CURRICULUM VITAE

Dr. Sambhaji Shivaji Kumbhar

(*M.Sc., Ph.D.*)

Assistant Professor,
Department of Physics, Karmaveer Bhaurao Patil College, Uran Islampur-415409, India.

Contact: +91 7767095004

Email: sambhajikumbhar2897@gmail.com

Google Scholar: https://scholar.google.com/citations?user=ZVVCRTcAAAAJ&hl=en

Education and Experience

June 2025-Present	Assistant Professor	Department of Physics, Karmaveer Bhaurao Patil College, Uran Islampur, India
April 2025-June 2025	Assistant Professor	Sanjeevan Group of Institutions, Panhala, India
2020-2025	Ph.D. (Physics)	Centre for Interdisciplinary Research, D. Y. Patil Education Society, Kolhapur, India.
2018-2020	M.Sc. (Physics)	Department of Physics, Smt. Kasturbai Walchand College, Sangli, India.
2016-2018	B.Sc. (Physics)	K. N. Bhise Arts and Commerce College, Kurduwadi, India.

Ph.D. Thesis Title

Synthesis of Cobalt Vanadium Oxide/Reduced Graphene Oxide Composite Electrode for Supercapacitor Application

Under the supervision of Dr. Umakant M. Patil, Associate Professor, Center for Interdisciplinary Research, D. Y. Patil Education Society (Deemed to be University), Kolhapur-416006, India.

Master's Dissertation Title

Room Temperature Processed Copper Tin Sulfide (CTS) Thin Film by Successive Ionic Layer Adsorption and Reaction Method

Under the supervision of Dr. M. M. Tonape, Smt. Kasturbai Walchand College, Sangli-416416, India.

Research Awards

2021-2023 Junior Research Fellow (JRF) (MAHAJYOTI, Government of Maharashtra, India).

2023-2024 Senior Research Fellow (SRF) (MAHAJYOTI, Government of Maharashtra, India).

Publications

Book Chapter (01)

- **S. S. Kumbhar**, S. J. Marje, V. V. Patil, S. B. Bhosale, S. S. Pujari, J. L. Gunjakar, C. D. Lokhande, U. M. Patil, 1D, 2D, and 3D Structured Metal Chalcogenides for Supercapacitor Application. In: Ezema, F.I., Lokhande, C. D., Lokhande, A.C. (eds) Chemically Deposited Metal Chalcogenide-based Carbon Composites for Versatile Applications. Springer, (2023) 53-82, https://doi.org/10.1007/978-3-031-23401-9_2.

Patents (Granted 06, Published 01)

1) Chemical method for growing a cobalt vanadium oxide thin film on solid substrate, Dr. U. M. Patil, **Mr. S. S. Kumbhar**, Ms. S. B. Bhosale, Mr. V. V. Patil, Prof. C. D. Lokhande, Dr. P. R. Deshmukh, (Indian Patent No: 459219) (**Granted**).

2) Cobalt vanadium oxide, preparation method for the same, and supercapacitor comprising the same, Dr. U. M. Patil, **Mr. S. S. Kumbhar**, Ms. S. B. Bhosale, Mr. V. V. Patil, Prof. C. D. Lokhande, Dr. R. R. Salunkhe, (Indian Patent No: 529322) (**Granted**).

3) Nickel cobalt phosphate thin-film electrodes: chemical method for preparation of the same, application for supercapacitor and electrocatalysis using the same, Dr. U. M. Patil, Mr. V. V. Patil, **Mr. S. S. Kumbhar**, Ms. S. B. Bhosale, Prof. C. D. Lokhande, (Indian Patent No: 432303) (**Granted**).

4) A chemical synthesis process of manganese ferrite thin films on conducting substrates for energy storage, Dr. V. S. Jamadade, Mr. R. P. Bhosale, Mr. S. B. Ubale, **Mr. S. S. Kumbhar**, Prof. C. D. Lokhande, (Indian Patent No: 415578) (**Granted**).

