NAME: **Dr. TAPATI JANA**

Designation: Associate Professor

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Qualification: M.Sc, M.Tech, Ph.D

Official address: Department of Physics, Sarojini Naidu College for Women, 30, Jessore Road, Dumdum, Kolkata -700028

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Teaching Experience: Sept 2008 - till date

Administrative Experience: NIRF Coordinator: 2018 - 2024

IQAC Coordinator: January 2024- till date

Biography

Dr. Tapati Jana has been associated with the Department of Physics at Sarojini Naidu College for Women, Kolkata, as a faculty member since September 2008. She obtained her B.Sc. (Honours) in Physics in 1991, followed by an M.Sc. in Physics with a specialization in Nuclear Physics in 1993, both from Jadavpur University, Kolkata. In 1995, she completed her M.Tech in Material Science, specializing in Semiconductor Technology, at the Indian Institute of Technology, Kharagpur. She was awarded a Ph.D. in Science by Jadavpur University in August 2000.

Teaching Modules/Topics:

- Mechanics
- Optics
- Digital & Analog Systems and Applications
- Communication Electronics
- Particle Physics

Research Experience: 12 years

- March 1995 – April 1999 : SRF in IACS, Kolkata
- May 1999 – Dec 2003: Research Associate (CSIR)
- August 2000 – Nov 2000: Guest Scientist at **ISI-PV, KFA, Jülich, Germany**
- April2004- March 2006: **Research Assistant, University of Hawaii, USA**
- August 2006 – July 2008: Research Associate II, IACS,Kolkata

Area of Research:

- Semiconductor thin film
- Silicon Solar Cell

- Diamond Like carbon

Other Academic Interests:

Quantum dot solar cell, Carbon Nanotubes

Regular papers: 18

1. "Optoelectronic and Structural Properties of Plasma Deposited Nanocrystalline Hydrogenated Silicon Oxide Thin Films", **Tapati Jana** and Romyani Goswami, *NANO*: Vol. 16, No. 10 (2021) 2150115-1 to 11, https://doi.org/10.1142/S1793292021501150
2. "Kinetics of water desorption in select Marine Ferromanganese Crust materials by Stepped Isothermal Evolved Gas Analysis", **Tapati Jana,** Chemical Science Transactions, 9 (2020) 178-191, https://dx.doi.org/10.7598/cst2020.2020004
3. "Multiwalled Carbon Nanostructure with Antibacterial Activity by Spray Pyrolysis Technique", **Tapati Jana**, Uday Das and Swati Ray, International Journal of Biomedical Engineering Vol.1, no.1 (2016), https://dx.doi.org/10.37628/IJBE
4. "Kinetics of Water Desorption in Select Marine Ferromanganese Crust Materials", **Tapati Jana,** The Beats of Natural Sciences Vol. 1, Issue 1 (2014), ISSN 2348 – 7615
5. "Transparent polymer and diamond like hydrogenated amorphous carbon thin films by PECVD technique", Romyani Goswami, **Tapati Jana** and Swati Ray, J. Phys. D: Vol. 41, no. 15, (2008)155413. http://dx.doi.org/10.1088/0022-3727/41/15/155413.
6. "Studies on microstructure of silicon thin films and its effect on solar cells", by Swati Ray, Sumita Mukhopadhyay and **Tapati Jana**, Solar Energy Materials and Solar Cells 90 (2006) 631-639. https://doi.org/10.1016/j.solmat.2005.05.006.
7. "Development of low temperature silicon oxide thin films by photo-CVD for surface passivation", by Sumita Mukhopadhyay, **Tapati Jana** and Swati Ray, J. Vac. Sci. Technol. A 23(3) (2005) 417. https://doi.org/10.1116/1.1874174.
8. "Degradation Studies of Transparent Conducting Oxide: a Substrate for microcrystalline Silicon thin film solar cells", by Rajesh Das, **Tapati Jana** and Swati Ray, *Solar Energy Materials and Solar Cells*, **86** (2005) 207. https://doi.org/10.1016/j.solmat.2004.07.009.
9. "Optoelectronic and structural properties of undoped microcrystalline silicon thin films: dependence on substrate temperature in VHF-PECVD technique", by Chandan Das, **Tapati Jana** and Swati Ray, *Japanese Journal of Applied Physics*, ***43,*** No. 6A (2004) 3269. https://doi.org/10.1143/JJAP.43.3269.
10. "Transition from amorphous to microcrystalline Si:H: effects of substrate temperature and hydrogen dilution", S. Ray, S. Mukhopadhyay, **T. Jana** and R. Carius, *Journal of Non-Crystalline Solids,* ***299-302*** (2002) 761. https://doi.org/10.1016/S0022-3093(01)01122-X
11. "The changes in electric and optical properties of intrinsic microcrystalline silicon upon variation of the structural composition", O. Vetterl , A. Groß , **T. Jana**, S. Ray, A. Lambertz, R. Carius and F. Finger, *Journal of Non-Crystalline Solids*, ***299-302*** (2002) 772. https://doi.org/10.1016/S0022-3093(01)00981-4.

