

Curriculum Vitae

Name : Dr. (Ms.) Tanuja Mohanty

Position : Assistant Professor, School of Physical Sciences (since April-2006)

Jawaharlal Nehru University (JNU), New Delhi-67, India

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Research Experience:

DST-Young Scientist: First Track - Inter University Accelerator Centre, New Delhi (**June 2004-2006**)

CSIR-Research Associate: Inter University Accelerator Centre, New Delhi (Nov. **2000- May2004**)

Project Scientist: Physics Department, I.I.T. Delhi (**1998-1999**)

Ph.D.(Physics): Utkal University, Orissa – **1999** (*Ph.D. work carried out at Nuclear Science Centre, New Delhi*),

M.Phil. (Physics): Utkal University, Orissa - **1993**

Current Research Area: *Experimental Condensed Matter Physics & Nanoscience*

Investigation of optoelectronic properties of graphene and graphene like layered transition metal dichalcogenides (TMDC) materials, nanoscale semiconductor and oxide material thin films, Photovoltaic and photocatalytic applications of graphene and metal oxide based nanocomposites, synthesis and application of metal nanocluster as chemical and bio sensor, study of defects in solid state materials, defect engineering in smart materials using ion beam.

Awards & Honours

DST-DAAD Research Project (personnel exchange programme)- 2011

DST Fast Track Young Scientist Project: 2004

CSIR Research Associate award: 2000

SBI award for State Topper (HSC exam, Board of Secondary Education), Odisha -1984

State Merit Scholarship from 1984-1991

International Collaboration/Consultancy

Physics Department, Duisburg University, Essen, Germany

Courses taught:

- Special topics in condensed matter Physics,
- Electronics
- Atoms and Molecules
- Experimental Techniques in Condensed Matter Physics
- M.Sc. Physics Lab courses

No. of students awarded Ph.D. degree: 03

No. of students pursuing Ph.D. degree: 05

Chapter in Books

Ion beam induced resizing of semiconducting oxide nanostructures, **T. Mohanty**, Chapter 19, in book titled “**Synthesis and Engineering of Nanostructures**” Nova Science Publishers, Inc. 2010, ISBN 978-1-61668-209-5

Publications in International (SCI) Journals

1. *A study on the interaction between Molebdenum disulfide and Rhodamine B by spectroscopic methods*, Jyoti Shakya, Harekrushna Sahoo and **Tanuja Mohanty**, **J. Mater. Sci.** 52 (2017) 3831-40
2. Investigating the energy transfer from Dye molecules to DNA stabilized Au nanoparticles, Arun Singh Patel, Harekrushna sahuo, **Tanuja Mohanty**, **J. of Fluorescence**, 26 (2016) 1849-55
3. *Composition dependent Fermi level shifting of Au decorated MoS₂ nanosheets*, Jyoti Shakya, Arun Singh Patel, Fouran Singh and **Tanuja Mohanty**, **Appl. Phys. Lett.** 108 (2016) 013103
4. *Structural and morphological study of magnetic Fe₃O₄/reduced graphene oxide nanocomposites*, A. Mishra and **T. Mohanty**, Materials Today Proceeding, 3 (2016) 1576
5. *Swift heavy ion induced optical and electronic modifications of Graphene-TiO₂ nanocomposites*, M. Mishra, F. Meinerzhagen, M. Schleberger, D. Kanjilal and **Tanuja Mohanty**, **J. Phys. Chem. C**, 119, (2015) 21270.
6. *Understanding the interactions involved in the formation of fluorescent silver nanoclusters*, Arun Singh Patel, Harekrushna Sahoo, and **Tanuja Mohanty**, **J. Nanosci. Nanotechnol.** 15 (2015) 1-6.

