

# CURRICULUM VITAE



## Dr. Sreekanth J. Varma

Assistant Professor (Academic Level 12)  
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**h-index: 13 (total citations: ~715)**

**No. of Ph.D. students: 04 (01 submitted)**

### Areas of Interest

- Energy Storage (Supercapacitors) and Integrated Wearable Devices
- Organic/Inorganic Perovskite Hybrid Solar cells & LEDs
- Organic/polymer photovoltaics & LEDs
- Conducting Polymers
- Nanomaterials (Graphene, 2D transition metal dichalcogenides and Quantum dots)

### List of Patents/Books/Publications

#### Patent(s)

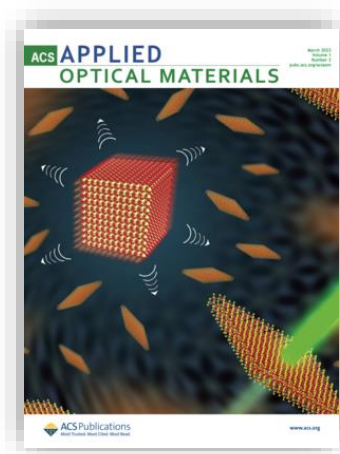
1. Prema K.H, Raji Krishnan, Edamana Prasad, **Sreekanth J.Varma**, Aswathy Gopan, 2020, 'A process of preparing metal nanoparticles,' Patent no.360528, 08/03/2021

#### Book(s)/Chapter(s)

1. S.Jayalekshmi, **Sreekanth J.Varma**, 'The Versatile Roles of Graphene in Organic Photovoltaic Device Technology', in Applied Spectroscopy and the Science of Nanomaterials, Progress in Optical Science and Photonics Volume 2, Springer Singapore, 2015, pp. 223-251
2. Jayesh C, **Sreekanth J.Varma\***, 'Electrospun Manganese Oxide-Based Composites as Anodes for Lithium-Ion Batteries', in Electrospinning for Advanced Energy Storage Applications, Springer Nature International, 2021, Chapter 12, pp 345-372
3. Prasad V.S., Jayesh C, **Sreekanth J.Varma\***, "Polymer Nanocomposites-Based Solid Electrolytes for Lithium-Ion Batteries", in Polymer and Ceramic Electrolytes for Energy Storage Devices, Vol.1, Taylor & Francis (CRC Press), 2021, Chapter 4 (e-ISSN 9781003144793)
4. **Sreekanth J.Varma\*** and R.Jayakrishnan, 'Progress in Perovskite Photovoltaics', in Spectroscopy and Characterization of Nanomaterials and Novel Materials: Experiments, Modeling, Simulations, and Applications, Wiley, 2021 (Print ISBN:9783527349371 |Online ISBN:9783527833689) <https://doi.org/10.1002/9783527833689.ch13>

- Rohith R., Anandhu T.P, Ranjini R.Mohan, **Sreekanth J.Varma\***, ‘Supercapacitors: Fundamentals, Working Principle, Classifications, Energy Storage Mechanisms, Nanostructured Electrode and Electrolyte Materials, Promises, Challenges and Future Perspectives’, Chapter 1 in Nanostructured Materials for Energy Storage: Volume II: Supercapacitors, Wiley, 2023 (Accepted)
- Anandhu T.P., Rohith R., Manju V., Ranjini R. Mohan, **Sreekanth J.Varma\***, 'Biopolymer-Based Electroactive Materials', Chapter 10 in 'Sustainable Materials in Supercapacitors: New Developments in Energy Storage' Elsevier, 2023 - Under Review

