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# SREEPRASAD T SREENIVASAN

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Post-doctoral Research Fellow

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## I. Education

- **Doctor of Philosophy (Chemistry)**, Indian Institute of Technology Madras, Chennai, India, July **2011**  
*Achievement* : *Prof. Ramamurthy Endowment Award for Best Ph.D. Thesis in Chemistry*
  - **Master of Science (Chemistry)**, M. G. University, School of Chemical Sciences, Kerala, India , March **2005**  
*Achievement* : *Awarded 1<sup>st</sup> Rank and Gold Medal in Physical Chemistry*
  - **Bachelor of Science (Chemistry)**, M. G. University, Kerala, India, March **2002**  
*Achievement* : *Awarded the Honor of Distinction (90.5 %)*
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## II. Awards, Honors, and Funding

- Prof. Ramamurthy Endowment Award for **Best Ph.D. Thesis** in Chemistry, IIT Madras, Chennai, India
  - **Awarded 1<sup>st</sup> Rank** and gold medal in Physical Chemistry (MS), M. G. University, Kerala, India
  - **Secured 99.14 percentile** in Graduate Aptitude Test in Engineering (GATE) 2005, with all India rank 29
  - Qualified National Eligibility Test (NET, Lectureship, Chemistry) 2005
  - Junior and Senior Research Fellowship from IIT Madras to pursue PhD
  - **Funding from Johnson Cancer Center (as Co-PI, PI: Dr. Vikas Berry)** for graphene based cancer sensors
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## III. Skills and Research Expertise

- Extensive experience in interdisciplinary projects of material science, chemistry and engineering involving graphene, MoS<sub>2</sub>, BN, WS<sub>2</sub>, various metallic and semiconducting anisotropic nanostructures
  - Delivered 32 publications (492 citations, h-index 14), 2 patents and 6 patent applications
  - Obtained funding from Johnson Cancer Center (as Co-PI) and participated in technical writing to various funding agencies
  - Skilled in various characterization techniques;
    - ✓ **Microscopy:** HRTEM and Microtome, SEM, AFM, and Confocal fluorescence Microscope
    - ✓ **Spectroscopy:** Raman, FTIR, UV/Visible, Fluorimeter, XPS, XRD, DESI and MALDI-TOF-MS
  - **Instrument Building:** Participated in setting-up HRTEM (JEOL, 300 kV) and SEM, experienced in building Raman microscope, AFM, high vacuum cryo-chamber for electrical measurements, LPCVD set-up, etc.
  - **Thin film fabrication:** LPCVD and *physical deposition (DC sputtering, thermal evaporation etc.)*
  - **Device fabrication:** Expert in *Electron Beam Lithography (EBL)*, *UV lithography*, DC sputtering, thermal evaporation for nanoscale graphene based FET
  - **Etching techniques:** Conventional Reactive-ion etching, Capacitively or Inductively coupled plasma etching
  - **Semiconductor electronic analysis:** Experienced in analyzing graphene/MoS<sub>2</sub> based FETs at room temperature and at cryogenic temperatures (70 K)
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## IV. Research Experience

- Post-doctoral Research fellow: Kansas State University Manhattan, KS (Nov 2011- till to date)
  - Research Associate: Indian Institute of Technology Madras (Feb 2011-Oct 2011)
  - Research Scholar: Indian Institute of Technology Madras (Jan' 2006-Feb 2011)
  - Research Assistant: Indian Institute of Technology Madras (Sep' 2005-Dec' 2005)
  - Master's Project fellow in National Chemical Laboratory, Pune (July 2004-Nov' 2004)
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## V. Publications, Patents, and Presentations