7. *Probing the Förster Resonance transfer between fluorescent copper nanocluster and Cobalt complex*, Arun Singh Patel, Harekrushna Sahoo and **Tanuja Mohanty**, **Appl. Phys. Lett.** **105** (2014) 063112
8. *Electrical and optical modification of graphene oxide by incorporation of silver nanoparticles*, Mukesh Mishra and **T. Mohanty**, **Adv. Sci. Lett.** **20** (2014) 1012
9. *Electro-optic modulation induced enhancement in photocatalytic activity of N-doped TiO₂ thin films*, Avesh Kumar and **T. Mohanty**, **J. Phys. Chem. C** **118** (2014) 7130
10. *Silver nanocluster in BSA template: a selective sensor for hydrogen peroxide*, Arun Singh Patel and **T. Mohanty**, **J. Mater. Sci.** **49** (2014) 2136
11. *Analysis of surface potential and photocatalytic activity of Au-graphene oxide nanocomposites*, Arun Singh Patel, Mukesh Mishra and **T. Mohanty**, **AIP Conf. Proceedings** **159** (2014) 442
12. *Photoreduction altered work function of Au-TiO₂ nanoparticles measured by scanning Kelvin probe microscopy*, Arun Singh Patel, Avesh Kumar and **T. Mohanty**, **J. Nanosci. Nanotech.** **13** (2013) 8217
13. *Evolution of damage fraction due to dense ionizing radiation on TiO₂ thin films*, Avesh Kumar, D. Kanjilal and **T. Mohanty**, **Appl. Surf. Sci.** **282** (2013) 595
14. *Role of Oxygen in the work function modification at various stages of chemically synthesized graphene*, Mukesh Mishra, Rakesh K Joshi, Sunil Ojha, D. Kanjilal and **T. Mohanty**, **J. Phys. Chem. C**, **117**(2013) 19746-19750
15. *Chemically synthesized Graphene for electrochemical Biosensing*, Mukesh Mishra, Subbiah Alwarappan, Rakesh K Joshi and **T. Mohanty**, **J. Nanosci. Nanotech.** **13** (2013) 4040-4044
16. *Swift heavy ion induced topography changes of Tin oxide thin films*, M. K. Jaiswal, Avesh Kumar, D. Kanjilal and **T. Mohanty**, **Appl. Surf. Sci.** **263** (2012) 586
17. *Correlation of photodegradation efficiency with surface potential of silver-TiO₂ Nanocomposite thin films*, Avesh Kumar, Arun S Patel and **T. Mohanty**, **J. Phys. Chem. C** **116** (2012) 20404
18. *Fermi level shifting of TiO₂ nanostructures during dense electronic excitation*, Avesh Kumar, M. K. Jaiswal, D. Kanjilal, R.K. Joshi and **T. Mohanty**, **Appl. Phys. Lett.** **99** (2011) 013109
19. *Mesoscopic inhomogeneity creation in YBa₂Cu₃O_{7-y} thin film by swift heavy ion irradiation at low temperature*, R. Biswal, J. John, P. Raychaudhuri, D. Behera, **T. Mohanty**, D.K. Avasthi, D. Kanjilal and N.C. Mishra, **Rad. Eff. & Def. Solids** **166** (2011)628
20. *Ion beam induced grain growth in tin oxide thin films*, **T. Mohanty**, S. Dhounsi, P. Kumar, A. Tripathi and D. Kanjilal, **Surf. Coat. Tech.** **15** (2009) 2410

