


FACULTY PROFILE PERFORMA

Title (Ms/Mr/Dr/Prof)	Dr	First Name	Rachana	Last Name	Kumar	Photograph
Designation	Professor					
Department	Physics					
Address (Official)	Department of Physics, Kalindi College, New Delhi-1100008					
Phone No.						
Email	rachnakumar@kalindi.du.ac.in					
Education						
Subject	Institution		Year	Details		
B.Sc. (Hons.) Physics,	Hindu College, University of Delhi		1984	Sixth rank in the University		
M.Sc. Physics,	University of Delhi		1986	First Rank in the University (Gold Medalist)		
Ph.D.	Maastricht University, Maastricht, The Netherlands		1997			
Post Doctorate	Center of Excellence in Nanotechnology, Asian Institute of Technology (AIT), Bangkok, Thailand		2009-11			
Career Profile						
Organization/Institution	Designation		Duration	Role		
Kalindi College, University of Delhi.	Present Designation- Professor		Since 1991 till presently:	Teaching Undergraduate students, Research		
Centre of Excellence in Nanotechnology, Asian Institute of Technology,	Post Doc Fellow, Visiting faculty		2009-2011	Research		

Department of Biochemistry, Maastricht University,	Ph D. Researcher	1993-1997	Research leading to a PhD degree
Solid State Physics Laboratory, DRDO, Ministry of Defense, Government of India	Scientist B	1987-1991	Research related to Mercury Cadmium Telluride based photoconductive detectors.
Rajdhani College, University of Delhi.	Lecturer (Adhoc)	1986-1987	Teaching Undergraduate students

Awards & Distinctions

- **Award for College Lecturer** (2014-15) by Directorate of Higher Education, Government of Delhi
- **Distinguished Teachers Award**, 2021 for outstanding contribution in the field of Academics and Teaching from Lions Club Delhi Capital Greens
- Visiting Fellow (2009-2011), Centre of Excellence in Nanotechnology, Asian Institute of Technology (AIT), Thailand
- **K.S. Krishnan Gold Medal** for obtaining First Rank in M.Sc., 1986.
- **Dr Meghnad Saha Award** (for Physics) for original popular science writing in Hindi, 1992, by the Government of India (Department of Science and Technology).
- **Certificate of Merit** by the Ministry of Defence, 1991 for work in the field of processing of infrared detectors.
- **Best paper presentation** on the topic: “Addressing sector wise gender diversity in Corporates- a way towards Atma- Nirbhar Bharat” in two-day National Seminar on ‘Women in decision making roles in Corporates’ on 2nd-3rd Nov, 2023 at the Conference Centre, University of Delhi by non-Collegiate Women’s education board (NCWEB)
- **Award for literature** for Neo-literates by Government of India (Ministry of Education and Culture)
- Jagmohan Krishan Shikshak Samman, 2006 by Balkan –Ji-Bari International
- Ambassador for Peace Prize from Universal Peace Federation (Interreligious and International Federation for World Peace)

- Award of Junior Research Fellowship by National Physical Laboratory, 1987
- Qualified the National level entrance examination for M.Sc. at IIT, 1984
- National Scholarship (1984-86) for meritorious performance in B.Sc. (Hons.) Physics
- Undergraduate (1984) and Postgraduate Science Merit Awards (1986) from the Faculty of Science, University of Delhi
- National Merit Certificates in Secondary School Examinations.

Appointed Member in University of Delhi Committees

Technical Contribution/Curriculum Development

- Appointed **Member** of the “Committee of Courses for Under-Graduate Studies” in Physics by Department of Physics and Astrophysics from 05.09.2019-2023
- Appointed as **Member** of the team (2019) for preparing the Model Problem Set and Model Question paper for “Electromagnetic Theory” paper, B.Sc. (Honours) Physics by Department of Physics and Astrophysics, University of Delhi.
- **Member** of Curriculum Development Committee, University of Delhi for Physics, 2004; developing discipline courses in Physics of II and III years of B.Sc. course and I year Foundation course
- **Member** of Committee of Courses (Hons, P.G. and Research Studies) of University of Delhi (1999-2001).

Administrative Contribution

Currently

- **Convenor** Anti- Ragging Committee
- **Member** CCL Committee
- **Member** Subject Research Committee (2025-26)

Also served as:

- Convener** Academic Committee
- **Convener** Purchase Committee
- **Convener** Criterion 2, NAAC
- **Convener** Lab Fund Distribution Committee
- **Convener** Space and Infrastructure Committee
- **Convener** Internal assessment monitoring and moderation Committee
- **Convener** “Innovation Club”
- **Convener** Central Admission Committee-Humanities for 2025
- **Deputy-Superintendent** Central Theory Exam Committee-2025
- **Member** e-Tender Committee
- **Member** ARIIA Committee
- **Member** Golden Jubilee Fund Distribution Committee, 2017
- **Teacher In Charge** of Physics Department (2014-16), also served previously as Teacher-In Charge in two terms in 1992 and 2002
- **Member**, Selection Committee for Permanent/Ad-hoc appointments in Physics Department several times
- Senior most Member for Sciences, Kalindi College in University Expert Committee for promotions from Stage I to Stage II for Zoology and Botany Departments and Stage II to Stage III for Zoology Department. Member, Screening Committee for promotions from Stage II to Stage III for the college
- **Convener and Deputy-Superintendent** of Theory Semester Examinations for Entire College in the session 2014-2015
- **Convener** of Admission Committee of entire College in 2012-13
- **Member** Admission Core Committee, B.Sc. (Hons) Physics
- **Member, Selection Committee** for appointment of project fellow in IUAC.
- **Member**, Screening Committee, 2014
- **Convener**, Physics Models for participation in Antardhavni, 2013-15
- **Member Reception Committee** for ‘Lehren’, ‘Gyan Lehren’, Annual Day
- **Member**, Gandhi Study Circle, 2004-2009
- **Member**, Sports Committee, 2004-2009

- **Member**, Library committee, 2007-2008
- **Deputy-Superintendent** of Physics Practical examination in the session 1992, 2002-04, 2005, 2024-25.
- **Co-Convener** Annual Day celebrated in FICCI Auditorium on the occasion of Silver Jubilee of the college
- **Head- Examiner/ Paper setter** for Physics theory papers and External examiner for practical examinations appointed by University of Delhi several times
- One of the **Founder members** of Physics Department of the college

Organization of co-curricular activities

- **Convener**, Farewell Committee
- **Convener**, “Science Fiction Writing” in Dimenzie , 2017
- **Organized** Bits and Bytes Festival under “Physcom” Society of the college (2015-16). The events comprised Scientific Rangoli, Paper presentation, Poster making and Quiz
- Served as **Convener** of various cultural activities under the Annual Cultural Festival **LEHREN** in the College including
 - Inter college Fashion show (1999)
 - Creative Writing in Hindi-Katha Kahani
 - Quiz
 - Graffiti
 - Choreography
 - Caption writing
 - Mehndi
 - Just A Minute
 - Rangoli
 - Stage decoration
 - Fresher Welcome Function with Miss Fresher contest
 - Served as Judge several times in Student’s Activities like Power Point Presentations, Painting Competition, Slogan Writing

Research Interests/Specialization

- **Specialization:** Solid State Physics

- **Research Area of Interest:** Nanotechnology, Self- assembly of gold silica Nanoparticles by dip coating technique, Carbon nanotubes and their functionalization

Research Guidance

While doing Post Doc research in AIT, Bangkok gave research guidance to Ph.D. student Mr. Z.A. Khan in the field of Self Assembly of gold silica nanoparticles. This collaboration resulted in three published research papers of international repute. Have guided students of B.Sc. (H) Physics III year for various projects. Currently, guiding students on Carbon Nanotube Gas Sensor related Project.

Teaching Experience (Subject/Courses taught)

Total teaching experience – 34 years, one of the Founder Members of Physics

Department. **Theory**

- Mathematical Physics
 - B.Sc. (H) Physics I Year (Semester I and II), NEP, CBCS, FYUP, Semester and Annual mode
- Electromagnetic Theory
 - B.Sc. (H) Physics III Year, NEP, CBCS, FYUP, Semester and Annual mode
- Statistical Mechanics
 - B.Sc. (H) Physics III Year, NEP mode
- Electromagnetism
 - B.Sc. (H) Computer Science I year, Semester mode
 - B.Sc. (G) Group A, Annual mode
 - B.Sc.(H) Mathematics, Annual mode
- Solid State Physics
 - B.Sc. (H) Physics III Year
- Thermal physics
 - B.Sc. (H) Physics II Year
- Optics
 - B.Sc.(H) Physics II Year

Practical Labs:

- Took various Practical labs related to Waves and oscillations, Mechanics, Electric circuit analysis, Electricity and Magnetism, Light and Matter, Thermal Physics for B.Sc. (H) Physics (Annual/Semester/FYUP/CBCS/NEP mode) and B.Sc., Physical Sciences/ B Sc

Program, B.Sc. (Group A)/subsidiary for B.Sc.(H) Mathematics/ Discipline course for Chemistry(H) FYUP mode

Publications (Peer Reviewed/Indexed Journals)

