**Dr. Manindra Kumar**

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| **Mob. No.:** +91 9451929427 |  |  |  |
| **Date of Birth:** 12 January 1986 |  |  |  |
| **Corresponding address:** |  |  |
| Manindra Kumar  |  |  |
| Department of Physics |  |  |
| Deen Dayal Upadhyaya Gorakhpur University |  |  |
| Gorakhpur- 273009 (U.P.) |  |  |  |
| India |  |  |  |  |
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|  |  |
| **Education:** |  |  |  |  |
|  |  |  |  |  |  |
|  | **Year** | **Course** | **Subject (s)** | **University/Board** | **Percentage** |
|  |  |  |  |  |  |
|  |  |  |  | Banaras Hindu |  |
| 2014 | Ph.D. | Physics | University, | Awarded |
|  |  |  |  | Varanasi (U.P.), |  |
|  |  |  |  | India |  |
|  |  |  |  | D.D.U. Gorakhpur |  |
| 2007 | Post-Graduation | Physics | University, | 61.77% |
|  |  | (M.Sc.) | (Spectroscopy) | Gorakhpur (U.P.), |  |
|  |  |  |  | India |  |
|  |  |  |  | D.D.U. Gorakhpur |  |
| 2005 | Graduation | Physics, Electronics, | University, | 61.61% |
|  |  | (B.Sc.) | Mathematics | Gorakhpur (U.P.), |  |
|  |  |  |  | India |  |
|  |  | Intermediate | Physics, Chemistry, | U.P. Board, |  |
| 2002 | (12th) | Mathematics, General | Allahabad, India | 68.20% |
|  |  |  | Hindi, English |  |  |
|  |  | High School | Science, Math, | U.P. Board, |  |
| 2000 | (10th) | Sanskrit, Hindi, | Allahabad, India | 61.00% |
|  |  |  | English, Social |  |  |
|  |  |  | Science |  |  |

**Research Interest:**

* Electrolyte materials for batteries, super-capacitors etc.
* Understanding the ion- dynamics behavior of solid polymer electrolytes.
* Microbial Fuel Cell

**Awards & Fellowship:**

* UGC-BHU Research Award
* Rajiv Gandhi National Fellowship
* UGC- Postdoctoral Fellowship 2015-17

**Teaching Experience (From January 2016 to till now):**

* B.Sc. (Hons.) IV semester: Modern Physics
* B.Sc. (Hons.) V semester: Electromagnetism
* B.Sc. I semester: Newtonian Mechanics
* B.Sc. V semester: Atomic and Molecular Spectra
* B.Sc. VI semester: Modern Physics
* M.Sc. II semester: Thermal properties (Solid State Physics)
* M.Sc. IV semester: Spectroscopy (Nonlinear Optics, Holography)

**Instrumentation handling/Analysis techniques:**

1. Metallization of thin films viz. high melting point materials using Vacuum coating unit (Hind Hivac 12A4D model); thermal evaporation method
2. FTIR study (with ATR attachment; MIRacle 10 & IRAffinity-1) of thin film and powder samples
3. Transference number measurement using computer controlled Keithley 2100 Digital multimeter and from WX3000 XYt recorder.
4. CH Instrument Electrochemical work station (600 series)
5. Agilent Precision Source/Measure Unit (SMU) B2900A series
6. Autolab potentiostat/galvanostat

**Patent:**

1. Electrolysis of starch-based electrolytes

Patent Number- 372370

Neelam Srivastava, **Manindra Kumar**, Tuhina Tiwari

1. Low Cost Electrolyte Membranes for Microbial Fuel Cell Application Synthesized by Complexing Starch (Wheat, Corn and Rice) with Salt

Neelam Srivastava, **Manindra Kumar**, Madhavi Yadav, Jagdish Kumar Chauhan, Dr. S Venkata Mohan, Naresh, Om Prakash

