

CURRICULUM VITAE

Dr. Sagar Bhattarai

Assistant Professor

Arunachal University of Studies

Namsai, Arunachal Pradesh (India)

Pin- 792103

E-mail: sagarbhattarai012@gmail.com

Mobile: +91-8135996060

<https://scholar.google.com/citations?user=1Y2FB0wAAAAJ&hl=en>

Permanent Address

T.K. Grant

Pin- 784145

Sipajhar (Darrang)

Assam (India)

Fields of Research Interest

- Condensed Matter Physics.
- Photovoltaic devices: Perovskite solar cell, Organic Light Emitting Diode, Mathematical Modeling, Simulations of devices.
- Optoelectronics: III-V inorganic compounds, Quantum dot and Quantum well.

Educational Degrees

- PhD: Department of Basic and Applied Science (Physics), National Institute of Technology, Arunachal Pradesh, 2019-2022.
Title of thesis: “Investigation on Perovskite material for Solar cell application”.
- M.Sc.: Department of Basic and Applied Science (Physics), National Institute of Technology, Arunachal Pradesh, 2017 (CGPA- 7.66)
- B.Sc.: Pub Kamrup College (Physics), Gauhati University, 2017, (CGPA-7.3)
- Higher Secondary: Sipajhar Higher Secondary and M.P School, Darrang, 2014 (71.8%).
- HSLC: Khalihai Anchalik Adarsha Vidyalaya, Sipajhar, 2012 (85.5%, with Distinction).

Experience in Research

- I. Working as HoD and Assistant Professor in Arunachal University of Studies, Namsai, Arunachal Pradesh (India). {From 19/09/2022- till now}
- II. Worked as a Doctoral Research Fellow in Department of Basic and Applied Science (Physics), National Institute of Technology, Arunachal Pradesh (June 2019 – August 2022).
- III. Worked as a Post-Graduate Research Scholar for 6 month in the Basic and Applied Science (Physics) (Dec 2018-June 2019).

Journal publications (SCI)

1. **Sagar Bhattarai**, Rahul Pandey, Jaya Madan, Debora Muchahary “A novel graded approach for improving the efficiency of lead-free perovskite solar cells”, *Solar Energy*, **244**, 255-263(2022) (**I.F- 7.188**).
2. **Sagar Bhattarai**, T. D. Das, “Optimization of carrier transport materials for the performance enhancement of the MAGeI_3 based perovskite solar cell”, *Solar Energy*, **217** (2021), 200 (**I.F- 7.188**).
3. **Sagar Bhattarai**, Asya Mhamdi, Ismail Hossain, Yassine Raoui, Rahul Pandey, Jaya Madan, Abdelaziz Bouazizi, Madhusudan Maiti, Dipankar Gogoi, Arvind Sharma, “A detailed review of perovskite solar cells: Introduction, working principle, modelling, fabrication techniques, future challenges” *Micro and Nanostructures*, **172**, 2022, 207450. (**I.F- 3.22**).
4. **Sagar Bhattarai**, Arvind Sharma, T. D. Das, “Efficiency enhancement of perovskite solar cell by using doubly carrier transport layers with a distinct bandgap of MAPbI_3 active layer”, *Optik*, **224** (2020) 165430 (**I.F- 2.84**).
5. **Sagar Bhattarai**, Rahul Pandey, Jaya Madan, Firdousa Ahmed, Shahnaz Shabnam, *Material Today Communication*, 2022 (**I.F-3.662**).
6. **Sagar Bhattarai**, T. D. Das, “Optimization of the perovskite solar cell design to achieve a highly improved efficiency”, *Optical Materials*, **111** (2021), 110661 (**I.F- 3.754**).
7. **Sagar Bhattarai**, Arvind Sharma, Debora Muchahary, Dipankar Gogoi, T.D. Das, “Numerical simulation study for efficiency enhancement of doubly graded perovskite solar cell”, *Optical Materials*, **118** (2021), 111285(**I.F-3.754**).
8. **Sagar Bhattarai**, Arvind Sharma, Debora Muchahary, Monika Gogoi, T.D. Das, “Carrier transport layer free perovskite solar cell for enhancing the efficiency: a simulation study”, *Optik*, **243** (2021), 167492 (**I.F-2.84**).
9. **Sagar Bhattarai**, Arvind Sharma, PK Swain, T.D. Das, “Numerical Simulation to Design an Efficient Perovskite Solar Cell Through Triple-Graded Approach”, *Journal of Electronic Materials*, **50**(2021), 6756–6765 (**I.F-2.047**).
10. **Sagar Bhattarai**, Rahul Pandey, Jaya Madan, Asya Mhamdi, Abdelaziz Bouazizi, Debora Muchahary, Dipankar Gogoi, Arvind Sharma and T. D. Das, “Investigation of

- Carrier Transport Materials for Performance Assessment of Lead-Free Perovskite Solar Cells” IEEE Transactions on Electron Devices 2022 (0018-9383), 1-8 (**I.F- 3.221**).
11. Deboraj Muchahary, Lakum Sai Ram, Rewrewa Narzary, Partha Pratim Sahu, **Sagar Bhattarai**, Shubham Tayal, “Heterojunction between crystalline silicon and nanocomposite coupled ZnO· SnO₂ and optimization of its photovoltaic performance” Current Applied Physics, **38** (2022) 15-21(**I.F- 2.856**).
 12. Arvind Sharma, **Sagar Bhattarai** & T. D. Das, “Efficiency improvement of organic light-emitting diodes device by attaching microlens arrays and dependencies on the aspect ratio”, Indian Journal of Physics (2022) (**I.F- 1.9**).
 13. Rahul Pandey, Sagar Bhattarai, Kulbhushan Sharma, M. Khalid Hossain “Halide Composition Engineered Non-Toxic Perovskite-Silicon Tandem Solar Cell with 30.7% Conversion Efficiency” ACS Applied Electronic Materials DOI: 10.1021/acsaelm.2c01574 (2023) (**I.F- 4.494**).
 14. **Sagar Bhattarai** Rahul Pandey, “Performance analysis and optimization of all-inorganic CsPbI₃ based perovskite solar cell”, Indian Journal of Physics (2023) (**I.F- 1.9**).

Conference publications (Scopus indexed)

1. **Sagar Bhattarai**, Arvind Sharma, and T. D. Das, “Factor affecting the performance of perovskite solar cell for distinct MAPI layer thickness”, AIP Conference Proceedings, **2269**, 030071 (2020).
2. **Sagar Bhattarai**, Arvind Sharma, and T. D. Das, “Performance Enhancement for Scattering Effect in Perovskite Solar Cell with Distinct Cathode Materials” Electronic Systems and Intelligent Computing, 965-971 (2020) (**BOOK CHAPTER**)
3. Arvind Sharma, **Sagar Bhattarai**, and T. D. Das, “Fluorescent trilayer OLED device: An electrical and optical characterization-based simulation”, AIP Conference Proceedings, **2269**, 030049 (2020).
4. D Muchahary, **S Bhattarai**, AK Mahato, S Maity, “A Brief on Emerging Materials and Its Photovoltaic Application” Emerging Materials, 361-406 (**BOOK CHAPTER**)
5. Dipankar Gogoi, **Sagar Bhattarai**, Hrishikesh Kalita, TD Das, “Aluminum doped Zinc oxide anode film for performance enhancement of trilayer fluorescence organic light emitting diode” Materials Today: Proceedings doi: <https://doi.org/10.1016/j.matpr.2022.10.290>.

Book Publication

1. THE PHYSICS OF PEROVSKITE SOLAR CELLS: Materials and Characterizations, **ISBN: 9798887832289** (Notion Press).

Other Professional Experience

1. Faculty of Physics in Potential Coaching and Career Counselling, Itanagar Branch (Arunachal Pradesh).

References

1. Dr. Tushar Dhabal Das, Assistant Professor, Department of Basic and Applied Science, NIT Arunachal Pradesh, 791112, India (Email: tddas@hotmail.com).
2. Dr. Pratap Kumar Swain, Assistant Professor, Department of Basic and Applied Science, NIT Arunachal Pradesh, 791112, India (Email: pratap@nitap.ac.in)
3. Prof. Saurabh Basu, Professor, Department of Physics, IITG, Guwahati, Assam, 781039, India (Email: saurabh@iitg.ac.in)
4. Dr. Deboraaj Muchahari, Assistant Professor, National Institute of Technology, Raipur, Chhattisgarh, 492010, India. (Email: debomuchahary@yahoo.com).
5. Dr. Debojit Dutta, Assistant Professor, Department of Basic and Applied Science, NIT Arunachal Pradesh, 791112, India (Email: debjit@nitap.ac.in).
6. Dr. Rahul Pandey, Assistant Professor, Chitkara University, Punjab (Email: rahul.pndey@chitkara.edu.in).
7. Dr. Asya Mhamdi, Faculty of Sciences of Monastir, University of Monastir, 5019 Monastir, Tunisia (Email: mhamdiasya@gmail.com).

Other achievements

1. IIT –JAM qualified in the year of 2017.
2. Ranked 9th in Tezpur University Ph.D. Entrance Test (Physics) in the year of 2019.

Personal Details

Date of birth: October 15, 1995

Place of birth: Sipajhar, Assam, India