

Dr Jaydeep Vinayakrao Sali

Professor
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Education Qualification

S.No.	Degree	University	Year	Subjects	Percentage	Class
1.	B.Sc.	University of Pune	1991	Electronics	78.17	Distinction
2.	M. Sc.	University of Pune	1993	Physics	73.85	Distinction
3.	Ph.D.*	University of Pune	2000	Physics		

*Ph.D. thesis title:

Study of Structural, optical and electrical properties of a-Si:H, a-SiGe:H and $\mu\text{-Si:H}$ films deposited using PCVD and HWCVD

Awards/Fellowships/prizes received:

Senior Research Fellowship (CSIR) 1997

Details of employment (past & present):

Institution	Position held	Period
S.R.T.M. University, Nanded	Lecturer	06-08-1999 to 21-05-2003
University of Pune, Pune	Lecturer	22-05-2003 to 30-05-2005
North Maharashtra University, Jalgaon	Reader	31-05-2005 to 30-05-2008
North Maharashtra University, Jalgaon	Associate Professor	31-05-2008 to 30-05-2011
North Maharashtra University, Jalgaon	Professor	31-05-2011 onward

TRAININGS:

Obtained Training in

- *“Operation and Maintenance of Stand-alone Solar Photovoltaic System”* and
- *“Solar Photovoltaic System Design and Engineering”* at Indian Institute of Technology, Chennai.

Hobbies: Listening Music, Painting, reading and Photography

RESEARCH:

Worked in the field of Materials for solar photovoltaic applications.

- *Synthesis of α -Si:H, μ c-Si:H, α -SiGe:H by PCVD,*
- *Thin films growth by HWCVD and*
- *Organic Solar Cells and Perovskite Solar Cells*

Current Research Activities:

Broad Area: Solar Photovoltaic: Materials and Technology

Research interest:

Development of Science and technology for preparation of Organic Solar Cells and Perovskite Solar Cells by Ultrasonic Spray method

Modeling and simulation of various physical processes related to synthesis of Organic Solar Cells by different deposition methods.

**Research Laboratory:
Organic Photovoltaic Laboratory**



PhD students:

	Student	My Role
1	Ms. Mrunal Mahajan	Guide
2	Mr. Deepak Marathe	Guide
3	Mr. Hemant Tarkas	Guide
4	Ms .Yogita Choudhary	Guide
5	Mr. Mahendra Patil	Guide
6	Ms. P. R. Nikam	Co-Guide
7	Mr . M. Faizal	Co-Guide



Ms Mrunal S Mahajan



Ms Pratibha Nikam



Mr Hemant S Tarkas



Mr Deepak Marathe



Mr Faisal AlMuntaser



Mr Mahendra Patil



Ms Yogita Choudhary

PhD thesis completed:

Studies on structural, optical and electrical properties of hydrogenated nanocrystalline silicon (nc-Si:H) thin films grown by Hot-Wire-CVD for photovoltaic applications

By Nabeel Ali Bakr (2010)

Guide: S.R. Jadkar

Co-Guide: Jaydeep V. Sali

Chemical synthesis of extremely thin film consisting of nanoparticles onto TiO₂ and their light sensitization for solar cell applications
By Deepak Salunkhe (2013)

Guide: B.R. Sankpal
Co-Guide: Jaydeep V. Sali

On morphology control in bulk-heterojunction for polymer based solar cells
By Sanjay S. Ghosh (2013)

Guide: S.R. Jadkar
Co-Guide: Jaydeep V. Sali

Synthesis of Organic Thin Films by Dual Feed Ultrasonic Spray Method and Study of Their Nanomorphology for Application in Low Cost Organic Solar cells
By Ganesh Lonkar (2014)

Guide: Jaydeep V. Sali

M. Phil. thesis completed:

Effect of intermittent spray pyrolysis on optical and structural properties of SnO₂
By Mr Deore Nitin N. (2008)

