CURRICULUM VITAE

Dr. Manish Kumar

Deputy Director,

Centre for Green Energy and Nanotechnology (C-GENT) **&**

Assistant Professor

Department of Electronics and Communication Engineering

Himachal Pradesh University (HPU), Shimla, India

Total Citations – 1233 ; h-index – 12 ; i10-index – 16

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

Research Gate: https://www.researchgate.net/profile/Manish-Kumar-149

Linkedin: https://www.linkedin.com/in/manish-kumar-ph-d-b297b277/

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PERSONAL DETAILS

Date of Birth: Sept 11, 1991 **Gender**: Male

Native Place: Mandi, Himachal Pradesh **Nationality:** Indian

Correspondence Address: Department of Electronics and Communication Engineering, University Institute of Technology, Himachal Pradesh University (HPU), Summer Hill, Shimla, India - 171001

KEY AREA OF INTEREST AND FIELD OF WORK

- Integrated solar PV systems applications (Floating solar PV, Agriculture Based solar PV, etc.)
- Performance and reliability analysis of solar photovoltaic technologies
- Modeling of PV modules
- Environmental accelerated testing of PV modules
- PV modules' defects characterization using spatial and non-spatial techniques
- Optimization and sizing of PV systems

EDUCATIONAL QUALIFICATION

Ph.D. Department of Hydro and Renewable Energy Indian Institute of Technology (IIT) Roorkee, Uttarakhand, India **Thesis Title:** *Performance assessment of different photovoltaic technologies on water bodies*	October 2019 CGPA 7.86 /10
M.Tech Energy Technology National Institute of Technology (NIT) Hamirpur, Himachal Pradesh, India **Thesis Title:** *Modeling and output power prediction of PV Systems in real outdoor conditions*	July 2015 CGPA 8.28 /10 **(1st Division and Gold Medalist)**
B.Tech Electronics and Communication Engineering Himachal Pradesh University Shimla, Himachal Pradesh, India	June 2012 70.91% **(1st Division)**
Diploma Electronics and Communication Engineering Government Polytechnic Rohroo, Shimla, Himachal Pradesh, India	June 2009 74.39% **(1st Division)**

EXPERIENCE DETAILS

Designation	From	To	Period
Visiting Scientist Fraunhofer Institute for Solar Energy Systems ISE, Freiburg im Breisgau, Germany	September 2025	Ongoing	1 month
Deputy Director Centre for Green Energy and Nanotechnology (C-GENT), Himachal Pradesh University (HPU), Shimla, India	August 2025	Ongoing	2 months
Member, **Board of Governors** National Skill Development Forum (NSDF) The Institution of Engineers (India) (IEI)	June 2025	Ongoing	4 months
Assistant Professor (Regular) Department of Electronics and Communication Engineering, Himachal Pradesh University (HPU), Shimla, India	May 2022	Ongoing	3.3 years
Scientist (Regular) Solar Power System Department, Institute of Energy Technology (IFE) Kjeller, Norway	October 2021	May 2022	8 months
Postdoctoral Fellow Department of Energy Science and Engineering Indian Institute of Technology (IIT) Bombay, Mumbai, India	December 2019	September 2021	1 year 9 months

CURRENT RESEARCH GRANTS & CONSULTANCY PROJECTS

- **Project Name:** Development of a Solar Tree-Based Agro-PV System with AI Optimization to Improve Performance, Reliability, and Crop Yield for Sustainable Energy and Agriculture
  - **Funding Organization:** Anusandhan National Research Foundation, Ministry of Science and Technology, Govt. of India under ANRF PMECRG
  - **Budget:** ≈ ₹58 Lakh
- **Project Name:** Long-Term Stability, Performance, and Reliability Analysis of Perovskite Solar Cells Under Real-World Environmental Conditions
  - **Funding Organization:** Anusandhan National Research Foundation (ANRF), Government of India under ANRF PAIR
  - **Budget:** ₹10 crores (Total Project Budget); Approx. ₹1.3 crores allocated to Co-PI
- **Project Name:** Performance assessment of different PV technologies for Floating PV systems
  - **Funding Organization:** Universiti Brunei Darussalam, Govt of Brunei
  - **Budget:** ≈ ₹ 30 lakh
- **Consultancy Project Name:** Site Performance Acceptance Testing of 5 MT Solar Cold Storage System at Bajaura, Kullu District, Himachal Pradesh
  - **Sponsoring Agency:** CoolCrop Technologies, in collaboration with Energy Efficiency Services Limited (EESL) and Himachal Pradesh Horticulture Department
  - **Amount:** ₹1,10,000

PUBLICATIONS

Published Journal Articles (All are SCI/SCIE indexed):

1. V. S. Nysted, L. E. S. Stieng, **M. Kumar**, N. Roosloot, G. Otnes, T. Kjeldstad, and J. Selj, 2025. Modelling wave induced losses for floating photovoltaics: Impact of design parameters and environmental conditions. ***Solar Energy***, vol. 293, p. 113439 **(I.F. = 6.0)**
2. A. Pareek, H.M. Niyaz, M. Kumar, and R. Gupta, 2024. Categorizing Indian states based on operating condition of photovoltaic system. ***Solar Energy Advances***, vol. 4, p.100052. **(I.F. = NA)**
3. **M. Kumar**, P. Malik, R. Chandel, and S. S. Chandel, 2023. Development of a novel solar PV module model for reliable power prediction under real outdoor conditions. ***Renewable Energy***, vol. 217, p.119224. **(I.F. = 9.0)**
4. P. Malik, M. Awasthi, S. Upadhyay, P. Agrawal, G. Raina, S. Sharma, **M. Kumar**, S. Sinha. Planning and optimization of sustainable grid integrated hybrid energy system in India. ***Sustainable Energy Technologies and Assessments.*** vol. 56. pp. 103115 **(I.F. = 7.1)**
5. *R. Meena, ****M. Kumar,*** *S. Kumar, R. Gupta, 2022. Comparative degradation analysis of accelerated-aged and field-aged crystalline silicon photovoltaic modules under Indian subtropical climatic conditions. ***Results in Engineering***. vol. 16, pp. 100674

   Authors marked with * have contributed equally and are also first authors **(I.F. = 6.0)**
6. R. Meena, **M. Kumar,** R. Gupta, 2022. Investigation of dominant degradation mode in field-aged photovoltaic modules using novel differential current-voltage analysis approach. ***Progress in Photovoltaics: Research and Applications***. vol. 30, pp. 1312-1324 **(I.F. = 8. 0)**
7. T. Kjeldstad, V. S. Nysted, **M. Kumar**, S. Oliveira-Pinto, G. Otnes, D. Lindholm, J. Selj, 2022. The performance and amphibious operation potential of a new floating photovoltaic technology. ***Solar Energy,*** vol. 239, pp. 242-252 **(I.F. = 6.0)**
8. **M. Kumar,** H. M. Niyaz, R. Gupta, 2021. Challenges and opportunities towards the development of floating photovoltaic systems. ***Solar Energy Materials and Solar Cells***. vol. 233, pp. 1-43 **(I.F. = 6.3)**
9. H. Mohammed, **M. Kumar**, R. Gupta, 2021. Estimation of module temperature for water-based photovoltaic systems. ***Journal of Renewable and Sustainable Energy - AIP.*** vol**.** 13, pp. 053705 **(I.F. = 2.1)**
10. **M. Kumar,** A. Kumar, R.Gupta, 2021. Comparative degradation analysis of different photovoltaic technologies on experimentally simulated water bodies and estimation of evaporation loss reduction. ***Progress in Photovoltaics: Research and Applications,*** 29, pp. 357-378 **(I.F. = 8.0)**
11. H. Mohammed, **M. Kumar**, R. Gupta, 2021. Mapping of Most Frequent Operating Condition of Photovoltaic Module Across India. ***Sustainable Energy Technologies and Assessments***, 47, p.101369 **(I.F. = 7.1)**
12. **M. Kumar**, S.S. Chandel, A. Kumar, 2020. Performance analysis of a 10 MWp utility scale grid-connected canal-top photovoltaic power plant under Indian climatic conditions. ***Energy***, 204, p.117903. **(I.F. = 9.0)**
13. H. Mohammed, **M. Kumar**, R. Gupta, 2020. Bypass diode effect on temperature distribution in crystalline silicon photovoltaic module under partial shading. ***Solar Energy***, 208, pp. 182-194 **(I.F. = 6.0)**
14. **M. Kumar,** A. Kumar, 2020. Experimental Characterization of the Performance of Different Photovoltaic Technologies on Water-bodies**.** ***Progress in Photovoltaics: Research and Applications,*** 28, pp. 25-48. **(I.F. = 8.0)**

15. **M. Kumar**, A. Kumar, 2019. Performance Assessment of Different Photovoltaic Technologies for Canal-Top and Reservoir Applications in Subtropical Humid Climate. ***IEEE Journal of Photovoltaics***, 9, pp. 722-732. **(I.F. = 2.5)**
16. **M. Kumar**, A. Kumar, 2019. Experimental validation of performance and degradation study of canal-top photovoltaic system. ***Applied Energy***, 243, pp. 102-118. **(I.F. = 10.1)**
17. **M. Kumar**, A. Kumar, 2017. Performance assessment and degradation analysis of solar photovoltaic technologies: A review. ***Renewable and Sustainable Energy Reviews***, *78*, pp. 554-587. **(I.F. = 16.3)**
18. **M. Kumar**, A. Kumar, 2017. An efficient parameters extraction technique of photovoltaic models for performance assessment. ***Solar Energy***, *158*, pp. 192-206. **(I.F. = 6.0)**
19. A. Kumar, **M. Kumar**, 2017. Solar energy in irrigation. ***Journal of Indian Water Resources Society***, 37, pp. 13-20

Published Conference Articles:

1. D. Sharma, M. Sharma, C. Kumar, and **M. Kumar**, "Evaluating the Performance of Temporal Fusion Transformer for Accurate Solar PV Power Prediction," ***IEEE 5th International Conference on Sustainable Energy and Future Electric Transportation (SEFET 2025)***, **MNIT Jaipur**, 2025, Jaipur, India (Accepted)
2. A. Sharma, J. Kaur, and **M. Kumar**, "A Technical Review on Emerging Li-Fi Technology," ***Proceedings of the International Conference on Innovation in Clean Energy Technologies (ICET) 2023,*** **MNIT Bhopal**, 2023.
3. **M. Kumar**, V. S. Nysted, G. Otnes, T. Kjeldstad, N. Roosloot, J. Selj. Impact of Water Waves on the Output Power of Floating PV Systems on Water Bodies. ***In 2022 8th World Conference on Photovoltaic Energy Conversion (WCPEC) (A Joint Conference of 50th IEEE PVSC, 32th PVSEC & 39th EU PVSEC).*** Sep 26-30, Milan, Italy
4. **M. Kumar**, H. Mohammed, R. Gupta. Analysis of Partial Shading Effect on the Crystalline Silicon Photovoltaic Module Temperature Distribution. ***In 2021 4th International Conference on Recent Developments in Control Automation and Power Engineering (RDCAPE 2021)***. IEEE, 7th-8th October 2021, India.
5. **M. Kumar**, H. Mohammed, R. Gupta. Comparative Performance Evaluation of Multi-crystalline and Thin-film PV Technologies on the Water Surface. ***In 2021 4th International Conference on Recent Developments in Control Automation and Power Engineering (RDCAPE 2021)***. IEEE, 7th-8th October 2021, India
6. **M. Kumar**, A. Kumar, 2020, Dec. Performance of Solar Photovoltaic systems under the influence of climatic parameters and carbon emission reduction. ***In 2020 International Conference on Challenges and Applications in Clean Energy (ICCACE-2020).*** Dec 25-26, NIT Kurukshetra, India.
7. **M. Kumar**, A. Kumar, 2018, June. Power Estimation of Photovoltaic System using 4 and 5-parameter Solar Cell Models under Real Outdoor Conditions. In ***2018 IEEE 7th World Conference on Photovoltaic Energy Conversion (WCPEC) (A Joint Conference of 45th IEEE PVSC, 28th PVSEC & 34th EU PVSEC)*** (pp. 0721-0726). IEEE. June 10-15, Hawaii, USA.
8. **M. Kumar**, A. Kumar, 2018, Jan. Effect of environmental parameters on the performance of Solar Photovoltaic systems. In ***2018 International Conference on Electrical, Electronics, Computers, Communication, Mechanical and Computing (IEEE-EECCMC)***, Jan 28-29, Tamil Nadu, India.

9. **M. Kumar**, N. Kumar, S.S. Chandel, 2015**.** Power prediction of photovoltaic system using four parameter model**.** ***In 2015 SARC-International Conference on Industrial Electronics and Computer Science (ICIECS-2015),*** 29 March 2015, Pune**.**

Book Chapters:

1. **Manish Kumar,** Roopmati Meena, Rajesh Gupta, 2021. Floating photovoltaic systems: an emerging PV technology. Enabling Methodologies for Renewable and Sustainable Energy, ***CRC Press, Taylor & Francis***
2. Roopmati Meena, **Manish Kumar,** Rajesh Gupta, 2021. Reliabilty and degradation analysis of crystalline silicon photovoltaic module. Advancements in Renewable Energy Development, ***River Press, Denmark and IEEE digital xplore***
3. Ravi Kumar, **Manish Kumar,** Rajesh Gupta, 2021. Leakage current in solar photovoltaic modules. Advancements in Renewable Energy Development, ***River Press, Denmark and IEEE digital xplore***

SCHOLASTIC ACHIEVEMENTS (AWARDS AND RECOGNITIONS)

- ***INTERNATIONAL***
  1. International Fellowship awarded under **Paired Early Career Fellowship in Applied Research (PECFAR) 2025 by Indo-German Science & Technology Centre (IGSTC)** for two months (starting from August 2025 to October 2025) reseach stay at **Fraunhofer Institute for Solar Energy Systems in Germany**
  2. Scholarship awarded by **Ministry of Science and Technology, Taiwan** to attend nine day training program on Renewable Energy at **National Taiwan University, Taipei City, Taiwan.**
  3. Scholarship awarded under **PROM Programme "International scholarship exchange of PhD candidates and academic staff**", realized by the **Polish National Agency of Academic Exchange** and financed by the **European Union from the European Social Fund** for research stay at Lodz University of Technology (TUL), Poland.
  4. **International Travel Support (ITS)** to attend WCPEC-7 conference awarded by Science and Engineering Research Board, **Government of India.**
- ***NATIONAL***
  1. **Gold medalist** in Master in Technology (M.Tech) at National Institute of Technology, Hamirpur, India.
  2. **Best Paper Award** for at International Conference on Innovation in Clean Energy technologies at MNIT Bhopal 2023
  3. **Student Career Development Fund (SCDF)** awarded by alumni association of Indian Institute of Technology Roorkee, India.
  4. **Editor** for book on **Sustainable Distribution Systems: Integrated Planning of Renewable Energy Resources, Electric Vehicle, and Green Energy Storage**, by **CRC Press, Taylor & Francis Group (2025**). This book focuses on the integrated planning of renewable energy sources, electric vehicle infrastructure, and green energy storage for sustainable power distribution.
  5. Appointed as **Review Editor** in **Frontier in Energy Research** (SCI/SCIE Journal; I.F. 2.746)
  6. **MHRD scholarship** awarded by Government of India for **Doctoral Studies** from 2015 to present.
  7. **MHRD scholarship** awarded by Government of India for **Post graduate course** from 2013-2015.
  8. GATE qualified 2013 in Electronics and Communication Engineering.

