


## FACULTY PROFILE PERFORMA

Title (Ms/Mr/Dr/Prof)	<b>Dr</b>	First Name	<b>Rachana</b>	Last Name	<b>Kumar</b>	Photograph
Designation	Professor					
Department	Physics					
Address (Official)	Department of Physics, Kalindi College, New Delhi-1100008					
Phone No.	9811104857					
Email	rachanabkumar@gmail.com					
<b>Education</b>						
Subject	Institution		Year	Details		
<b>B.Sc. (Hons.) Physics,</b>	Hindu College, University of Delhi		1984	<b>Sixth rank</b> in the University		
<b>M.Sc. Physics,</b>	University of Delhi		1986	<b>First Rank</b> in the University ( <b>Gold Medalist</b> )		
<b>Ph.D.</b>	Maastricht University, Maastricht, The Netherlands		1997			
<b>Post Doctorate</b>	Center of Excellence in Nanotechnology, Asian Institute of Technology (AIT), Bangkok, Thailand		2009-11			
<b>Career Profile</b>						
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 Defence, 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

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- **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.
- **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**

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### **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 to present.
- 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**

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### Currently

- **Convenor** Academic Committee
- **Convenor** Purchase Committee
- **Convenor** Campus Development Committee
- **Co-Convenor** Laboratory Fund Distribution Committee
- **Convenor** “Criterion II: Teaching, Learning and Evaluation” ,NAAC
- **Member** IQAC Core Committee

- **Member** “Academic Audit Committee” , NAAC
- **Member** Girl’s Hostel Committee
- **Member** Internal Assessment Moderation Committee

Also served as:

- **Convener** “Innovation Club”
- **Member** ARIIA Committee
- **Member**, Golden Jubilee Fund Distribution Committee, 2017
- **Convener**, Laboratories, NAAC Execution Committee
- **Convener**, Preparation of SSR Report, Department Portfolio and Power point Presentation of Physics Department for NAAC Evaluation
- **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 /Adhoc 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 rotation wise.
- **Convener**, LCD, Mike Committee during Vice Chancellor visit to Kalindi College
- **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

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- **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

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- **Specialization:** Solid State Physics

- **Research Area of Interest:** Nanotechnology, Self- assembly of gold silica Nanoparticles by dip coating technique

## Research Guidance

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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)

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Total teaching experience – 32 years, one of the Founder Members of Physics

Department. **Theory**

- Mathematical Physics
  - B.Sc. (H) Physics I Year, Annual mode
  - B.Sc. (H) Physics I Year, Semester mode
  - B.Sc. (H) Physics I Year, FYUP mode
  - B.Sc. (H) Physics I Year, CBCS mode
- Electromagnetic Theory
  - B.Sc. (H) Physics III Year, Annual mode
  - B.Sc. (H) Physics III Year, Semester mode
  - B.Sc. (H) Physics III Year, FYUP 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 Optics, Thermal Physics, Electricity, Mechanics for B.Sc. (H) Physics (Annual/Semester/FYUP/CBCS 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	2022	Rate kinetics and isotherm study of step functionalised carbon nanotubes gas sensor for NO <sub>2</sub> adsorption	Materials Today, Proceedings. ISSN: 2214-7853, <a href="https://doi.org/10.1016/j.matpr.2022.06.544">https://doi.org/10.1016/j.matpr.2022.06.544</a>	Seema Gupta, Ankur Anand, Neeru
2	2021	Study of adsorption kinetics of pristine and SnO <sub>2</sub> functionalized carbon nanotubes as environment gas sensors for NO <sub>2</sub> and NH <sub>3</sub> gases	Materials Today, Proceedings, Volume 47, Part 8, Pages 1651-1655. ISSN: 2214-7853	Seema Gupta, Ankur Anand, Neeru
3	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
4	2021	Experimental Study of Pristine and SnO <sub>2</sub> 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
5	2020	Fresnel's equations in transition from Single	Sambodhi, UGC-CARE Listed Journal, Vol-43, No.-04 (IV)	Seema Gupta, Savita Sharma

		to Multiple Interfaces and Evaluation of Optical parameters.	July-September (2020), ISSN: 2249-6661	
6	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
7	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
8	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
9	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
10	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
11	2009	Self- assembly of citrate stabilized gold with chitosan/PDDA capped silica colloidal nanoparticles	Proceedings of the 3 <sup>rd</sup> Thailand Nanotechnology Conference 2009-Health, Energy, Environment	ZA Khan, J Dutta
12	1999	Fibrin induced platelet procoagulant	Blood, 93(2); pp 564-570, ISSN 0006-4971	Begu S,



		activity in clotting plasma- Role of GPIIb/IIIa and GP Ib/IX Receptors and von Willebrand factor.		Keularts I, Coller B, Hemker HC
13	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,
14	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
15	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
16	1994	The influence of fibrinogen and fibrin on thrombin generation-evidence for 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
17	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,
18	1991	Dependence of Responsivity on the structure of a Blocking Contact in an Intrinsic HgCdTe Photoconductor	Infrared Physics, Vol 31, No,1,pp.101-107. ISSN 0020-0891.	Sudha Gupta, Vishnu Gopal K.C.Chhabra
19	1990	Doped Surface Layer Characteristics for	Infrared Physics (Pergamon Press), Vol	Vishnu Gopal,