5) A method of preparation of lanthanum strontium tungsten oxide composite electrode for supercapacitor application, Prof. A. P. Torane, Mr. A. Mr. R. P. Bhosale, Dr. S. B. Ubale, **Mr. S. S. Kumbhar**, Prof. C. D. Lokhande, Prof. B. T. Jadhav, (Indian Patent No: 471088) (**Granted**).

6) Nickel vanadate thin film on conducting substrate, preparation method for the same and supercapacitor comprising the same, Dr. J. L.Gunjakar, Ms. S. B. Bhosale, Dr. U. M. Patil, **Mr. S. S. Kumbhar**, Mr. V. V. Patil, Prof. C. D. Lokhande, (Indian Patent No: 567378) (**Granted**).

7) Chemical synthesis of manganese ferrite/reduced graphene oxide composite thin film electrodes for energy storage application, Dr. V. S. Jamadade, Mr. R. P. Bhosale, **Mr. S. S. Kumbhar**, Mr. S. P. Pardhi, Dr. P. N. Chavan, Prof. C. D. Lokhande, (Application No: 202421060274) (**Published**).

Articles in International Journals (Published 19, Submitted 01)

1) **S. S. Kumbhar**, S. B. Bhosale, S. S. Pujari, V. V. Patil, N. Kumar, R. R. Salunkhe, C. D. Lokhande, U. M. Patil*, Growth dynamics-dependent chemical approach to accomplish nanostructured cobalt vanadium oxide thin film electrodes with controlled surface area for high-performance solid-state hybrid supercapacitor devices, **Energy Technology**, 11 (2023) 2300400 (**I.F- 3.6**).

2) **S. S. Kumbhar**, S. B. Bhosale, S. S. Patil, A. Ransing, V. G. Parale, C. D. Lokhande, H. Park*, U. M. Patil*, Chemical Synthesis of Binder-Free Nanosheets Like Cobalt Vanadium Oxide Thin Film Electrodes for Hybrid Supercapacitor Devices, **Sustainable Energy & Fuels**, 8 (2024) 5467-5483 (**I.F.-4.1**).

3) **S. S. Kumbhar**, S. B. Bhosale, R. P. Bhosale, S. S. Patil, A. Ransing, H. Choi, V. G. Parale, C. D. Lokhande, V. S. Jamadade, H. Park, U. M. Patil, Yoking Compositional Synergy Among 2-D Nanohybrids of Cobalt Vanadium Oxide Nanoplates and Reduced Graphene Oxide Nanosheets Based Cathode Material for Hybrid Supercapacitors, **Journal of Energy Storage**, (**I.F.- 9.8**) (Submitted).

4) S. B. Bhosale, **S. S. Kumbhar**, S. S. Patil, A. Ransing, V. G. Parale, C. D. Lokhande, J. L. Gunjakar, H. Park, U. M. Patil*, Harnessing morphological alteration from microflowers to nanoparticles and cations synergy (Co:Ni) in binder-free cobalt nickel vanadate thin film cathodes synthesized via SILAR method for hybrid supercapacitor devices, **Journal of Colloid and Interface Science**, 666 (2024) 101-117 (**I.F- 9.7**).

5) S. A. Khalate, S. A. Kadam, Y. R. Ma, **S. S. Kumbhar**, S. B. Bhosale, V. V. Patil, V. G. Parale, S. B. Kulkarni, C. D. Lokhande, H. Park, U. M. Patil*, Impact of Co:Fe cations composition in amorphous and mesoporous cobalt iron phosphate electrocatalysts synthesized by SILAR method on durable electrochemical water splitting, **International Journal of Hydrogen Energy**, 61 (2024) 162-172 (**I.F- 8.3**).

6) R. P. Bhosale, **S. S. Kumbhar**, P. P. Bagwade, C. D. Lokhande, V. S. Jamdade*, Chemical synthesis of manganese ferrite thin films for energy storage application, **Journal of Materials Science: Materials in Electronics**, 35 (2024) 5, (**I.F- 2.8**).