### Cover pages in International Journals



### Journal Publications

- Anandhu Thejas Prasannakumar, Rohith R, Manju V, Ranjini R. Mohan, **Sreekanth J.Varma\***, "Graphene nanoflake-self stabilized dispersion polymerized PANI hybrids as efficient, binder-free electrode materials for high-performance flexible symmetric supercapacitors", Journal of Electroanalytical Chemistry (2024) 952, 117952 (**Impact factor: 4.5**)
- Anandhu Thejas Prasannakumar, Rohith R, Manju V, Ranjini R. Mohan, **Sreekanth J.Varma\***, "High energy density electrodes based on solution-intercalated, self-stabilised dispersion polymerised polyaniline/MWCNT hybrids for supercapacitors", Journal of Energy Storage (2024) 76,109732 (**Impact factor: 9.4**)
- Rohith R, Anandhu Thejas Prasannakumar, Manju V, Ranjini R. Mohan, **Sreekanth J.Varma\***, "Flexible, Symmetric Supercapacitor using Self-stabilized Dispersion-Polymerised Polyaniline/ V2O5 Hybrid Electrodes", Chemical Engineering Journal (2023) 467, 143499 (**Impact factor: 16.744**)
- Anandhu T.P., Ranjini R. Mohan, Rohith R., Manju V., Dr. **Sreekanth J.Varma\***, "Progress in Conducting Polymer-Based Electrospun fibers for Supercapacitor Applications: A Review", ChemistrySelect (2023) 8, e202203564 (**Impact factor: 2.307**)
- Ranjini R.Mohan, Anandhu T.P., Joseph John, **Sreekanth J.Varma\***, S Jayalekshmi\*, "Electromagnetic shielding performance of polyaniline-nanorod/graphene-nanoflake

- hybrid films in the S- and X-bands", *New Journal of Chemistry* (2023) 47, 2565-2574 (*Impact factor: 3.925*)
6. Anandhu T.P., Beryl C., Rohith R., U. Reeta Felscia, Reji Philip\*, **Sreekanth J.Varma\***, *ACS Applied Optical Materials* (2023) 1, 3, 660-668 (*Front Cover*)
  7. Manju V, Rohith R, Anandhu T. P, Bhavija B.V, **Sreekanth J.Varma\***, Dielectric and Electrochemical Performance of Rhombohedral Lanthanum Manganite Perovskite Nanostructures, *New Journal of Chemistry* (2022) 46, 19874-19887 (*Impact factor: 3.925*)
  8. Rohith. R, Anandhu Thejas Prasannakumar, Dr. Ranjini R. Mohan, Manju V, Dr. **Sreekanth J.Varma\***, *Advances in 2D Molybdenum Disulfide-Based Functional Materials for Supercapacitor Applications*, *Chemistry Select* (2022) 7, e202203068 (*Impact factor: 2.307*)
  9. Anandhu T.P., Rohith R., Jayesh Cherusseri, Ranjini R.Mohan, **Sreekanth J.Varma\***, "High Areal Capacitance and Long Cycling Stability in Asymmetric Supercapacitors Using Binder-Free, Hierarchical Nanostructured Ni<sub>3</sub>S<sub>2</sub>/MnO<sub>2</sub> Hybrid Electrodes", *Journal of Energy Storage* (2022) 55, 105723 (*Impact factor: 9.4*)
  10. Anandhu T.P., Beryl C., Rohith R., U. Reeta Felscia, Reji Philip\*, **Sreekanth J.Varma\***, "Hematene Nanoflakes: A non-van der Waals material with superior nonlinear optical properties", *ChemRxiv* (2022) DOI: 10.26434/chemrxiv-2022-fftqk \*Corresponding author
  11. 29. Ranjini R.Mohan, Abhilash. A, Manoj Mani, **Sreekanth J.Varma\***, S.Jayalekshmi\*, "Nano CuO-embedded polyaniline films as efficient broadband electromagnetic shields" , *Materials Chemistry and Physics* (2022) 290, 126647 (*Impact factor: 4.778*) \*Corresponding authors
  12. Anandhu T.P., Ranjini R.Mohan, Jayesh Cherusseri, Rohith R., **Sreekanth J.Varma**, "High areal capacitance and enhanced cycling stability of binder-free, pristine polyaniline supercapacitor using hydroquinone as a redox additive", *Electrochimica Acta*, (2022) 425, 140740 (*Impact factor: 7.337*)
  13. Jayesh Cherusseri, Claire Mary Savio, Mohammad Khalid, Vishal Chaudhary, Arshid Numan, **Sreekanth J.Varma**, Amrutha Menon and Ajeet Kaushik, "SARS-CoV-2-on-Chip for Long COVID Management", *Biosensors* (2022) 12, 890 (*Impact factor: 5.743*)
  14. Ramakrishnan Jayakrishnan, Ramesh Chandran, Aruna R. Raj, **Sreekanth J.Varma**, "Copper-doped cesium lead bromide colloidal nano-platelets", *Journal of Nanoparticle Research* (2021) 23, 210 (*Impact factor: 2.533*)
  15. Aruna Raj, **Sreekanth J.Varma**, R.Jayakrishnan, "Self-assembled methylammonium lead bromide thin films with blue photoluminescence", *Applied Nanoscience* (2021) 11, 2095-2102 (*Impact factor: 3.869*)

