

Naveen Kumar Elumalai
Research Active Lecturer
Engineering



Research interests

Keywords

Electrospinning, Green Hydrogen, Solar Cells, Optoelectronics, Self-Cleaning Coatings, Material Science and Nanotechnology, Energy Storage (Batteries), Functional Composites, Additive Manufacturing, Impedance Spectroscopy

Research interests

Driving Innovations in Clean Energy Technologies and Sustainable Materials for a Greener Future

Overview

Welcome to the research profile of Dr Naveen Elumalai, a distinguished expert in clean energy technologies and sustainable material systems. Recognized among the top 2% of scientists globally by Stanford University in 2022, he is committed to addressing the growing global energy demand and material needs of humanity through cutting-edge research and collaborative initiatives.

He has authored over 70 articles in prestigious international journals, with an h-index of 36 and 4,324 citations as of March 2023. (Google Scholar)

Dr Naveen's research group is at the forefront of developing innovative clean energy technologies and sustainable materials to address the increasing global energy demand and material needs. His interdisciplinary research program focuses on the synthesis and characterization of advanced nanostructured materials and devices, utilizing the expertise in nanomaterials engineering, device fabrication, and advanced opto-electronic characterization methods.

His research interests encompass a wide range of cutting-edge topics, including:

- Energy materials: Exploring novel materials for energy generation, storage, and conversion to promote sustainable energy solutions.
- Electrospinning nanostructures: Investigating the fabrication and applications of electrospun nanofibers for energy devices and systems.
- Green hydrogen: Developing efficient methods for hydrogen production and storage, promoting a sustainable and carbon-free energy source.
- Air-stable batteries and PEC cells: Advancing the development of high-performance batteries and photoelectrochemical cells for renewable energy applications.
- Organic and perovskite solar cells: Creating next-generation solar cells with improved efficiency, stability, and scalability.
- Photocatalytic self-cleaning coatings: Engineering functional coatings that harness solar energy for self-cleaning and environmental remediation.
- Advanced manufacturing: Collaborating with the Advanced Manufacturing Alliance (AMA) to develop novel materials and alloys for additive manufacturing applications in various industries.
- Advanced electrochemical characterization: Applying state-of-the-art electrochemical techniques to study and analyze energy materials and devices.

Dr Naveen's research group aims to make a lasting impact on the global clean energy landscape and contribute to a more sustainable future.

Highlights

- Interdisciplinary Expertise: Dr Naveen's research program encompasses nanomaterials engineering, device fabrication, and advanced opto-electronic characterization methods, providing a comprehensive environment for you to explore diverse applications in clean energy technologies.
- High-Impact Research: Dr Naveen has made significant contributions to energy materials and electrospinning research, with more than 50+ publications, including a world-record performance in PV devices and highly efficient semi-

transparent organic solar cells for power-generating window applications.

- Collaborative Opportunities: Engage in ongoing collaborations with prestigious institutions in Australia and worldwide, including UNSW Sydney, QUT Brisbane, Murdoch University, Curtin University, National University of Singapore, Morgan State University, and Friedrich Alexander University Erlangen Nürnberg, Germany.
- Advanced Techniques: Gain hands-on experience in electrospinning techniques for nanofiber synthesis, electrochemical characterization, and the development of novel materials and alloys for additive manufacturing applications in various industries.
- Advanced Technologies: Delve into ground-breaking research topics such as energy materials, electrospinning nanostructures, green hydrogen, air-stable batteries, PEC cells, organic and perovskite solar cells, photocatalytic self-cleaning coatings, advanced manufacturing, and advanced electrochemical characterization.

As a PhD or HDR student, you will have the opportunity to embark on a fulfilling journey toward a sustainable future, work with world-class researchers, and develop your skills in a stimulating environment that nurtures innovation, collaboration, and excellence.