### a) Publications (Total citation: 492; h index-14)

1. **Sreeprasad, T. S.;** P. Nguyen, N. Kim, and V. Berry (2013) Controlled, Defect-Guided, Metal-Nanoparticle-Incorporation onto MoS<sub>2</sub> via Chemical and Microwave Routes: Electrical, Thermal, and Structural Properties. *Nano Letters* 13, 4434–4441.
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2. **Sreeprasad, T. S.;** A. A. Rodriguez, J. Colston, A. Graham, E. Shishkin, V. Pallem, and V. Berry (2013) Electron-Tunneling Modulation in Percolating Network of Graphene Quantum Dots: Fabrication, Phenomenological Understanding, and Humidity/Pressure Sensing Applications. *Nano Letters* 13, 1757-1763.
3. Mohanty, N.; D. Moore, X. Zhiping, **T. S. Sreeprasad**, A. Nagaraja, A. A. Rodriguez, and V. Berry (2012) Nanotomography based production of transferrable and dispersible graphene-nanostructures of controlled shape and size. *Nature Communication* 3, Article number: 844.
4. Ahn, B. K.; J. Sung, Y. H. Li, N. Kim, M. Ikenberry, K. Hohn, N. Mohanty, P. Nguyen, P.; **T. S. Sreeprasad**, S. Kraft, V. Berry, and X. S. Sun (2012) Synthesis and characterization of amphiphilic reduced graphene oxide with epoxidized methyl oleate. *Advanced Materials* 24, 2123-2129.
5. Nguyen, P.; J. Li, **T. S. Sreeprasad**, K. Jasuja, N. Mohanty, M. Ikenberry, K. Hohn, V. B. Shenoy, and V. Berry (2013) Covalent Functionalization of Dipole-Modulating Molecules on Trilayer Graphene: An Avenue for Graphene-Interfaced Molecular Machines. *Small Early View (DOI: 10.1002/sml.201300857)*.
6. **Sreeprasad, T. S.** and V. Berry (2013) How Do the Electrical Properties of Graphene Change with its Functionalization? *Small* 9, 273-283.
7. Maliyekkal, S. M.; **T. S. Sreeprasad**, D. Krishnan, S. Kouser, A. K. Mishra, U. V. Waghmare, and T. Pradeep (2013) Graphene: A reusable substrate for unprecedented adsorption of pesticides. *Small* 9, 341-350.
8. **Sreeprasad, T. S.;** S. S. Gupta, S. M. Maliyekkal, and T. Pradeep (2013) Immobilized graphene-based composite from asphalt: Facile synthesis and application in water purification. *J. Haz. Mater.* 246-247, 213-220.
9. Gupta, S. S.; **T. S. Sreeprasad**, S. M. Maliyekkal, S. K. Das, and T. Pradeep (2012) Graphene from sugar and its application in water purification. *ACS Appl. Mater. Interfaces* 4, 4156-4163.
10. **Sreeprasad, T. S.** and T. Pradeep (2012) Graphene for environmental and biological applications (Review). *Int. J. Mod. Phys. B* 26, 1242001 (26 pages).
11. **Sreeprasad, T. S.;** M. Shihabudheen Maliyekkal, K. P. Lisha, and T. Pradeep (2011) Reduced graphene oxide-metal/metal oxide composites: Facile synthesis and application in water purification. *J. Haz. Mater.* 186, 921-931 (*Selected among top 25 article and more than 50 citations*).
12. Gupta, S. S.; M.V. Siva, S. Krishnan, **T. S. Sreeprasad**, P. K. Singh, T. Pradeep, and S. K. Das (2011) Thermal conductivity enhancement of nanofluids containing graphene nanosheets. *J. Appl. Phys.* 110, 84302.
13. **Sreeprasad, T. S.** and T. Pradeep (2011) Tubular nanostructures of Cr<sub>2</sub>Te<sub>4</sub>O<sub>11</sub> and Mn<sub>2</sub>TeO<sub>6</sub> through room-temperature chemical transformations of tellurium nanowires. *J. Phys. Chem. C* 115, 16524-16536.
14. **Sreeprasad, T. S.** and T. Pradeep (2011) Reversible assembly and disassembly of gold nanorods induced by EDTA and its application in SERS tuning. *Langmuir* 27, 3381-3390.
15. Prasad, T. N. V. K. V.; P. Sudhakar, Y. Sreenivasulu, P. Latha, V. Munaswamy, K. Raja Reddy, **T. S. Sreeprasad**, P. R. Sajanlal, and T. Pradeep (2012) Effect of nanoscale zinc oxide particles on the germination growth and yield of peanut. *J. Plant Nutr.* 35, 905-927.
16. **Sreeprasad, T. S.;** S. M. Maliyekkal, K. Deepthi, L. Xavier, K. Chaudhari, and T. Pradeep (2011) Transparent, luminescent, antibacterial and patternable film forming composites of graphene oxide/reduced graphene oxide. *ACS Appl. Mater. Interfaces* 3, 2643-2654.
17. Sajanlal, P. R.; **T. S. Sreeprasad**, A. K. Samal, and T. Pradeep (2011) Anisotropic nanomaterials: Structure, growth, assembly, and functions. *Nano Reviews* 2, 5883 (DOI: 10.3402/nano.v2i0.5883).
18. Samal, A. K.; **T. S. Sreeprasad**, and T. Pradeep (2010) Investigation the role of NaBH<sub>4</sub> in the chemical synthesis of gold nanorods. *J. Nanopart. Res.* 12, 1777-1786.
19. **Sreeprasad, T. S.;** A. K. Samal, and T. Pradeep (2009) Tellurium nanowire-induced room temperature conversion of graphite oxide to leaf-like graphenic structures. *J. Phys. Chem. C* 113, 1727-1737.
20. **Sreeprasad, T. S.;** A. K. Samal, and T. Pradeep (2009) Bending and shell formation of tellurium nanowires induced by thiols. *Chem. Mater.* 21, 4527-4540.
21. Ramasamy, P.; S. Guha, E. Shibu, **T. S. Sreeprasad**, S. Bag, A. Banerjee, and T. Pradeep (2009) Size tuning of Au nanoparticles formed by electron beam irradiation of Au<sub>25</sub> quantum clusters anchored within and outside of dipeptide nanotubes. *J. Mater. Chem.* 19, 8456-8462.