16. Ligi ML., Abhilash A., **Sreekanth J.Varma** et al., "Light emitting, segmented block copolymers containing distyrylbenzene blocks connected through  $\alpha,\omega$ -nonamethylenedioxy chain spacer for applications in polymer light emitting diodes", *Dyes and Pigments* (2021) 184, 108729 (*Impact factor: 5.122*)
17. Jayesh C., **Sreekanth J.Varma\*** et al., "Synthesis of air-stable two-dimensional nanoplatelets of Ruddlesden-Popper Organic-inorganic perovskites", *Nanoscale*, (2020) 12, 10072-10081 (\*Equal contribution) (*Impact factor: 8.307*)
18. **Sreekanth J.Varma**, Jayesh C. et al., "Quantum dots of two-dimensional Ruddlesden-Popper organic-inorganic hybrid perovskite with high optical limiting properties", *AIP Advances* (2020) 10, 045130. (*Impact factor: 1.6*)
19. Aruna Raj, R.Jayakrishnan, **Sreekanth J.Varma**, "Polymer encapsulation as an effective method for enhanced stability in perovskite quantum dots", *AIP Conference Proceedings*, (2020) 2265, 030148
20. Yang Liu, **Sreekanth J.Varma**, et al., "Reflux Pretreatment Mediated Sonication: A New Universal Route to obtain 2D Quantum Dots", *Materials Today* (2019) 22, 17-24 (*Impact factor: 31.041*)
21. Ranjini R.Mohan, **Sreekanth J.Varma\***, S.Jayalekshmi\*, "Effective Electromagnetic Shield using Conductive Polyaniline Films", *Materials Today Proceedings* (2019) 8, 371-378 (\* Corresponding author)
22. **Sreekanth J.Varma** et al., "Fibre-type Solar Cells, Nanogenerators, Batteries and Supercapacitors for Wearable Applications", *Advanced Science* (2018) 1800340. (*Impact factor: 17.521*) (*Cover page*)
23. Cacie Hart, Avra Kundu, Kowsik Kumar, **Sreekanth Varma**, Jayan Thomas and Swaminathan Rajaraman, "Rapid Nanofabrication of Nanostructured Interdigitated Electrodes (nIDEs) for Long-Term in vitro Analysis of Human Induced Pluripotent Stem Cell Differentiated Cardiomyocytes", *Biosensors* 2018, 8(4), 88. (*Impact factor: 5.743*)
24. **Sreekanth J.Varma** et al, "2D TiS<sub>2</sub> Layers: A Superior Nonlinear Optical Limiting Material", *Advanced Optical Materials*. (2017) 1700713. (*Impact factor: 10.05*) (Published in the Best of Advanced Optical Materials 2017)
25. **Sreekanth J.Varma** et al, "Enhanced nonlinear optical limiting in TiS<sub>2</sub> dichalcogenide 2D Sheets" in *Light Manipulating Organic Materials and Devices IV*, Proc. of SPIE Vol. 10360, 103600A (2017)
26. Ranjini R.Mohan\*, **Sreekanth J.Varma\*** and Jayalekshmi Sankaran, "Impressive electromagnetic shielding effects exhibited by highly ordered, micrometer thick polyaniline films", *Applied Physics Letters*, 108, (2016) 154101 (\*Equal contribution) (*Impact factor: 3.971*)
27. Anand P.B, Shijeesh M.R, **Sreekanth J.Varma**, S. Jayalekshmi, "Exceptionally crystalline and conducting acid doped Polyaniline (PANI) films by level surface