		HgCdTe Photoconductive Detectors	30, No 4, pp 323-329. ISSN 0020-0891.	K.C.Chhabra,
20	1989	Accumulation Layer Characteristics for Responsivity Enhancement of HgCdTe Photoconductors	Proceedings of National Seminar on Recent Trends in IR Devices and their Defence Applications, New Delhi, 17-18 March	Vishnu Gopal, K.C.Chhabra,

## Published Books

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- 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**.

## Seminar/Workshop/Conferences Presentation/Resource person

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### 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” held 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 2<sup>nd</sup> 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 NO<sub>2</sub> And NH<sub>3</sub>**” 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 NH<sub>3</sub> and NO<sub>2</sub> 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 NO<sub>2</sub> and NH<sub>3</sub>**” 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 SnO<sub>2</sub> 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 NO<sub>2</sub> adsorption**” in International Conference on “**Recent Advances in Functional**

**materials RAFM-22**", Department of Physics, ARSD College, University of Delhi, 14-16 March, 2022.

## **Organization of conferences/workshops/special lectures**

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- **Coordinator**, "Plantation Drive and Teacher's Day Celebration" on 4<sup>th</sup> 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 held on 9-10 December, 2020.
- **Convener, National Webinar** on "Emerging out a Winner in Lockdown", Speaker Dr Anula Maurya, Vice Chancellor, JR Sanskrit University on 14<sup>th</sup> May, 2020
- **Convener, National Webinar** on "Science, Society, and Exponential Change: Reimagining the future, Speaker Dr Pratibha Jolly, Former Vice Principal, Miranda house on 13<sup>th</sup> 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 on 11<sup>th</sup> 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 at Kalindi College.
- **Convener, Workshop** on 'LIGHT', 1<sup>st</sup> September, 2015 to celebrate the year 2015- the international year of light as declared by the United Nations. by Prof A.K.Ghatak , 24<sup>th</sup> Sept 2014, Kalindi College, DU partially sponsored by National Academy of Sciences along with Dr. Pushpa Bindal. The details of the experts were as follows: Prof. V. P. Sharma (Padma Shree and Padma Bhushan, Add. Dir. Gen. of ICMR and Chairman in Public Health Research CRDT, IIT Delhi), Prof. Ajoy Ghatak (Shanti Swarup Bhatnagar Awardee, Formerly Prof. of Department of Physics, IIT Delhi), Prof. A. Pathak (Prof of Department of Physics, IIIT- Noida).  
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, 24<sup>th</sup> Sept 2014, Kalindi College, DU partially sponsored by National Academy of Sciences along with Dr Pushpa Bindal and Dr Punita Verma

- **Member, Organising 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 (2016 onwards)**

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1. **Workshop** on “Optics and its applications in Information Technology” organized by Bennett University, Greater Noida on October 1, 2016
2. **International Conference** on “ Spatial Decision Support Systems for United Nations Sustainable Development Goals” held at Kalindi College on 2-3 February, 2017
3. **National Seminar** on “A Paradigm Shift towards Empowerment of Women” held at Kalindi College on 3-4 February, 2017
4. **Conclave** on Biodiversity for everyone’s life, held at Miranda House, University of Delhi on 31<sup>st</sup> August, 2018
5. **Seminar** on “Life and Works of Prof M.N.Saha and Prof.S.N.Bose” held at Jaypee Institute of information Technology, Noida on 15<sup>th</sup> September, 2018
6. **Nominated** by the college to participate in United Nations World Teachers Day Celebrations and Higher Education and Research Summit for a cleaner world held at India International Centre, New Delhi on 5<sup>th</sup> October, 2018
7. **Workshop** “An exposition of perishable products of North- East and its challenges, organized by IBSD-Kalindi College Centre on 6<sup>th</sup> March, 2019
8. **National Conference** “Biotechnology in present era: Impact on human life and environment” organized by Maitreyi College, University of Delhi and Department of biotechnology, Govt of India, 23 August, 2019
9. **National Seminar** on “ Nuclear, particle and Accelerator Physics” jointly organized by Department of Physics, Kalindi College and The National Academy of Sciences (NASI) Delhi Chapter on 6<sup>th</sup> November, 2019
10. **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 7<sup>th</sup> January, 2020
11. **Webinar** on “Online Teaching and Learning Technology”, ARSD College on 27<sup>th</sup> April, 2020
12. **Webinar** on “Being happy by choice not chance in Covid Times”, Department of Mathematics, Kalindi College on 1<sup>st</sup> May, 2020
13. **Webinar** on “ Search, Research and Publication Ethics” organized by Library , Kalindi College on 4<sup>th</sup> May, 2020

