

## Curriculum – Vitae

### ***Dr. Kuldeep Kumar***

Assistant Professor  
Department of Physics  
Career Convent Girls Degree College  
Vikas Nagar Lucknow

#### ***Contact Information***

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#### **EDUCATIONAL QUALIFICATION:**

- High School from U P Board in 2008
- Intermediate from U P Board in 2010
- B.Sc. from Lucknow University in 2013
- M.Sc. from Babasaheb Bhimrao Ambedkar University in 2013
- Ph.D.\* from Babasaheb Bhimrao Ambedkar University in 2021

*\*Investigation on Graphene functionalized with metal oxides and their sensing applications*

**Ph.D. Supervisor:** Prof. Bal Chandra Yadav, (Head of Department & Director of USIC), BBA University (A Central University) Lucknow

#### **TEACHING PHILOSOPHY:**

I aim to bring an open mind, a positive attitude, and high expectations to the classroom each day. I believe that I owe it to my students, as well as the community, to bring consistency, diligence, and warmth to my job in the hope that I can ultimately inspire and encourage such traits in the children as well. I have taught papers at Graduate level

- Mechanics
- Electromagnetic Theory
- Nuclear Physics
- Solid State Physics

- Quantum Mechanics

#### **PRESTIGIOUS AWARDS/HONOURS:**

- Has been selected in an International Program “*Global Talent Internship 2020 (GTI-2020)*”, in the Taiwan.
- **Best Oral Paper Presentation** Award in One day online national Conference on Emerging Trends in Physical Sciences 2020 (NCETPS-20), July, 22<sup>th</sup>, 2020, Shivaji University, Kolhapur, Maharashtra, India.
- **Best Oral Paper Presentation Award** in Sukshm Padarth evam Sambaddh Chetan Urja Par Rashtreey Sangoshthi, Feb 01-03, 2019, BBAU Lucknow, Uttar Pradesh, India.

#### **WORKED WITH INTERNATIONAL RESEARCH GROUP:**

- **Prof. G. I. Dzhardimalieva**, Institute of Problems of Chemical Physics, Russian Academy of Sciences, Chernogolovka, Moscow Region, 142432, **Russia**
- **Prof. I. E. Uflyand**, Southern Federal University, B. Sadovaya Str. 105/42, Rostov-on-Don, 344006, **Russia**
- **Prof. Tae Wu Kim**, Mokpo National University, Muan-gun, Jeollanam-do 58554, **Republic of Korea**

#### **PROFESSIONAL MEMBERSHIP:**

- Student member of Indian Physics Association

#### **AREA OF RESEARCH:**

- Nanoscience and Nanotechnology, Carbon Nanomaterials, Organometallic nanocomposite, Sensors

#### **SKILLS AND STRENGTH:**

- Solving research problems using FTIR, Raman, UV- Visible spectroscopy, X- ray diffraction (XRD), Impedance spectroscopy, Scanning electron

microscopy (SEM), and Tunneling electron microscopy (TEM).

- Having experience in the synthesis of various carbon nanostructured materials using chemical vapor deposition method and their surface functionalization for various applications.
- Scale up processing for the bulk synthesis of nanostructured materials.
- Experience in the fabrication of different type of gas, humidity and photo sensors using the synthesized nanomaterials and their surface characterization.
- Experience in handling and the maintenance of various laboratory equipment's and facilities.
- Experience in the documentation of research findings for the reports and journals.

#### **INSTRUMENTS OPERATING AND ANALYSIS SKILLS:**

- X-ray Powder Diffractometer (Phillips PAN analytical)
- FTIR Instrument (Shimadzu-8300, Japan)
- Keithely Electrometer (6517 B),
- Impedance Analyzer (6440) ,
- Particle size analyzer and zeta potential (NYS90),
- Spin coater (Matrex electronic instrument),
- Hot air furnace (Biogen Scientific)
- UV-Vis spectrometer (Evolution 202),
- Chemical Vapor Deposition (Matrex electronic instrument),
- Gas and Humidity sensing setup (local)

#### **PUBLICATIONS IN INTERNATIONAL JOURNALS**

1. **Kuldeep Kumar**, A. Singh, U. Kumar, R. K. Tripathi, B. C. Yadav, The beauty inhabited inside the modified Graphene for moisture detection at different frequencies, *Journal of Materials Science: Materials in Electronics*, 31 (2020) 10836-10845
2. **Kuldeep Kumar**, U. Kumar, M. Singh, and B. C. Yadav, Synthesis and characterizations of exohedral functionalized Graphene oxide with iron