- assisted solution casting approach”, Applied Physics Letters, 108, (2016) 161901. (*Impact factor: 3.971*)
28. Vidya G\*, **Sreekanth J.Varma\***, M.V.Mahesh Kumar, S.Prathapan, S.Jayalekshmi and Rani Joseph, “Semiconducting Thienylene – Biphenylenevinylene Hybrid Polymers: Synthesis, Characterization and Application Prospects in Polymer LEDs”, Dyes and Pigments, 126 (2016) 303-312 (\*Equal contribution) (*Impact factor: 5.122*)
  29. Ranjini R.Mohan, **Sreekanth J.Varma**, Muhammad Faisal and Jayalekshmi S, “Polyaniline/graphene hybrid film as an effective broadband electromagnetic shield”, RSC Advances, 5 (2015) 5917-5923 (*Impact factor: 4.036*)
  30. M. Sajimol Augustine, P.P Jeeju, **S.J Varma**, P.A Francis Xavier, S. Jayalekshmi, “Enhanced photoluminescence in transparent thin films of polyaniline-zinc oxide nanocomposite prepared from oleic acid modified zinc oxide nanoparticles”, Thin solid Films, 562 (2014) 84-89 (*Impact factor: 2.1*)
  31. **Sreekanth J.Varma**, Ranjini R.Mohan, Vidya G, S.Jayalekshmi, S.Prathapan, “Effect of Solvents on the Photoluminescence Emission of a Few Novel, Light Emitting, Segmented Block Copolymers and Hybrid Polymers”, AIP Conference Proceedings, 1576 (2014) 171-175
  32. **S.J.Varma**, Jerin George, Jeeju.P.P, S.Jayalekshmi, “Quantum confinement effects in highly conducting, ultrathin Polyaniline films pursued through spectroscopic investigations”, Journal of Luminescence, 132 (2012) 801-805 (*Impact factor: 3.6*)
  33. **S.J.Varma**, Francis Xavier P.A, Soney Varghese and S.Jayalekshmi, “Synthesis and studies on exceptionally crystalline polyaniline thin films”, Polymer International, 61, (2012) 743–748 (*Impact factor: 3.2*)
  34. **S.J.Varma**, S.Jayalekshmi, “On the prospects of Polyaniline and Polyaniline/MWNT Composites for possible pressure sensing applications”, Journal of Applied Polymer Science, 117 (2010) 138–142 (*Impact factor: 3.0*)
  35. Pullarkat P Jeeju, Augustine M Sajimol, Vallath G Sreevalsa, **Sreekanth J Varma** and S.Jayalekshmi, “Size-dependent optical properties of transparent, spin-coated polystyrene/ZnO nanocomposite films”, Polymer International, 60 (2011) 1263–1268 (*Impact factor: 3.2*)
  36. P.P.Jeeju, **S.J.Varma**, P.A.Francis Xavier, A.M.Sajimol, S.Jayalekshmi, “Novel Polypyrrole films with excellent crystallinity and good thermal stability”, Materials Chemistry and Physics, 134, (2012) 803-808 (*Impact factor: 4.6*)
  37. M.Sajimol Augustine, **S.J.Varma**, P.A. Francis Xavier and S. Jayalekshmi, “Enhanced photoluminescence in oleic acid modified polyaniline”, Transactions of the Indian Institute of Metals, 64 (2011) 209-212
  38. M.Amrithesh, K.P.Chandni, S.Jayalekshmi, Febin Kurian, **S.J.Varma**, On the interesting optical transitions observed in polyaniline films in the conducting and

insulating states, Optoelectronics and Advanced Materials – Rapid Communications, Vol.3, No. 2, February 2009, 149 – 154

