



Prof. M.S. Ramachandra Rao, *FInstP*
Department of Physics,
Nano Functional Materials Technology Centre and
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Head, Indian Solar Energy Harnessing Centre (ISEHC)
Indian Institute of Technology (IIT) Madras, Chennai – 600036.
[*FInstP*: Fellow of Institute of Physics (IoP), UK]

Academic Background:

M.Sc. (Physics) : Indian Institute of Technology, Kharagpur (1983)
Ph.D. (Expt. SSP) : Indian Institute of Technology, Kharagpur (1988)

Employment:

Assistant Professor : IIT Madras (1995-2004)
Associate Professor : IIT Madras (2004-2006)
Professor : IIT Madras (2006 - present)
Senior Professor : IIT Madras (from July 01, 2013)
Chair Professor : IIT Madras (from May 2018)

Other Employment/post-doc/fellowship/visiting position details (before and after joining IIT as a faculty):

Research Scientist : Solid State Physics labs, CNRS Bellevue, France ('90 – '91)
Research Associate : Materials Science Research Centre, IIT Madras ('91 – '93)
Visiting Fellow (1993-'94) : Solid State Electronics Group, Tata Institute of Fundamental Research (TIFR), Bombay
Alexander von Humboldt Fellow (Jan – Jul '99) : II. Physikalisches Institut University of Cologne, Germany
Visiting Faculty (2003-'04) : Thin film group, Department of Physics, University of Maryland, College Park, MD 20742
JSPS Fellow (May – July, 2007) : Department of Electrical Engineering, Kyushu University, Japan
Visiting Faculty (2008, '09, '10, '11 and '12) : Department of Electrical Engineering, Kyushu University, Japan [Short visits]
Erasmus Mundus Professor (2007 – present) : University of Montpellier, France; University of Rennes, France; Technical University of Munich, Germany [Duties: Teaching the Master's students, conduct collaborative research and supervision of students].
DAAD STAR Professor (2010) : Walther Meissner Institute, Garching, Germany
Visiting Faculty and BoG member : IISER, Trivandrum (2015-present)
Visiting Faculty : Information Science and Department of Electrical Engineering, Kyushu University, Japan (December 2015 to February 2016).
Visiting Faculty : Department of Physics, Shibaura Institute of Technology (SIT), Tokyo.

MRSI (Materials Research Society of India) Council Member (2015-2018).

Editorial Board Member (from India (2005 – December 2014)) of Journal of Physics D. Applied Physics, Institute of Physics (IoP), UK.

Section Editor (from January 2015) of “Condensed matter, interfaces and related nanostructures section”; J. Phys.D. Appl. Phys. Institute of Physics (IoP), UK.

Established “**Nano functional Materials Technology Centre (NFMTC)**” at IIT Madras [one of the three PIs] with a grant from DST and Industry.

Research Activities: Nanomaterials, Nanostructured thin films: Electronic, optical and magnetic properties: Magnetic nanoparticles and magnetic tunnel junctions, spintronics, nanocrystalline diamond coatings for wear-resistance and bio-medical applications, superconductivity in diamond, nano-ink based CIGS/CZTS photovoltaics, oxygen diffusion in nano-oxides, PZT films for power harvesting, ZnO nanostructures and quantum structures for light emission, IGZO and graphene-ZnO interfaces for TFT and tenability in optical pumping.

Publications : 225 (in international journals)
170 papers presented in national and intl. conferences (2018 not included).

Patents : 15 patents and 4 technology transfers; **Incubated a company in Research Park on the technology developed with diamond coatings.**

Teaching : 23 years of teaching experience at undergraduate, postgraduate and Ph.D. level courses at IIT Madras. [Taught in the US and France].

Projects : 20 (completed), 06 (on going)
[Established good research facilities to carry out competent research in the areas of Nanoscience and Nanotechnology; Physics of advanced materials, thin films and heterostructures].

Invited Talks : 85 (since 2013)

Guidance: Ph.D. : 24 (completed) and 17 (on going);
M.Tech/M.Sc./B.Tech./MS : 85 (21/35/26/03; completed)

Books Written: “**Nanoscience and Nanotechnology: Fundamentals to Frontiers**” (Wiley) – Text book. ISBN: [9788126542017](#)

“**ZnO nanostructures and Allied Materials**”
(Springer). ISBN: [978-81-322-1159-4](#)

J. Phys. D. Special Issues roadmap an:

- 1. Carbon-based Nanoscience and Nanotechnology: Where are we, where are we heading?**
J. Phys. D: Appl. Phys. 43 (2010) 37030. doi: [10.1088/0022-3727/43/37/370301](#).
- 2. Three decades of scanning tunnelling microscopy that changed the course of surface science.** *J. Phys. D: Appl. Phys.* 44 (2011) 460301. doi: [10.1088/0022-3727/44/46/460301](#).
- 3. 25 years of pulsed laser deposition.** *J. Phys. D: Appl. Phys.* 47 (2014) 030301
doi: [10.1088/0022-3727/47/3030301](#).
- 4. 100 years of crystallography: new dimensions offered by large scale facilities.**
doi: [10.1088/0022-3727/48/50/500301](#).

5. **The 2016 Oxide Electronic Materials and Oxide Interfaces Roadmap:** *J.PhysD. Appl.Phys.* 49 (2016) 433001. doi: 10.1088/0022-3727/49/43/433001.
6. **Awards and honours:** Alexander von Humboldt Fellow, Germany; JSPS fellow, Japan; DST Young Scientist project; Supervised the B.Tech. project that received INEA best project award (national); Guide to the research paper that received TVS best paper award; Hostel blues for excellence in academics and sports at IIT Kharagpur; 1st Place Mentor Award, University of Maryland, USA; Certificate of recognition for excellent achievements in Science education outreach in 2004-'05, University of Maryland (UMD)–MRSEC (Materials Research Science and Engineering Centre), UMCP, USA; Guided the best thesis in Physics department (2009); DAAD STAR Professor award fellowship, Germany (2010); MRSI Council member since 2015; Visiting Professor, IISER, Trivandrum (since 2015); BoG member; IISER, Trivandrum, Visiting Faculty at Shibaura Institute of Technology (SIT), Tokyo, since 2015. Visiting Faculty in the Erasmus Mundus Master's program at the University of Montpellier and TUM, Germany since 2018.

Cover pages of the published books:

