A. MEENAKSHAMMA Ph.D
DST-Women Scientist-B
(Science & Technology interventions for societal benefit)
Department of Physics, Yogi Vemana University, Kadapa, India.
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SUMMARY:

- Highly professional, with detail-oriented skills offering over 05 years of experience in teaching and 06 years of experience in research with professional standards in meeting due diligence requirements and compliance.
- A very efficient lecturer and researcher develop and deliver various program of study at different level; transfers knowledge including practical skills, methods and techniques; encourages the development of innovative approaches to course design and ensures that teaching designs implemented comply with the quality educational standards and regulations of the department.
- Proficiency in handling and operation of sophisticated, analytical instruments like UV-Vis-NIR Spectrophotometer (Shamadzu, 170), Solar Simulator (PEC-L01, Peccell Inc.) with an AM 1.5 spectral filter and source meter (2401 Keithley Instruments Inc.), Electrochemical workstation IVIUMSTAT.h (at amplitude of 10 mV and in the 1 Hz to 1 MHz frequency range), Scanning Electron Microscopy (SEM, JEOL JSM-IT-500), powder X-ray diffractometer (Regaku, Miniflex II, with Cu Kα radiation operated at 35 kV and 30 mA)
- Experience in Surface analysis software.
- Proven track record on hands-on experience in synthesis and characterization of luminescent upconversion materials, which used for efficient eco-friendly, cost-effective Dye Sensitized Solar Cells and Perovskite Solar Cells used for the indoor and outdoor applications. Fabricated Dye Sensitized Solar Cells used for IoT devices.
- Demonstrated device performance of solar energy-based Dye Sensitized Solar Modules for indoor and outdoor conditions.
- Proven track record on design and development for various Solar Cells and Solar Modules, evaluating the performance, troubleshooting laboratory failures and implement corrective actions, technological transfer, industry collaboration
- Hands on experimental skills in carry out the low and high temperature experiments, analyse samples and their structural, optical property elucidation

EXPERIENCE IN PRODUCT DEVELOPMENT / TECHNOLOGY INNOVATION (DELIVERED IN 2020):

Successfully Synthesized $LiYF_4:Er^{3+}/Yb^{3+}$ upconversion materials at different LiOH concentrations by hydrothermal method and applied these materials on the fabrication of Dye Sensitized Solar Cells fabrication achieved 10.53 % efficiency. And successfully synthesized ZnO nanoparticles at different pH values achieved an efficiency of 13.38 %.

EDUCATION:

2024: DST-Women Scientist-B- Yogi Vemana University, Kadapa, Andhra Pradesh, India.
2023: Doctoral scholar in Physics – Yogi Vemana University, Kadapa, Andhra Pradesh, India.
2012: Master of Science in Physics from Sri Venkateswara University, Tirupati, Andhra Pradesh, India.
2010: Degree of Bachelor of Education in Physical Sciences and Mathematics from Sri Krishnadevaraya University, Andhra Pradesh, India
2009: Bachelor of Science in Physics, Chemistry, Mathematics from Sri Krishnadevaraya University, Andhra Pradesh, India

2006: Bard of Intermediate Education, Andhra Pradesh, India
2004: School of Secondary Education, Andhra Pradesh, India

FELLOWSHIP/PROJECT/ PROFESSIONAL RECOGNITION RECEIVED:

Project handled

(i) DST-Women Scientist -B (Science & Technology (S&T) interventions for societal benefit)

Project cost: ~20 Lakhs Role: Principal Investigator (2021-Till date)

Title: Design and Development of high performance, stable, cost-effective perovskite solar cells with upconverter and study its proto-type module advancement.

DST- SERB-EMR Role: Project Fellow (2018-2021)

Title: Fabrication of cost effective dye sensitized solar cells with platinum free counter electrode and bi-functional upconversion photo electrodes.