14. **Webinar** on “Understanding the Corona Virus: some good news”, Department of Mathematics, Kalindi College on 5th May, 2020
15. **Webinar** on “Cyber Crime and Prevention during lockdown”, Mata Sundri College on 6<sup>th</sup> May, 2020
16. **National Webinar** on “What is light: Evolution of Quantum Theory”, Kalindi College on 12<sup>th</sup> May, 2020
17. **National Webinar** on “An introduction to Measurement of Light”, Kalindi College on 13<sup>th</sup> May, 2020
18. **International Webinar** on “Hypertension and COVID-19: A Cardiologist’s Perspective” organized by Swami Shraddhanand College on July 3, 2020. 2.
19. **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 13th& 14th August 2020.
20. **International Webinar** on “Recent Trends in Material Science“, organized by Shivaji College, University of Delhi on 9/10/2020
21. 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.
22. Online **National Conference** on “Recent Advances in Functional Materials” (RAFM2020) organized by ARSD (University of Delhi) on 5-6th November, 2020.
23. “Exploring Physics with Experts” National Webinar organized by Physics Department, Kalindi College & NASI Delhi Chapter Held on 10 Feb 2021.
24. **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.
25. **National Webinar** on “Role of Analytical techniques in research and development” organized by Faculty of Science, Aggarwal College, Ballabgarh held on 11.6.2021.
26. “Geopolitics of Vaccine: Access, R &D and Manufacturing,” Kalindi College on 22 June, 2021.
27. **Hands on training session on E-Content development using basic tools**, organized by E-content development committee, Kalindi College on 27<sup>th</sup> September, 2021
28. 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)
29. **National Seminar on” Innovation and Opportunities in Marine Bioresources & Biotechnology”** on 21<sup>st</sup> August, 2021, Marine Biotechnology Laboratory Department of Botany, University of Delhi & Cluster Innovation Centre (CIC), University of Delhi
30. “**Intellectual Property Rights in Academics**”, organized by Research Committee in Collaboration with IQAC, Kalindi College on September 30, 2021.

31. **“Immunity boosting herbs to combat Covid 19”**, Department of Botany, Kalindi College on 1<sup>st</sup> October, 2021
32. National Seminar on the topic **“Understanding Ambedkar, relevance of Dr BR Ambedkar in contemporary era”**, Dr BR Ambedkar Study Center, Kalindi College on 8<sup>th</sup> October, 2021.
33. National Webinar on **“Fight Against Tobacco”** organized by the Anti-Tobacco Committee in collaboration with IQAC, Kalindi College, 16th October, 2021.
34. International Webinar on **“Gender, Culture and everyday experience”** organized by Physithon, Physics Society, Kalindi College on 27<sup>th</sup> October 2021.
35. **“Nanotechnology and Optoelectronics”** by Neutronics Society, Rajdhani College, University of Delhi on 8<sup>th</sup> November, 2021.
36. **“Tools and Techniques for avoiding Plagiarism in E-content development”**, E-Content development committee, Kalindi College on 9<sup>th</sup> November, 2021.
37. **“Fundamentals and Applications of Physics”** organized by Shaheed Rajguru College of Applied Sciences for Women on January 8, 2022.

### Participation in Professional Courses

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- 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 “**, 17<sup>th</sup> -23<sup>rd</sup> December, 2019 organised by Kalindi College in collaboration with Mahatma Hansraj Faculty Development Centre, Hansraj College.
- FDP on” Latex “organized by CMR Engineering college, Hyderabad from 1-5<sup>th</sup> June, 2020.
- FDP on “Scilab” organized by St peter Engineering college from 15-19 June, 2020.
- TEQIP- III sponsored Five Day Workshop on “Matlab and its Applications”, 4-8th January, 2021, Organized by Rajasthan Technical University, Kota & Department of Electrical Engineering and Sri Balaji College of Engineering & Technology.



## **Projects (Major Grants / Collaborations)**

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**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 Dr Seema Gupta, Mr. Ankur Anand working with undergraduate students on **Innovation Projects**:

**I. 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:** Ongoing, Nature of the project: College funded.

**II. Year 2021-22, Interdisciplinary project of music and Physics Department.**

Project Title: **Recording with Influx of Sound dynamics: A novel perspective from music.**

**Status:** Ongoing, Nature of the project: College funded.

**III. 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.

#### IV. 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**”.

- Student team comprised of four students of Physics (H) II Year.

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

#### V. 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.**”

- Student team comprising of three students of Physics (H) III Year and three of II year was involved in the project.

**Status:** Completed

### Student welfare

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- Physics teacher representative of Physcom society 2014-16 and in 2002-2004. Organised ‘**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

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- Have contributed articles in college magazine. Given several radio talks on popular science, written stories for children in popular children 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**

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Member of Indian Association of Physics Teachers (IAPT)