Gold Nanorod–Nanosphere Heterodimers. *J. Phys. Chem. C* **2016**, *120* (21), 11621–11630. https://doi.org/10.1021/acs.jpcc.6b02941.
5. Vickers, E. T.; **Garai, M.**; Bonabi Naghadeh, S.; Lindley, S.; Hibbs, J.; Xu, Q.-H.; Zhang, J. Z. Two-Photon Photoluminescence and Photothermal Properties of Hollow Gold Nanospheres for Efficient Theranostic Applications. *J. Phys. Chem. C* **2018**, *122* (25), 13304–13313. https://doi.org/10.1021/acs.jpcc.7b09055.
6. Zhu, H.; **Garai, M**.; Chen, Z.; Xu, Q.-H. Two-Photon Excitation of Gold Nanorods Interrupted by Extremely Fast Solvent-to-Metal Electron Transfer. *J. Phys. Chem. C* **2017**, *121* (51), 28546–28555. https://doi.org/10.1021/acs.jpcc.7b10235.
7. Zhu, Z.; Yuan, P.; Li, S.; **Garai, M.**; Hong, M.; Xu, Q.-H. Plasmon-Enhanced Fluorescence in Coupled Nanostructures and Applications in DNA Detection. *ACS Appl. Bio Mater.* **2018**, *1* (1), 118–124. https://doi.org/10.1021/acsabm.8b00032.
8. Jiao, L.; Liu, M.; **Garai, M.**; Gao, N.; Yang, J.; Xu, Q.-H.; Hong, M. Simulation of Fluorescence Enhancement by an AFM Tip on a Gold Particle Quenched Emitter. *Appl. Opt.* **2016**, *55* (31), 8722–8726. https://doi.org/10.1364/AO.55.008722.
9. Chua, M. H.; Ni, Y.; **Garai, M.**; Zheng, B.; Huang, K.-W.; Xu, Q.-H.; Xu, J.; Wu, J. Towards Meso-Ester BODIPYs with Aggregation-Induced Emission Properties: The Effect of Substitution Positions. *Chem. –*

An Asian J. **2015**, *10* (8), 1631–1634. https://doi.org/https://doi.org/10.1002/asia.201500420.

10. Yuan, P.; Ma, R.; Gao, N.; **Garai, M.**; Xu, Q.-H. Plasmon Coupling-Enhanced Two-Photon Photoluminescence of Au@Ag Core–Shell Nanoparticles and Applications in the Nuclease Assay. *Nanoscale* **2015**, *7* (22), 10233–10239. https://doi.org/10.1039/C5NR01409C.

List of Conferences

1. Presented an oral talk at "**DPG** Spring Meeting", Berlin, 2024.
2. Presented an oral talk at "**NanoSpain** Conference", Spain, 2023.
3. Presented a poster in Chemistry National Meeting Singapore (**ChnmSG-2018**).
4. Presented an oral talk at "9th World Congress on Materials Science and Engineering", Rome, 2017.
5. Presented a poster in 4th International conference **ANNUM IV, Singapore, 2016**.
6. Received **best poster award** at International conference **IUMRS-ICEM, Singapore, 2016**.
7. Received "**Award of Excellence**" in **Chemistry Graduate Symposium**, NUS, Singapore, 2016.
8. Presented a poster in 9th Singapore International Chemistry Conference (**SICC-9 2016**).