21. *Formation of nanocrystalline TiO₂ by 100 MeV Au⁸⁺*, M. Thakur Desai, **T. Mohanty**, J. John, T K Gundu Rao, Pratap Raychaudhuri, D. Kanjilal and V. Bhattacharyya, **Appl. Surf. Sci.** **255** (2009) 8935-8940
22. *200 MeV Ag ion irradiation induced structural modification in YBa₂Cu₃O_{7-y} thin films at 89K; An insitu X-ray Diffraction study*, R. Biswal, J. John, P. Mallick, P K. Kulriya, D K Avasthi, D. Kanjilal, D. Behera, **T. Mohanty**, P. Raychaudhuri and N C Mishra, **J. Appl. Phys.** **106** (2009) 053912
23. *Synthesis of nanodimensional TiO₂ thin films*, M. Thakurdesai, **T. Mohanty**, John J, T.K. Gundu Rao, Pratap Raychaudhuri, V. Bhattacharya, D. Kanjilal, **J. of Nanoscience Nanotechnol** **8** (2008) 4231-4237
24. *Formation of controlled semiconductor nanostructures by dense electronic excitations*, Y. Batra, **T. Mohanty** and D. Kanjilal, **Nucl. Instrum. Meth. B** **266** (2008) 3107
25. *Point defect creation by low fluence swift heavy ion irradiation-induced low energy electrons in YBa₂Cu₃O_{7-y}*, R. Biswal, J. John, D. Behera, P. Mallick, Sandeep Kumar, D. Kanjilal, **T. Mohanty**, Pratap Raychaudhuri, N.C. Mishra, **Supercond. Sci. Technol.** **21**(2008) 085016
26. *Nanocrystalline SnO₂ formation using energetic ion beam*, **T. Mohanty**, Y. Batra, A. Tripathi and D. Kanjilal, **J. Nanosci. Nanotechnol** **7** (2007) 2036.
27. *Investigation of nanosize defects in InP induced by swift iron ions* R.L. Dubey, S.K. Dubey, A.D. Yadav, S.D. Pandey, T.K. Gundu Rao, **T. Mohanty** and D. Kanjilal, **Nucl. Instrum. Meth. B** **257** (2007) 287
28. *Investigation on the 100 MeV Au⁷⁺ ion irradiation of GaN*, V. Suresh Kumar, M. Senthil Kumar, J. Kumar, **T. Mohanty**, D. Kanjilal, A. Tripathi, F. Fontana and A. Kamarani, **Semicond. Sci. Technol.** **22**(2007) 571.
29. *Epitaxial recrystallization of amorphous Si layers by swift heavy ions* P.K. Sahoo, **T. Mohanty**, D. Kanjilal, A. Pradhan and V.N. Kulkarni, **Nucl. Instrum. Meth. B** **257** (2007) 244.
30. *Synthesis of nanocrystalline Tin Oxide thin film by swift heavy ion irradiation*, **T. Mohanty**, P V Satyam and D. Kanjilal, **J. of Nanosci. Nanotechnol.** **6**, (2006) 2554.
31. *Swift heavy ion irradiation induced modification of tris- (8- hydroxyquinoline) aluminum thin films*, K. Thangaraju, R. Kumaran, **T. Mohanty**, K. Asokan, P. Ramamurthy, D. Kanjilal and J. Kumar, **Rad. Eff. Def. Solids** **161** (2006) 695
32. *Studies of defects and annealing behavior of silicon irradiated with 70 MeV⁵⁶Fe ions*, S. K. Dubey, A.D. Yadav, B. K. Kamalapurkar, T.K. Gundu Rao, M.Gokhale, **T. Mohanty** and D. Kanjilal, **Nucl. Instrum. Meth. B** **244** (2006) 157