Research Metrics

Citations - 2557

h-index 28

i10-index 45

(Source - Google Scholar, updated Jan 2021)

Employment

Lecturer - Mechanical Engineering

Research Active Lecturer

Engineering

Faculty of Science and Technology

4 Jan 2024 → present

Lecturer

Curtin University Malaysia

Malaysia

1 Jun 2018 → 1 Jul 2020

Research Fellow

University of New South Wales

Kensington, Australia

1 Mar 2015 → 1 Feb 2018

Research Fellow

University of South Australia

Adelaide, Australia

1 Feb 2014 → 1 Feb 2015

Project Engineer

Wipro Technologies

India

1 Sept 2007 → 1 May 2009

Awards

Best Lecturer Students' Choice Award 2019 (Semester 2) – Curtin University, Malaysia

Best Lecturer Students' Choice Award 2019 (Semester 1) – Curtin University, Malaysia

Best Lecturer Students' Choice Award 2018 (Semester 2) – Curtin University, Malaysia

Best Paper Award (2018) – Awarded by MDPI, Switzerland for paper in Energies Journal
Prestigious NUS research Scholarship, National University of Singapore (2009 – 2013)
BE, Mech. Engineering, Anna University Rank 6 - among 5649 candidates from entire state (TN-India)
College Gold Medal (Rank 1 in Mechanical Department) – Panimalar Engineering College, Chennai, India

External Grants

1.Fundamental Research Grant Scheme (FRGS) (2020) – Malaysia Government (MOHE)
Project Title: Synergistic Effect of Nanocellulose Incorporation in the Green Conductive Stretchable Composite based on Ionogel and Palm waste

Funding Amount: RM 92,237
Role: Project Leader / Chief Investigator
Status: On-Going (Jan 2021 -Jan 2023)

Significant Journal Publications

2 in Energy & Environmental Science (IF 33.2) (First author)
2 in ACS Applied Materials & Interfaces (IF 8.4)
2 in Nanoscale (IF 6.9)
1 in ACS Photonics (IF 7.1)
1 in Journal of Power Sources (IF 7.4)
9 in Solar Energy Materials & Solar Cells (IF 6)
4 in Electrochimica Acta (IF 5.3),
4 in Physical Chemistry Chemical Physics (IF 4.1)
3 in Organic Electronics (IF 3.5),

Total of 57 journal articles excluding conference (12 First-authored), (25 – Second authored), (30 – Corresponding Authored)

Research outputs

Investigating the Impact of Interfacial Layers on Device Performance of Highly Stable $\text{Cs}_2\text{InBiBr}_6$ Based Double Perovskite Solar Cells

Meng, G., Elumalai, N. K., Mehdizadeh-Rad, H., Ram, K. S., Setsoafia, D. D. Y. & Ompong, D., 8 Dec 2023, (E-pub ahead of print) In: Advanced Theory and Simulations. p. 1-13 13 p.

Study of Capacitive Behavior and its Inter-Relationship with Electrolyte Solution Concentration in Hybrid Ionogels

Suen, J. W., Elumalai, N. K., Debnath, S., Mubarak, N. M., Lim, C. I., Reddy M, M. & Khalid, M., Sept 2023, In: ECS Journal of Solid State Science and Technology. 12, 9, 097001.

A review on influence of nanoparticle parameters on viscosity of nanofluids and machining performance in minimum quantity lubrication

Hirudayanathan, H. P., Debnath, S., Anwar, M., Johar, M. B., Elumalai, N. K. & Mohammed Iqbal, U., 28 Jul 2023, (E-pub ahead of print) In: Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering. p. 1-20 20 p.

Investigating the Correlation between Electrolyte Concentration and Electrochemical Properties of Ionogels

Suen, J. W., Elumalai, N. K., Debnath, S., Mubarak, N. M., Lim, C. I., Reddy Moola, M., Tan, Y. S. & Khalid, M., Jul 2023, In: Molecules. 28, 13, p. 1-19 19 p., 5192.

The Role of Interfaces in Ionic Liquid-Based Hybrid Materials (Ionogels) for Sensing and Energy Applications

Suen, J. W., Elumalai, N. K., Debnath, S., Mubarak, N. M., Lim, C. I. & Reddy, M. M., 2 Dec 2022, In: Advanced Materials Interfaces. 9, 34, p. 1-35 35 p., 2201405.

Effect of Concentration of Electrolyte Solution on the Electrochemical Stability of Ionogel

Wei, S. J., Elumalai, N. K., Debnath, S., Ing, L. C., Reddy M., M., Mubarak, N. M. & Pramanik, A., Jun 2022, *Materials Science Forum*. Pramanik, A., Surzhikov, A., Liang, S. Y., Nguyen, T. N. & Jamaluddin, A. (eds.). 1 ed. Switzerland: Trans Tech Publications Ltd, Vol. 1064. p. 65-70 6 p. (Materials Science Forum; vol. 1064).