39. **Sreekanth J.Varma**, S.Jayalekshmi, “Carbon Nanotube – Polymer Nanocomposites for Possible Pressure Sensor Applications” Proc. of SPIE Vol. 7037, 703716, (2008)

## **International/National Conferences: 40**

### **Invited Lectures**

- “*Organic Electronics: In the Perspective of Sensors and Optoelectronic Devices*”, in Recent Trends in MEMS Sensors and Devices on the 11<sup>th</sup> of October 2013 as part of Continuing Education Programme of DRDO at Naval Physical and Oceanographic Laboratory (NPOL)
- “*Spin coating technology*”, in a workshop on Virtual Instrumentation and Advanced Experimental techniques on the 12<sup>th</sup> of November 2013 at Government College, Nattakam, Kottayam
- “*Graphene as a Prospective Material for Organic Photovoltaic Applications*”, in the National Seminar on Recent Trends in Supramolecular Assembly and Nanomaterials during the 11<sup>th</sup> and 12<sup>th</sup> of December 2013 at MSM College, Kayamkulam
- “*Polymer Research: The evolution from passive insulation to active light emission*”, in the National seminar on Current Trends in Material Science during the 13<sup>th</sup> and 14<sup>th</sup> of August 2014 at Aquinas College, Edakochi

### **Achievements/Awards**

- Raman PDF (University Grants Commission, Govt. of India) – (2016-17)  
*International award given to pursue research in the forefront areas of science and technology in the United States of America. Worked as a Research Scientist in the NanoScience Technology Center, University of Central Florida, Orlando, FL*
- Dr.D.S.Kothari Postdoctoral fellowship (University Grants Commission, Govt. of India) - 2013

### **Minor/Major Projects**

- 2015 - Minor Project entitled “Development of highly crystalline conducting polymers and polymer nanocomposites for electromagnetic shielding applications” funded by University Grants Commission – Rs.5 lakhs
- 2015 - Study of the pressure sensing properties of conducting polymers and their composites - (Student: Mr.Praveen P.) Rs.13,000/-
- 2019 - Synthesis of various transition metal dichalcogenides for catalytic applications (Students: Anaghasree V.S, Keerthana V.S) Rs.10,000/-
- 2021 - Organic–Inorganic Nanohybrids for Energy Applications (Students: Gowri S Nair, Parvathy V) Rs.10,000/-

### **Professional Associations**

- Reviewer for the international peer-reviewed journals like Electrochimica Acta, Nature Scientific Reports, Applied Physics Letters, Journal of Materials Chemistry C, New Journal of Chemistry, Physica Scripta, The Chemical Records, Chemistry – A European Journal, Polymer Chemistry, RSC Advances, Polymer International, SN Applied

Sciences, Journal of Frontiers in Environmental Engineering (FIEE), International Journal of Chemistry and Material Science (IJCMS), Iranian Polymer Journal, Crystals, Gel, Membranes, Molecules, Applied Sciences, Materials, Coatings, International Journal of Environmental Research and Public Health.