33. *Study of optical properties of swift heavy ion irradiated gallium Antimonide*, S.K. Dubey, R. L. Dubey, A.D. Yadav, T.K. Gundu Rao, **T. Mohanty** and D. Kanjilal, **Nucl. Instrum. Meth. B 244 (2006) 141.**
34. *Effect of swift heavy ions of silver and oxygen in GaN*, V. Suresh Kumar, P. Puviarasu, F. Singh, **T. Mohanty**, D. Kanjilal and J. Kumar, **Nucl. Instrum. Meth. B 244 (2006) 145**
35. *Luminescence from Si nanocrystal grown in fused silica using keV and MeV beam* **T. Mohanty**, Mishra N C, Pradhan Asima and Kanjilal D, **Surf. Coat. Technol. 196 (2005) 34.**
36. *Modifications in TL characteristics of $K_2Ca_2(SO_4)_3$: Eu by 7Li MeV ion beam*, P.D. Sahare, Numan Salah, S P Lochab, **T. Mohanty** and D. Kanjilal, **J. of Physics D: Appl. Phys. 38 (2005) 3995.**
37. *Nanoprecipitation in transparent matrices using an energetic ion beam* **T. Mohanty**, A. Pradhan, S. Gupta and D. Kanjilal, **Nanotechnology 15 (2004) 1620.**
38. *Dense Electronic Excitation induced defects in fused silica* **T. Mohanty**, N.C. Mishra, S.V. Bhat, P.K. Basu and D. Kanjilal, **J. of Physics D: Applied Physics 36 (2003) 3151.**
39. *Latent track creation in fused silica by 200 MeV Silver Beam*, **T. Mohanty**, P.V. Satyam P V, N.C. Mishra and D. Kanjilal, **Rad. Meas. 36 (2003) 137.**
40. *Color center formation in sapphire by swift heavy ion irradiation*, **T. Mohanty**, N.C. Mishra, F. Singh, S.V. Bhat and D. Kanjilal, **Rad. Meas. 36 (2003) 723.**
41. *Swift heavy ion irradiation induced modifications in Al_2O_3* , **T. Mohanty**, N.C. Mishra, F. Singh, U. Tiwari and D. Kanjilal, **Nucl. Instrum. and Meth. B 212 (2003) 179.**
42. *Effect of Secondary Electrons from latent tracks created in YBCO by swift heavy ion irradiation*, D. Behera, **T. Mohanty**, S. Dash, T. Banerjee, D. Kanjilal, N.C. Mishra, **Rad. Meas. 36 (2003) 125.**
43. *Investigation of 70 MeV iron irradiation induced defects in c-Silicon*, B. A. Kamalapurkar, S.K. Dubey, Yadav A D, K G Bhole, **T. Mohanty** and D. Kanjilal, **Nucl. Instrum. and Meth. B 2121 (2003) 525.**
44. *High Energy Ion implantation on silicon*, K G Bhole, A K Bhagyashree, S K Dubey, A.D. Yadav, **T. Mohanty** and D. Kanjilal, (2003), **Nucl. Instrum. and Meth. B 211 (2003) 383.**
45. *Granularity controlled irradiation response of cuprate superconductors*, N.C. Mishra, D. Behera, **T. Mohanty**, D. Mahanta, D. Kanjilal, G.K. Mehta and R. Pinto, **Nucl. Instrum. and Meth. B 156 (1999) 30.**

46. *Si-Ion irradiation induced T_c enhancement in YBCO thin films*, N.C. Mishra, D. Behera, **T. Mohanty**, K. Patnaik, L. Senapati, O.G. Singh, D. Kanjilal, G.K. Mehta and R. Pinto, *140 MeV*, **Mod. Phys. Lett. B**, **13** (1999) **79**.
47. *Defect dynamics in ion irradiated cuprate superconductors*, **T. Mohanty**, N.C. Mishra, K. Patnaik, L. Senapati, D. Kanjilal and G.K. Mehta, , **Vacuum** **48** (1997) **973**.
48. *250 MeV Ag ion irradiation induced defects in $YBa_2Cu_3O_{7-y}$ thick films*, **T. Mohanty**, N.C. Mishra, K. Patnaik, L. Senapati, D. Kanjilal and G.K. Mehta, **The Physics of Disordered Materials**, , Edited by M.P. Saxena and Deepika Bhandari, 1997 pp. 279-283, NISCOM, New Delhi
49. *Diffusion assisted defect annealing studies in high energy heavy ion irradiated cuprates*, **T. Mohanty**, N.C. Mishra, K. Patnaik, L. Senapati, D. Kanjilal and G.K. Mehta, **Mater. Sci. Forum**, **223-224** (1996) **187**.
50. *Heavy ion irradiation induced transient behaviour studies in cuprate superconductors*. **T. Mohanty**, A.K. Mohapatra, P.K. Samal, B.N. Dash, D. Behera, H.P. Mohapatra, S. Misra, N.C. Mishra, K. Patnaik, L. Senapati, D. Kanjilal and G.K. Mehta, **Ind. J. Phys.** **69A** (1995) **29**.
51. *Role of Alkaline Earth ions in charge transfer in cuprate superconductors*. P.K. Samal, H.P. Mohapatra, S. Misra, S. Mohapatra, G.S. Roy, **T. Mohanty**, D. Behera, N.C. Mishra and K. Patnaik, **Ind. J. of Phys.** **69 A** (1995) **45**.