Fellowships availed:

- DST-SERB-EMR: Project Fellow and Senior research Fellow (2018-2021)

SUMMARY OF THE RESEARCH / TEACHING CONTRIBUTIONS:

Criteria	Institution	Yrs	Criteria	Status	Nos
Teaching:			Transfer of Technologies	Govt. Organization	**1**
2021 to till date (Total Period: 2021-2024)	YVU, Kadapa	**2**	Research Grants	Ongoing	**1**
				Completed	**1**
2018 to 2021	YVU-Kadapa	**3**	SCI / SSCI Indexed Articles	Published	**14**
			Fellowship/scholarship received	International	**-**
Research:				National	**2**
(i) Post-Doctoral Research			Papers presented in Conferences	International	**7**
2021 to till date (Total Period: 2021-2024)	YVU, Kadapa	**1**		National	**4**
(ii)Doctoral Research					
2018 to 2023	YVU, Kadapa	5			
			Book chapters	Completed	**2**

YVU- Yogi Vemana University, Kadapa, Andhra Pradesh

KEY ACHIEVEMENTS:

As Teaching Faculty:

- Teaching senior and entry level PG, UG and Intermediate students in the area of Fundamental Physics, Materials Science, Advanced Functional Materials, Nanotechnology, Instrumentation, Magnetism, Electronics, Optoelectronics/Photonics (devices and application), Modern Physics, NuclearPhysics, Solid State Physics
- Arranged research work sessions at laboratory and guided students on the procedures of performingspecific experiments.
- Informed students about the recent technological advantage based upon the fundamental principles ofPhysics
- Conducted course assessment tests and provided test feedback
- Arranged practical work sessions at laboratory and guided students on the procedures of performingspecific experiments and designed models relating to physical phenomenon.

As Doctoral Research Fellow:

- **Development of dye sensitized solar cells for indoor and outdoor lighting applications:** Developed $ZrO_2:Er^{3+}/Yb^{3+}$ upconversion based dye sensitized solar module and operated indoor and outdoor light conditions.
- **$NaYF_4:Er^{3+}/Yb^{3+}$:** Synthesized $NaYF_4:Er^{3+}/Yb^{3+}$ upconversion material based dye sensitized solar cells and perovskite solar cells achieved higher power conversion efficiency compared to commercial $NaYF_4:Er^{3+}/Yb^{3+}$
- **$CeO_2:Er^{3+}/Yb^{3+}$** : Hydrothermally synthesized $CeO_2:Er^{3+}/Yb^{3+}$ used to develop photoelectrode, its surface modified with LiI and sandwiched with the Platinum free SnS-Carbon counter electrode for the development of dye sensitized solar cell.
- Dual function $CeO_2:Er^{3+}/Yb^{3+}$ assisted photoelectrode sensitized with N719 and SPSQ1 dyes. Low cost PEDOT:PSS/SnS based counter electrode used for the development of dye sensitized solar cell.
- **$LiYF_4:Er^{3+}/Yb^{3+}$:** Dual function $LiYF_4:Er^{3+}/Yb^{3+}$ (upconverter, light scatter) assisted photoelectrode is co-sensitized, fabricated dye sensitized solar cell achieved higher power conversion efficiency for solar cell applications.

CURRENT RESEARCH & FUTURE PLAN:

- Development of Proto-type modules using Pb-free perovskite solar cells and integrated with Li-ion batteries, its applications
- Synthesis and characterization of luminescent materials, development of tandem solar cells using upconversion materials and its applications for IoT devices
- Research and development on environmentally friendly Pb-free, cost effective perovskite solar cells for renewable energy applications

PUBLICATIONS:

Journal Papers: 13 (International SCI Journals):

1. **A. Meenakshamma,** R. Rajeswari, M. Gurulakshmi, G. Siddeswaramma, Y. P. Venkata Subbaiah, and M. Raghavender*. Effective upconverter and light scattering dual function $LiYF_4:Er^{3+}/Yb^{3+}$ assisted photoelectrode for high performance co-sensitized DSSC. **ACS applied electronic materials, 2020, 2(1), 962-970. I.F: 4.7**
2. **A. Meenakshamma,** M. Gurulakshmi, S. Narendra babu, S. Suresh, Y. P. Venkata Subbaiah, and M. Raghavender*. Highly effective SnS composite counter electrode sandwiched bi-function $CeO_2:Er^{3+}/Yb^{3+}$ assisted surface modified photoelectroded dye sensitized solar cell exceeds 9.5% efficiency. **Solar energy, 2020, 207, 1158-1164. I.F: 6.7**
3. **A. Meenakshamma,** P. Muni Mounika, M. Gurulakshmi, T. Vijayalaxmi, K. Susmitha, M. Raghavender*. Co-sensitized photoelectrode of $CeO_2:Er^{3+}/Yb^{3+}$ dual functional upconverter with cost effective PEDOT:PSS/SnS bi-layer counter electrode for efficient dye sensitized solar cells, **Optical Materials, 2022, 129, 112515. I.F: 3.9**
4. **A. Meenakshamma**, P. Muni Mounika, M. Gurulakshmi, K. Susmitha, M. Raghavender***.** Dual function $NaYF_4:Yb^{3+}/Er^{3+}$ boosts efficiency beyond 11% for multi-dye sensitized solar cells and 16% for carbon based $CsPbI_2Br$ perovskite solar cells. **ChemPhotoChem, 2023, DOI: 10.1002/cptc.202200302. I.F:3.6**
5. **A. Meenakshamma*,** P. Muni Mounika, M. Gurulakshmi, K. Susmitha, D. Harinath, L. Goswami, G. Govind, M. Raghavender*. Voltage and power conversion performance of bi-