12. "Low Temperature Silicon Oxide and Nitride for Surface Passivation of Silicon Solar Cells", **Tapati Jana**, Sumita Mukhopadhyay and Swati Ray, *Solar Energy Materials and Solar Cells* **71 (2)** (2002) 197. https://doi.org/10.1016/S0927-0248(01)00058-7.
13. "Development of p-type microcrystalline silicon carbon alloy films by the very high frequency plasma-enhanced chemical vapor deposition technique" **Tapati Jana**, Arup Dasgupta and Swati Ray, *J. Mater. Res,* **16(7)** (2001) 2130. https://doi.org/10.1557/JMR.2001.0290.
14. "P-type Microcrystalline Silicon Films Prepared by VHF-PECVD Technique" **Tapati Jana**, Arup Dasgupta and Swati Ray, *Indian J. Phys. **75A (4)*** (2001) 409-412.
15. "Microcrystalline Silicon phase in Silicon Oxide thin films developed by photo-CVD technique", **Tapati Jana** and Swati Ray, *Thin Solids Films. **376*** (2000) 241. https://doi.org/10.1016/S0040-6090(00)01211-6.
16. "Boron Doped a-SiO_X:H films prepared by Photo-CVD technique"; **Tapati Jana** and Swati Ray, *Journal of Non-Crystalline Solids, **260,** No.3* (1999) 188. https://doi.org/10.1016/S0022-3093(99)00570-0.
17. "Silicon oxide thin films prepared by a photo-chemical vapour deposition technique"; **T. Jana**, S. Ghosh and S. Ray, *Journal of Materials Science **32*** (1997) 4895. https://doi.org/10.1023/A:1018616022092.
18. "Fabricatin of P+ implanted Shallow junctions with $TiSi_2$ in Si MOS structure" ; **T. Jana**, D. N. Bose and P. V. S. Subrahmanyam, *Indian Journal of Engineering and Materials Science, **3*** (1996) 148.

Conference papers: 25

1. "Development of low temperature surface passivation and antireflection coating for single and multicrystalline silicon solar cell", **Tapati Jana**, Kuntal Biswas, Romyani Goswamic and Swati Ray, *1st International e-Conference on Recent Advances in Physics & Materials Science-2020 (IC-RAPMS-2020), July 9 - 10, 2020.*
2. "Amorphous silicon oxide (a-SiOx:H): A promising material for a wide range of application in solar cell", **Tapati Jana**, Kuntal Biswas and Swati Ray, *Virtual International Conference on Recent Trends in Basic and Applied Sciences (VirtCon2020), 6^{th}-7^{th} July, 2020.*
3. "AN Investigation on Dispersion Characteristics of Inverted Microstrip Lines", Kuntal Biswas, Lakshman Dhal, **Tapati Jana** and Bidyut Haldar, *Virtual International Conference On Recent Trends in Basic and Applied Sciences (VirtCon2020), 6^{th}-7^{th} 6 th &7th July, 2020.*
4. "Semiconductor-graphene nanocomposites for optoelectronic application", **Tapati Jana**, *International Conference on Nano Science and Technology", 5^{th}-7^{th} March, 2020, Kolkata*
5. "Transition from amorphous to diamond like hydrogenated nano- carbon by Plasma Enhanced Chemical Vapour deposition technique (PECVD)" by **Tapati Jana**, Romyani Goswami and Swati Ray, *Proceedings of the National Conference on Recent Developments in Nanoscience & Nanotechnology (NCRDNN)2019, 29^{th}-31^{st} January 2019*
6. "Amorphous silicon oxide (a-SiOx:H) and silicon nitride (a-SiNx:H) films as surface passivation layer in silicon solar cell", **Tapati Jana,** *Proceedings of the State Level*