Principal Investigator of Research Projects:

- 1. Co-P.I. in UPOE project-ID- 102: 2014-2019; Nanostructure function analysis of thin film by advanced TEM techniques for novel anti-biofilm materials.**
- 2. Study of electronic and optical properties of graphene/metal oxide nanocomposites thin films for its application as transparent conductors, -2011-2013, DST-DAAD project**
- 3. Ion Beam directed Self Organization of Metal Oxide nanowires array and their integration into Dye-Sensitized Solar Cells” 2008-2011, funded by DAE-BRNS, BARC, Mumbai**
- 4. Synthesis and characterization one dimensional (1D) tin oxide nanostructures and their modifications by Ion beam”2007-2010 Funded by Inter University Accelerator Centre, New Delhi, New Delhi**
- 5. “Growth of Si-nanoclusters in insulators by ion beam” Fast Track Project Funded by Department of Science and Technology 2004-2007**

As reviewer of International Reputed Journals : Nanotechnology, Langmuir, Phase Transition, Surface and coating Technology, Int. J. Nanotechnology, Rad. effects and Defects in solids

Member of the Editorial Review Board, Scientific Journal International (SJI)

Member of UFR project committee, IUAC, New Delhi

Papers presented in National and International Conferences

Invited lectures at

1. Electronic excitation induced spectroscopic & surface electronic behavior of layered Materials, **T. Mohanty**, Ion Beams in Materials Engineering and Characterization (**IBMEC**), Sept.28-1st Oct. **2016**, Inter University Accelerator Centre, New Delhi
2. Controlled modulation of surface-electronic properties of Graphene by ion implantation, **T. Mohanty**, 6th Global Experts meeting on Nanomaterials and Nanotechnology, **April 21-23, 2016, Dubai**,
3. Nitrogen ion implantation induced optical modification of graphene, **T. Mohanty**, Invited talk at National Workshop on Low Energy Ion Beam Facility at Inter University Accelerator Centre, New Delhi Nov. **3-4, 2015**.
4. Electronic Excitation induced changes in contact surface potential difference of Graphene-TiO₂ nanocomposites, **T. Mohanty**, International conference on swift Ions in Material Engineering and Characterization (**SHIMEC 2014**), Inter University Accelerator Centre, New Delhi, India-67, **Oct.14-17, 2014**.
5. Swift heavy ion induced damage fraction in oxide Nanomaterials, **T. Mohanty**, Invited Talk at International Conference on Nanostructuring by Ion Beams (**ICNIB 2013**), MNIT, Jaipur, India, Oct. 25-27, 2013
6. *Work Function and Photocatalytic Response of TiO₂ Nanostructures*, Avesh Kumar and **T. Mohanty**, **First National Conference on recent advances in polymer Nanocomposites (NCPN-1) on January 14-15, 2011, Zakir Husain College (University of Delhi) New Delhi, India.**

7. *Effect of metallic dopant concentration on electrical & optical properties of nanocrystalline TiO₂ thin film*, Avesh Kumar, Manoj K. Jaiswal and **T. Mohanty**, International Conference on Nano Science and Technology (**ICONSAT**) **2010**, IIT Bombay, India, **17th to 20th February 2010**
8. RBS analysis of metal oxide thin films synthesized by athermal annealing process, Manoj Jaiswal and **T. Mohanty**, International Conference on **Ion Beam Analysis (IBA-2009)**, **Cambridge University, U.K., 7-11 September, 2009**, Ion Beam Analysis, Cambridge University, Cambridge, UK, IBA, **2009**
9. **Mohanty T**, Presented the paper .Metal oxide nanocomposites for improved photocatalytic applications., national symposium on Nanoscience, Theory and Application, **SES, JNU, New Delhi, 6-7 November, 2009**
10. *Ion beam induced shaping and resizing of oxide nanostructure*, **T. Mohanty** DAE-BRNS sponsored seminar cum workshop on “Materials characterization and surface modification in research and industry using ion accelerators (MICA) to be held at **Institute of Physics, Bhubaneswar from 31st March to 4th April 2008**
11. *Modification of Oxide Nanostructures by Energetic ion Bombardment*, **Tanuja Mohanty**, **International Conference-cum-Workshop on Nanoscience and Nanotechnology, December 17-21, 2007 AIT, Gurgaon**
12. *250 keV Argon ion Beam induced grain growth of Tin oxide nanocrystalline thin films*, **T. Mohanty**, S. Dhounsi, P. Kumar and D. Kanjilal, **15th International Conf.on Surface of modification of Materials by Ion beam, 2007 (SMMIB) held at Mumbai University 30th Sept. to 5th Oct. 2007**
13. *Ion Implantation: A Technique for Nucleation and Growth of Monodisperse Nanoparticles*, T. Mohanty, **Workshop on Synthesis and Characterization of Advanced Functional Materials, IGCAR, Kalpakkam, 26th March to 28th March 2007**
14. *Ion Beam induced Nanocrystallization of Doped and undoped tin oxide Semiconductors*, *Advance Nanomaterials (ANM-2007) an International Conference* on Experimental Condensed Matter Physics, January 8-10, 2007, IIT, Mumbai
15. *Nanocrystalline SnO₂ phase formation by energetic ion beam* **International Conference on Nano Science and Technology (ICONSAT -2006), 16th-18th March 2006, New Delhi**
16. *Control of size distribution of SnO₂ nanophase thin films by 250 keV Xe ion beam*, , **Indo-German International Workshop, Feb. 2005 held at Nuclear Science Centre, New Delhi, India**

