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- **No. of Ph. D. Student: Awarded-** 07
  **Submitted-** 03
  **Working-** 03
- **Research Projects:**

| Project Title | Investigators | Funding Agency | Duration | Amount ₹ in lakhs |
|---|---|---|---|---|
| Development of Super-hydrophobic Aerogels and coatings based on organosilane compound | Dr. A.V. Rao (PI)<br>Dr. R. S. Vhatkar (Co-P.I.) | DAE-BRNS | 2007-2010 | 1.5 |
| Development of Large Size Hydrophobic Monolithic Aerogels Using Two-Stage Sol-Gel Process | Dr. A.V. Rao (PI)<br>Dr. R. S. Vhatkar (Co-P.I.) | BRNS-DAE | 2009-2013 | 82.68 |
| Studies on applicability of NavIC/lRNSS signals to explore Ionospheric irregularities and effects on radio signals near the EIA crest of the Indian sector | Dr. R. S. Vhatkar (Co-P.I.) | DST-SERB | 2019-2022 | 22.48 |

**List of Publications:**

1. Thermodynamics Green synthesized carbon aerogel for electric double layer capacitor, A V Patil, S A Sawant, R G Sonkwade, R S Vhatkar, Journal of Energy Storage, Volume 72, Part D, 30 November 2023, 108533-10846.

2. Thermodynamics of Azo Dye Adsorption on a Newly Synthesized Titania-Doped Silica Aerogel by Cogelation: A Comparative Investigation with Silica Aerogels and Activated Charcoal, PD Sarvalkar, AS Vadanagekar, OS Karvekar, PD Kumbhar, SS Terdale, ACS omega 8 (14), 13285-13299.

3. Advances in chemical and biomass-derived graphene/graphene-like nanomaterials for supercapacitors, SA Sawant, AV Patil, MR Waikar, AS Rasal, SD Dhas, AV Moholkar, Journal of Energy Storage 51, 104445.

4. A review on multifunctional nanotechnological aspects in modern textile, PD Sarvalkar, SD Barawkar, OS Karvekar, PD Patil, SR Prasad, The Journal of The Textile Institute 114 (3), 470-487

5. Phonon Spectrum of Distorted Graphene with Stone-Wales Dislocations at Tersoff and Airebo Potential, PP Jadhav, RS Vhatkar

6. Spotless days and geomagnetic index as the predictors of solar cycle 25, DS Burud, R Jain, AK Awasthi, S Chaudhari, SC Tripathy, N Gopalswamy, Research in Astronomy and Astrophysics 21 (9), 215

7. Determination of the diffusion coefficient of urea solution using double exposure digital holographic interferometry (DEDHI) to study plant growth, PP Chikode, SR Sabale, RS Vhatkar, VJ Fulari, Optics and Spectroscopy, 1-6

8. Deformation studies of cylindrical nanostructured silica aerogels by using phase shifting digital holographic interferometry, PP Chikode, RJ Kamble, SS Mahajan, SR Sabale, SD Patil, RS Vhatkar, Materials Today: Proceedings 46, 2298-2306

9. Preparation of Superhydrophobic Coating Using Silica–PMMA Nanocomposite, Sonali B. Jadhavar, Rajaram S. Sutar, Sanjay S. Latthe, and R. S. Vhatkar, Macromol. Symp. 2020.

10. Investigations of defects in ceramic tiles using Double Exposure Digital Holographic Interferometry (DEDHI) technique, Prashant P. Chikode, Rajiv S. Vhatkar, Sandip D. Patil, Vijay J. Fulari, Optik - International Journal for Light and Electron Optics, 2020.

11. Effect of temperature on thermal conductivity of silicon germanium square nanowire using nonequilibrium molecular dynamics simulation, PP Jadhav, TD Dongale, RS Vhatkar - AIP Conference Proceedings, 2019

12. Potential of IRNSS/NavIC L5 signals for ionospheric studies, AK Sharma, OB Gurav, A Bose, HP Gaikwad, Advances in Space Research, 2019

13. Spray pyrolytic deposition of α-MoO 3 film and its use in dye-sensitized solar cell, PS Tamboli, CV Jagtap, VS Kadam, RV Ingle, Applied Physics A, 2018

14. α-$MoO_3$-C composite as counter electrode for quantum dot sensitized solar cells, PS Tamboli, MBR Prasad, VS Kadam, RS Vhatkar, Solar Energy Materials and Solar

Cells, 2017.

15. $TiO_2$ based nanostructured memristor for RRAM and neuromorphic applications: a simulation approach, TD Dongale, PJ Patil, NK Desai, PP Chougule, Nano Convergence, 2016.

16. Determination of Young's modulus of silica aerogels using holographic Interferometry, PP Chikode, SR Sabale, RS Vhatkar, AIP Conference Proceedings 1728, 020685 (2016).

17. Silica based superhydrophobic coating for long-term industrial and domestic applications, SA Mahadik, F Pedraza, RS Vhatkar, Journal of Alloys and Compounds 663, 487-493,2016.

18. TiO2 based Nanostructured Memristor for RRAM and Neuromorphic Applications: A Simulation Approach, TD Dongale, PJ Patil, NK Desai, PP Chougule, SM Kumbhar, arXiv preprint arXiv:1601.06503,2016.

19. Superhydrophobic coatings prepared from methyl-modified silica particles using simple dip-coating method, AB Gurav, Q Xu, SS Latthe, RS Vhatkar, S Liu, H Yoon, SS Yoon, Ceramics International 41 (2), 3017-3023,2015.

20. Occurrence of equatorial plasma bubbles over Kolhapur, A. K. Sharma, D. P. Nade, S. S. Nikte, P. T. Patil, R. N. Ghodpage, R.S. Vhatkar, Advances in Space Research 54 (3), 435-442,2014.

21. Superhydrophobic surface decorated with vertical ZnO nanorods modified by stearic acid, A.B. Gurav, S. S. Latthe, R. S. Vhatkar, J. G. Lee, D. Y. Kim, J. J. Park, S. S. Yoon, Ceramics International 40 (5), 7151-7160,2014

22. Development of fast image analysis technique for All-Sky images, AK Sharma, DP Nade, SS Nikte, RN Ghodpage, PT Patil, MV Rokade, ...2014

23. Sol-gel-processed porous water-repellent silica micro bowls, AB Gurav, SS Latthe, RS Vhatkar, Surface Innovations 1 (3), 157-161,2013

24. Superhydrophobic silica coating by dip coating method, SA Mahadik, RS Vhatkara, DB Mahadik, MS Kavale, PB Wagh, S Gupta, Applied Surface Science 277, 67-72,2013

25. Effect of aluminum and copper acetylacetonate on physicochemical properties of tetraethoxysilane based silica aerogels, VG Parale, DB Mahadik, MS Kavale, AV Rao, RA Patil, YR Ma, S Mullens, ...Journal of Porous Materials 20 (3), 563-570,2013

26. Enrichment in hydrophobicity and scratch resistant properties of silica films on glass by grafted microporosity of the network, MS Kavale, SA Mahadik, DB Mahadik, VG Parale, AV Rao, RS Vhatkar, ...Journal of sol-gel science and technology 64 (1), 9-16,2012.