Electrospinning research and products: The road and the way forward

Al-Dhahebi, A. M., Ling, J., Krishnan, S. G., Yousefzadeh, M., Elumalai, N. K., Saheed, M. S. M., Ramakrishna, S. & Jose, R., 1 Mar 2022, In: Applied Physics Reviews. 9, 1, p. 1-45 45 p., 011319.

Optimizing Device Structure of PTB7-Th:PNDI-T10 Bulk Heterojunction Polymer Solar Cells by Enhancing Optical Absorption

Setsoafia, D. D. Y., Ram, K. S., Rad, H. M., Ompong, D., Elumalai, N. K. & Singh, J., 1 Feb 2022, In: Energies. 15, 3, p. 1-15 15 p., 711.

Sources of Thermal Power Generation and Their Influence on the Operating Temperature of Organic Solar Cells

Mehdizadeh Rad, H., Sreedhar Ram, K., Mehdizadeh-Rad, F., Ompong, D., Setsoafia, D. D. Y., Elumalai, N. K., Zhu, F. & Singh, J., 1 Feb 2022, In: Nanomaterials. 12, 3, p. 1-12 12 p., 420.

Operating Temperature of Nonfullerene Acceptor-Based Bulk Heterojunction Organic Solar Cells

Ram, K. S., Setsoafia, D. D. Y., Mehdizadeh-Rad, H., Ompong, D., Elumalai, N. K. & Singh, J., Oct 2021, In: Physica Status Solidi (A) Applications and Materials Science. 218, 19, p. 1-11 11 p., 2100255.

Advances in stable and flexible perovskite solar cells

Wali, Q., Iftikhar, F. J., Elumalai, N. K., Iqbal, Y., Yousaf, S., Iqbal, S. & Jose, R., May 2020, In: Current Applied Physics. 20, 5, p. 720-737 18 p.

Low-temperature processed efficient and colourful semitransparent perovskite solar cells for building integration and tandem applications

Upama, M. B., Mahmud, M. A., Yi, H., Elumalai, N. K., Conibeer, G., Wang, D., Xu, C. & Uddin, A., Feb 2019, In: Organic Electronics. 65, p. 401-411 11 p.

Progress in non-fullerene acceptor based organic solar cells

Duan, L., Elumalai, N. K., Zhang, Y. & Uddin, A., 2019, In: Solar Energy Materials and Solar Cells. 193, p. 22-65 44 p.

Enhanced electron transport enables over 12% efficiency by interface engineering of non-fullerene organic solar cells

Upama, M. B., Elumalai, N. K., Mahmud, M. A., Xu, C., Wang, D., Wright, M. & Uddin, A., 1 Dec 2018, In: Solar Energy Materials and Solar Cells. 187, p. 273-282 10 p.

Electrospun 3D composite nano-flowers for high performance triple-cation perovskite solar cells

Mahmud, M. A., Elumalai, N. K., Pal, B., Jose, R., Upama, M. B., Wang, D., Goncales, V. R., Xu, C., Haque, F. & Uddin, A., 1 Nov 2018, In: Electrochimica Acta. 289, p. 459-473 15 p.

Data of chemical analysis and electrical properties of SnO₂-TiO₂ composite nanofibers

Bakr, Z. H., Wali, Q., Ismail, J., Elumalai, N. K., Uddin, A. & Jose, R., Jun 2018, In: Data in Brief. 18, p. 860-863 4 p.

Highly crystalline bilayer electron transport layer for efficient conjugated polymer solar cells

Xu, C., Wright, M., Elumalai, N. K., Mahmud, M. A., Wang, D., Upama, M. B., Haque, F. & Uddin, A., May 2018, In: Current Applied Physics. 18, 5, p. 505-511 7 p.

Passivation of interstitial and vacancy mediated trap-states for efficient and stable triple-cation perovskite solar cells

Mahmud, M. A., Elumalai, N. K., Upama, M. B., Wang, D., Gonçales, V. R., Wright, M., Xu, C., Haque, F. & Uddin, A., 15 Apr 2018, In: Journal of Power Sources. 383, p. 59-71 13 p.