S No	Year of Publication	Title	Journal (Name of the journal. Vol Issue ISSN)	Co-Authors
1	2023	Analytical modeling of adsorption isotherms for pristine and functionalized carbon nanotubes as gas sensors	Int. J. Mater. Res. 114(7-8)653-661. ISSN: 2195-8556	Seema Gupta, Ankur Anand, Neeru
2	2023	Kinetic study of adsorption of NH ₃ gas on pristine and tin oxide functionalised Carbon Nanotubes	Hans Shodh Sudha, Vol 4, Issue 2, pp15-24. ISSN: 2582-9777	Seema Gupta, Ankur Anand, Neeru
3	2022	Rate kinetics and isotherm study of step functionalised carbon nanotubes gas sensor for NO ₂ adsorption	Materials Today, Proceedings. ISSN: 2214-7853, https://doi.org/10.1016/j.matpr.2022.06.544	Seema Gupta, Ankur Anand, Neeru
4	2022	Impact of Tin oxide step functionalization on recovery time of carbon nanotube gas sensors	Shodhsamhita, Journal of fundamental & comparative research, vol IX, No 5, 2022.	Seema Gupta, Ankur Anand, Neeru
5	2021	Study of adsorption kinetics of pristine and SnO ₂ functionalized carbon nanotubes as environment gas sensors for NO ₂ and NH ₃ gases	Materials Today, Proceedings, Volume 47, Part 8, Pages 1651-1655. ISSN: 2214-7853	Seema Gupta, Ankur Anand, Neeru
6	2021	Enhanced gas sensing performance on Surface Functionalization of single walled carbon nanotubes.	Journal of Education: Rabindra Bharati University UGC- CARE Listed Journal, Vol XXIII, No 10, 2021, pp 61-67. ISSN: 0972-7175	Seema Gupta, Ankur Anand, Neeru

7	2021	Experimental Study of Pristine and SnO ₂ functionalized Single Walled Carbon Nanotubes as gas sensors for Environmental hazardous gases.	“Vigyaan Prakash” UGC-CARE Listed Journal, Issue 3, pp 5-13. ISSN: 1549-523-X, June - September 2021	Seema Gupta, Ankur Anand, Neeru
8	2020	Fresnel’s equations in transition from Single to Multiple Interfaces and Evaluation of Optical parameters.	Sambodhi, UGC-CARE Listed Journal, Vol-43, No.-04 (IV) July-September (2020), ISSN: 2249-6661	Seema Gupta, Savita Sharma
9	2017	To study the generation of thermo emf as an alternative source of energy using different thermocouples under various modified parameters.	Yearly Academic Journal, Kalindi College, 15, pp 217-222. ISSN 2348-9014	Seema Gupta et al
10	2016	Effect of Chitosan capping on optical response of thin films of colloidal gold and silica nanoparticles.	Yearly Academic Journal, Kalindi College, pp 31-38, ISSN 2348- 9014	ZA Khan
11	2013	Effective Medium Theory Applied to Colloidal Solution of Gold Nanoparticles and Alternating Gold-Silica multilayer Thin Film Composites.	Journal of the Chemical Society of Pakistan 35 (2), pp 250 – 256. ISSN 0253-5106	ZA Khan, J Dutta
12	2012	Multilayer thin films of colloidal gold and silica nanoparticles: Effect of polyelectrolyte coating	The Canadian Journal of Chemical Engineering, 90 (4), pp 919 – 924, 2012. ISSN 1939-019X	ZA Khan, J Dutta
13	2011	Optical thin film filters of colloidal gold and silica nanoparticles prepared by a layer by layer self- assembly method	Journal of Materials Science, pp 1-6, 2011. ISSN 0022-2461	ZA Khan, WS Mohammed, GL Hornyak, J Dutta

14	2009	Self- assembly of citrate stabilized gold with chitosan/PDDA capped silica colloidal nanoparticles	Proceedings of the 3 rd Thailand Nanotechnology Conference 2009-Health, Energy, Environment	ZA Khan, J Dutta
15	1999	Fibrin induced platelet procoagulant activity in clotting plasma- Role of GPIIb/ IIIa and GP Ib/ IX Receptors and von Willebrand factor.	Blood, 93(2); pp 564-570, ISSN 0006-4971	Beguin S, Keularts I, Coller B, Hemker HC
16	1997	Thrombin, fibrin and platelets; a resonance loop in which Von Willebrand factor is a necessary link	Thrombosis and Haemostasis 77, State of the Art Issue XVIth Congress ISTH, ISSN 0340-6245	Beguin S,
17	1996	Inhibition of platelet mediated tissue factor induced thrombin generation by the Mouse/Human chimeric antibody,	Journal of Clinical Investigation, 98(3), pp.863-874. ISSN 0021-9738	Reverter JC, Beguin S, Kessels H, Hemker HC, Coller BS
18	1995	The effect of fibrin clots and clot bound thrombin on the development of platelet procoagulant activity	Thrombosis and Haemostasis, 74 (3), pp962-068,ISSN 0340-6245	Beguin S, Hemker HC
19	1994	The influence of fibrinogen and fibrin on thrombin generation-evidence for the feedback activation of the clotting system by clot bound thrombin.	Thrombosis and Haemostasis, 72(5), pp 713-721, ISSN 0340-6245	Beguin S, Hemker HC
20	1991	A $n^{2+} - n^+ - n$ Blocking Contact Structure for an Intrinsic Photoconductor.	Infrared Physics, Vol. 31, No 5, 1991, pp. 435-440. ISSN 0020-0891.	Vishnu Gopal, K.C. Chhabra,
21	1991	Dependence of Responsivity on the	Infrared Physics, Vol 31, No,1,pp.101-	Sudha Gupta,