9. **Mukhya Mantri Protsahan Yojna (MMPY) Scholarship** awarded by **Govt. of Himachal Pradesh** for getting admission in Indian premier institute
10. Reviewer of various peer reviewed journals such as **Nature sustainability, Solar Energy, Renewable Sustainable Energy Reviews, Energy Science and Engineering, International Transactions on Electrical Energy Systems, etc.**

STUDENTS MENTORSHIP/ TEACHING ASSISTANTSHIP

- **Student mentorship**

During Assistant Professorship at Himachal Pradesh University (HPU):

1. Guiding Ph.D. student Dheeraj Sharma on developing an artificial intelligence framework for assessing the performance and reliability of PV systems on water bodies.

During Postdoc at IIT Bombay:

- Partially guided a Ph.D student (Humaid Mohammed Niyaz) on the topic of Performance analysis of PV systems and estimation of PV module temperature under different environmental conditions.
- Partially guided a Ph.D student (Roopmati Meena) on the topic of characterization and degradation analysis of field aged PV module.
- Guided two M.Tech and one B.Tech students on the topic of potential induced degradation in PV systems and parameters extraction techniques of PV modules for their characterization.

During Ph.D at IIT Roorkee:

- During my Ph.D. at IIT Roorkee, I guided M.Tech students on modeling PV modules and analyzing system performance under varying environmental conditions. I also provided dedicated one-on-one support to students with special needs, assisting them in successfully completing their theses. Additionally, I served as the department coordinator, representing research-related concerns of PG students before the institute administration.

Teaching Assistantship

During Postdoc at IIT Bombay:

1. Demonstrated experiments to PG and PhD students in the PV reliability and NDT laboratory

During Ph.D at IIT Roorkee:

1. Demonstrated experiments to UG and PG students in the solar energy laboratory

SKILLS

- **Equipment handled:**
  - Environmental chamber for PV modules
  - I-V curve simulators
  - Infrared Thermography
  - PV curve analyzer
  - Dark lock-in Thermography (DLIT)
  - Electroluminescence (EL) Imaging technique
  - Insulation resistance measurement
- **Tools:** HOMER, MATLAB, PVsyst, RETscreen, Origin, etc.
- **Languages Known:** English (S/R/W); Hindi (S/R/W)
- **Countries Visited:** United States of America, China, Taiwan, France, Germany, Czech Republic, Italy, Norway, Sweden, The Netherlands, Poland, Spain etc.

OTHER ACADEMIC RESPONSIBILTIES

- **Institution Coordinator** – Responsible for coordinating the signing and execution of Memorandums of Understanding (MoUs) among various institutions.
- Faculty In-Charge, Basic Electronics Laboratory – Oversight and management of laboratory operations and academic activities.
- **Additional In-Charge, Training and Placement Cell** – Assisting in coordinating training sessions and placement activities for students.
- **Institution Coordinator, Innovation Club** – Leading and managing innovation-related initiatives and events at the institutional level.
- **Joint Secretary, NIT Hamirpur Alumni Association** – Assisting in the administration and coordination of alumni affairs and events.
- **Committee Member, University-Level Collaboration and Community Engagement Committee** – Contributing to initiatives and partnerships related to community outreach and institutional collaboration.