Guide: Jaydeep V. Sali

Research Project completed

Sr. No.	Name of PI / Co-PI	Title of the Project	Funding Agency	Period	Total Funding (Rs.)
1	PI: Dr. Jaydeep V. Sali, Co-PI: Dr S.S. Ghosh	Design and development of three wheeler efficient bullock cart.	RGSTC, Mumbai.	2008-2011	5 18 650/-
2	PI: Dr Sanjay S. Ghosh Co-PI: Dr J V Sali	Synthesis of low cost and environmental friendly organic/inorganic hybrid solar cells and their study.	UGC	2009-2011	1 50 000/-
3	PI: Dr. J.V. Sali, Co-PI: Dr Suneet Rane (C-MET, Pune)	Fabrication of fully Ultrasonic-spray coated Polymer (P3HT) : Fullerene (PCBM) Bulk Heterojunction Organic Solar Cells	UGC	2010-2013	7 30 800/-
4	PI: Dr. B R Sankapal and Co-PI:Dr J V Sali	Chemical Synthesis of Quantum Dots and their sensitization for the applications in Solar Cells	DAE-BRNS	2010-2013	1945400/-

Ongoing Research Project:

Sr. No.	Name of PI / Co-PI	Title of the Project	Funding Agency	Period	Total Funding (Rs.)
1	PI: Dr. Jaydeep V. Sali, Co-PI: Dr S.S. Ghosh	Investigating Dual Liquid Feed Ultrasonic Spray Method as a mean to control bulk-heterojunction morphology in ternary polymer (P3HT): polymer (PBDTTT-E) : Fullerene(PC ₇₀ BM/ICBA)* bulk heterojunction Organic Solar Cells and evaluation of their performance with efficiency target of better than 5%.	SERB-DST	2014-2017	51,50,000/-

Ongoing Research Project in the Laboratory

Sr. No.	Name of PI / Co-PI	Title of the Project	Funding Agency	Period	Total Funding (Rs.)
2	PI: Ms Gauri Bisen Mentor: J V Sali	Fabrication of highly efficient low cost inverted polymer (PTB7): modified fullerene (PC ₇₁ BM) solar cells by ultrasonic spray method with special emphasis on understanding phase separation mechanism in spray deposited films	Women Scientist Scheme A (WOS-A)	2015-2018	15,95,000

Research Publications:

- Changes in in-plane electrical conductivity of PEDOT: PSS thin films due to electric field induced dipolar reorientation
MS Mahajan, DM Marathe, SS Ghosh, V Ganesan, JV Sali
RSC Advances 5 (2015) (105), 86393-86401
- Poly 3-Hexylthiophene: Single Wall Carbon Nanotube Active Layer by Dual Feed Ultrasonic Spray Method for Solar Cell Application
Deepak M Marathe, Hemant S Tarkas, Mrunal S Mahajan, Sanjay S Ghosh, Rajendra S Khadayate, Jaydeep V Sali
Journal of Nanoelectronics and Optoelectronics, 11 (1) 12-17
- SILAR coated Bi₂S₃ nanoparticles on vertically aligned ZnO nanorods: Synthesis and characterizations
Pratibha R.Nikam, Prashant K.Baviskar, JaydeepV.Sali, KishorV.Gurav, JinH.Kim, Babasahe R.Sankapal
Ceramics International 41 (2015) 10394–10399
- Formation of P3KHT:PCBM bulkheterojunction using orthogonal solvents by ultrasonic spray method
Mrunal S Mahajan, Ganesh S Lonkar, Sanjay S Ghosh, Mahendra B Patil, Dipak S Dalal and Jaydeep V Sali
J. Phys. D: Appl. Phys. 48 (2015) 265105 (10pp)
- Improvement in Out-of-plane Conductivity of PEDOT: PSS Thin Films due to Electric Field Treatment at Elevated Temperature
Mrunal S. Mahajan, Sanjay S. Ghosh, and Jaydeep V. Sali