### **Education**

- MSc (2004) - Maharaja's College, Ernakulam, Kerala, India
- PhD (2012)- Department of Physics, Cochin University of Science and Technology, Kochi, Kerala, India
- Postdoc (2016) - NanoScience Technology Center, University of Central Florida, Orlando, FL



## **In the Media**

### **INNOVATIVE FLEXIBLE SUPERCAPACITOR OFFERS PROMISING ENERGY STORAGE SOLUTION**

- <https://www.gktoday.in/innovative-flexible-supercapacitor-offers-promising-energy-storage-solution/>

### **BREAKTHROUGH IN ENERGY STORAGE: FLEXIBLE SUPERCAPACITORS DEVELOPED WITH CONDUCTING POLYMER AND NANOSTRUCTURED OXIDES**

- <https://newsstation.media/latest-news/breakthrough-in-energy-storage-flexible-supercapacitors-developed-with-conducting-polymer-and-nanostructured-oxides/>

### **FLEXIBLE SUPERCAPACITORS WITH POLYMER-OXIDE HYBRIDS FOR EFFICIENT ENERGY STORAGE**

- <https://www.electronicsforu.com/news/flexible-supercapacitors-with-polymer-oxide-hybrids-for-efficient-energy-storage>

### **FLEXIBLE SUPERCAPACITORS WITH EFFICIENT ENERGY STORAGE DEVELOPED USING CONDUCTING POLYMER & NANOSTRUCTURED INORGANIC OXIDE HYBRIDS**

- <https://pib.gov.in/PressReleasePage.aspx?PRID=1969175>
- <https://dst.gov.in/flexible-supercapacitors-efficient-energy-storage-developed-using-conducting-polymer-nanostructured>
- [https://www.facebook.com/story.php?story\\_fbid=pfbid0QEtkTh1eVJuvWthQvKXtoYmr7gt9A8UA7GKFf7jxxaGfAJw1MHgNeUmPppSPcdXsl&id=100064382571801&mibextid=ZbWKwL&paipv=0&eav=AfZnnbKr17VbgTB4Mk1KbAcvzv2Eeah7kzTjbYHyw3vnLY5utAsOalr6iDpefi2\\_9z8&\\_rdr](https://www.facebook.com/story.php?story_fbid=pfbid0QEtkTh1eVJuvWthQvKXtoYmr7gt9A8UA7GKFf7jxxaGfAJw1MHgNeUmPppSPcdXsl&id=100064382571801&mibextid=ZbWKwL&paipv=0&eav=AfZnnbKr17VbgTB4Mk1KbAcvzv2Eeah7kzTjbYHyw3vnLY5utAsOalr6iDpefi2_9z8&_rdr)
- <https://x.com/IndiaDST/status/1715231961692938623?s=20>

### **NEW LOW-COST, POLYMER-BASED ELECTRODE CAN INCREASE ELECTROCHEMICAL PERFORMANCE OF SUPERCAPACITORS IN WEARABLE INTEGRATED DEVICES**

- [https://dst.gov.in/new-low-cost-polymer-based-electrode-can-increase-electrochemical-performance-supercapacitors?fbclid=IwAR0t2K108oZ79StgqOGc0RMOW0-kUPfCeEU\\_gccWu9Yt7Ef7Y228uNszsZY](https://dst.gov.in/new-low-cost-polymer-based-electrode-can-increase-electrochemical-performance-supercapacitors?fbclid=IwAR0t2K108oZ79StgqOGc0RMOW0-kUPfCeEU_gccWu9Yt7Ef7Y228uNszsZY)
- <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1846909>
- <https://www.facebook.com/search/top/?q=A%20new%2C%20low-cost%20conducting%20polymer>
- <https://twitter.com/IndiaDST/status/1554029474362322945?t=iY-3GBqWdtwdUIP8P04R4Q&s=08>

### **2D NANOFILAKES OF MATERIAL EXTRACTED FROM IRON ORE CAN PROTECT SENSITIVE OPTICAL EQUIPMENT FROM LIGHT-INDUCED DAMAGE**

- <https://dst.gov.in/2d-nanofilakes-material-extracted-iron-ore-can-protect-sensitive-optical-equipment-light-induced>