Annealing induced microstructure engineering of antimony tri-selenide thin films

Haque, F., Elumalai, N. K., Wright, M., Mahmud, M. A., Wang, D., Upama, M. B., Xu, C. & Uddin, A., Mar 2018, In: Materials Research Bulletin. 99, p. 232-238 7 p.

Tandem perovskite solar cells

Wali, Q., Elumalai, N. K., Iqbal, Y., Uddin, A. & Jose, R., Mar 2018, In: Renewable and Sustainable Energy Reviews. 84, p. 89-110 22 p.

Synergistic combination of electronic and electrical properties of SnO₂ and TiO₂ in a single SnO₂-TiO₂ composite nanofiber for dye-sensitized solar cells

Bakr, Z. H., Wali, Q., Ismail, J., Elumalai, N. K., Uddin, A. & Jose, R., 10 Feb 2018, In: Electrochimica Acta. 263, p. 524-532 9 p.

Cesium compounds as interface modifiers for stable and efficient perovskite solar cells

Arafat Mahmud, M., Kumar Elumalai, N., Baishakhi Upama, M., Wang, D., Gonçales, V. R., Wright, M., Justin Gooding, J., Haque, F., Xu, C. & Uddin, A., Jan 2018, In: Solar Energy Materials and Solar Cells. 174, p. 172-186 15 p.

Adsorbed carbon nanomaterials for surface and interface-engineered stable rubidium multi-cation perovskite solar cells

Mahmud, M. A., Elumalai, N. K., Upama, M. B., Wang, D., Zarei, L., Gonçales, V. R., Wright, M., Xu, C., Haque, F. & Uddin, A., 2018, In: Nanoscale. 10, 2, p. 773-790 18 p.

Effect of annealing dependent blend morphology and dielectric properties on the performance and stability of non-fullerene organic solar cells

Upama, M. B., Elumalai, N. K., Mahmud, M. A., Wright, M., Wang, D., Xu, C. & Uddin, A., 2018, In: Solar Energy Materials and Solar Cells. 176, p. 109-118 10 p.

MoS₂ incorporated hybrid hole transport layer for high performance and stable perovskite solar cells

Wang, D., Elumalai, N. K., Mahmud, M. A., Yi, H., Upama, M. B., Chin, R. A. L., Conibeer, G., Xu, C., Haque, F. & Duan, L., 2018, In: Synthetic Metals. 246, p. 195-203 9 p.

Optimization of conjugated polymer blend concentration for high performance organic solar cells

Xu, C., Wright, M., Elumalai, N. K., Mahmud, M. A., Gonçales, V. R., Upama, M. B. & Uddin, A., 2018, In: Journal of Materials Science: Materials in Electronics. 29, 19, p. 16437-16445 9 p.

Realizing 11.3% efficiency in PffBT4T-2OD fullerene organic solar cells via superior charge extraction at interfaces

Xu, C., Wright, M., Elumalai, N. K., Mahmud, M. A., Wang, D., Gonçales, V. R., Upama, M. B., Haque, F., Gooding, J. J. & Uddin, A., 2018, In: Applied Physics A: materials science and processing. 124, 6, p. 1-11 11 p., 449.

V₂O₅-PEDOT: PSS bilayer as hole transport layer for highly efficient and stable perovskite solar cells

Wang, D., Elumalai, N. K., Mahmud, M. A., Wright, M., Upama, M. B., Chan, K. H., Xu, C., Haque, F., Conibeer, G. & Uddin, A., 2018, In: Organic Electronics. 53, p. 66-73 8 p.

Role of fullerene electron transport layer on the morphology and optoelectronic properties of perovskite solar cells

Upama, M. B., Elumalai, N. K., Mahmud, M. A., Wang, D., Haque, F., Gonçales, V. R., Gooding, J. J., Wright, M., Xu, C. & Uddin, A., Nov 2017, In: Organic Electronics. 50, p. 279-289 11 p.

Organic solar cells with near 100% efficiency retention after initial burn-in loss and photo-degradation

Upama, M. B., Elumalai, N. K., Mahmud, M. A., Sun, H., Wang, D., Chan, K. H., Wright, M., Xu, C. & Uddin, A., 31 Aug 2017, In: Thin Solid Films. 636, p. 127-136 10 p.

