


Brief Biodata

Name: Dr. Bipin Kumar Gupta

Designation:	Principal Scientist	
DP No. and Name:	4.2 and Photonic Materials Metrology	
DU No. and Name:	4 and Advanced Materials and Device Metrology	
Email:	guptabgupta@nplindia.org	
Date of Joining CSIR-NPL:	03-08-2007	
Phone (office)	+91-011-45608284	

Research Area/ Interest

He has more than 20 years of research experience in the field of Experimental Solid State and Condensed Matter Physics: Materials Science (Luminescent Materials: Bulk and Nanophosphors), Nanotechnology, Bio-nanotechnology and Hydrogen Energy: Storage and its applications in Hydrogen Fuelled Vehicles and Devices. His current research interest is focused on development of luminescent materials (bulk/nano), luminescent graphene quantum dots and 2-D new emerging materials for applications in luminescent security ink, security codes, optoelectronic devices, biological fluorescence labeling, fluorescence quenching, field emission displays and luminomagnetic nanophosphors as nano probe for drug delivery and external magnetic tracking applications.

Educational Qualifications

(Please write latest qualification first)

Degree	Subject	University/ Institute	Year
B. Sc (Hons.)	Physics	Banaras Hindu University, Varanasi-221004	1996
M. Sc.	Solid State Physics	Banaras Hindu University, Varanasi-221004	1998
PhD	Physics	Banaras Hindu University, Varanasi-221004	2004

Academic / Research Experience

Grade / Post	Institute	Duration		Research Field
		From	To	
Rs 8000-13500 (Then)/ Lecturer	Department of Physics, Lucknow University, Lucknow	Oct. 2006	Aug. 2007	Physical Sciences
Scientist B (Then) Now as Junior Scientist	CSIR-NPL, New Delhi	Aug. 2007	Aug. 2010	Luminescent Materials and Device
Scientist C (Then) Now as Scientist	CSIR-NPL, New Delhi	Aug. 2010	Aug. 2014	Luminescent Materials and

				Device
Senior Scientist	CSIR-NPL, New Delhi	Aug. 2014	Aug. 2017	Luminescent Materials and Device & 2D/Quantum Materials Metrology
Principal Scientist (Senior Scientist to Principal Scientist is Merit Promotion)	CSIR-NPL, New Delhi	Aug. 2017	Till Now	Luminescent Materials and Device & 2D/Quantum Materials Metrology
Visiting Scientist (Deputation)	Rice University, USA	Oct. 2010	Sept. 2011	Luminescent Materials and Device & 2D/Quantum Materials Metrology

No. of Publications

No. of Publications in SCI Journals	No. of Publications in non-SCI Journals	No. of Publications in Conference Proceedings	Books	Total
170	10	30	2	212

Selected Publications

1. Temperature dependent Raman scattering of directly grown twisted bilayer graphene film using LPCVD method by Girija Shankar Papanai, Jasveer Singh, Nita Dilawar Sharma, S. G. Ansari and Bipin Kumar Gupta*, Carbon, 177, 2021, 366-376 (Impact Factor; if=11.31, ci=4).
2. A novel approach to design luminomagnetic pigment formulated security ink for manifold protection to bank cheques against counterfeiting by Kanika, Garima Kedawat, Satbir Singh, and Bipin Kumar Gupta*, Advanced Materials Technologies, 6, 2021, 2000973. After first online published on 6th December 2020, this article is considered as HOT TOPIC ARTICLE of Magnetic materials in Wiley publication and Highlights of this research work is published in Science Wire; Vigyan Prasar Science Portal, 29th January, 2021; EET (Electronics Engineering community for news) India portal on 2nd February 2021; CSIR News in Media, 2021, page number : 14, Vigyan Pragati; CSIR-News Bulletin, page number: 50, February, 2021; Science Reporter; page number : 52-53, March, 2021 in CSIR Technology Showcase (if=8.86, ci=7).
3. Ultrasensitive wearable strain sensors based on a VACNT/PDMS thin film for a wide range of human motion monitoring by Sharon J. Paul, Indu Elizabeth* and Bipin Kumar Gupta*, ACS Applied Materials & Interfaces, 13, 2021, 8871-8879 and the highlights of this research work is published at Nature India Plat- form as —Wearable sensors for monitoring heart beats, blood pressure, 22 March 2021, doi:10.1038/nindia.2021.43 (if=10.38, ci=26).
4. A comparative study of compressible and conductive vertically aligned carbon nanotube forest in different polymer matrixes for high-performance piezoresistive force sensors by Sharon J. Paul, Indu Sharma, Indu Elizabeth, Bhasker Gahtori, S Seelakumar Titus, Prakash

Chandra and Bipin Kumar Gupta*, ACS Applied Materials & Interfaces,12,2020,16946-16958 (if=10.38, ci=12).