Application Number-201611006732 filed on 26/02/2016 *(Submitted)*

**List of Publications:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S.No.** | **Title** | **Authors** | **Journal name** | **Year** | **DOI** |
| 1 | High-temperature variable range hopping conduction and dielectric relaxation in CoFe2O4 ceramic | Sesh Mani Yadav, Sandeep Kumar, **Manindra Kumar**, Avijit Ghosh, Deepash Shekhar Saini | Open Ceramics | 2024 | <https://doi.org/10.1016/j.oceram.2023.100517>  |
| 2 | Conductivity and electrochemical behaviour of CoFe2O4 dispersed potato starch-based solid biopolymer electrolyte for energy application | Km Jyoti Rai, Deepash Shekhar Saini, Prashant Shahi, Marium Khan, Aalia Farid & **Manindra Kumar** | Ionics | 2024 | [10.1007/s11581-023-05353-9](https://doi.org/10.1007/s11581-023-05353-9)  |
| 3 | Investigation of dielectric relaxor-like anomaly behaviour of non-ferroelectric BaZrO3 polycrystalline ceramic | Deepash Shekhar Saini, Sandeep Kumar, Sesh Mani Yadav, **Manindra Kumar**, Avijit Ghosh | Materials Science and Engineering: B | 2023 | [10.1016/j.mseb.2023.116603](https://doi.org/10.1016/j.mseb.2023.116603) |
| 4 | High-conducting, economical, and flexible polymer-in-salt electrolytes (PISEs) suitable for energy devices: a reality due to glutaraldehyde crosslinked starch as host | Madhavi Yadav, **Manindra Kumar** & Neelam Srivastava | Journal of Solid State Electrochemistry | 2023 | [10.1007/s10008-023-05421-0](https://doi.org/10.1007/s10008-023-05421-0) |
| 5 | Conductivity, Dielectric and Modulus Study of NH4PF6 Based Zwitterionic Polymer Electrolyte | **Manindra Kumar,**  Neelabh Srivastava | Recent Innovations in Chemical Engineering | 2021 | [10.2174/2405520413999200807151653](http://dx.doi.org/10.2174/2405520413999200807151653) |
| 6 | Impedance and Electric Modulus Spectroscopy of Polycrystalline La 0.5 Sr 0.5 Bi 0.2 Co 0. 4 Fe 0.4 O 3–d Cathode Ceramic for Intermediate Temperature SOFCs | Sunder Singh, **Manindra Kumar**, Anil Kumar, Deepash Shekhar Saini | Indian Journal of Pure & Applied Physics (IJPAP) | 2021 |  [10.56042/ijpap.v59i8.49705](http://op.niscpr.res.in/index.php/IJPAP/article/view/49705)  |
| 7 | NaClO4 added, corn and arrowroot starch based economical, high conducting electrolyte membranes for flexible energy devices | Jagdish Kumar Chauhan, Dipti Yadav, Madhavi Yadav, **Manindra Kumar**, Tuhina Tiwari & Neelam Srivastava | SN Applied Sciences | 2020 | [10.1007/s42452-020-2660-0](https://doi.org/10.1007/s42452-020-2660-0) |
| 8 | Study of Arrowroot Starch-Based Polymer Electrolytes and Its Application in MFC | Tuhina Tiwari, **Manindra Kumar**, Madhavi Yadav, Neelam Srivastava | Starch/Staerke | 2019 | [10.1002/star.201800313](https://doi.org/10.1002/star.201800313) |
| 9 | Modifying potato starch by glutaraldehyde and MgCl2 for developing an economical and environment-friendly electrolyte system | Baby Komal , Madhavi Yadav , **Manindra Kumar** , Tuhina Tiwari and Neelam Srivastava | e-Polymers | 2019 | [10.1515/epoly-2019-0047](https://doi.org/10.1515/epoly-2019-0047) |
| 10 | Electrochemical characterization of NaClO4–mixed rice starch as a cost-effective and environment-friendly electrolyte | Madhavi Yadav, Gayatri Nautiyal, Akanksha Verma, **Manindra Kumar**, Tuhina Tiwari & Neelam Srivastava | Ionics | 2019 | [10.1007/s11581-018-2794-x](https://doi.org/10.1007/s11581-018-2794-x) |
| 11 | Supercapacitive performance analysis of low cost and environment friendly potato starch based electrolyte system with anodized aluminium and teflon coated carbon cloth as electrode | Madhavi Yadav, **Manindra Kumar**, Neelam Srivastava | Electrochimica Acta | 2018 | [10.1016/j.electacta.2018.07.060](https://doi.org/10.1016/j.electacta.2018.07.060) |