7) R. P Bhosale, **S. S. Kumbhar**, S. B. Bhosale, R. R. Salunkhe, V. A. Kadam, S. P. Pardhi, S. S. Gholap, C. D. Lokhande, V. S. Jamadade*, Morphology modulation of $MnFe_2O_4$ thin film electrode for enhanced performance of hybrid supercapacitor, **Journal of Energy Storage**, 86 (2024) 111146 (**I.F- 9.8**).

8) S. B. Bhosale, **S. S. Kumbhar**, S. S. Pujari, V. V. Patil, N. Kumar, R. R. Salunkhe, C. D. Lokhande, J. L. Gunjakar, U. M. Patil*, Development of binder-free, amorphous nickel vanadate cathodes by SILAR method for hybrid supercapacitors: Exploiting surface area by monitoring growth rate, **Journal of Energy Storage**, 72 (2023) 108417-108432 (**I.F- 9.8**).

9) V. V. Patil, S. S. Pujari, S. B. Bhosale, **S. S. Kumbhar**, V. G. Parale, C. D. Lokhande, J. L. Gunjakar, M. G. Mali, D. S. Mhamane, H. Park, U. M. Patil*, SILAR synthesized binder-free, hydrous cobalt phosphate thin film electrocatalysts for OER application: annealing effect on the electrocatalytic activity, **International Journal of Energy Research**, 2023 (2023) 1-17 (**I.F- 4.2**).

10) G. Kadam, S. Patil, B. Patil, S. Kumbhar, **S. Kumbhar**, S. Madake, L. Kadam, Y. Ma, S. Kadam, R. Nimat*, Dielectric behavior and phase transition of $La_2Mo_2O_9$ thin films synthesized by spray pyrolysis technique, **Journal of Materials Science: Materials in Electronics**, 34 (2023) 387 (**I.F-2.8**).

11) S. S. Pujari, S. A. Kadam, Y. R. Ma, S. B. Jadhav, **S. S. Kumbhar**, S. B. Bhosale, J. L. Gunjakar, C. D. Lokhande, U. M. Patil*, Hydrothermally synthesized nickel copper phosphate thin film cathodes for high-performance hybrid supercapacitor devices, **Journal of Energy Storage**, 52 (2022) 105037 (**I.F- 9.8**).

12) S. S. Pujari, S. A. Kadam, Y. R. Ma, S. B. Jadhav, **S. S. Kumbhar**, S. B. Bhosale, V. V. Patil, J. L. Gunjakar, C. D. Lokhande, U. M. Patil*, A binder-free facile synthetic approach for amorphous, hydrous nickel copper phosphate thin film electrode preparation and its application as a highly stable cathode for hybrid asymmetric supercapacitors, **Sustainable Energy & Fuels**, 6 (2022), 5608 (**I.F- 4.1**).

13) V. V. Patil, S. S. Pujari, S. B. Bhosale, **S. S. Kumbhar**, V. G. Parale, J. L. Gunjakar, H. Park, C. D. Lokhande, M. G. Mali, D, S. Mhamane, U. M. Patil*, Hydrous and amorphous cobalt phosphate thin-film electrodes synthesized by the SILAR method for high-performing flexible hybrid energy storage devices, **ACS Energy & Fuels**, 36 (2022) 12791 (**I.F- 5.3**).

14) A. A. Admuthe, **S. S. Kumbhar**, S. K. Chougule, G. N. Padasare, M. M. Tonape*, Synthesis and Characterization of MnS Thin Film at Room Temperature for Supercapacitor Application, **Macromolecular Symposia**, 392 (2020) 2000186 (**I.F- 1.04**).