- <https://www.facebook.com/IndiaDST/posts/pfbid0SRRQ8roobXwGns9XqtHSQYJqzECTqHDJkMic5PXXyyquWuyRNtVqKh1W8EjM4CF8l>
- <https://twitter.com/IndiaDST/status/1684170701237006338?t=FDnrxygVZSLEAWxKswjfw&s=08>
- <https://twitter.com/IndiaDST/status/1684170703850057732>

## ATMAS (AUTOMATIC TEMPERATURE MEASUREMENT AND ALERT SYSTEM)

- <https://www.thehindu.com/news/national/kerala/students-of-sd-college-in-alappuzha-develop-automated-temperature-monitoring-system/article36080722.ece#:~:text=In%20the%20search%20for%20newer%20technologies%20that%20are,a%20camera%2C%20temperature%20module%2C%20and%20an%20Arduino%20microcontroller>
- <https://www.madhyamam.com/kerala/local-news/alappuzha/--839748>

Students of SD College in Alappuzha develop automated temperature monitoring system

STAFF REPORTER  
KALAMANGALAM AUGUST 24, 2023 18:58 IST  
UPDATED: AUGUST 24, 2023 18:58 IST

ATMAS, developed by final-year BSc students Abhishek R. Nath, Midhun Mohan and Sangeeth S. Kith under the guidance of assistant professor Sreerakha J. Varma, makes use of recycled items



Thermal scanners, infrared thermometers and thermal camera, which can measure body temperature in a contactless manner, have become vital tools in the fight against the COVID-19 pandemic.

In the search for newer technologies that are cost-effective and safe, three students of the Department of Physics, Sanatana Dharma (SD) College, Alappuzha, have designed an Automatic Temperature Measurement and Alert System (ATMAS).

The system consists of a camera, temperature module, and an Arduino microcontroller. It measures the temperature of the forehead of a person approaching via face recognition

### കോവിഡ് പ്രതിരോധത്തിന് ഓട്ടോമാറ്റിക് സംവിധാനവുമായി കോളേജ് വിദ്യാർത്ഥികൾ



കോവിഡ് പ്രതിരോധത്തിന് സൗകര്യമേകുന്ന ഓട്ടോമാറ്റിക് സംവിധാനം നിർമ്മിച്ച ആലപ്പുഴ എൻ. ഡി കോളേജ് വിദ്യാർത്ഥികളായ അഭിഷേക് നാഥ്, മിഥുൻ മോഹൻ, സന്ദീപ് എന്നിവർ അവരുടെ വിദ്യാർത്ഥി സംവിധാനം വിദ്യാർത്ഥികൾക്ക് സഹായകമായി ഉപയോഗിക്കാൻ തയ്യാറാക്കി.

ATMAS, developed by final-year BSc students Abhishek R. Nath, Midhun Mohan and Sangeeth S. Kith under the guidance of assistant professor Sreerakha J. Varma, makes use of recycled items

The system consists of a camera, temperature module, and an Arduino microcontroller. It measures the temperature of the forehead of a person approaching via face recognition

In the search for newer technologies that are cost-effective and safe, three students of the Department of Physics, Sanatana Dharma (SD) College, Alappuzha, have designed an Automatic Temperature Measurement and Alert System (ATMAS).

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### ഇനി അധികം 'ചൂടായാൽ' യന്ത്രം 'പിടികൂടും'

ഇതിനായി സിദ്ധാർത്ഥൻ ഇന്ത്യയിൽ സാങ്കേതിക വിദ്യാർത്ഥികൾക്ക് സഹായകമായി ഉപയോഗിക്കാൻ തയ്യാറാക്കി

ആലപ്പുഴ എൻ. ഡി കോളേജ് വിദ്യാർത്ഥികൾക്ക് സഹായകമായി ഉപയോഗിക്കാൻ തയ്യാറാക്കി

ATMAS, developed by final-year BSc students Abhishek R. Nath, Midhun Mohan and Sangeeth S. Kith under the guidance of assistant professor Sreerakha J. Varma, makes use of recycled items