17. *Nanophase formation in transparent matrices*, **T. Mohanty**, D. Kanjial, presented in **DAE Solid State Symposium 2004, Amritsar, India**
18. *Optical Studies of Swift heavy Ion Induced Defects in fused silica*, **T. Mohanty**, F. Singh, R. Raman and D. Kanjilal, Presented in **National Laser Symposium held from 22nd -24th Dec. 2003, at I.I.T. Kharagpur, India**
19. *Ion Beam Synthesis of Silicon Nanostructures Embedded in Transparent Dielectrics*, **T. Mohanty**, R. Krishna, Asima Pradhan and D. Kanjilal, Presented in **International Conference on Nano Science and Technology (ICONSAT -2003) held from 17th - 20th December , SINP, Calcutta, India**
20. *Luminescence from Si-nanocrystals grown using keV and MeV beam*, **T. Mohanty** Oral presentation in **13th International Conference on Surface of modification of Materials by Ion beam, 2003 (SMMIB 03) held at San Antonio, Texas, U.S.A. from 21st -26th September 2003.**
21. *Luminescence in Sapphire induced by Swift heavy Ion irradiation*, **Proceedings of National Symposium on Luminescence and its Applications (NSLA) 2003, p 350-352.**
22. *Swift Heavy Ion Irradiation Induced Optical Changes in α -Al₂O₃* **20th International Conference on Atomic Collision on Solids (ICACS-20) held at Puri, India, 2003.**
23. *Latent track creation in fused silica by 200 MeV silver beam*, **21st International Conference on Nuclear tracks in Solids (ICNTS-21)**, held in Oct. 2002
24. *T. Mohanty, ESR Studies of 70 MeV Iron Irradiated Silicon*, **DAE Solid State Symposium 2002.**
25. *T. Mohanty, Swift Heavy Ion Induced Modification in Optical Properties of SiO₂*, **DAE Solid State Symposium 2002**
26. *Secondary electron emission induced point defects in SHI irradiation on YBCO thin films*, **Proceedings of DAE Solid State Symposium 44 (2001) 343**
27. *Swift heavy ion induced structural modification in GaAs*, **Proceedings of DAE Solid State Symposium 44 (2001) 521-522.**
28. *Nanophase Thin Film Deposition by Reactive RF Magnetron Sputtering*. **National Symposium on Vacuum Technology and Thin Films**, September, 2001.
29. *Ag induced Suppression of Irradiation Response in YBCO/Ag Composite Thin Films*. **DAE - SSPS 1998**
30. *140 MeV Si-ion irradiation effect in YBCO thin films*, **Proc. of International Symposium on advances in Superconductivity: New Materials' Critical Currents and Devices (1996) 235**
31. *Non-Equilibrium Ordering in O-ion irradiated Cuprates*, **DAE-Solid State Physics Symposium 1995.**