

Name	Dr. Sunit Barasu Rane 
Designation	Scientist 'E'
Educational qualification	M.Sc. Ph.D. (Physics)
Research area	Electronic Materials (Thick/Thin Film technology, LTCC, Solar Cells, Nanomaterials & devices (energy & other applications), Flexible devices, RF/Microwave materials and components, Sensors), Additive Manufacturing Technology (materials and 3D printing etc.
Recognized Awards/Honors/Fellow	<ul style="list-style-type: none"> • BOYSCAST Fellowship, Govt. of India at University of Modena, Italy (2003-2004) • Emerald Literati Network- Awards for Excellence 2008 and 2010 • Fellow of Maharashtra Academy of Sciences (FMASc) (2016) • Executive Council Member, Maharashtra Academy of Sciences (Since Sept. 2019) • Secretary, Materials Research Society of India, Pune Chapter (Since Feb. 2020) • Worked/Working as Member, Board of Studies, Physics, North Maharashtra University, Jalgaon, Instrumentation Science, S.P. Pune University, Pune, Energy Studies, S.P. Pune University, Pune, Physics, A.H. Solapur University, Solapur • Worked as Associate Editor, Chemical Sensors Journal, Simplex Academic Publishers, Editorial board member of International Journal of Sensors and Sensor Networks, Advances in Materials, International Journal of Materials Science and Applications
Projects	<p>Ongoing:</p> <ol style="list-style-type: none"> 1. Development of screen printable silver thick film ink for Radio Frequency identification (RFID) Tags on environment friendly, flexible substrate for smart sensor applications (PN/SP/073) MeitY, New Delhi, Outlay- Rs. 108.85 Lakhs, Duration- Nov. 2018-Nov.2021, 2. Studies on effect of annealing on magnetic performance of

	<p>NiFe laminations for Pulsed magnets used in Accelerators (PN/SP/081) Sponsored by BRNS, Outlay Rs. 34 Lakh Duration- Jan. 2020-Jan. 2022.</p> <p>Completed:</p> <ol style="list-style-type: none"> 1. Development of nanostructured MnO₂ and Mn₃O₄ (PN/SP/066), Sponsored by MOIL, Nagpur, Outlay- Rs. 24.76 Lakhs, Duration- Feb. 2018-Jan.2020. 2. Development of microcrystalline silver powder for photovoltaic cells and EMI shielding applications, (PN/TS/015) Sponsored by- Modison Metals Ltd. Mumbai, Outlay Rs. 26.77 Lakh, Duration- Jan. 2017-June.2018. 3. Synthesis of Transition Metal Doped Hollow Glass Microspheres for Hydrogen Storage Applications, (PN/CC/P05), Sponsored by MeitY, New Delhi, Outlay- Rs. 53.00 Lakhs, Duration- April 2014-Mar.2017. 4. In-house development of photo-conducting paste (using semiconductor nanostructures) for exploration in photopatternable thick film technology for advanced optoelectronic applications (PN/SP/043), Sponsored by MeitY, Outlay- Rs. 90.00 Lakh, Duration-March 2012-Feb. 2016 5. Development of “Green” Low Temperature Fireable Thick Film Piezo-resistive composite pastes for Strain Gauge Applications (PN/SP/035), Sponsored by DRDO, New Delhi, Outlay-Rs. 48.35 Lakhs, Duration- Dec.2010-Sept. 2014. 6. Hybrid Solar Cells based on Organic Polymers and Inorganic Nano particles (PN/SP/034), Sponsored by MeitY, New Delhi, Outlay-Rs. 100 Lakhs, Duration-May 2010-May 2013. 7. Development of leadfree thick film thermal sensors using RuO₂ based nanosized complex materials (PN/SP/020), Sponsored by-MeitY, New Delhi, Outlay-22.40 Lakhs, Duration- May 2006-April 2010
<p>Publications/Patents (Past 5 years)</p>	<p>Publications:</p> <ol style="list-style-type: none"> 1. Facile synthesis of hollow urchin-like Nb₂O₅ nanostructures and their performance in dye sensitized solar cells, Neeta Mohite, Manish Shinde, Arun Kumar Gupta, Yogesh Waghadkar, Suresh W. Gosavi, K. C. Mohite, Ratna Chauhan and Sunit Rane, J. Solid State Electrochemistry, 24, 2 (2020) 273-281. 2. Gas Sensing Properties of Thick Films Prepared Using Pt Loaded TiO₂ Nano Particles, Sapana S. Rane, Sudhir Arbuji, Neha Joshi, Rahul Ghuge, Sunit B. Rane, and Suresh W. Gosavi, Sensors Letters 17, 4 (2019) 269-276. 3. Two-dimensional hexagonal SnS₂ nanostructures for