| 12 | Coupled mode surface plasmon resonance sensor: in situ detection of humidity with starch biofilm | Gulab Chand Yadav, Gaurav Sharma, Vivek Singh, **Manindra Kumar**, Neelam Srivastava, Sushil Kumar & Vinay Gupta | Optical and Quantum Electronics | 2018 | [10.1007/s11082-017-1275-1](https://doi.org/10.1007/s11082-017-1275-1) |
| 13 | Arrowroot + NaI: a low-cost, fast ion conducting eco-friendly polymer electrolyte system | Tuhina Tiwari, Jagdish Kumar Chauhan, Madhavi Yadav, **Manindra Kumar** & Neelam Srivastava | Ionics | 2017 | [10.1007/s11581-017-2028-7](https://doi.org/10.1007/s11581-017-2028-7) |
| 14 | Effect of NaClO4 concentration on electrolytic behaviour of corn starch film for supercapacitor application | Jagdish Kumar Chauhan, **Manindra Kumar**, Madhavi Yadav, Tuhina Tiwari & Neelam Srivastava | Ionics | 2017 | [10.1007/s11581-017-2136-4](https://doi.org/10.1007/s11581-017-2136-4) |
| 15 | Wheat starch + NaI: a high conducting environment friendly electrolyte system for energy devices | Madhavi Yadav, **Manindra Kumar**, Tuhina Tiwari & Neelam Srivastava | Ionics | 2017 | [10.1007/s11581-016-1930-8](https://doi.org/10.1007/s11581-016-1930-8) |
| 16 | Core–shell functionalized MWCNT/poly(m-aminophenol) nanocomposite with large dielectric permittivity and low dielectric loss | Sushil K. Verma, **Manindra Kumar**, Pradip Kar, Arup Choudhury | Polymers for Advanced Technologies | 2016 | [10.1002/pat.3836](https://doi.org/10.1002/pat.3836) |
| 17 | Ion dynamics and relaxation behavior of NaPF6-doped polymer electrolyte systems | Neelam Srivastava & **Manindra Kumar** | Journal of Solid State Electrochemistry | 2016 | [10.1007/s10008-016-3147-1](https://doi.org/10.1007/s10008-016-3147-1) |
| 18 | Conductivity and dielectric investigation of NH4I-doped synthesized polymer electrolyte system | **Manindra Kumar** & Neelam Srivastava | Ionics | 2015 | [10.1007/s11581-014-1294-x](https://doi.org/10.1007/s11581-014-1294-x) |
| 19 | Understanding the ion dynamics and relaxation behavior from impedance spectroscopy of NaI doped Zwitterionic polymer system | **Manindra Kumar,** Tuhina Tiwari, Jagdish Kumar Chauhan and Neelam Srivastava | Materials Research Express | 2014 | [10.1088/2053-1591/1/4/045003](https://doi.org/10.1088/2053-1591/1/4/045003) |
| 20 | Ion transport properties of NaPF6- and NaCl-doped poly(N-phenylene N′imino pentyl)imminium propane sulfonate | Tuhina Tiwari, Nazia Tarannum, **Manindra Kumar** & Neelam Srivastava | Ionics | 2014 | [10.1007/s11581-014-1097-0](https://doi.org/10.1007/s11581-014-1097-0) |
| 21 | Ion dynamics behavior in solid polymer electrolyte | Neelam Srivastava, **Manindra Kumar** | Solid State Ionics | 2014 | [10.1016/j.ssi.2013.10.026](https://doi.org/10.1016/j.ssi.2013.10.026) |
| 22 | Investigation of electrical and dielectric properties of NaI doped synthesized systems | **Manindra Kumar**, Neelam Srivastava | Journal of Non-Crystalline Solids | 2014 | [10.1016/j.jnoncrysol.2014.02.002](https://doi.org/10.1016/j.jnoncrysol.2014.02.002) |
| 23 | Electrical transport study of potato starch-based electrolyte system-II | Tuhina Tiwari, **Manindra Kumar**, Neelam Srivastava, P.C. Srivastava | Materials Science and Engineering: B | 2014 | [10.1016/j.mseb.2013.11.010](https://doi.org/10.1016/j.mseb.2013.11.010) |
| 24 | Diffusion-Limited Aggregation in Potato Starch and Hydrogen Borate Electrolyte System | Tuhina Tiwari, **Manindra Kumar**, Kmlesh Pandey, Neelam Srivastava and P. C. Srivastava | Advances in Condensed Matter Physics | 2013 | [10.1155/2013/781058](https://doi.org/10.1155/2013/781058) |
| 25 | Electrical transport behaviour of bio-polymer electrolyte system: Potato starch + ammonium iodide | **Manindra Kumar**, Tuhina Tiwari, Neelam Srivastava | Carbohydrate Polymers | 2012 | [10.1016/j.carbpol.2011.11.059](https://doi.org/10.1016/j.carbpol.2011.11.059) |