Perovskite solar cells for roll-to-roll fabrication

Uddin, A., Mahmud, M. A., Elumalai, N. K., Wang, D., Upama, M. B., Wright, M., Chan, K. H., Haque, F. & Xu, C., 27 Jul 2017, In: Renewable Energy and Environmental Sustainability. 2, 5 p., 7.

Plasmonics in Organic and Perovskite Solar Cells: Optical and Electrical Effects

Chan, K., Wright, M., Elumalai, N., Uddin, A. & Pillai, S., 17 Mar 2017, In: Advanced Optical Materials. 5, 6, p. 1-19 19 p., 1600698.

Optical modelling of P3HT:PC₇₁BM semi-transparent organic solar cell
Upama, M. B., Wright, M., Elumalai, N. K., Mahmud, M. A., Wang, D., Chan, K. H., Xu, C., Haque, F. & Uddin, A., 2 Jan 2017, In: Optical and Quantum Electronics. 49, 1, p. 1-6 6 p., 28.

Dark carrier dynamics and electrical characteristics of organic solar cells integrated with Ag-SiO₂ core-shell nanoparticles
Chan, K. H., Elumalai, N. K., Tayebjee, M. JY., Uddin, A. & Pillai, S., Jan 2017, In: Synthetic Metals. 223, p. 34-42 9 p.

Low temperature processed ZnO thin film as electron transport layer for efficient perovskite solar cells
Mahmud, M. A., Elumalai, N. K., Upama, M. B., Wang, D., Chan, K. H., Wright, M., Xu, C., Haque, F. & Uddin, A., Jan 2017, In: Solar Energy Materials and Solar Cells. 159, p. 251-264 14 p.

A high performance and low-cost hole transporting layer for efficient and stable perovskite solar cells
Mahmud, M. A., Elumalai, N. K., Upama, M. B., Wang, D., Gonçales, V. R., Wright, M., Xu, C., Haque, F. & Uddin, A., 2017, In: Physical Chemistry Chemical Physics. 19, 31, p. 21033-21045 13 p.

Controlled nucleation assisted restricted volume solvent annealing for stable perovskite solar cells
Mahmud, M. A., Elumalai, N. K., Upama, M. B., Wang, D., Haque, F., Wright, M., Xu, C. & Uddin, A., 2017, In: Solar Energy Materials and Solar Cells. 167, p. 70-86 17 p.

Controlled Ostwald ripening mediated grain growth for smooth perovskite morphology and enhanced device performance
Mahmud, M. A., Elumalai, N. K., Upama, M. B., Wang, D., Puthen-Veettil, B., Haque, F., Wright, M., Xu, C., Pivrikas, A. & Uddin, A., 2017, In: Solar Energy Materials and Solar Cells. 167, p. 87-101 15 p.

Electroluminescence Analysis For Separation of Series Resistance From Recombination Effects in Silicon Solar Cells with Interdigitated Back Contact Design

Wang, D., Elumalai, N. K., Mahmud, M. A., Upama, M. B., Wright, M., Chan, K. H., Xu, C. & Uddin, A., 2017, 2017 IEEE 44th Photovoltaic Specialist Conference, PVSC 2017. Piscataway, NJ: IEEE, Institute of Electrical and Electronics Engineers, p. 2667-2671 5 p. (2017 IEEE 44th Photovoltaic Specialist Conference, PVSC 2017).

Graded (Al_zGa_{1-z})_xIn_{1-x}P Window-Emitter Structures for Improved Short-Wavelength Response
Mahmud, M. A., Elumalai, N. K., Upama, M. B., Wang, D., Wright, M., Chan, K. H., Xu, C. & Uddin, A., 2017, 2017 IEEE 44th Photovoltaic Specialist Conference, PVSC 2017. Piscataway, NJ: IEEE, Institute of Electrical and Electronics Engineers, p. 2079-2083 5 p. (2017 IEEE 44th Photovoltaic Specialist Conference, PVSC 2017).

High-efficiency semitransparent organic solar cells with non-fullerene acceptor for window application
Upama, M. B., Wright, M., Elumalai, N. K., Mahmud, M. A., Wang, D., Xu, C. & Uddin, A., 2017, In: ACS Photonics. 4, 9, p. 2327-2334 8 p.

