


Curriculum Vitae

Full Name	Dr. Hemwati Nandan			
Designation	Professor			
Department	Physics			
Campus	Birla Campus			
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Email	hemwati.nandan.physics@gmail.com hnandan@associates.iucaa.in			
Education Qualification	Ph.D. (2006), Kumaun University, Nainital (Under Sandwich Model Scheme Fellowship of DAAD Germany) M.Sc. (1998), Kumaun University, Nainital (1st Rank in the University) B.Sc. (1996), Kumaun University, Nainital			
Teaching Experience	13 Years	Research Experience	25 Years	
Areas of Interest/ Specialization				
(i) Theoretical High Energy Physics (THEP), Classical GR & Cosmology - Monopoles, Regge trajectories of Hadrons, Black Holes, Geodesics, Gravitational Lensing, Dark Matter, Dark Energy, and Raychaudhuri Equations. (i) Atmospheric Physics - Air Pollution, Extreme Events and Climate Change.				
Honours & Awards				
<ol style="list-style-type: none"> Honorary Extra-ordinary Professor at the Center for Space Research (CSR), North-West University, South Africa (Since January 2023). Research Associateship of the Inter University Centre for Astronomy and Astrophysics, Pune, India 2012 (fifth term is in progress and each term is of three years). Best teacher award conferred by Hon'ble VC of Gurukula Kangri (Deemed to be University), Haridwar, India on 26.01.2022 (Republic Day of India) for exemplary contribution to teaching. Shodh Ratna Award conferred by Hon'ble VC of Gurukula Kangri (Deemed to be University), Haridwar, India on 26.01.2022 (Republic Day of India) for remarkable contribution to research. Certificate of Appreciation by the UCOST Dehradun for being a part of coordination committee to organise 13th Uttarakhand State Science and Technology Congress held at UCOST Vigyan Dham, Dehradun during 26-28 February 2019. Certificate of Reviewer Excellence 2018 in recognition of outstanding contributions as a reviewer for the Journal of Astrophysics and Astronomy of Indian Academy of Sciences. Certificate of Appreciation by the UCOST Dehradun for being a part of coordination committee to organise 12th Uttarakhand State Science and Technology Congress 2014-15 held at UCOST Vigyan Dham, Dehradun during 7-9 March, 2016. Member of national executive council of Indian Association of Physics Teachers (IAPT) from January 2016 to January 2018. Research fellowship for a research stay by the German Academic Exchange Service (DAAD), Germany during September 1-October 10, 2013. 				

10. Research Associateship of the Institute of Mathematical Sciences, Chennai, India 2012 (not availed).
11. Visiting Associateship by Centre for Theoretical Studies, IIT Kharagpur, India in 2006, 2009 and 2011.
12. Young Scientist Award-2011 by Uttarakhand State Council for Science & Technology (UCOST) during 6th USSTC during 14-16 November 2011.
13. Dr. D. S. Kothari higher post-doctoral fellowship by the University Grants Commission (UGC), New Delhi, India from August 2009-March 2011.
14. Research fellowship for a research stay by the German Academic Exchange Service (DAAD), Germany during May 15-July 14, 2009.
15. High Energy Guest Scientist Fellowship of HECAP Section by the Abdus Salam International Centre for Theoretical Physics (ASICTP), Italy in 2009.
16. Post-doctoral fellowship by the Institute of Physics, Bhubaneswar, India 2009 (not availed).
17. DST-DFG award to participate in the 58th Noble Laureates Meeting from June 29-July 4, 2008 at Lindau (Germany).
18. Research Associateship at the Centre for Theoretical Studies, Indian Institute of Technology Kharagpur, India from October 2006-August 2009.
19. German Academic Exchange Service (DAAD) Sandwich Model Scheme Fellowship by DAAD, Bonn, Germany, 2004-2005.
20. Junior Guest Scientist Fellowship of HECAP Section, ASICTP, Trieste, Italy, 2004.
21. Senior Research Fellowship by Council of Scientific and Industrial Research, New Delhi, India in 2004 (not availed).
22. Research Fellowship by the University Grants Commission (UGC), New Delhi, India from 2001-2003.
23. Silver Jubilee Fellowship by Kumaun University, Nainital, India, during 1999-2001 on the basis of merit list of Kumaun University in M.Sc.