American Journal of Material Science & Technology (2015) Vol. 4 No. 1 pp. 47-57

6. Room temperature linker free growth of CdSe quantum dots on mesoporous TiO₂: solar cell application
Dipak B. Salunkhe, Deepak P. Dubal, Jaydeep V. Sali, Babasaheb R. Sankapal
Ceramics International Volume 41, Issue 3, Part A, April 2015, Pages 3940–3946
7. Linker free synthesis of TiO₂/Bi₂S₃ heterostructure towards solar cell application: Facile chemical routes
D.B. Salunkhe, D.P.Dubal, J.V.Sali, B.R.Sankapal
Materials Science in Semiconductor Processing 30 (2015) 335–342
8. P3HT:PCBM/TiO_x Interface Modification through Annealing for Improvement in Organic Solar Cell Performance
Sanjay S. Ghosh, Ganesh S. Lonakar, Mrunal S. Mahajan, Sandesh R. Jadkar, Jaydeep V. Sali
American Journal of Materials Science and Technology (2013) 1: 88-95
9. Poly (3-hexylthiophene):TiO₂ Bulk-heterojunction Hybrid Solar Cells
Sanjay S. Ghosh, Mrunal S. Mahajan , Ganesh S. Lonkar , Jaydeep V. Sali , Sandesh R. Jadkar
Research and Application of Material (2013) 44-48
10. Why specific mixed solvent composition leads to appropriate film formation of composite during spin coating?
S.S. Ghosh, A.P.. Zerwal, G.G. Bisen, G.S. Lonkar, J.V. Sali, V.S. Waman, S.R. Jadkar
APPLIED PHYSICS LETTERS 102, 051918 (2013)
11. Bulk-heterojunction morphology control during spin coating: Modelling diffusion assisted phase separation
S. S. Ghosh, G. S. Lonkar, M. S. Mahajan, S. R. Jadkar, V. S. Waman, M. M., V. Ganesan, and J. V. Sali
APPLIED PHYSICS LETTERS 101, 173305 (2012)
12. Effect of Thermal Annealing on P3HT: PCBM Blend Films
SS Ghosh, GS Lonakar, MS Mahajan, JV Sali, SR Jadkar
Invertis Journal of Renewable Energy 3 (4), 183-185
13. Modeling thin film formation by Ultrasonic Spray method: A case of PEDOT:PSS thin films
Ganesh S. Lonakar, Mrunal S. Mahajan, Sanjay S. Ghosh, Jaydeep V. Sali
Organic Electronics 13 (2012) 2575–2581
14. Synthesis and Characterization of Nanocrystalline TiO₂ by Sol-Gel Combustion Method
Sanjay S. Ghosh, Bharat V. Dhaduk, Mangesh V. Patil, Sandesh R. Jadker and JaydeepV. Sali
Invertis Journal of Renewable Energy, 1(3) (2011)138

15. Acetone vapor sensing properties of screen printed WO₃ thick films
R.S. Khadayate, J.V. Sali and P.P. Patil
Talanta, 72(3), (2007) 1077-1081
16. Influence of Liquid Petroleum Gas on the Electrical Parameters of the WO₃ Thick Film
R. S. Khadayate, J. V. Sali, P. P. Patil
Sensors & Transducers, 76(2) 2007 1001-1007
17. Deposition of hydrogenated amorphous silicon (a-Si:H) films by hot-wire chemical vapor deposition (HW-CVD) method: Role of substrate temperature
S. R. Jadkar, J. V. Sali, A. M. Funde, P. B. Vidyasagar R. R. Hawaldar and D. P. Amalnerkar
Solar Energy Materials and Solar Cells 91 714-720 (2007)
18. Preparation and Characterization of WO₃-Based Liquid Petroleum Gas Sensor
R. S. Khadayate , J. V. Sali, S. B. Rane & P. P. Patil
Materials and Manufacturing Processes, 22:2, 277-280
19. Ethanol vapor sensing properties of screen printed WO₃ thick films
R S Khadayate, R B Waghulde, M G Wankhede, J V Sali and P P Patil
Bulletin of Materials Science, 30(No. 2) 2007 129-134
20. Influence of process pressure on HW-CVD deposited a-Si:H films
S. R. Jadkar, J. V. Sali, S. T. Kshirsagar and M. G. Takwale
Solar energy Materials and Solar Cells 85 (2005) 301-312
21. Deposition of hydrogenated amorphous silicon (a-Si:H) films by hot wire chemical vapor deposition: role of filament temperature
S. R. Jadkar, J. V. Sali, S. T. Kshirsagar and M. G. Takwale
Thin Solid films, 437 (2003) 18-24
22. Synthesis of a-Si:H/ μ c-Si:H multilayer structures by HW-CVD technique: Study of optoelectronic and photovoltaic properties
S. R. Jadkar, Jaydeep V. Sali and M. G. Takwale
Solar Energy Materials and Solar Cells, 71, 543-551 (2002)
23. Influence of silane flow on structural, optical and electrical properties of a-Si:H thin films deposited by HW-CVD technique
S. R. Jadkar, Jaydeep V. Sali, D. V. Musale, S. T. Kshirsagar and M. G. Takwale
Solar Energy Materials and Solar Cells, 71, 153-167, (2002)
24. Narrow band gap, high photosensitivity a-SiGe:H films prepared by HW-CVD method
S. R. Jadkar, J. V. Sali, S. T. Kshirsagar and M. G. Takwale
Materials Letters, 52, 399-403 (2002)
25. The effect of substrate temperature on HW-CVD deposited a-SiGe:H films
S. R. Jadkar, Jaydeep V. Sali, S. T. Kshirsagar and M. G. Takwale
Journal of Non-Crystalline Solids, 299, 168-173 (2002)
26. The role of hydrogen dilution of silane and phosphorus doping on μ c-Si:H films prepared by HW-CVD technique