Seminar on Trends in Surface Science and Related Area (TSSRA-2018), 6th October, 2018.

7. "Ion damaged free amorphous silicon oxide (a-SiO_x:H) film as photogenerating as well as passivation layer in silicon solar cell", **Tapati Jana**, *Proceedings of the International Conference on Facets of Basic Sciences & applications (FBSA), February 5-7 , 2018.*
8. "Micromorph silicon solar cell by Very high frequency Plasma Enhanced Chemical Vapour deposition (VHF-PECVD) Technique", *Proceedings of the National Seminar on Modern Trends in Condensed Matter Physics (MTCMP)2016.*
9. "Multiwalled Carbon Nanostructure with Antibacterial Activity by Spray Pyrolysis Technique", Tapati Jana , *Proceedings of the National Seminar on Advanced Functional Materials Technology and Its Social Implications, at Haldia Institute of Technology, West Bengal, India, Jan 30-31, 2015,*
10. "Global Warming: Effects on Environment and Human Responsibilities", **Tapati Jana,** *Proceedings of the state level seminar Progress in Science vis-à-vis Environment, January 2013.*
11. "Synthesis of Carbon Nanotubes using Cu-Ag Catalyst by Spray Pyrolysis Technique", *Uday Das, Tapati Jana, Arup Chatterjee and Swati Ray*, Proceedings of the National Review and Coordination Meeting on Nanoscience and nanotechnology, *Organized by* International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI), Hyderabad, India, Feb 21-23, 2007.
12. "Performance dependence of silicon thin film solar cell on microstructure of the materials"; Swati Ray, Sumita Mukhopadhyay and Tapati Jana, *Proceedings of the 14th International Photovoltaic Science and Engineering Conference, Bangkok, Thailand, January 26-30, 2004.*
13. Properties of microcrystalline silicon films deposited at high growth rate at different plasma excitation frequencies", by Swati Ray, Sumita Mukhopadhyay, Chandan Das and Tapati Jana, *Proceedings of the '3rd World Conference on Solar Energy Conversion', held at Osaka, Japan during 11th-16th May 2003.*
14. "Effect of TCO coated substrate and p-layer on performance of microcrystalline silicon solar cells", Swati Ray, Tapati Jana, Chandan Das and Rajesh Das, *Proceedings of the '3rd World Conference on Solar Energy Conversion', held at Osaka, Japan during 11th-16th May 2003.*
15. "Fabrication of Microcrystalline Silicon Solar Cells using VHF PECVD Technique", Swati Ray, Tapati Jana and Chandan Das, *Proceedings of the International Conference on New Millenium-Alternative Energy Solutions for Sustainable Development, on 19th – 21st January, 2003, at PSG College of Technology, Coimbatore, India.*
16. "Transition from amorphous to microcrystalline Si:H : effects of substrate temperature and hydrogen dilution" by S. Ray, S. Mukhopadhyay, T Jana and R. Carius, *Proceedings of the International conference on Amorphous and Crystalline semiconductor held at Nice, France during 27th – 31st August (2001)*
17. "Changes in electrical and optical properties of intrinsic microcrystalline silicon upon variation of the structural composition" by O. Vetterl, A, Groβ, T. Jana, S. Ray, A. Lambertz, R Carius and F. Finger, *Proceedings of the 19th International conference on Amorphous and Microcrystalline semiconductors held in Nice, France during 27th – 31st August (2001).*