Member of Academic Institutions

1. Board Member of School of Physical & Material Sciences, Himachal Pradesh Central University (HPCU), Dharmasala, India (2021-2024).
2. Member, National Steering Committee, Rashtriya Aavishkar Abhiyan, Ministry of Education, Government of India (2020 -).

Membership of Scientific Organization

1. National Radon Network Society, New Tehri, India.
2. Indian Association of Physics Teachers (IAPT), Kanpur, India.
3. Indian Science Congress Association, Kolkata, India.
4. Hindi Vigyan Sahitya Parishad, Mumbai, India.
5. Indian Physics Association, Mumbai, India.
6. Indian Physical Society, Kolkata, India.
7. National Book Trust, New Delhi, India.
8. Indian Association of General Relativity and Gravitation (IAGRG), Pune, India.
9. People's Association for Himalaya Area Research (PAHAR), Nainital, India.
10. Science in Service of Society (SSS), Dehradun, India.

Research Supervision (No. of Ph.D. Degree Awarded/ Registered)

Awarded: **11** (Supervision: **08**, Co-supervision: **03**, Registered/Ongoing: **03**)

Post-Doc Supervision: **02**

M.Sc. Dissertation: **45**

Research Projects

1. Kinematics of geodesic flows in space-times of general relativity and other alternative theories of gravity (Grant: INR 10,32,000.00/-, DST, New Delhi, Duration - 03 years) (status - **completed**).
2. Null Geodesics Around Strong Gravitational Source (Grant: INR 17,72,958.00/-, SERB, New Delhi, Duration – 03 years) (status - **completed**).
3. Gravitational Lensing and Black Hole Shadows (Grant: INR 3,88,000/-, UCOST, Dehradun, Duration - 02 years) (status - **completed**).
4. Statistical analysis of precipitation, temperature, and cloud cover over northwestern Himalaya with special reference to Uttarakhand (Grant: INR 3,88,000/-, UCOST, Dehradun, Duration - 02 years) (status - **completed**).
5. Assimilating the Concepts of Physics through Hand on Experiments Demonstration Experiments Workshops and Kit Making for PGT Physics in Uttarakhand 2023 (Grant: INR 9,02,000/-, DST, New Delhi, Duration - 01 year) (status - **ongoing**).
6. Wormholes with no Exotic matter and their Possible Fingerprints in the observations from LIGO and EHT 2023 (Core Research Grant, SERB, New Delhi, Duration – 03 years) (status - **approved**).

Administrative Experience

1. Head, Department of Physics, Birla Campus, HNBGU (January 2024 onwards).
2. Director, Research and Development Cell, HNBGU (November 2023 onwards).
3. President, IIC, HNBGU (March 2023 onwards).
4. Coordinator, IUCAA Centre for Astronomy Research and Development (ICARD), Department of Physics, Gurukula Kangri Vishwavidyalaya, Haridwar (March, 2019 onwards).

Scientific Visits Abroad/International Collaboration (2017- onwards)

1. VAN LANG University, Vietnam June 5, 2023 for Invited talk/Meeting.
2. PIAS, Hanoi, Vietnam May 24, 2023 for Invited talk/Meeting.
3. PIRE-GEMADARC Summer School, Collaboration Meeting, and Undergraduate Research Experience - 2023 during 24 May- 4 June 2023.
4. Research visit to Central Department of Physics, Tribhuvan University/International Center for Integrated Mountain Development (ICIMOD), Nepal during 5-9 January, 2020.
5. Visiting Professor at the Center for Space Research, Physics Department, North-West University (Mahikeng Campus), Republic of South Africa during 23 June to July 7, 2019.
6. Visiting Scientist, Astrophysics and Cosmology Unit (ACRU), University of KwaZulu-Natal, Durban, Republic of South Africa during 17-23 June, 2019.
7. Visiting Scientist, Institute of Physics, University of Zurich, Switzerland 3 - 30 June, 2018.
8. Visiting Scientist, Institute of Physics, University of Zurich, Switzerland, June 8 - July 8, 2017.