15) K. G. Belekar, S. S. Patil, S. B. Bhosale, **S. S. Kumbhar**, G. D. Jadhav, V. G. Parale, C. D. Lokhande, H. H. Park, P. K. Katkar*, U. M. Patil*, Amorphous, Binder-free Cobalt Manganese Phosphate Cathodes Prepared by SILAR Method for Asymmetric Supercapacitors: Harnessing Cationic Synergy, **Synthetic Metals**, 311 (2025) 117800. (**I.F.-4.6**).

16) S. B. Bhosale, **S. S. Kumbhar**, S. S. Patil, K. G. Belekar, C. D. Lokhande, A. M. Patil, U. M. Patil*, Chemical Bath Synthesis of Binder-Free Nickel Vanadate Cathodes for Hybrid Supercapacitor Systems: Tailoring Morphology and Surface Area via Monitoring Hydrolyzing Agent, **Advanced Sustainable Systems**, 9 (2025) 2400657 (**I.F.-6.1**).

17) K. Belekar, S. Patil, **S. Kumbhar**, S. Bhosale, C. Lokhande, U. Patil*, SILAR Synthesis of Binder-Free, Nanosheets-like Manganese Phosphate Electrodes for Mg-Ion Supercapacitors, **Solid State Communications**, 401 (2025) 115916 (**I.F.-2.4**).

18) R. P. Bhosale, **S. S. Kumbhar**, S. B. Bhosale, A. M. Patil, S. C. Jun, D. S. Gaikwad, C. D. Lokhande*, V. S. Jamadade*, 3D Controlled Growth of Binder-Free Manganese Ferrite Electrodes for High-Performance Hybrid Supercapacitor Device, **Advanced Sustainable Systems**, 9 (2025) 2400657 (**I.F.-6.1**).

19) S. S. Patil, S. B. Bhosale, **S. S. Kumbhar**, G. D. Jadhav, K. G. Belekar, A. Ransing, V. G. Parale, H. Park, C. D. Lokhande, U. M. Patil*, Rational engineering of isostructural 1D cobalt hydroxide decorated 2D cobalt phosphate cathodes aided with isotype (p-p) junctions for hybrid supercapacitors, **Journal of Power Sources**, 649 (2025) 237461 (**I.F.-7.9**).

20) S. S. Patil, **S. S. Kumbhar**, S. B. Bhosale, G. D. Jadhav, R. N. Bulakhe, V. C. Lokhande, A. Vinu, C. D. Lokhande, U. M. Patil, Chemical Engineering of Nickel Cobalt Hydroxide Anchored Nickel Cobalt Phosphate Cathodes in 1D@2D Nano-Micro Architecture: Enhancing Hybrid Supercapacitor Performance via Mott-Schottky Junctions and Morphological Synergy, **Chemical Engineering Journal**, 519 (2025) 164812 (**I.F.- 13.2**).

Presented/Attended, International/ National Conference, Workshop and Seminar

1) Attended workshop "Royal Society of Chemistry Yusuf Hamied Inspirational Science Programme under the Rural Science Education Training Utility Programme (RuSETUP) A Flagship Programme of INYAS" held at D. Y. Patil Education Society, Kolhapur (India), from 20th-21st September 2024.

2) **Poster presentation** at the "Third International Conference on Advances in Materials Science (ICAMS-2018)" held at Raje Ramrao Mahavidyalaya, Jath (India), from 27th to 29th December 2018. (**Best Poster Presentation Award**)

3) **Poster presentation** at the "International Conference on Nanotechnology Addressing the Convergence of Materials Science, Biotechnology, and Medical Science (IC-NACMBM-2024)" held at D. Y. Patil Education Society, Kolhapur, from 12th -14th February 2024.

4) **Poster presentation** at the National Conference on "Recent Trends in Functional Materials and Their Applications (RTFMA-2024) held at Shardabai Pawar Mahila Arts,

Commerce & Science College Shardanagar, Malegoan, Baramati, from 13th to 14th March 2024.

5) **Poster presentation** at the International Conference on "Advanced Materials Synthesis, Characterisation and Application-2023 (AMSCA-2023)" held at Savitribai Phule Pune University, Pune, from 21st to 24th November 2023.