18. "Amorphous and Microcrystalline Silicon Oxide Films Developed by Photo-CVD", Swati Ray, Sumita Mukhopadhyay and **Tapati Jana**, Proceedings of the *National Symposium on Photochemical Processes on Solid Surfaces, Banaras Hindu University, India, 8th-10th March (2000) 46.*
19. "p-type microcrystalline silicon-carbon alloy films by VHF PECVD technique" ; **Tapati Jana**, Arup Dasgupta and Swati Ray, *Proceedings of the Symposium on Condensed Matter Physics, Calcutta, India, 4-6 Dec* (1999) 95.
20. "Low temperature Silicon Nitride for surface passivation by PECVD technique"; **Tapati Jana** and Swati Ray, *Proceedings of the Tenth International Workshop on the "Physics of Semiconductor Devices", Delhi, 14-18 Dec* (1999) 845.
21. "A wide optical gap amorphous silicon material for application in multijunction thin film solar cells" ; Arup Dasgupta, Nandita Palit, **Tapati Jana** and Swati Ray, Proceedings of the *5th IUMRS International Conference in Asia, Bangalore, India, Oct,* (1998) Abstract p.231.
22. "Amorphous silicon oxide with microcrystalline silicon phase by mercury sensitized photo CVD technique"; **Tapati Jana** and Swati Ray, Proceedings of the *5th IUMRS International Conference in Asia, Bangalore, India, Oct.* (1998) Abstract p.192.
23. "Microcrystalline Silicon-Carbon alloy Thin Films prepared by VHF-PECVD Technique" ; **Tapati Jana**, Arup Dasgupta and Swati Ray, *Proceedings of the DAE Solid State Physics Symposium, **Vol 40c*** (1997) 182.
24. "Boron doped a-SiO_x:H films developed by Photo-CVD technique"; **Tapati Jana** and Swati Ray, *Proceedings of the DAE Solid State Physics Symposium, **Vol 39c*** (1996) 214.
25. "Development of wide gap a-SiO_x:H film by PHOTO-CVD method"; **Tapati Jana**, Sukriti Ghosh and Swati Ray, *Proceedings of the DAE Solid State Physics Symposium, Vol 38c* (1995) 189**.**

Chapters in Book: 04

1. "Highly conducting semi-transparent amorphous silicon oxide (a-SiOx:H) thin films: For a wide range of applications in solar cells", **Tapati Jana** and Kuntal Biswas, *Basic and Applied Sciences into Next Frontiers: The Aspects of Bio & Physical Sciences***,** New Delhi Publishers, New Delhi, India, 2021: Page 27-44, ISBN: 978-81-948993-0-3.

2. "An Analysis on Inverted Microstrip Lines", Kuntal Biswas and **Tapati Jana**, *Emerging Trends and New Horizons in Applied Sciences: Few Selected Topics on Bio & Physical Sciences,* New Delhi Publishers, New Delhi, India, 2021,: Page 15-22, ISBN: 978-81-940943-5-7.

3. "An Introduction to Python: The Most Efficient Language for Scientific Computation for Physics in Recent Times", Kuntal Biswas and **Tapati Jana**, Futuristic Information & Communication Technologies, 2021, Page:73- 98, ISBN: 978-93-88879-92-7.

4. "Improvement of performance of single and multicrystalline silicon solar cell using low temperature surface passivation layer and antireflection coating", **Tapati Jana** and Romyani Goswami**,** *Advanced Materials and nano Systems: Theory and Experiment (Part 2),* Bentham

Science Publishers Pte. Ltd. Singapore, 2022, Page: 63-76, ISBN (Online): 978-981-5049-96-1. ISBN (Print): 978-981-5049-97-8.