High performance semitransparent organic solar cells with 5% PCE using non-patterned MoO₃/Ag/MoO₃ anode
Upama, M. B., Wright, M., Elumalai, N. K., Mahmud, M. A., Wang, D., Chan, K. H., Xu, C., Haque, F. & Uddin, A., 2017, In: Current Applied Physics. 17, 2, p. 298-305 8 p.

Interfacial engineering of electron transport layer using Caesium Iodide for efficient and stable organic solar cells
Upama, M. B., Elumalai, N. K., Mahmud, M. A., Wright, M., Wang, D., Xu, C., Haque, F., Chan, K. H. & Uddin, A., 2017, In: Applied Surface Science. 416, p. 834-844 11 p.

Interfacial engineering of hole transport layers with metal and dielectric nanoparticles for efficient perovskite solar cells
Wang, D., Chan, K. H., Elumalai, N. K., Mahmud, M. A., Upama, M. B., Uddin, A. & Pillai, S., 2017, In: Physical Chemistry Chemical Physics. 19, 36, p. 25016-25024 9 p.

Photo-degradation of high efficiency fullerene-free polymer solar cells
Upama, M. B., Wright, M., Mahmud, M. A., Elumalai, N. K., Soufiani, A. M., Wang, D., Xu, C. & Uddin, A., 2017, In: Nanoscale. 9, 47, p. 18788-18797 10 p.

Solution-processed lithium-doped ZnO electron transport layer for efficient triple cation (Rb, MA, FA) perovskite solar cells
Mahmud, M. A., Elumalai, N. K., Upama, M. B., Wang, D., Soufiani, A. M., Wright, M., Xu, C., Haque, F. & Uddin, A., 2017, In: ACS Applied Materials and Interfaces. 9, 39, p. 33841-33854 14 p.

Single vs mixed organic cation for low temperature processed perovskite solar cells
Mahmud, M. A., Elumalai, N. K., Upama, M. B., Wang, D., Wright, M., Chan, K. H., Xu, C., Haque, F. & Uddin, A., 20 Dec 2016, In: Electrochimica Acta. 222, p. 1510-1521 12 p.

Hysteresis in organic-inorganic hybrid perovskite solar cells
Elumalai, N. K. & Uddin, A., Dec 2016, In: Solar Energy Materials and Solar Cells. 157, p. 476-509 34 p.

Augmentation of optoelectronic properties via P3HT doping for low temperature processed perovskite solar cell
Mahmud, M. A., Elumalai, N. K., Upama, M. B., Wang, D., Wright, M., Chan, K. H., Xu, C. & Uddin, A., 18 Nov 2016, 2016 IEEE 43rd Photovoltaic Specialists Conference, PVSC 2016. New Jersey: IEEE, Institute of Electrical and Electronics Engineers, p. 1653-1656 4 p. 7749903. (Conference Record of the IEEE Photovoltaic Specialists Conference; vol. 2016-November).

Analysis of burn-in photo degradation in low bandgap polymer PTB7 using photothermal deflection spectroscopy
Upama, M. B., Wright, M., Puthen-Veettil, B., Elumalai, N. K., Mahmud, M. A., Wang, D., Chan, K. H., Xu, C., Haque, F. & Uddin, A., 2016, In: RSC Advances. 6, 106, p. 103899-103904 6 p.

Enhanced stability of low temperature processed perovskite solar cells via augmented polaronic intensity of hole transporting layer
Mahmud, M. A., Elumalai, N. K., Upama, M. B., Wang, D., Chan, K. H., Wright, M., Xu, C., Haque, F. & Uddin, A., 2016, In: Physica Status Solidi - Rapid Research Letters. 10, 12, p. 882-889 8 p.

Hysteresis and electrode polarization in normal and inverted hybrid perovskite solar cells
Elumalai, N. K., Mahmud, A., Wang, D., Wright, M., Upama, M. B., Chan, K. H., Xu, C. & Uddin, A., 2016, Conference Record of the IEEE Photovoltaic Specialists Conference. Piscataway, NJ: IEEE, Institute of Electrical and Electronics Engineers, Vol. 2016-November. p. 764-767 4 p.