photocatalytic hydrogen generation and dye degradation, Shubhangi R. Damkale, Sudhir S. Arbuj, Govind G. Umarji, Rajendra P. Panmand, Supriya K. Khore, Ravindra S. Sonawane, **Sunit B. Rane** and Bharat B. Kale, Sustainable Energy & Fuels 3 (12), (2019) 3406-3414.

4. Effect of nanosecond and femtosecond pulse laser on the formation of WS₂ nanostructures and field emission characteristics, Pankaj Koinkar, Kohei Sasaki, Akihiro Furube, Kei-Ichiro Murai, Toshihiro Moriga, Manish Shinde, **Sunit Rane**, Somnath Bhopale and Mahendra A. More, Modern Physics Letters B Vol. 33, No. 14n15, 1940014 (2019).
5. Solvothermally Synthesized Nickel Doped Tin Dioxide based Thick Films for H₂ and NH₃ Gas Sensing, Sapana S. Rane, Manish D. Shinde, Sudhir S. Arbuj, Neha Joshi, **Sunit B. Rane**, Suresh W. Gosavi Materials Today Proceedings, 23, (2020) 154-164.
6. Sol-Gel Assisted Isotropic Morphological Progression in Nanostructured MoO₃ and Allied Investigations on Photocatalytic Dye-Degradation, N Qureshi, M Shinde, S Arbuj, **S Rane**, A Bhalerao, H U Kim, T Kim, D Amalnerkar, Journal of Nanoscience and Nanotechnology, 19 (6), 2019, 3479-3486.
7. Effect of firing temperature on microstructure and dielectric properties of chromium oxide-based glass composite thick films on stainless steel substrate, Ghanasham D. Shirke, Govind, G. Umarji, Arjun R. Tarale, Vikas L. Mathe, Uttam P. Mulik, **Sunit B. Rane**, Journal of Materials Science: Materials in Electronics, 29, 12, (2018), 9871-9878.
8. Highly efficient dye-sensitized solar cells by TiCl₄ surface modification of ZnO nano-flower thin film, Yogesh Waghadkar, Manish Shinde, **Sunit Rane**, Suresh Gosavi, Chiaki Terashima, Akira Fujishima, Ratna Chauhan, Journal of Solid State Electrochemistry, 22, 11 (2018)3621-3630.
9. 1, 1'-Bis (diphenylphosphino) ferrocene-appended nickel (II) dithiolates as sensitizers in dye-sensitized solar cells, Amita Singh, Pooja Singh, Gabriele Kociok-Köhne, Manoj Trivedi, Abhinav Kumar, Ratna Chauhan, **Sunit B. Rane**, Chiaki Terashima, Suresh W. Gosavi and Akira Fujishima, New Journal of Chemistry, 42 (2018) 9306.
10. Hydrothermally Synthesized Zinc Sulphide Microspheres for Solar Light-Driven Photocatalytic Properties, Yogesh Waghadkar, Sudhir Arbuj, Manish Shinde, Reshma Ballal, **Sunit B. Rane**, Suresh W. Gosavi, H. Fouad and Ratna Chauhan, Journal of Electronic Materials 2018, 47, 2687-269
11. Template-free hydrothermal synthesis of beaded nanochain bundles of ZnO and their application as photoanode in dye-

sensitized solar cells, Reshma Ballal, Manish Shinde, Yogesh Waghadkar, Sudhir Arbuj, **Sunit Rane**, Ratna Chauhan, Applied Physics A, 124, 2, (February 2018) 203.