- S. R. Jadkar, J. V. Sali, M. G. Takwale, D. V. Musale and S. T. Kshirsagar
Thin Solid Films, 395, 206-212 (2001)
27. Hot-wire CVD growth simulation for thickness uniformity
Jaydeep V. Sali, S. R. Jadkar, S. B. Patil and M. G. Takwale
Thin Solid Films, 395, 66-70 (2001)
28. Synthesis of highly conductive boron-doped p-type $\mu\text{c-Si:H}$ by HWCVD technique
S. R. Jadkar, Jaydeep V. Sali, M. G. Takwale, D. V. Musale and S. T. Kshirsagar
Solar Energy Materials and Solar Cells, 64, 333-346 (2000)
29. The effect of substrate temperature on P-CVD deposited a-SiGe : H films
Rashad, A., Sali, J.V., Marathe, B.R., Takwale, M.G., Shaligram, A.D.
Solar Energy Materials and Solar Cells 57 (3), pp. 209-216, (1999)
30. Interelectrode separation effects on a-SiGe:H films prepared by plasma chemical vapor deposition
Sali, J.V., Rashad, A., Marathe, B.R., Takwale, M.G., Gangurde, K.D., Shaligram, A.D.
Thin Solid Films 322 (1-2), pp. 1-5 (1998)
31. Preparation of highly conductive p-type $\mu\text{c-Si:H}$ window layer using lower concentration of hydrogen in the rf glow discharge plasma
Sali, J.V., Panaskar, V.D., Takwale, M.G., Marathe, B.R., Bhide, V.G.
Solar Energy Materials and Solar Cells 45 (4), pp. 413-421(1997)

Citation indices	All	Since 2010
Citations	268	170
h-index	9	7
i10-index	9	5

Patents applied

- [1] An Improved Animal Cart
[Application Number: 1673/MUM/2011]
• Inventors:
Jaydeep V. Sali, Sanjay S. Ghosh, Digwijay P. Wagh
- [2] SYNTHESIS OF INORGANIC/ORGANIC NANOSTRUCTURE BY SOLUTION SPRAY SYSTEM (SSS)
[Application Number:3225/MUM/2014]
• Inventors:
Jaydeep V. Sali, Hemant S. Tarkas

Scientific Instruments/facility available:

Sr. No.	Generic Name of Equipment	Model, Make
1	Ultrasonic Spray System	Nozzle: Nozzle # 120-2-16-09-000-030 THD with broad band generator, Sonotek, 2009
2	Two Valveless fluid pumps	FMI, RHV00SKY 2011
3	Photoluminescence Spectrophotometer	Fluoromax-4C, Horiba
4	Glove-Box	Vacuum Technologies Inc.
5	Vacuum Coating Unit	Hind High Vacuum Ltd Bangalore
6	Digital single pan balance	Shimadzu
7	16 Channel Datalogger/ Pyranometer	Dynalab, Pune.
8	Double Distillation Plant	BOROSIL
9	Ultrasonic Cleaner	Duex, Mumbai
10	Solar Simulator	Sciencetech Inc.

**Solar Simulator****Ultrasonic spray system with pumps**

Development of an improved bullock-cart:

An improved animal-cart has been developed under a research project funded by Rajiv Gandhi Science and Technology Commission, Mumbai. The cart has been tested in the field and under modification stage based on the results of testing and suggestions of the users during field testing. An instruction manual for fabrication of the cart has also been written.



AN IMPROVED ANIMAL-CART DESIGN MANUAL

Prepared by

Dr Jaydeep V. Sali
and
Mr Sanjay S. Ghosh

Department of Physics
North Maharashtra University
Jalgaon





1. Polymer-SnS nanoparticle composite solar cells
2. Polymer-CNT composite Solar Cells
3. Ternary Organic Solar Cell
4. Development of protocol for large area thin film coating by Ultrasonic spray method
5. Perovskite Solar Cells by Ultrasonic Spray Method