5. Single excitable dual emissive novel luminescent pigment to generate advanced security features for anti-counterfeiting applications by Amit Kumar Gangwar, Kanika Nagpal, Garima Kedawat, Girija Shankar Papanai and Bipin Kumar Gupta*, Journal of Materials Chemistry C,7, 2019, 13867-13877, the highlights of this research work is recognized as List of Science and Technology 2020 & 2019 : Inventions and Discoveries, 3rd February,2020 and 31st December, 2019 and also covered by The Hindu News; 13th October, 2019, Science Chronicle; 12th October, 2019, Science Wire; Vigyan Prasar Science Portal, 24th December, 2019, CSIR-News Cover Page; volume 70, number : 1& 2, January, 2020, Science Reporter; February, 2020 in CSIR Technology Showcase, Indus Dictum News; 24th December, 2019, India Times News; 1st January 2020, Telly Updates TV; 27th December, 2019 and The Print; 19th December, 2019 (if=8.07, ci=22) .

6. Highly-efficient, chemically-stable, UV/blue light excitable biluminescent security ink to combat counterfeiting by Akhilesh Kumar Singh*, Satbir Singh and Bipin Kumar Gupta*, ACS Applied Materials & Interfaces, 10, 2018, 44570– 44575 and cited by Science India Portal as Research Highlights: UV/Blue-LED excitable bi-luminescent security ink to combat counterfeiting, Published online 12th February, 2018. (if=10.38, ci=40).

7. Unclonable security codes designed from multicolour luminescent lanthanide-doped Y₂O₃ nanorods for anticounterfeiting, Pawan Kumar, Kanika Nagpal and Bipin Kumar Gupta*, ACS Appl. Mater. Interfaces,9, 2017,14301–14308 (if=10.38, ci=100).

8. Hybrid 2D nanomaterials as dual-mode contrast agents in cellular imaging by T. N. Narayanan, Bipin Kumar Gupta, Sajna Antony Vithayathil, Jaime TahaTijerina, Bin Xie, Suzy V. Torti, Benny Abraham Kaiparettu and P. M. Ajayan*, Advanced Materials, 24, 2012, 2992-2998 (if=32.09, ci=70)

9. Graphene quantum dots derived from carbon fibers by Juan Peng, Wei Gao, Bipin Kumar Gupta, Rebeca Romero, Zheng Liu, Liehui Ge, Li Song, Lawrence B. Alemany, Xiaobo Zhan, Guanhuai Gao, Sajna Antony Vithayathil, Benny Abraham Kaiparettu, Angel A. Martí, Jun-Jie Zhu* and Pulickel M. Ajayan*, Nano Letters, 12, 844-849, 2012 Cited by Science Daily: Graphene quantum dots: The next big small thing, Considered among top ten works in several disciplines of science and engineering: Material sciences (6th in top ten list), Chemical Engineering (5th in top ten list), Engineering (5th in top ten list) and Chemistry(10th in top ten list) in a recent survey —International Comparative Performance of India's Research Base (2009-2014) of the Department of Science and Technology, Govt. of India, published in April, 2016, web link:

http://iigm.res.in/uploads/awards/DST_NSTMIS_Report.pdf, News Covered by BIOS SPIE PHOTONICS WEST MEDIA USA on 18 Jan. 2012, Cited by Photonics Spectra: One-step process turns carbon fibers into graphene QDs, Cited by Laser Focus World: Graphene quantum dots are fabricated in bulk from ordinary carbon fiber (if=12.26, ci=2132)

10. Optical bi-functionality of europium-complexed luminescent graphene nanosheets by Bipin Kumar Gupta*, Palanisamy Thanikaivelan, Tharangattu N. Narayanan, Li Song, Wei Gao, Takuya Hayashi, AravaLeela Mohana Reddy, Avishek Saha, V. Shanker, Morinobu Endo, Angel A. Martí and Pulickel M. Ajayan*, Nano Letters,11, 2011, 5227-5233 (if=12.26, ci=92)

- (a) Total number of patents granted: 2
- Indian Patent on Graphitic Nano fibers, Indian Patent No. 202340, 2006
 - US Patent in Bi-luminescent Security in and formulation, Patent No.: US 11,247,506 B2, 2022
- (b) Total number of patents filed and in progress: 2 (applied)
- Indian Patent Ref. No. 201711037004, dated on 18th October 2017, Title-Printable bi-luminescent security pigment for security ink formulation and process for the preparation thereof; Bipin Kumar Gupta, Pawan Kumar, Ajay Dhar and D.K. Aswal.
 - Indian Patent Ref. No. 201811002025 dated on 18th January 2018, Title- A process for the synthesis of luminescent undoped Zn₂SiO₄ nanophosphor; Dhiraj, Bipin Kumar Gupta, S.P. Singh, Sukhvir Singh, Govind and A.K. Srivastava.