Conference/Symposium/Workshop Attended during last five years (2017-2022).**International**

1. India International Science Festival 2023 held at DBT THSTI-RCB Campus, Faridabad, Haryana during 17-20 January, 2024.
2. Conference on Cosmology at Centre for Cosmology and Science Popularization

(CCSP), SGT University, Gurugram, Haryana during 28 November-1 December, 2023.

3. Inaugural Conference on Cosmology at Centre for Cosmology and Science Popularization (CCSP), SGT University, Gurugram, Haryana during 17-19 October, 2022.
4. India International Science Festival 2022 held at National Technology Institute, Bhopal, Madhya Pradesh during 21-24 January, 2023.
5. International E-Conference on Recent Advances in Physics: A Promise to Society organised by Government PG College, Bazpur, Uttarakhand during 29-30 June, 2020.
6. India International Science Festival held at Science City, Kolkata during 5-9 November, 2019.
7. International Conference on "Climate Change and Disaster risk Reduction" held at HNB Garhwal University Campus Badshahi Thaul, Tehri Garhwal, Uttarakhand, India during 26-28th October 2018.
8. International Conference on Aerosols, air Quality and Climate Change on Himalayan Region of Uttarakhand (AAC-2018) held at Department of Physics, HNBGU Srinagar (Garhwal) during 21-23 October, 2018.
9. Fifteenth Marcel Grossmann Meeting held at University of Rome "Sapienza", Rome, Italy during 1-7 July, 2018.
10. Two Days Workshop on Physical and Applied Sciences held at Department of Physics, HNBGU Srinagar (Garhwal) during 14-15 March, 2018.
11. India International Science Festival held at Anna University, Chennai during 13-16 October, 2017.
12. Second National Conference on Radiation Awareness and Detection in Natural Environment (RADNET-II) held at Department of Physics, Gurukula Kangri Vishwavidyalaya, Haridwar during 25-27 September, 2017.
13. ACES (Atomic Clock Ensemble in Space) workshop held at the Institute of Physics, University of Zurich, Zurich, Switzerland during 29-30 June, 2017.
14. IAGRG-29: The Era of Gravitational Waves) held at the Department of Physics, IIT, Guwahati during 18-20 May, 2017.

National

1. National workshop on "Concepts of Physics and Development of innovative teaching methods to inspire inquiring spirit among School and Under Graduate Students" held at department of Physics, P.N.G. Govt. P.G. College Ramnagar, Nainital, Uttarakhand, India, during 04-05 February 2020.
2. One day workshop on "Awareness on Intellectual Property Rights" held at department of Physics, Govt. P.G. College New Tehri, India in collaboration with UCOST, Dehradun during 03 December 2019.
3. One day workshop on "Conservation of Renewable Energy Sources for Sustainable Development" held at department of Physics, Govt. P.G. College New Tehri, India in collaboration with USERC, Dehradun during 02 December 2019.
4. One day workshop on "Intellectual Property Rights" held at P.N.G. Govt. P.G. College Ramnagar (Nainital) during 23 November 2019.
5. 4th National conference on Recent Trends in the Study of Compact Objects: Theory and Observation (RETCO-IV) held at IUCAA, Pune during 17 - 20 April 2019.

6. National Workshop on Computer Interfaced Low-Cost Science Experiments & Study of basics of Plasma, Its Characteristics and Applications held at VSKC PG College, Dakpathar, Dehradun during 1-2 March, 2019.
7. 30th IAGRG (Indian Association of General Relativity and Gravitation) meeting held at BITS Pilani Hyderabad Campus, Hyderabad during 3-5 January, 2019.
8. Two Days Workshop on Physical and Applied Sciences held at Department of Physics, HNBGU Srinagar (Garhwal) during 14-15 march, 2018.

Conference/Symposium/Workshop Organized during last five years (2017-onwards)