6) Attended DST-STUTI funded one-week training programme on "Hands-on Training on Sophisticated Instruments for Materials Science" organized by Bundelkhand University, Jhansi, from 14th to 20th September 2022.

7) Attended workshop & hands-on training on XRD organized by SAIF-CFC under the STRIDE programme at the Shivaji University, Kolhapur, held from 11th to 12th November 2021.

8) Attended a national seminar on "Emerging Nano Materials for Renewable Energy" organized by Sanjay Ghodawat University, Kolhapur, held on 26th December 2022.

Area of Specialization/Research Interest

- Material Science
- Supercapacitor
- 1D/2D/3D Materials
- Water Splitting
- Anticorrosion

Instruments Operator / Expert Skill

Capable of handling X-Ray Diffractometer (Rigaku Miniflex 500), Fourier Transformation Infrared Spectroscope (FT-IR, Bruker), UV-Visible spectrophotometer (Cary-60 spectrophotometer, Electrochemical Workstation (Zive MP1 and VERSASTAT4).

Personal Skill Profile

Expertise

Synthesis of Materials

- Synthesis of transition metal oxides, hydroxides, and carbon-based materials (GO and rGO).
- Synthesis of composite materials.
- Synthesis of doping materials.
- Synthesis of porous materials.
- Energy conversion & storage device fabrication.

Synthesis Methods

- Hydrothermal, Chemical Bath Deposition (CBD), Successive Ionic Layer Adsorption and Reaction (SILAR), Electrodeposition, Dip Coating, Reflux, Co-precipitation.

Softwares

- X'Pert Highscore Plus, ZView-Impedance, XPS Peak 41, Image J, Gatan, Origin, CrysTbox, GSAS.

Research Collaborations (Internationals)

- **Dr. Vinayak G. Parale,** International Institute for Sustainability with Knotted Chiral Meta Matter, Hiroshima University, 1-3-1 Kagamiyama, Higashi-Hiroshima, Hiroshima, 739-8526, Japan.

- **Dr. Rahul R. Salunkhe**, Department of Physics, Indian Institute of Technology, Jammu-181221, India.

- **Prof. Hyung-Ho Park**, Department of Materials Science and Engineering, Yonsei University, 50 Yonsei-ro, Sedaemun-gu, Seoul-03722, Korea.

- **Dr. Amar Patil**, Nano-Electro-Mechanical Device Laboratory School of Mechanical Engineering, University Seoul 120-749, South Korea.

Extra-Curricular Activities

- Play volleyball, football, badminton, and chess
- Running
- Volunteering at events
- Participation in cultural activities

Personal Details

- Date of Birth: 28th June 1997
- Nationality: Indian
- Sex: Male
- Marital Status: Unmarried
- Blood Group: B^+
- Career Objective: Research
- Languages Known: English, Hindi, and Marathi
- Permanent Address: A/p Chincholi, Tal. Madha, Dist. Solapur, India-413208.

References

1. **Dr. Umakant M. Patil**, Associate Professor, Center for Interdisciplinary Research, D. Y. Patil Education Society (Deemed to be University), Kolhapur-416006, India.
E-mail ID: umakant.physiscs84@gmail.com
Mob. No.: +91 7020790779

2. **Prof. Chandrakant D. Lokhande**
Dean and Research Director, Center for Interdisciplinary Research, D. Y. Patil Education Society (Deemed to be University), Kolhapur-416006, India.
Email: l_chandrakant@yahoo.com
Mob. No.: +91 9765788816

3. **Dr. Gajanan S. Ghodake**, Associate Professor, Dongguk University, Seoul, South Korea.
E-mail ID: ghodakegs@gmail.com
Mob. No.: +821025958206

I hereby certify that the above information is accurate and correct to the best of my knowledge.

Kumbhar S.

Place: **India**

Dr. Sambhaji S. Kumbhar