**Research grants:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S. No.** | **Title of the project** | **Funding agency** | **Total amount of grant (Rs)** | **Period** | **Status (completed/ running)** |
| 1 | Development of Potato Starch based flexible electrolyte membrane for the energy storage devices. | UGC | 10 Lacs | 2020 | Completed |

**Invited Talks:**

1. “*Environment friendly biopolymer based electrolyte membrane for wastewater treatment and bio-energy generation using Microbial Fuel Cell*” in ‘Online National Conference On Environment & Energy Materials: Innovation of Tomorrow (NCEEM-2020) at Department of Environmental Sciences School of Basic Sciences and Research Sharda University Greater Noida-201 310, on 27-28 June 2020
2. “Conductivity and electrochemical performance of solid bio-polymer electrolyte based on CoFe2O3 dispersed potato starch for energy application” in International conference on Advancement in Functional Materials (ICAFM) during February 08-10, 2024 at Prof. Rajendra Singh (Rajju Bhaiya) Institute of Physical Sciences, Veer Bahadur Singh Purvanchal University, Jaunpur.

**Conferences/Seminar Attended:**

1. “*International Conference on Science and Engineering of Materials*” held at

Sharda University, Greater Noida on 6-8 January 2014 (**Poster Presentation**)

1. *6th One Day Conference on “New Trends in Research”* held at Department ofPhysics, B.H.U, Varanasi on Dec. 21, 2012 (**Participated**)
2. *5th International Conference on Electroactive Polymers Materials and Devices”* organized by Department of Physics, B.H.U, Varanasi on Nov. 04-09, 2012 (**Oral** **Presentation**)
3. *5th One Day Conference on “New Trends in Research”* held at Deptt. of Physics,B.H.U, Varanasi on Feb. 25, 2012 (**Participated**)
4. Workshop on *“Writing Research Papers”* held at Deptt. of Physics, B.H.U, from June 10-11, 2011 (**Participated**)
5. Workshop on *“Electronic and Ionic Materials and Devices”* held at Deptt. of Physics, B.H.U, from March 25-27, 2011 (**Participated**)
6. *“National Seminar on Recent Trends in Condensed Matter Physics”* held at Deptt.of Applied Physics, IT-BHU, Varanasi from March 05-06, 2011 (**Poster** **Presentation**)
7. *4th One Day Conference on “New Trends in Research”* held at Deptt. of Physics,B.H.U, Varanasi on March 03, 2011 (**Oral Presentation**)
8. *3rd One Day Conference* on *“New Trends in Research”* held at Deptt. of Physics,B.H.U, Varanasi on Mar. 30, 2010 (**Poster Presentation**)
9. National conference on *“Application of Material Science in Service of the Society-*

*Second Series”* held at Deptt. of Chemistry, C.M.P. Degree College, Allahabadfrom Sept. 12-13, 2009 (**Poster Presentation**)

1. *2nd One Day Conference* on*“New Trends in Research”* held at Deptt. of Physics,B.H.U, Varanasi on Jan. 17, 2009 (**Participated**)
2. National conference on “*Experimental tools for materials science research: State* *of Art”* held at Deptt. of Physics MMV, BHU, Varanasi on 3-4 Dec. 2010 (**Poster****Presentation**)

1. National conference on “ *Recent trends in exotic materials”* held at Sharda University, Greater Noida on 26-28 August 2010 (**Poster Presentation**)
2. Workshop on “*Physical techniques for the investigation of fast ion conducting* *materials”* held at Deptt. of Physics, The M.S. University of Baroda, Gujarat on20-22 March 2010 (**Participate**)