12. Optical fiber based humidity sensor using Ag decorated ZnO nanorods, Shweta Jagtap, Sapana Rane, Sudhir Arbuj, **Sunit Rane***, Suresh Gosavi, Microelectronic Engineering 187–188 (2018) 1–5.
13. Morphological evolution of nanorod like to submicron brick like cobalt oxide structures under microwave solvothermal regime, Manish Shinde, Nilam Qureshi, **Sunit Rane**, Chisung Ahn, Taesung Kim and Dinesh Amalnekar, Science of Advanced Materials 10, 1 (2018)144-148.
14. Porous N-doped Zinc Oxide Nanostructure by novel paper mediated template method and its photocatalytic study for dye degradation under natural sunlight, Gajanan Baburao Kale, Sudhir S Arbuj, Ujjwala V. Kawade, **S B Rane**, Jalindar D. Ambekar and Bharat B Kale, RSC Mater. Chem. Front., 2 (2018) 163-170.
15. Growth study of hierarchical $\text{Ag}_3\text{PO}_4/\text{LaCO}_3\text{OH}$ heterostructures and their efficient photocatalytic activity for RhB degradation V. G. Deonikar, S. S. Patil, M. S. Tamboli, J. D. Ambekar, M. V. Kulkarni, R. P. Panmand, G. G. Umarji, M. D. Shinde, **S. B. Rane**, N. R. Munirathnam, D. R. Patil and B. B. Kale, Phys. Chem. Chem. Phys, 19, 2017, 20541.
16. Swift tuning from spherical molybdenum microspheres to hierarchical molybdenum disulfide nanostructures by switching from solvothermal to hydrothermal synthesis route, Nilam Qureshi, Sudhir Arbuj, Manish Shinde, **Sunit Rane**, Milind Kulkarni, Dinesh Amalnerkar and Haiwon Lee, Nano Convergence 4 (2017) 25.
17. ZnSe/ZnO Nano-Heterostructures for Enhanced Solar Light Hydrogen Generation, Asiya F. Shaikh, Sudhir S. Arbuj, Mohaseen S. Tamboli, Sonali D. Naik, **Sunit B. Rane**, and Bharat B. Kale, Chemistry Select, 2 (2017) 9174 – 9180.
18. Perforated ZnO nanoflakes via hydrothermal routes for dye sensitized solar cells (DSSC) applications. Neeta Mohite, Manish Shinde, Reshma Ballal, **Sunit Rane**, K. C. Mohite and Ratna Chauhan, Energy and Environment Focus 6, 2, December 2017, pp. 132-138.
19. Exploration of Nb₂O₅ nanorods via hydrothermal routes for dye sensitized solar cells (DSSC) applications, Neeta Mohite, Reshma Ballal, Manish Shinde, **Sunit Rane**, K. C. Mohite and Ratna Chauhan, Energy and Environment Focus, 6, 2, December, 2017, 179–183.
20. Time-varied synthesis of hierarchical ZnO microspheres and

their applications in dye-sensitized solar cells, Yogesh Waghadkar, Manish Shinde, Reshma Ballal, **Sunit Rane**, Suresh Gosavi, Ratna Chauhan, *J Solid State Electrochem.* 21, 6 (2017) 1797–1804.