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The system consists of a camera, temperature module, and an Arduino microcontroller. It measures the temperature of the forehead of a person approaching via face recognition

### ഓട്ടോമാറ്റിക് സംവിധാനം വികസിപ്പിച്ച് എൻ.ഡി കോളേജിലെ വിദ്യാർത്ഥികൾ

ആലപ്പുഴ കോവിഡ് പ്രതിരോധത്തിന് സൗകര്യമേകുന്ന ഓട്ടോമാറ്റിക് സംവിധാനം നിർമ്മിച്ച ആലപ്പുഴ എൻ. ഡി കോളേജ് വിദ്യാർത്ഥികൾക്ക് സഹായകമായി ഉപയോഗിക്കാൻ തയ്യാറാക്കി

ATMAS, developed by final-year BSc students Abhishek R. Nath, Midhun Mohan and Sangeeth S. Kith under the guidance of assistant professor Sreerakha J. Varma, makes use of recycled items

The system consists of a camera, temperature module, and an Arduino microcontroller. It measures the temperature of the forehead of a person approaching via face recognition

In the search for newer technologies that are cost-effective and safe, three students of the Department of Physics, Sanatana Dharma (SD) College, Alappuzha, have designed an Automatic Temperature Measurement and Alert System (ATMAS).

The system consists of a camera, temperature module, and an Arduino microcontroller. It measures the temperature of the forehead of a person approaching via face recognition

### flexible-supercapacitors-with-polymer-oxide-hybrids-for-efficient-energy-storage

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Efficient and stable electrode materials for energy storage have long been a focal point of scientific research, driven by the escalating global energy demands. Among the many avenues researchers explore, supercapacitor electrodes hold a crucial position as they strive to surpass the energy density levels typically associated with batteries. In this quest, conducting polymers, hailed for their pseudocapacitive properties and tunable compositions, stand out as promising candidates capable of meeting the fundamental requirements for supercapacitor electrodes.

The Materials for Energy Storage and Optoelectronics Division Group at Sanatana Dharma College, Alappuzha, has engineered a hybrid electrode-based flexible symmetric supercapacitor. This invention has electrochemical characteristics, exceptional cycle stability, and high energy density. The hybrid electrode is fabricated without using binders, comprising a combination of high molecular-weight polyvinylidene fluoride (PVDF) synthesized through a self-initiated dispersion polymerization process and urethane-polymer membranes created via a facile microwave-assisted technique.

Electrode Fabrication Method

Showing their conventional methods that involve the application of emulsion-like power cast as a slurry onto flexible substrates, the research adopts a unique approach. The electrodes are crafted from a dispersion of PVDF, incorporating a secondary aspect of in-situ cast. The electrode's preparation method proves a pivotal role in the outstanding performance of the hybrid electrode. It encompasses the virtue of flexibility and conductivity, leveraging high molecular-weight PVDF synthesized through an elegant, solvent-mediated self-initiated polymerization process and exceptionally stable PVDF membranes with remarkable rate capability. The resultant hybrid electrode boasts numerous individual merits, exhibiting a synergistic effect that significantly enhances performance.

The flexible supercapacitor device fabricated from these groundbreaking electrodes exhibits superior electrochemical attributes, featuring an impressive energy density and cycling stability. The

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A hybrid electrode-based flexible symmetric [supercapacitor](#) that shows excellent electrochemical properties, cycle stability & high energy density could bring a future solution for efficient [Energy Storage](#).

[@DrItendraSingh@karandi65@PratishthaDST](#)  
[dst.gov.in/flexible-supercapacitor](#)

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This research work was carried out at Sanatana Dharma College, Alappuzha using the instrumentation facility provided by [IndiaDST](#) through the Fund for Improvement of S&T Infrastructure (FIST) programme.

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