GUEST TALK DELIVERED

- Acted as a resource person on **floating PV systems** at **international forum** which is jointly organized **by IEEE Lahore section and Institute if IT Experts on 5th October 2020.**
- Acted as a resource person **on FDP program** at **Vivekananda Institute of Technology (VIT)**, Jaipur which is jointly organized by **VIT Jaipur and RTU Kota on** 22 Sep 2020.
- Acted as a resource person **on FDP program** at **JNTUA College of Engineering,** Chittoor which is sponsored by Faculty Development Cell, AICTE, under Technical Teachers Training scheme of AICTE, New Delhi on 2nd - 7th November 2020.
- Acted as a resource person in DST sponsored six-week Solar Technology based online Entrepreneurship program **at Shri Vishwakarma Skill University (SVSU) (India's first government skill university) Haryana** from 15th March to 28th April 2021.
- Acted as a resource person **on FDP program** "Advances in Renewable Energy and Smart Grid Integration" **at Amity University Noida** from 31th May to 04th June 2021.
- Acted as a resource person **on FDP program** " "Role of Renewable Energy Sources in Power System" **at Government Engineering College, Patan** held on 8th July 2021.
- Acted as a resource person **on FDP program** "Recent trends on green technologies" **at GMR Institute of Technology, Rajam, Andhra Pradesh** from 12th July to 17th July 2021.
- Acted as a resource person **on PVQAT Series at international forum in International PV Quality Assurance Task Force on** December 14, 2022.
- Acted as a resource person **on FDP program** at **VIT Vellore on 26th May, 2023**.
- Acted as a resource person **on FDP program** at **NIT Jalandhar on 5th June, 2023**.
- Acted as a resource person **on FDP program on "Futuristic Trends in Clean Energy and Manufacturing Technologies" at HBTU Kanpur on Jan 02 2025**
- Invited Expert Lecture on STC program on "**Opportunities and Challenges in Green Energy Transition**" at NIT Patna from 29th July 2024 to 2nd August 2024

TRAINING/WORKSHOP

- One-week FDP program on **"Energy Engineering"** September 26-30, 2020, organised by AICTE Training And Learning (ATAL) Academy at National Institute of Technology, Silchar, India
- One-week short term training program on "**Application of Artificial Intelligence in Electrical Energy System**" August 17-21, 2020, organised by National Institute of Technology, Srinagar, India

- Online international short term course on "**Microgrid Opportunity: Renewable Energy Resources and Buildings**", June 16-20, 2020, organised by Faculty of Engineering, Dayalbagh Educational Institute, Dayalbagh, Agra, India,
- Workshop on "**Thin Film Solar Cells",** April 16 - 17, 2018, organized by Indian Institute of Technology Roorkee.
- APEC Workshop on "**Promoting Community Empowerment in APEC's Rural Area",** July 14 - 15, 2016, organized by Feng Chia University, Taiwan and supported by Asia-Pacific Economic Cooperation (APEC).
- **Southeast Asia International Joint-Research and Training Program for Green Energy Technologies: Biofuel and Renewable Energy Technologies** in June 8-June 16, 2016, Taiwan, organized and funded by MOST Taiwan.
- Workshop on "**National Workshop on Renewable Energy (NWRE-2014)**" held at Sundernagar, India, on November 22, 2014, Organized by Jawaharlal Nehru Government Engineering College and centre for sustainable development, Sundernagar, India.
- Two months training on "**Solar Radiation Forecast and Correlation with Other Weather Parameters**, May 27 - July 21, 2014, Solar Energy centre, Ministry of New and Renewable Energy, New Delhi, India.
- Training on "**Operation and Maintenance**", June 28- July 25 2010, Vodafone Essar Spacetel Ltd, India.
- Training on "**Telecommunication"** four week industrial training in June 2005, Bharat Sanchar Nigam Limited, Mandi, India.

EXTRA CURRICULARS

- District level Taekwondo Player.
- Participated in 21 km half marathon event, organised by, IIT Roorkee.
- Participated two times in Sangram (annual sports event), organised by, IIT Roorkee.
- Two times coordinator in the annual cultural event of IIT Roorkee
- Centre's Academic Programme Council Representative.
- Central election committee member at IIT Roorkee for conducting election for student representatives.
- Founding member of Institute Medical Emergency Fund at IIT Roorkee.

REFERENCES

Dr. Arun Kumar
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