21. Hydrogen, ethanol and ammonia gas sensing properties of nano-structured titanium dioxide thick films, Sapana S. Rane, Deepak A. Kajale, Sudhir S. Arbuji, **Sunit B. Rane**, Suresh W. Gosavi, *J. Materials Science: Materials in Electronics*, 28 (2017) 9011-9016.
22. 1,2-Bis(diphenylphosphino)ethane nickel (II) O, O'-dialkyldithiophosphates as potential precursors for nickel Sulfides, Reena Yadav, Ashish Kumar Singh, Yogesh Waghadkar, Gabriele Kociok-Köhn, Abhinav Kumar, Ratna Chauhan, Sunit Rane and Suresh Gosavi, *New Journal of Chemistry*, 41 (2017) 1327-1333.
23. CO₂ laser direct written MOF-based metal-decorated and hetero-atom doped porous graphene for flexible micro-supercapacitor with extremely high cycling stability, Aniruddha Basu, Kingshuk Roy, Neha Sharma, Sunit Rane, Chandrashekhar Rode, Satishchandra Ogale, *ACS Applied Materials & Interfaces*, 8,46 (2016), 31841-31848.
24. Synthesis of SnO/SnO₂ Nanocomposites and study of Its Photocatalytic Activity, Animesh Roy, Sudhir Arbuji, Yogesh Waghadkar, Govind Umarji, **Sunit Rane**, Kashinath Patil, Suresh Gosavi and Ratna Chauhan, *J. Solid State Electrochemistry*, 21, 1 (2017) 9-17.
25. Synthesis, Characterization and Fabrication of NTC Thick Film Thermistor Using Lead Free Glass Frit, Shweta Jagtap, **Sunit Rane**, Suresh Gosavi, *J. Mat. Science and Engineering A & B*, 6, 6 (2016)301-309.
26. Instantaneous Synthesis of faceted nanostructures of iron oxide using microwave solvothermal assisted combustion technique, Manish Shinde, Nilam Qureshi, **Sunit Rane**, Jang Ah Kim, Taesung Kim and Dinesh Amalnekar, *Journal of Nanoscience and Nanotechnology* 17, (2017) 5024–5030.
27. Transition metal ferrocenyl dithiocarbamates functionalized dyesensitized solar cells with hydroxy as an anchoring group, Reena Yadav, Yogesh Waghadkar, Gabriele Kociok-Kohn, Abhinav Kumar, **Sunit B. Rane**, Ratna Chauhan, *Optical Materials* 62 (2016) 176-183.
28. Ferrocenyl Chalcones with Phenolic and Pyridyl Anchors as Potential Sensitizers in Dye Sensitized Solar Cells, Ratna Chauhan, Reena Yadav, Ashish Kumar Singh, Manoj, Trivedi, Gabriele Kociok-Köhn, Abhinav Kumar, Suresh Gosavi and **Sunit Rane**, *RSC Adv.*, 6, (2016) 97664-97675.
29. Bipyramidal and rod like ZnO nanoarchitectures synthesized

	<p>by precipitation route at different pH for dye sensitized solar cells, Navya V. Tellabati, Yogesh B. Waghadkar, Manish D. Shinde, Sunit B. Rane, Suresh W. Gosavi and Ratna Chauhan, Journal of Nanoeng. Nanomanuf., 6, 2 (2016) 114-120.</p> <p>30. Nano-Scale Mo-MoO₃ entrapped in engineering thermoplastic: Inorganic pathway to bactericidal and fungicidal action, Nilam Qureshi, Ravindra D. Chaudhari, Pramod C. Mane, Manish Shinde, Sandesh Jadakar, Sunit Rane, Bharat Kale, Anand Bhalerao, Dinesh Amalnerkar, IEEE Transactions on NanoBioscience, 15,3 (2016) 258-264.</p> <p>Patents:</p> <ol style="list-style-type: none"> 1. Negative Temperature Coefficient Thermistor Composition and A Process for Preparing the Same, Shweta Jagtap, Sunit Rane, Suresh Gosavi, Application No. Temp/E-1/44834/2016-DEL dated 30.12.2016 2. Piezoresistor Composition and A Process for Preparing the Same, Sunit Rane, Pradnya Pujari, Govind Umarji, Application No. Temp/E-1/44884/2016-DEL dated 30.12.2016
Google scholar link	<p>https://scholar.google.com/citations?hl=en-US&user=eHpQwP4AAAAJ</p>