		structure of a Blocking Contact in an Intrinsic HgCdTe Photoconductor	107. ISSN 0020-0891.	Vishnu Gopal K. C. Chhabra
22	1990	Doped Surface Layer Characteristics for HgCdTe Photoconductive Detectors	Infrared Physics (Pergamon Press), Vol 30, No 4, pp 323-329. ISSN 0020-0891.	Vishnu Gopal, K. C. Chhabra,
23	1989	Accumulation Layer Characteristics for Responsivity Enhancement of HgCdTe Photoconductors	Proceedings of National Seminar on Recent Trends in IR Devices and their Defense Applications, New Delhi, 17-18 March	Vishnu Gopal, K. C. Chhabra,

Published Books

- i) **Rachana Kumar**, On the procoagulant effect of fibrin. A resonance loop between fibrin-von Willebrand factor – platelets and thrombin (published doctoral thesis), Unigraphic, Maastricht ISBN 90-9010707-X, 1997.
- ii) Four published books in Hindi. One out of them on popular science-“Vigyan Nai Rahen” awarded by **Department of Science and Technology, Government of India**. Another book awarded by **Ministry of Education and Culture, Government of India**.
- iii) Book chapter, “Optimally functionalized Carbon nanotubes showing improved sensor response towards environmental monitoring”, Rachana Kumar, Neeru and Seema Gupta in Nanomaterials, Metamaterials and Thin Films: A Multidisciplinary Approach to Modern Engineering, Published by: Aryabhat Institute of Academics and Research. ISBN: 978-93-95463-89-8, First Edition: 2025

Seminar/Workshop/Conferences Presentation/Resource person

Conferences Presentations:

1. Presented a paper on “**The effect of antibodies against GPIIb/IIIa on the resonance loop between**

- platelet activation and thrombin generation during the clotting of plasma**". in AZU, Utrecht, Netherlands, October 1994
2. Presented a paper on **"Inhibition of Glycoproteins IIb/IIIa damps the resonance loop between platelet activation and thrombin generation in platelet rich plasma"** in Cambridge, England in Annual Meeting of the European Society for Clinical Investigation, April 1995
 3. Presented a paper on **"Fibrin bound thrombin, but also fibrin alone, elicits procoagulant activity in platelet rich plasma"** in Jerusalem, Tel Aviv in XVth Congress ISTH, June 1995.
 4. Presented a paper on **"Effect of fibrin clots (with/without bound thrombin) on the development of platelet pro-coagulant activity"** in Houthalan, Belgium in NVTH Symposium, January 1996
 5. Presented a paper on **"Thrombin, fibrin and platelets: a resonance loop in which van Willebrand factor is a necessary link"** In Florence, Italy in XVIth Congress ISTH, June 1997
 6. Presented a paper on **"Multilayer thin films of colloidal gold and silica nanoparticles- Effect of polyelectrolyte coating"** in Pathumthani, Thailand in Nanothailand Conference, Nanotechnology for a sustainable world, November 2010
 7. Presented a paper on **"Maxwell-Garnett (M-G) theory simulations of alternating gold-silica colloidal multilayer thin film composites"** in Pathumthani, Thailand in Nanothailand Conference, November 2010
 8. Presented a paper on **"Thin film multilayers of gold and silica nanoparticles by layer- by- layer technique"** in Bangkok, Thailand in International Conference of Nanotechnology, December 2011
 9. Presented a paper on **"Sustainable Development Goals and the Development Gaps across Indian states"** in International Conference on "Spatial Decision Support Systems for United Nations Sustainable Development Goals" held at Kalindi College, February, 2017
 10. Poster presentation **"To study the generation of thermo-emf as an alternative source of energy using different thermocouples under various modified parameters"** along with Dr Seema Gupta in National Seminar on "A Paradigm shift towards Empowerment of Women" at Kalindi College, February, 2017. The poster was awarded the Best Poster Presentation (in sharing) in the subtheme: "Alternative sources of energy".
 11. Presented a paper on **"Machine learning and its applications to Physics"** in National Conference on "Emerging trends in Information Technology" (UGC sponsored), organized by Department of Computer Science, Kalindi College, August ,2019.
 12. Presented a poster on **"Determination of Optical and Dielectric parameters for single to multiple interfaces using Fresnel's equations"** along with Dr Seema Gupta in National Conference on Advanced Materials: theory and Applications (NCAMTA) held in Hansraj College, University of Delhi, September, 2019