- nanoparticles for humidity detection, *Journal of Materials Science: Materials in Electronics*, 30(14) (2019) 13013-13023
3. **Kuldeep Kumar** and B. C. Yadav , An Overview on the Importance of Chemical Vapor Deposition Technique for Graphene Synthesis, *Adv. Sci. Eng. Med.*, 10 (2018) 760–763
  4. P. Gupta, **Kuldeep Kumar**, N. K. Pandey, B. C. Yadav, Effect of annealing on highly sensitive nickel oxide based LPG sensor operated at room temperature, *Applied Physics A* 127 (2021) 1-15
  5. S. Singh, U. Kumar, B. C. Yadav, **Kuldeep Kumar**, R. Tripathi, and K. Singh, Development of scattering based glucose sensor using hydrothermally synthesized cuprous oxide nanoparticles, *Results in Physics* 15 (2019) 102772
  6. Priya Gupta, N. K. Pandey, **Kuldeep Kumar**, B. C. Yadav, Structural, optical and LPG sensing properties of zinc doped nickel oxide pellets operated at room temperature, *Sensor and Actuator A: Physical*, 319 (2021) 112484.
  7. C. Singh, T. W. Kim, R. Yadav, **Kuldeep Kumar**, B. C. Yadav, Anthracene based g-C<sub>3</sub>N<sub>4</sub> photocatalyst for regeneration of NAD(P)H and sulfide oxidation based on Z-scheme nature, *International Journal of Energy Research* 45 (2021) 13117-13129
  8. P. Singh, R. K. Yadav, T. W. Kim, T. C. Yadav, V. Gole, A. K. Gupta, K. Singh, **Kuldeep Kumar**, B. C. Yadav, D. K. Dwivedi, Solar Light Active Flexible Activated Carbon Cloth Based Photocatalyst for the Markovnikov-Selective Radical-Radical Cross-Coupling of S-Nucleophiles to Terminal Alkyne and LPG sensing, *Journal of Chinese Chemical Society* 112 (2021) 123
  9. Sarvesh Kumar Avinashi, Ajaz Hussain, **Kuldeep Kumar**, Bal Chandra Yadav, Chandkiram Gautam, Synthesis and structural characterizations of HAp-NaOH-Al<sub>2</sub>O<sub>3</sub> composites for liquid petroleum gas sensing applications, *Oxford Open Materials Science*, 2021;, itab006, <https://doi.org/10.1093/oxfmat/itab006>
  10. L. K. Gupta, **Kuldeep Kumar**, Shripal, T. P. Yadav, G. I. Dzhardimalieva, Igor Uflyand, Comparative study on humidity sensing abilities of synthesized mono and poly rhodium acryl amide tin oxide (RhAAM/SnO<sub>2</sub>) nano composites, *Sensors and Actuators A: Physical* 330 (2021) 112839

11. Surabhi Chaubey, Tae Wu Kim, Rajesh K. Yadav, Atul P. Singh, **Kuldeep Kumar** and B. C. Yadav, Ultrahigh Sun-Light-Responsive/Not Responsive Integrated Catalyst for C-S Arylation/Humidity Sensing, *Vietnam Journal of Chemistry*, 59 (2021) 500-510
12. Amrita Sharma, Poorn Prakash Pande, Prateek Khare, **Kuldeep Kumar**, Synthesis and Application of Polyacrylamide/Cellulose Gel/Fuller's Earth Composite for Removal of Methylene Blue from Water, *Iranian Journal of Chemistry and Chemical Engineering (IJCCE)*, 2022, doi: 10.30492/ijcce.2022.533829.4828
13. P. Gupta, **Kuldeep Kumar**, S. H. Saeed, N. K. Pandey, V. Verma, P. Singh, B.C. Yadav, Influence of tin doping on the liquefied petroleum gas and humidity sensing properties of NiO nanoparticles, *Journal of Materials Research* 37 (2022) 369–379.
14. L. K. Gupta, **Kuldeep Kumar**, S. Sikarwar, B.C. Yadav, *et al.* Frontal polymerization synthesis of scandium polyacrylamide nanomaterial and its application in humidity testing. *Colloid Polym. Sci.* 300 (2022) 191–202
15. A. Singh, **Kuldeep Kumar**, S. Sikarwar, B.C. Yadav, Highly sensitive and selective LPG sensor working below lowest explosion limit (LEL) at room temperature using as-fabricated indium doped SnO<sub>2</sub> thin film, *Materials Chemistry and Physics*, 287 (2022) 126275