1. Monthly General Physics Lecture Series held Online during November 29, 2022 - April 25, 2023 [Coordinator].
2. Sky watch Program held at Astrophysics Planetarium, HNB Garhwal University December 19 - December 21, 2022 [Coordinator].
3. Science Week 2023, held at HNB Garhwal University during February 28-March 4, 2023 [Coordinator].
4. Workshop on Securing Research Funding, HNB Garhwal University, December 11-December 12, 2022 [Convener]
5. Workshop on Getting Involved with Physics, HNB Garhwal University, December 9, 2022 [Convener].
6. Workshop on Classical Concept of Akash Tatva held at Doon University Campus, Dehradun on 21 October, 2022 [Secretary].
7. Seminar on North West & Central Himalayan Disasters held at Doon University Campus, Dehradun on March 26, 2023 [Convener].
8. *Vigyan Sarvatra Pujiyate* program of Vigyan Prasar, Government of India, held at Gurukula Kangri (Deemed to be University), Haridwar, from 22-28 February 2022 [Local event Coordinator].
9. Physics in Vedic Thoughts held as online Webinar on July 3, 2020 [Secretary].
10. An Educator Workshop in Astronomy and Sky Watch held at ICARD, Department of Physics, Gurukula Kangri Vishwavidyalaya, Haridwar on November 27, 2019 (supported by Aryabhata Institute of Observational Sciences (ARIES), Nainital) [Convener].
11. Environmental Physics: Electronic Devices and Data Science held at Department of Physics, Gurukula Kangri Vishwavidyalaya, Haridwar on September 17, 2018 (Funded by Department of Physics) [Secretary].
12. XXXII Annual IAPT Convention and National Symposium on Recent Trends in Physics at Different Scales held at Department of Physics, Gurukula Kangri Vishwavidyalaya, Haridwar during 29-31 October, 2017 (Funded by IAPT, SERB New Delhi, UCOST Dehradun and ARIES Nainital) [Secretary].
13. Second National Conference on Radiation Awareness and Detection in Natural Environment (RADNET-II) held at Department of Physics, Gurukula Kangri Vishwavidyalaya, Haridwar during 25-27 September, 2017 (Funded by AERB, Mumbai and CSIR, New Delhi) [Secretary].

Research Publications 2017 onwards

Journals

1. Ahuja, V., Pandey, C. P., Joshi, L. K., **Nandan, H.**, & Pathak, P. P. (2024). Extreme value analysis of precipitation and temperature over Jammu & Kashmir and Ladakh in western Himalaya, India. *Mausam*, 75(1), 149–180. [IF 0.906]

2. Sindhu, D. G., Ranjan, A., **Nandan, H.**, & Sharma, V. (2024). Heavy Hexaquarks in the Flux Tube. *Modern Physics Letters A*, 2450008. [IF 1.594]
3. Ahuja, V., Pandey, C. P., Joshi, L. K., **Nandan, H.**, & Pathak, P. P. (2023). Statistical modelling of century-long precipitation and temperature extremes in Himachal Pradesh, India: generalized extreme value approach and return level estimation. *Indian Journal of Physics*, 1-12. [IF 1.778]
4. Giri, S., Sheoran, P., **Nandan, H.**, & Shaymatov, S. (2023). Chaotic motion and Periastron precession of spinning test particles moving in the vicinage of a Schwarzschild black hole surrounded by a quintessence matter field. *The European Physical Journal Plus*, 138(3), 245. [IF 3.758]
5. Pandey, C. P., Ahuja, V., Joshi, L. K., & **Nandan, H.** (2023). Extreme value analysis of precipitation and temperature over western Indian Himalayan State, Uttarakhand. *Journal of Earth System Science*, 132(2), 48. [IF 1.9]
6. Sindhu, D. G., Ranjan, A., & **Nandan, H.** (2023). Regge trajectories of tetraquarks and pentaquarks with massive quarks in the flux tube model. *International Journal of Modern Physics A*, 38(06n07), 2350044. [IF 1.475]
7. Singh, A., Deep, A., Pandey, C. P., & **Nandan, H.** (2023). Comparative study of gaseous pollutants and particulate matter for major cities in the foothills of Garhwal Himalaya of Uttarakhand. *Mausam*, 74(1), 57-72. [IF 0.906]
8. Singh, A., Pandey, C. P., **Nandan, H.**, & Semwal, P. (2023). Variation of AIRS-Retrieved CO₂ over Uttarakhand, India, During 2010–2017. *Journal of the Indian Society of Remote Sensing*, 1-12. [IF 1.894]
9. Giri, S., **Nandan, H.**, Joshi, L. K., & Maharaj, S. D. (2022). Stability analysis of circular orbits around a traversable wormhole with massless conformally coupled scalar field. *The European Physical Journal C*, 82(4), 298. [IF 4.994]
10. Giri, S., **Nandan, H.**, Joshi, L. K., & Maharaj, S. D. (2022). Geodesic stability and quasinormal modes of non-commutative Schwarzschild black hole employing Lyapunov exponent. *The European Physical Journal Plus*, 137(2), 1-11. [IF 3.758]
11. Kala, S., **Nandan, H.**, & Sharma, P. (2022). Shadow and weak gravitational lensing of a rotating regular black hole in a non-minimally coupled Einstein-Yang-Mills theory in the presence of plasma. *The European Physical Journal Plus*, 137(4), 1-18. [IF 3.758]
12. Sharma, P., **Nandan, H.**, Nashed, G. G., Giri, S., & Abebe, A. (2022). Geodesics of a Static Charged Black Hole Spacetime in $f(R)$ Gravity. *Symmetry*, 14(2), 309. [IF 2.7]
13. Singh, P., **Nandan, H.**, Joshi, L. K., Handa, N., & Giri, S. (2022). Stability of circular geodesics in equatorial plane of Kerr spacetime. *The European Physical Journal Plus*, 137(2), 263. [IF 3.758]
14. Giri, S., **Nandan, H.**, Joshi, L. K., & Maharaj, S. D. (2021). Stability analysis of circular orbits around a charged BTZ black hole spacetime in a nonlinear electrodynamics model via Lyapunov exponents. *Modern Physics Letters A*, 36(31), 2150220. [IF 1.594]
15. Kala, S., **Nandan, H.**, Sharma, P., & Elmardi, M. (2021). Geodesics and bending of light around a BTZ black hole surrounded by quintessential matter. *Modern Physics Letters A*, 36(31), 2150224. [IF 1.594]