13. Presented a paper on **“To study Carbon Nanotube (CNT) based gas sensors, effect of gas adsorption and their selective gas sensing properties”** along with Dr Seema Gupta in 2nd National Conference on **“New Trends in Nanotechnology and Applications”**, NTNA 2020 organized by Department of Physics, ARSD College, University of Delhi, February, 2020
14. Poster Presentation in same Conference on **“Single Walled Carbon Nanotube as Environmental Sensor for NO₂ And NH₃”** along with Dr Seema Gupta & Mr Ankur Anand.
15. Presented Paper on Topic **“Fresnel's equations in transition from Single to Multiple interfaces and evaluation of optical parameters”** in the First Online International Conference on **“Continuity, Consistency and Innovation in Applied Sciences and Humanities” (ICCIASH-2020)** organized by Department of Science and Humanities, St. Martin's Engineering College, Dhulapally, Secunderabad, on 13th & 14th August 2020.
16. Presented Paper on Topic **“Study of Adsorption Kinetics of Pristine and Functionalized Carbon Nano Tubes for NH₃ and NO₂ gases”** in Online National Conference on Recent Advances in Functional Materials (RAFM-2020) organized by ARSD (University of Delhi) on 5-6th November, 2020.
17. Delivered a Selected talk on **“Single Walled Carbon Nanotube as Effective Environmental Sensor for Toxic Gases NO₂ and NH₃”** and participated in Virtual Conference on Contemporary Research in Physics 2020 organized by Post Graduate Department of Physics, Vijaya College, Bangalore held during 17th -19th December, 2020.
18. **Resource person** with Three e-lectures delivered on **“Electromagnetic Theory”** on **“Learning physics with conceptual and problem-based approach”** on the platform of National Academy of Sciences, Delhi Chapter, An 11-week Course (July 27, 2020 to October 11, 2020).
19. **Resource person** with lecture given on **“How to make Power Point Presentation”** in the Workshop **“Skill Enhancement by ICT Learning in the period of online knowledge exchange”** held on 9-10 December, 2020 organized by Department of Physics, Kalindi College in collaboration with IQAC.
20. **Resource person** in two sessions in 3 days **“National Workshop Challenges of teaching physics Laboratories courses in online mode”**, 23-25 January, 2021. Resource person for **“Mechanics”** and **“Waves and Optics”** laboratories organized by Department of Physics, Kalindi College together with Department of Physics and Astrophysics, DU and NASI.
21. Presented Paper on Topic **“Enhanced gas sensing performance on surface functionalization of single walled carbon nanotubes”** in International Conference on **“Continuity, Consistency and Innovation in Applied Sciences and Humanities” (ICCIASH 2021)** organized by Department of Science and Humanities of St. Martin's Engineering College, Dhulapally, Secunderabad, Telangana, India on 29th and 30th July, 2021.
22. Presented paper on **“Analytical modeling of Adsorption kinetics of pristine and SnO₂ functionalized Carbon nanotubes”** In International Conference on **“Energy and Advanced Materials (ICEAM-2021)** organized by Department of Physics and Materials Science and Engineering, Jaypee Institute of Information Technology, Noida, UP from October 21-23, 2021.

23. Presented paper on “**Rate kinetics and dynamic response of functionalized gas sensor for NO₂ adsorption**” in International Conference on “**Recent Advances in Functional materials RAFM-22**”, Department of Physics, ARSD College, University of Delhi, 14-16 March ,2022.
24. Presented paper on “**Recovery time in Tin Oxide functionalized carbon nanotube gas sensor for NO₂ gas**” in 3rd International conference on “Continuity, consistency and Innovation in Applied Sciences and Humanities on 16-17th September,2022 organized by St Martin Engineering College, Secunderabad.
25. Presented paper on” **Optimization of growth parameters of self- assembly of gold and silica nanoparticles bilayers for use as optical filters**” in one day national Symposium on Advancements on various fields of physics organized online on 3rd September 2023 by Association of Indian Physicists.
26. **Paper presentation** on the topic: “Addressing sector wise gender diversity in Corporates- a way towards Atma- Nirbhar Bharat” in two-day National Seminar on ‘Women in decision making roles in Corporates’ on 2nd-3rd Nov, 2023 at the Conference Centre, University of Delhi by non-Collegiate Women’s education board (NCWEB).
27. **Resource person** in Summer Internship Program on **Nanoscience and Nanotechnology- NanoXplore 2025** from June 8-July 8,2025 organized by Kalindi College in hybrid mode.
28. **Paper presentation** on the topic: **Optimally functionalized carbon nanotubes showing improved sensor response towards environmental monitoring** in National Conference on Multifunctional materials for sustainable development organized by department of physics, University of Lucknow on September 20-21,2025.
29. Resource person and Judge in National poster making competition in National Artificial Intelligence Workshop organized by Physithon society, kalindi College on February 6th, 2026.

Organization of Conferences/Workshops/Special lectures

- **Co-Convener**, National poster Competition “**Scientific perspectives of young minds**” on theme **Science and Society** held at Kalindi College on 9th April, 2025
- **Convener**, Webinar Series part II entitled “**Role of women Scientists towards Science and Society** “under National academy of sciences India Delhi chapter: Science and society program (Project DC2) on March 7, 2025.
- **Co- Convener**, Rural Workshop “**Women and children health and hygiene awareness**” under National academy of sciences India Delhi chapter: Science and society program (Project DC2) on Feb 10, 2025 in Chandrawal village, Delhi.