Open circuit voltage of organic solar cells: An in-depth review
Elumalai, N. K. & Uddin, A., 2016, In: Energy and Environmental Science. 9, 2, p. 391-410 20 p.

Optical Modelling of Semi-transparent OPV devices
Upama, M. B., Wright, M., Elumalai, N. K., Mahmud, M. A., Wang, D., Chan, K. H., Xu, C., Haque, F. & Uddin, A., 2016, 2016 International Conference on Numerical Simulation of Optoelectronic Devices (NUSOD). Piprek, J., Poulton, C., Steel, M. & de Sterke, M. (eds.). 1 ed. Piscataway, NJ: IEEE, Institute of Electrical and Electronics Engineers, p. 45-46 2 p.

Perovskite solar cells: Progress and advancements
Elumalai, N. K., Mahmud, M. A., Wang, D. & Uddin, A., 2016, In: Energies. 9, 11, p. 1-20 20 p., 861.

Simultaneous enhancement in stability and efficiency of low-temperature processed perovskite solar cells
Mahmud, M. A., Elumalai, N. K., Upama, M. B., Wang, D., Wright, M., Sun, T., Xu, C., Haque, F. & Uddin, A., 2016, In: RSC Advances. 6, 89, p. 86108-86125 18 p.

Stability of perovskite solar cells
Wang, D., Wright, M., Elumalai, N. K. & Uddin, A., 2016, In: Solar Energy Materials and Solar Cells. 147, p. 255-275 21 p.

p-CuO/n-Si heterojunction solar cells with high open circuit voltage and photocurrent through interfacial engineering
Masudy-Panah, S., Dalapati, G. K., Radhakrishnan, K., Kumar, A., Tan, H. R., Naveen Kumar, E., Vijila, C., Tan, C. C. & Chi, D., May 2015, In: Progress in Photovoltaics: research and applications. 23, 5, p. 637-645 9 p.

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Elumalai, N. K., Vijila, C., Jose, R., Uddin, A. & Ramakrishna, S., 2015, In: Materials for Renewable and Sustainable Energy. 4, 3, 11.

Nanostructured Materials for Sustainable Energy

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Does carbon coating really improves the electrochemical performance of electrospun SnO_2 anodes?

Aravindan, V., Sundaramurthy, J., Elumalai, N. K., Kumar, P. S., Ling, W. C., von Hagen, R., Mathur, S., Ramakrishna, S. & Madhavi, S., 1 Mar 2014, In: *Electrochimica Acta*. 121, p. 109-115 7 p.

Effect of trap depth and interfacial energy barrier on charge transport in inverted organic solar cells employing nanostructured ZnO as electron buffer layer

Elumalai, N. K., Vijila, C., Jose, R., Jie, Z. & Ramakrishna, S., 2014, In: *International Journal of Nanotechnology*. 11, 1/2/3/4

Biological, Chemical, and Electronic Applications of Nanofibers

Elumalai, N. K., Nguyen*, L. TH., Chen*, S., Prabhakaran, M. P., Zong, Y., Vijila, C., Allakhverdiev, S. I. & Ramakrishna, S., Aug 2013, In: *Macromolecular Materials and Engineering*. p. 822-867 46 p.

Electrospun ZnO nanowire plantations in the electron transport layer for high-efficiency inverted organic solar cells

Elumalai, N. K., Jin, T. M., Chellappan, V., Jose, R., Palaniswamy, S. K., Jayaraman, S., Raut, H. K. & Ramakrishna, S., 2013, In: *ACS Applied Materials and Interfaces*. 5, 19, p. 9396-9404 9 p.

Engineering of binary metal oxide nanostructures for highly efficient and stable excitonic solar cells

ELUMALAI, NAVEEN. KUMAR., 2013, National University of Singapore.

Enhancing the stability of polymer solar cells by improving the conductivity of the nanostructured MoO_3 hole-transport layer

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Influence of trap depth on charge transport in inverted bulk heterojunction solar cells employing ZnO as electron transport layer

Elumalai, N. K., Vijila, C., Sridhar, A. & Ramakrishna, S., 2013, *2013 IEEE 5th International Nanoelectronics Conference (INEC)*. p. 346-349 4 p.

Random nanowires of nickel doped TiO_2 with high surface area and electron mobility for high efficiency dye-sensitized solar cells

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