function ZrO_2: Yb^{3+}/Er^{3+} assisted and co-sensitized dye sensitized solar cells for Internet of Things applications. **CHEMPHYSCHEM, https://doi.org/10.1002/cphc.202300572 I.F: 3.5**

6. M. Gurulakshmi, **A. Meenakshamma**, K. Susmitha, N. Charanadhar, V. V. S. S. Srikanth, S. Narendra Babu, Y. P. Venkata Subbaiah, K. Venkateswarlu, M. Raghavender*. A transparent and Pt-free all-carbon nanocomposite counter electrode catalyst for efficient dye sensitized solar cells, **Solar energy, 2019, 193, 568-575. I.F: 6.7**
7. M. Gurulakshmi, **A. Meenakshamma**, G. Siddeswaramma, K. Susmitha, Y. P. Venkata Subbaiah, T. Narayana, M. Raghavender*. Electrodeposited MoS_2 counter electrode for flexible dye sensitized solar cell module with ionic liquid assisted photoelectrode. **Solar energy, 2020, 199, 447-452. I.F: 6.7**
8. M. Gurulakshmi, **A. Meenakshamma**, K. Susmitha, Y. P. Venkata Subbaiah, M. Raghavender*. Enhanced Performance of Dye-Sensitized Solar Cells (DSSCs) Based on MoS_2/Single-Walled Carbon Nanohorns Electrochemically Deposited on Bilayer Counter Electrodes. **Chem Plus Chem, 2020, 85 (12), 2599-2605, I.F: 3.2**
9. M. Sasi Kumar, M. Gurulakshmi, **A. Meenakshamma**, S. Mahesh, V. Jayathirtha Rao, S. Narendra Babu, C. Prabhakar, M. Raghavender, P.Someshwar. Cost effective thiophene assisted novel dopant-free hole transport materials for efficient perovskite solar cell performance. **Sustainable energy fuels, 2020, 4, 4754-4767. I.F: 6.8**
10. M.Gurulakshmi, **A.Meenakshamma**, T.Vijayalakxmi, M.Raghavender*. Optimal Dye Sensitized Solar Cell and Photocapacitor Performance with Efficient Electrocatalytic SWCNH Assisted Carbon Electrode. **ACS applied energy materials, 2021, 4(10), 11225-11233. I.F: 6.4**
11. M. Kishore, K. Ranjith, **A. Meenakshamma**, C. Prabhakar, R. Subhrangsu, V. D. Jadhav, S. Narendra Babu, G. Rambabu, M. Raghavender* and P. Someshwar*. Benzodithiophene-Based, Donor–Acceptor–π–Donor–Acceptor Systems as Hole Transporting Materials for Efficient Perovskite Solar Cells. **ChemPhotoChem, 2022, doi.org/10.1002/cptc.202200062. I.F: 3.6**
12. A.C. Kasi Reddy, M. Gurulakshmi*, P. Muni Mounika, **A. Meenakshamma**, K. Venkateswarlu, Y.P. Venkata Subbaiah*, M. Raghavender*. Cost effective lithography based PEDOT:PSS, platinum counter electrodes for dye sensitized solar cells**. Inorganic chemistry communications, 2023, 151, 110561. I.F:3.4**
13. Parnapalli Muni Mounika, **Ambapuram Meenakshamma**, Maddala Gurulakshmi, Susmitha Kalvapalli, Ganesha Mukesh, Singh Ashutosh, Thota Narayana, Rajesh Manne, Giribabu Lingamallu, Venkateswarlu Katta, Mitty Raghavender*. Unveiling a New Frontier in Solar Power Conversion Efficiency with a Novel Bi-Facial Tandem Dye-Sensitized Solar Cells. **ACS Applied Electronic Materials, 2023**, 5**, 10, 5661–5667. I.F:4.7**
14. A. C. Kasi Reddy, V. Neeraja, **A. Meenakshamma**, M. Gurulakshmi, M. gurubaskar, M. Raghavender, Y. P. Venkata Subbaiah*. Efficient Counter Electrode of MoS2-GO/PEDOT:PSS for Platinum free, High Performance Dye Sensitized Solar Cells. **ChemistrySelect, DOI: doi.org/10.1002/slct.202305200**