- **Co- Convenor**, Webinar Series part 1 entitled “**Role of women Scientists towards Science and Society**’ under National academy of sciences India Delhi chapter: Science and society program (Project DC2) held on Jan 25, 2025.
- **Co-Convenor**, National Seminar on “**Contribution of contemporary Science advancement of society**” under National Academy of Sciences India Delhi chapter: Science and society program (Project DC2) on Oct 21,2024 held at Kalindi College.
- **Program Coordinator**, Online Seminar on Yuva Shakti Abhiyan 2022, a one - week National Workshop organized by Kalindi College, 16th-23rd June, 2022.
- **Organizing team** of National Webinar series "Omnipresent Physics: An Experiential Approach" under the aegis of The National Academy of Sciences, India (NASI) - Delhi Chapter, Science-Society Program organized by Department of Physics, Kalindi College on 19th October- 1 November, 2022.
- **Coordinator**, “Plantation Drive and Teacher's Day Celebration” on 4th September 2021 celebrated at Kalindi College in collaboration with Lions Club Delhi.
- **Convener** for Webinar held on 11th December, 2020 on the topic “by Prof Vijay Kaul, Senior Professor, Department of Business Economics, University of Delhi organized by Kalindi College along with IQAC.
- **Convener** for Intercollege Student’s Quiz Competition, “Quizdemic” and Inter- College Photography Competition “Captures in Captive”, events held under Innovation Club of the college on 24th October,2020.
- **Co-Convener** in the Workshop “Skill Enhancement by ICT Learning in the period of online knowledge exchange” held by Department of physics, Kalindi College and IQAC , 9-10 December, 2020.
- **Convener, National Webinar** on “Emerging out a Winner in Lockdown”, Speaker Dr Anula Maurya, Vice Chancellor, JR Sanskrit University on 14th May, 2020
- **Convener, National Webinar** on “Science, Society, and Exponential Change: Reimagining the future, Speaker Dr Pratibha Jolly, Former Vice Principal, Miranda house ,13th May, 2020
- **Resource Person** for two sessions in NAAC sponsored **National Workshop** on “Skill Enhancement at Institutions of higher learning: training today for tomorrow” organized by Kalindi College ,11th January, 2019
- **Co- Convener**, Subtheme “Alternative Sources of Energy”: **National Seminar** on “**A Paradigm Shift towards Empowerment of Women**” held on 3-4 February, 2017, Kalindi College.
- **Convener, Workshop** on ‘**LIGHT**’, 1st September, 2015 to celebrate the year 2015- the international year of light as declared by the United Nations. by Prof A.K. Ghatak, 24th Sept 2014, Kalindi College, DU partially sponsored by National Academy of Sciences along with Dr. Pushpa Bindal. The workshop schedule also included physics lab visit by experts for demonstration of experiments.
- **Convener**, one day Workshop on ‘**Einstein and his year of miracles**’ by Prof A.K. Ghatak, 24th Sept 2014, Kalindi College, DU partially sponsored by National Academy of Sciences along with Dr Pushpa Bindal and Dr Punita Verma

- **Member, organizing committee, Convener Registration** of the UGC Sponsored National Seminar on Emerging Trends in Science and Technology: Photonics and Nanotechnology, 1-2 February, 2005, Kalindi College, University of Delhi.

Conference/Workshop Participation (2020 onwards)

1. **National Seminar** on “Laser Dynamics and Fiber Optics” organized by Department of Electronics and Department of Physics, Shaheed Rajguru College of Applied Sciences for Women, University of Delhi on 7th January, 2020.
2. **Webinar** on “Online Teaching and Learning Technology”, ARSD College on 27th April, 2020
3. **Webinar** on “Being happy by choice not chance in Covid Times”, Department of Mathematics, Kalindi College on 1st May, 2020
4. **Webinar** on “Search, Research and Publication Ethics” organized by Library, Kalindi College on 4th May, 2020
5. **Webinar** on “Understanding the Corona Virus: some good news”, Department of Mathematics, Kalindi College on 5th May, 2020
6. **Webinar** on “Cyber Crime and Prevention during lockdown”, Mata Sundri College on 6th May, 2020
7. **National Webinar** on “What is light: Evolution of Quantum Theory”, Kalindi College on 12th May, 2020
8. **National Webinar** on “An introduction to Measurement of Light”, Kalindi College on 13th May, 2020
9. **International Webinar** on “Hypertension and COVID-19: A Cardiologist’s Perspective” organized by Swami Shraddhanand College on July 3, 2020.
10. **Online International Conference** on “Continuity, Consistency and Innovation in Applied Sciences and Humanities” (ICCIASH-2020) organized by Department of Science and Humanities, St. Martin’s Engineering College, Dhulapally, Secunderabad, T.S, India on 13- 14th August 2020.
11. **International Webinar** on “Recent Trends in Material Science”, organized by Shivaji College, University of Delhi on 9/10/2020
12. **Webinar** on ‘Introduction to Nuclear energy and its applications’, organized by Shaheed Rajguru College of Applied Sciences for Women, University of Delhi on 17/10/2020.
13. **Online National Conference** on “Recent Advances in Functional Materials” (RAFM2020) organized by ARSD (University of Delhi) on 5-6th November, 2020.
14. “Exploring Physics with Experts” National Webinar organized by Physics Department, Kalindi College & NASI Delhi Chapter Held on 10 Feb 2021.
15. **International Webinar** on "Unravelling the mysteries of the universe with experts"; March 4, 2021 organized by Maitreyi College. 8. **International Webinar** on Ecosystem Restoration on 5th June, 2021 organized by JNU ENVIS, School of Environmental Sciences, JNU, New Delhi.
16. **National Webinar** on “Role of Analytical techniques in research and development” organized by Faculty of Science, Aggarwal College, Ballabgarh held on 11.6.2021.
17. “Geopolitics of Vaccine: Access, R &D and Manufacturing,” Kalindi College on 22 June, 2021.
18. **Hands on training session on E-Content development using basic tools**, organized by E-content development committee, Kalindi College on 27th September, 2021.