Current Activities

(Not more than 100 words)

- Design, synthesis and applications of optical materials specializing in multifunctional novel luminescent materials, two-dimensional materials and colour shift/optically variable pigments for security ink formulation to combat the counterfeiting of currency, passports and important documents.
- Development of invisible ink (red luminescent visible under 365 nm ultraviolet LEDs) to be used as deterrent against voting twice.
- Development of luminomagnetic materials for high-contrast fluorescent cellular imaging as well as MRI high-contrast imaging for drug delivery applications.
- Development of yellow phosphor integrated with blue diode laser to produce white light for automobile headlight applications.
- Development of carbon exotic materials (Graphene, Graphene Quantum Dots, Carbon Nanotubes and Nanofibres) for optical displays and energy storage applications.

Honour(s)/Award(s)/ Fellowship(s)

- i) Awarded the prestigious “*INDO-US Fellowship Award 2010*” in “*Physical Sciences,*” by **INDO-US Science & Technology Forum, New Delhi.**
- ii) Elected for the prestigious **Academician Fellow of Asia- Pacific Academy of Materials (APAM-2017)**
- iii) Awarded the prestigious “*MRSI Medal Award-2018*” by **Materials Research Society of India**

Contributions to AcSIR

1. Supervised **Ph.D. Thesis** of **Dr. Pawan Kumar**, a student of AcSIR, CSIR-NPL Campus, New Delhi, entitled “**Investigations on the synthesis, characterizations and spectroscopy study of luminescent (0D to 3D) nanomaterials for various strategic materials**” (Physical Sciences, Enrollment No. 10PP12A32005)-**Ph.D. Completed.**
2. Supervising **Ph.D. Thesis** of **Mr. Amit Kumar Gangwar**, a student of AcSIR, CSIR-NPL Campus, New Delhi, entitled “**Synthesis of luminescent materials for security ink applications**” underway (Physical Sciences, Enrollment No. 10PP14A32010) underway (Joined CSIR-NPL August 2014)-**Ph.D. Completed.**
3. Supervising **Ph.D. Thesis** of **Mr. Satbir Singh**, a student of AcSIR, CSIR-NPL Campus, New Delhi, entitled “**Synthesis and characterizations of luminomagnetic**

materials for strategic applications” (Physical Sciences, Enrollment No. 10PP15A32002) underway (Joined CSIR-NPL August 2015). -Ph.D. Completed.

4. Supervising **Ph.D. Thesis of Mr. Giriia Shankar Papanai**, a student of AcSIR, CSIR-NPL Campus, New Delhi, entitled **“Investigation on the synthesis, characterization and spectroscopic studies of 2D materials: (a) Graphene (b) MoS₂ (C) WSe₂ (D) MoSe₂” (Physical Sciences, Enrollment No. 10PP17J3209) -Ph.D. Completed.**
5. Supervising **Ph.D. Thesis of Mr. Pradeep Kumar Kashvap**, a student of AcSIR, CSIR-NPL Campus, New Delhi, entitled **“Synthesis and characterizations of two dimensional materials: Graphene and its analogous structures” (Physical Sciences, Enrollment No. 10PP16J32002) -Ph.D. Completed.**
6. Supervising, **Ms. Kanika Nagpal** as a CSIR-SRF at CSIR-NPL, New Delhi, **“Investigations on the synthesis and characterization of novel security pigments (luminescent and optical variables) for anti-counterfeiting applications (Engineering Sciences, Enrollment No. 10CC18A32058) underway (Joined CSIR-NPL August 2018).**
7. Co-Supervising **Ph.D. Thesis of Mr. Amit Kumar Chaudharv**, a student of AcSIR, CSIR-NPL Campus, New Delhi, entitled **“Investigations on the synthesis and characterization of quantum dots/2D materials core-shell structure using non-linear spectroscopy” (Chemical Sciences, Enrollment No. 10CC18A32058) underway (Joined CSIR-NPL August 2018).**
8. Experimental research work Supervising for thesis, **Ms. Sharon J. Paul, Ph.D. Internat** CSIR-NPL, (registered at Bundelkhand University, Jhansi, Uttar Pradesh), Ph.D. Thesis Title, **“The study on synergetic effects of combined carbon nanotubes and graphene on properties of conducting polymer nanocomposite”.**

CSIR-800 Projects Supervised:

1. Supervised **Ph.D. CSIR-800 project** of Dr. Pawan Kumar, a student of AcSIR, CSIR-NPL Campus, New Delhi, entitled **“Method for recvcling of waste phosphor powder from fluorescent lamps for bio-imaging and fluorescent lamp applications” (Physical Sciences, Enrollment No. 10PP12A32005) Submitted on 16th May 2017.**
2. Supervised **Ph.D. CSIR-800 project** of Mr. Amit Kumar Gangwar, a student of AcSIR, CSIR-NPL Campus, New Delhi, entitled **“Proposing piezoelectric smart road lights to reduce night-time accidents” underway (Physical Sciences, Enrollment No. 10PP14A32010) Submitted on 18th December 2018.**
3. Supervised **Ph.D. CSIR-800 project** of Mr. Satbir Singh, a student of AcSIR, CSIR-NPL Campus, New Delhi, entitled **“A brief survey of impurities presents in commercially available branded edible salt in India” underway (Physical Sciences, Enrollment No. 10PP15A32002) Submitted on 5th February 2019.**
4. Supervised **Ph.D. CSIR-800 project** of Ms. Sonam Perween, a student of AcSIR, CSIR-NPL Campus, New Delhi, entitled **“A study on passport forgery and forensic investigations for luminescent features of Indian passport” underway (Engineering Sciences, Enrollment No. 20EE15J32023) Submitted on 12th June 2019.**
5. Supervised **Ph.D. CSIR-800 project** of Mr. Pradeep Kumar Kashvap, a student of AcSIR, CSIR-NPL Campus, New Delhi, entitled **“A study on TDS meter to test household drinkable water for public awareness” underway (Physical Sciences, Enrollment No. 10PP16J32002) Submitted on 11th December 2019.**

Public engagement: Memberships in organizational committees of national/international conferences/forums:

- ❖ **Vice-President** of **Indian Association for Hydrogen Energy and Advanced Materials (IAHEAM)**.
- ❖ Life Membership of **Indian Physics Association (IPA)**, Banaras Hindu University, Varanasi Chapter.
- ❖ Founder Member (Delhi Zone) of National Hydrogen Energy Board (NHEB).
- ❖ Life Membership of **Luminescence Society** of India.
- ❖ Member of **Carbon Society of India**.
- ❖ Served as a **Jury member** for the **National Level Exhibition and Project Competition (NLEPC)**-2012, 2013, 2014, 2015, 2018 and 2019 under MANAK DST INSPIRE Awards component of Department of Science and Technology, organized by Department of Science & Technology, GOI, New Delhi.
- ❖ **Elected member** of Grievances committee of CSIR-NPL for Group (IV) scientists, New Delhi-110012.
- ❖ Giving lectures/demonstrations to students in school/colleges/CSIR open day and Jigyasa Program of CSIR -NPL for Kendriya Vidyalaya students to **motivate towards science**.
- ❖ Giving Hand-on Training on **PL mapping** to participants of **“International Workshop and Conference on Perovskite & Hybrid Photovoltaics ICPHPV-2019.”** At CSIR-NPL, New Delhi on 6th-8th February, **2019**.
- ❖ Giving Hands-on Training on **PL mapping** to participants of- **Short Term Course on “Organic photovoltaics & electronics technology 2018” (OPET2018)** organized by CSIR-National Physical Laboratory, New Delhi, India on 6th-10th September, **2018**.
- ❖ Membership and Reviewer award by ACS in recognition of ACS’s mission of service to the global community of Chemists.

Membership in governing and advisory bodies of national/international academic/industrial societies and associations:

- ❖ **Member of Advisory Board** of Applied Physics, Amity University, Noida, Sector-125, UP, India.
- ❖ **Member of Editorial Board** of “International Journal of Alternative Energy and Ecology” Russia.
- ❖ **Review Editor** of Journal Thin Solid Films, Frontier of Material Section, Switzerland.
- ❖ **Editorial board member** of International Journal of Nanomaterials, nanotechnology and nanomedicine (IJNNN), India.
- ❖ **Editorial board member** as assistant editor (Physical Sciences) Science India web portal, India.
- ❖ **Selection Committee member for Prime Minister Fellowship (PMRF)** , 2021-2022 and 2023.

Any other Information

(Not more than 100 words)

- Appointed as nominated member for the revise the specification of Bi-fluorescent features in Indian Passport at ISP, Nashik.
- Recognised as top 10% highly cited author in Materials portfolio of RSC journals-2019.
- Selected in List of Science and Technology 2019 : Inventions and Discoveries, 31st December, 2019.
- Recognised among TOP 130 Scientist List 2022 of India in Materials Science released by Research.com

<https://research.com/scientists-rankings/materials-science/in?page=2>