BOOK CHAPTERS PUBLISHED:

1. **A. Meenakshamma**, M. Gurulakshmi, M. Raghavender. Metal Nitrides and carbides as advanced counter electrodes for dye sensitized solar cells. **Elsevier publications**, 2022. 219-225. ISBN: 978-0-12-823936-0.

2. K. Susmitha*, M. Gurulakshmi, **A. Meenakshamma**, M. Raghavender*. Advancement in Hole transport materials and device architecture of perovskite solar cells. **KROS publications**, 2021. ISBN: 978-81-949685-5-9.

CONFERENCES/SEMINORS PRESENTED/PARTICIPATED:

1. International conference on nanoscience and nanotechnology (ICONN) organized by department of Physics and nanotechnology, SRM Institute of Science and Technology, Tamil Nadu, India. Match 27th -29th, 2023.
2. Five Day Faculty Development Program (Online) on Nanomaterials for Sustainable Future organized by Physics Division, Department of Basic Science and Humanities, GMR Institute of Technology, Rajam. December 12th - 16th, 2022.
3. DST funded National workshop under STUTI (synergistic Training Program utilizing the Scientific and Technological Infrastructure held at Vellore Institute of Technology, Vellore. October 13th to 19th, 2022.
4. National Conference on science, technology and applications of Rare Earths (STAR-2022) jointly organized by rare earth association of India and department of physics and chemistry, Sri Venkateswara university, Tirupati. September 22nd -23rd, 2022. **Selected for best paper award.**
5. International Conference on Material Science-ICMS-2022 organized by JNTU-Ananthapuram, A.P. April 11th -13th, 2022.
6. International Conference on Optoelectronics and Advanced Materials, SV University, Tirupati. March 26th – 27th, 2021.
7. Online National Awareness Workshop on UGC-DAE CSR Facilities Organized by UGC-DAE Consortium for Scientific Research, Mumbai Centre &SWAYAM Cell, HNB Garhwal University, Srinagar-Garhwal, Uttarakhand. November 9th -12th, 2020.
8. International Virtual Conference on High-Performance Materials for Energy, Environment &Healthcare in the Digital Era organized by Centre for Materials Technology, School of Advanced Sciences, VIT, Vellore, India. 30th June &1st July, 2020.
9. National Conference on Luminescence and its applications (NCLA-2020) organized by Department of Physics, National institute of technology, Warangal and Luminescence Society of India (LSI), February 10-12, 2020.
10. International Conference on Material Science for Societal Advancement (MSSA-2020) Organized by Osmania University, Hyderabad. January 20th - 22nd, 2020.
11. International Conference on Multifunctional Materials (ICMM- 2019) organized by Geetanjali College of Engineering College, December 19th - 21st, 2019.
12. International Workshop on Materials Energy Conversion and Storage held at Indian Institute of Technology Tirupati, Andhra Pradesh, December 24th - 25th, 2019.
13. National seminar on “The role of science and Technology in confronting Environmental Issues” organized by Telangana Academy of Sciences and NTR Govt. Degree College (W), Mahabubnagar, April, 2019.
14. Andhra Pradesh Science Congress-2018, organized by Yogi Vemana University, Kadapa, November 9th - 11th, 2018. **Selected as best paper award.**

INSTRUMENTS PROCURED FROM OWN PROJECT:

1. **Materials synthesis setup:** Procured from DST-Women Scientist -B project in Yogi Vemana University, Kadapa. (Year of procurement: 2022, Condition: Running)
2. **Mini Fume hood:** Procured from DST-Women Scientist-B project in Yogi Vemana University, Kadapa. (Year of procurement: 2022, Condition: Running)

PERSONAL DETAILS:

Sex: Female **Nationality:** Indian **Marital Status:** Married **DOB:** 13/05/1989