19. Two day's Workshop on "**Government e- Marketplace (GeM)**" conducted through Google Meet during 27 - 28 January, 2022, Bhaskaracharya College of Applied Sciences (University of Delhi)
20. **National Seminar on" Innovation and Opportunities in Marine Bioresources & Biotechnology"** on 21st August, 2021, Marine Biotechnology Laboratory Department of Botany, University of Delhi & Cluster Innovation Centre (CIC), University of Delhi
21. "**Intellectual Property Rights in Academics**", organized by Research Committee in Collaboration with IQAC, Kalindi College on September 30, 2021.
22. "**Immunity boosting herbs to combat Covid 19**", Department of Botany, Kalindi College on 1st October, 2021
23. National Seminar on the topic "**Understanding Ambedkar, relevance of Dr BR Ambedkar in contemporary era**", Dr BR Ambedkar Study Center, Kalindi College on 8th October, 2021.
24. National Webinar on "**Fight Against Tobacco**" organized by the Anti-Tobacco Committee in collaboration with IQAC, Kalindi College, 16th October, 2021.
25. International Webinar on "**Gender, Culture and everyday experience**" organized by Physithon, Physics Society, Kalindi College on 27th October 2021.
26. "**Nanotechnology and Optoelectronics**" by Neutronics Society, Rajdhani College, University of Delhi on 8th November, 2021.
27. "**Tools and Techniques for avoiding Plagiarism in E-content development**", E-Content development committee, Kalindi College on 9th November, 2021.
28. "**Fundamentals and Applications of Physics**" organized by Shaheed Rajguru College of Applied Sciences for Women on January 8, 2022.
29. National Workshop "**Fascinating Science and Indian Contributions**" under the aegis of The National Academy of Sciences, India (NASI) - Delhi Chapter, Science-Society Program organized by Department of Physics, Kalindi College in college premises on 28- 29 October, 2022.
30. "**India's big leap into space**" online lecture organized by Indian Association of Physics Teachers on 23rd, September 2023.
31. Hands on Online Workshop:" **Mastering Matlab -2024** "organized by JS Foundation and AIP on July 28, 2024
32. Inter-College workshop on "Indoor air pollution and Smoking" organized by Anti-Tobacco committee, Kalindi college on 25th Feb. 2025
33. Workshop on "**Pioneering women in quantum Science: A visionary Talk**, organized by Department of Physics and Electronics and Hansraj College on 8th March, 2025
34. Four day's **Special lecture series in Physics** organized by Mody University of Science and Technology from 5-8th May, 2025
35. Five-day Online workshop on **Integrating AI into teaching and research enhancing academic productivity** organized by Unit of educational studies and research, Institute of development and Communication, Chandigarh from 27-31st December, 2025
36. Capacity building Workshop on the theme **Academic integrity and plagiarism management: Hands on training on Turnitin** organized by IQAC, Kalindi College on 28th January, 2026.

Participation in Professional Courses

- 4-week **Orientation** Course, 1999 conducted by Centre for Professional Development in Higher Education (CPDHE) University of Delhi.
- 3-week Professional Development Programme, **Refresher Course**, 2001 in Physics and Electronics conducted by CPDHE University of Delhi.
- 3-week Professional Development Programme, **Refresher Course**, 2002 in Physics and Electronics conducted by CPDHE University of Delhi
- Participated in Faculty Development Programme on “**Recent Trends in Research Methodology, E content, Mathematical and Statistical methods in open education world**“, 17th -23rd December, 2019 organized by Kalindi College in collaboration with Mahatma Hansraj Faculty Development Centre, Hansraj College.
- FDP on” **Latex** “organized by CMR Engineering college, Hyderabad, 1-5th June, 2020.
- FDP on “**Sci-lab**” organized by St peter Engineering college, 15-19 June, 2020.
- TEQIP- III sponsored Five Day Workshop on “**Mat-lab and its applications**”, 4-8th January, 2021, Organized by Rajasthan Technical University, Kota & Department of Electrical Engineering and Sri Balaji College of Engineering & Technology.
- National Level Workshop (online) on “**Artificial intelligence awareness in Physics**” held from 15th-20th February, 2024 by Indian Association of Physics Teachers.
- National Virtual lab Workshop for Physics undergraduates under V-Labs, IIT Kanpur (NVWP-2024) from 10-15 September,2024
- Online International FDP on “and **Advanced materials and Characterization techniques**” organized by Indian Association of Physics Teachers from Feb. 6- Feb. 12, 2025
- Faculty development program (online) on “**NEP orientation and sensitization**” organized by Malaviya mission teacher training program (MMTTP) from March 3- March 11, 2025