22. Rajeev Kumar, V. R.; V. Sajini, **T. S. Sreeprasad**, V. K. Praveen, A. Ajayaghosh, and T. Pradeep (2009) Probing the initial stages of molecular organization of oligo(p-phenylene vinylene) assemblies with monolayer protected gold nanoparticles. *Chem. Asian. J.* 4, 840-848.
23. Sajanlal, P. R.; **T. S. Sreeprasad**, A. S. Nair, and T. Pradeep (2008) Wires, plates, flowers, needles and core-shells: Diverse nanostructures of gold using polyaniline templates. *Langmuir* 24, 4607-4614.
24. **Sreeprasad, T. S.**; A. K. Samal, and T. Pradeep (2008) One-, two-, and three-dimensional superstructures of gold nanorods induced by dimercaptosuccinic acid. *Langmuir* 24, 4589-4599.
25. **Sreeprasad, T. S.**; A. K. Samal, and T. Pradeep (2008) Reactivity of gold nanorods with Cu<sup>2+</sup>. *Bull. Mater. Sci.* 31, 219-224.
26. Subramaniam, C.; **T. S. Sreeprasad**, T. Pradeep, G. V. P. Kumar, C. Narayana, T. Yajima, Y. Sugawara, H. Tanaka, T. Ogawa, and J. Chakrabarti (2007) Visible fluorescence induced by the metal semiconductor transition in composites of carbon nanotubes with noble metal nanoparticles. *Phys. Rev. Lett.* 99, 167404.
27. **Sreeprasad, T. S.**; A. K. Samal, and T. Pradeep (2007) Body or tip controlled reactivity of gold nanorods and their conversion to particles through other anisotropic structures. *Langmuir* 23, 9463-9471.
28. Rajeev Kumar, V. R.; A. K. Samal, **T. S. Sreeprasad**, and T. Pradeep (2007) Gold nanorods grown on microgels leading to hexagonal nanostructures. *Langmuir* 23, 8667-8669 (*Selected as most accessed article in a quarter*).
29. Tom, R. T.; A. K. Samal, **T. S. Sreeprasad**, and T. Pradeep (2007) Hemoprotein bioconjugates of gold and silver nanoparticles and gold nanorods: Structure–function correlations. *Langmuir* 23, 1320-1325.
30. **Sreeprasad T. S.** (2012) “Assembly of Anisotropic Nanostructures” Chapter-15 in *A Textbook of Nanoscience and Nanotechnology* (Ed: T. Pradeep) *Tata McGraw-Hill Publications* (ISBN: 9781259007323).
31. **Sreeprasad, T. S.** and T. Pradeep (2013) Noble Metal Nanoparticles. **Springer Handbook of Nanomaterials** 303-388 (ISBN: 978-3-642-20594-1).
32. **Sreeprasad T. S.** (due in 2014) “Graphene for water purification and sensing: Chapter in *Aquananotechnology: Global Prospects* (Ed. David E. Reisner and T. Pradeep) *CRC Press* (ISBN: 9781466512245, *In Press*).

## b) Patent and Patent Applications

1. Reduced graphene oxide-based-composites for the purification of water (2012) WO/2012/028964.
2. Applications of nanoscale ZnO in peanut crop (2013) IN 2011CH03586.
3. Luminescent Graphene Patterns (2012) PCT Appl. No. PCT/IB2012/001518.
4. Graphene based antimicrobial composite and uses thereof (2012). US patent Application no. 13/443,408.
5. A method for the preparation of immobilized graphene-based composite from asphalt and its application in water purification (2012) Indian Patent Appl. no. 3863/CHE/2012.
6. Reusable Rewritable luminescent transparent graphene patterns for tracking (2012) Indian Patent Appl. no. 2097/CHE/2012.
7. Removal of pesticides from water using graphenic materials (2011) Indian Patent Appl. No. 3857/CHE/2011.
8. Reduced graphene oxide-based composites for the purification of water (2010) Indian Patent Appl. No. 2563/CHE/2010.

## c) Conferences Participated

- 1) Poster and Oral presentations in the MRS April meeting, San francisco, CA, USA (2013)
- 2) Poster and Oral presentations in the APS March meeting, Boston, MA, USA (2012).
- 3) Oral presentation in the Chennai Chemistry Conference, IIT Madras, Chennai (2011 **Best presentation award**).
- 4) Poster presented in the NS&NT review meeting, Kolkata (2009).
- 5) Poster presented at CRSI 10th national meeting, IISc Bangalore (2008, **Best poster award**).
- 6) Poster presented in Molecules and Material: New Dimensions, JNCASR Bangalore (2008).
- 7) Oral presentation in the NS&NT review meeting, Hyderabad (2007).
- 8) Poster presented in the CRSI first midyear meeting, IITM Chennai (2006).

## VI. Teaching Experience

- Lab instructor: Conducted postgraduate physical chemistry laboratories for three semesters in IIT Madras
- Private college tutor: Taught physical and inorganic chemistry classes for undergraduates