#### POSTER PRESENTATIONS IN NATIONAL/INTERNATIONAL CONFERENCES

- National Conference on Recent Advances and Innovations in Chemical and Materials Science (RAICMS), February 22-24 2017, Shri Jai Narain PG College & DSMNRU, Lucknow, U.P., India
- National Conference on Advanced Nanomaterials and their Applications, Dec 21-23, 2018, MNNIT Allahabad, Prayagraj, Uttar Pradesh, India
- International Conference On Renewable Energy for Sustainable Environment: Challenges and Remedies, March 20-21, 2017, Department of Energy Shri Mata Vaishno Devi University Kakrayal, Katra, Jammu & Kashmir, India
- International Conference on Nanoscience and Nanotechnology (ICNN-2017) Sep 22-24, 2017, BBAU, Lucknow, U.P., India

## ORAL PRESENTATIONS IN NATIONAL/ INTERNATIONAL CONFERENCES

- National Conference on Sukshma Padarth evam Sambaddh Chetan Urja Par Rashreey Sangoshthi, Feb 01-03, 2019, BBAU Lucknow, Uttar Pradesh, India
- National conference on Recent Advances in Chemical Sciences, March 29-30, 2019, *MMMUT, Gorakhpur, Uttar Pradesh*, India
- International Conference on Ultrasonics and Materials Science for Advanced Technology (ICUMST-2019), Nov 16-18, 2019, *VBSPU Jaunpur*, Uttar Pradesh, India
- National E-Conference on Interdisciplinary Research in Science and Technology (NCIRST-20), May 30-31, 2020, *University of Lucknow, Lucknow*, Uttar Pradesh, India
- National E-Conference on Emerging Trends in Physical Sciences 2020 (NCETPS- 20), July, 22<sup>th</sup>, 2020, *Shivaji University, Kolhapur, Maharashtra*, India

## WORKSHOP ATTENDED

- Summer Training School on Instrumentation and Characterizations (TraSIC) May 24-25, 2018, *BBAU Lucknow*, U.P., India
- *Trainer* in workshop on Instrumentation & Characterization (winter training school), Jan 30-31, 2019, *BBAU, Lucknow*, Uttar Pradesh, India

## SHORT COURSE ATTENDED

- Emerging Trends in Energy Research : Conversion Storage and Integration, July 16-20, 2018, *IIT Roorkee, Roorkee, Uttarakhand*, India
- Short Course on Surface Area and Porous material Characterization, Sept 23, 2019, *IIT Kanpur, Kanpur, Uttar Pradesh*, India
- Short term training program on “Nanotechnology and functional materials, 27<sup>th</sup> July-1<sup>st</sup>, Aug, 2020, *S.V. College of Engineering, Tirupati, Andhra Pradesh*, India

- Short term training program on “Nanotechnology and functional materials, Aug, 17-22, 2020, *S.V. College of Engineering, Tirupati, Andhra Pradesh*, India

#### **NATIONAL /INTERNATIONAL E-CONFERENCES/WORKSHOPS PARTICIPATION**

- National webinar on “Two dimensional materials for diverse applications”, May 23, 2020, *Cambridge Institute of technology, Bengaluru, Karnataka*, India
- E-International Symposium on Synthesis and Characterization of Smart Materials and Their Potential Applications (ISSCSMPA-2020) 14 -17 June, 2020, *Guru Gobind Singh Indraprastha University, New Delhi*, India
- International webinar on COVID-19 and Environmental Linkages, *Springer*, June 29, 2020, *BBAU Lucknow*, Uttar Pradesh, India
- Webinar on Renewable Sources of Energy, 11<sup>th</sup> July, 2020, *A.J. College of Engineering, Anna University, Chennai*, India
- National online conference on Recent Trends in Materials Research, July 29<sup>th</sup>, 2020, *Balwant College, Vita, Shivaji University Kolhapur, Maharashtra*, India

#### **AREA OF CURRENT REASEARCH**

Currently the research have been focused on the synthesis of Carbon nanostructured materials like Graphene, Graphene oxides, Carbon nanotubes and their functionalization with nanostructured metal oxides using the chemical and Chemical Vapor Deposition (CVD) techniques. We are making investigations on characterizations of synthesized nanomaterials using Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Atomic Force Microscopy (AFM), X-Ray Diffraction (XRD), Fourier Transform Infrared Spectroscopy (FTIR), UV-visible Spectroscopy, Raman Spectroscopy, for the determination of particle size, morphology, particle distribution, elastic properties, thermal properties, microstructure, microstructure phenomena etc. along with the modeling of modified phase stability and metastable phase transformation in the nanocomposites developing the final sensing mechanism to moisture, CO<sub>2</sub>, LPG and other gases.