Projects (Major Grants / Collaborations)

Post- Doctoral Research Project at Asian Institute of Technology, Thailand (2009-2011) on Study Leave from college

Topic Layer by layer Self Assembly of colloidal Gold and Silica Nanoparticles- Growth Process and Applications. provided Research guidance to PhD candidate Mr. Zaheer A. Khan.

Sponsored by; National Science and Technology Department Agency (NSTDA), Ministry of Science and Technology (MOST), Thailand

Principal Investigator along with Prof Seema Gupta working with undergraduate students on **Innovation Projects:**

- I. **Year 2025-26,**
Project title: **“Indian Heritage of Science from Early to later Vedic period”**
(Additional teachers, Prof Pushpa Bindal, Dr Nutan Pandey)
Status: Completed, Nature of the project: College funded.

- II. **Year 2024-25,**
Co- convenor for project entitled “Exposition to Science advancements with emphasis on role of contemporary Indian women scientists and sensitization in rural areas”
Status: Completed, Nature of the project: NASI, Delhi Chapter funded

- III. **Year 2023-24,**
Project title: **Analysis of pseudo first and second order kinetic models for adsorption of hazardous gases on carbon nanotube sensors.**
Status: Completed, Nature of the project: College funded.

- IV. **Year 2023-24,**
Project title: Indian contribution to science from Indus valley civilization to Vedic ages: a historical perspective (Additional teachers, Prof Pushpa Bindal, Dr Nutan Pandey)
Status: Completed, Nature of the project: College funded

- V. **Year: 2021-22,**
Project Title: **Simulation and Modeling of Adsorption Kinetics of Single Walled Carbon Nano Tubes for sensing environmentally hazardous gases.** The project has collaboration with Nanotechnology Group, Solid State Physics Laboratory, DRDO, Ministry of Defense.

Status: Completed, Nature of the project: College funded.

- VI. **Year 2021-22, Interdisciplinary project of music and Physics Department.**
Project Title: **Recording with Influx of Sound dynamics: A novel perspective from music.**

Status: Completed, Nature of the project: College funded.

- VII. **Year 2019-2021.**

Project Title: **To study Carbon Nanotube based gas sensors, effect of gas adsorption and their selective gas sensing properties”.** The project had collaboration with Nanotechnology Group, Solid State Physics Laboratory, DRDO, Ministry of Defense.

- a. Student team comprises of two students, Kamini and Priyanka of BSc (H) Physics II Year and two students, Ananya and Abhika of BSc (Program) II Year

Status: Completed. **Nature of the project:** College funded.

VIII. Year 2018-2019.

Principal Investigator along with Dr Seema Gupta and Dr Savita Sharma

Project Title: “To elucidate Fresnel’s equations for reflection of electromagnetic waves at an interface between dielectric media and to correlate the reflection and transmission coefficients of lossless and lossy materials for implication in energy conservation and its potential applications”.

Status: Completed. **Nature of the project:** College funded.

IX. Year 2015-2016

Project Title: “Study of variation of Thermo-emf using different thermocouples under various modified parameters and its subsequent generation for thermoelectric applications.”

Status: Completed

Student welfare

- Physics teacher representative of Physcom society 2014-16 and in 2002-2004. Organized ‘**Bits and Bytes Festival**’ under Physcom Society of the college. The events comprised Scientific Rangoli, Paper presentation, Poster making and Quiz which provided opportunity to students to present their talents in diverse fields
- Took students to National Physical Laboratory and IUAC for exposure to research facilities
- Took students to an excursion tour to Vaishno Devi temple, Jammu, 2006
- Referred students to Solid State Physics Laboratory for research work and also for summer internships.
- Provided LOR (Letter of Recommendation) to students for Universities in India and abroad for summer projects and Ph.D.
- Mentor to students groups to discuss their Academic, Carrier related and myriad of other queries.

Community Service

- Have contributed articles in college magazine. Given several radio talks on popular science, written stories for children in popular children’s magazines like *Nandan* and newspaper like Times of India
- **Member of NGO –Balkan ji Bari International** which organizes activities for children and children’s writers like painting competitions, plays, poetry and story writing and other

welfare activities.

Lifelong Membership

Member of Indian Association of Physics Teachers (IAPT)