16. Giri, S., & **Nandan, H.** (2021). Stability analysis of geodesics and quasinormal modes of a dual stringy black hole via Lyapunov exponents. *General Relativity and Gravitation*, 53(8), 76. [IF 2.8]
17. Sharma, P., **Nandan, H.**, Papnoi, U., & Chatterjee, A. K. (2021). Optical and thermodynamic properties of a rotating dyonic black hole spacetime in $N=2$, $U(1)$ gauged supergravity. *The European Physical Journal C*, 81(5), 429. [IF 4.994]
18. Pal, M., Kumari, N., Kushwaha, P., Singh, K. P., Gupta, A. C., Naik, S., ... & **Nandan, H.** (2021). Spectro-timing analysis of a highly variable narrow-line Seyfert 1 galaxy NGC 4748 with AstroSat and XMM-Newton. *Journal of Astrophysics and Astronomy*, 42, 1-13. [IF 1.1]
19. Kala, S., **Nandan, H.**, & Sharma, P. (2020). Deflection of light around a rotating BTZ black hole. *Modern Physics Letters A*, 35(39), 2050323. [IF 1.594]
20. Kala, S., Saurabh, Nandan, H., & Sharma, P. (2020). Deflection of light and shadow cast by a dual-charged stringy black hole. *International Journal of Modern Physics A*, 35(28), 2050177. [IF 1.475]
21. Sheoran, P., **Nandan, H.**, Hackmann, E., Nucamendi, U., & Abebe, A. (2020). Schwarzschild black hole surrounded by quintessential matter field as an accelerator for spinning particles. *Physical Review D*, 102(6), 064046. [IF 5.407]
22. Hackmann, E., **Nandan, H.**, & Sheoran, P. (2020). Particle collisions near static spherically symmetric black holes. *Physics Letters B*, 810, 135850. [IF 4.95]
23. Abebe, A., Al Ajmi, M., Elmardi, M., **Nandan, H.**, & Ul Sabah, N. (2021). Shear-free conditions of a Chaplygin-gas-dominated universe. *International Journal of Geometric Methods in Modern Physics*, 18(12), 2150192. [IF 1.63]
24. Sharma, P., **Nandan, H.**, Gannouji, R., Uniyal, R., & Abebe, A. (2020). Deflection of light by a rotating black hole surrounded by "quintessence". *International Journal of Modern Physics A*, 35(26), 2050155. [IF 1.475]
25. Rudra, A., **Nandan, H.**, Gannouji, R., Chakraborty, S., & Chatterjee, A. K. (2020). Rotating dyonic black hole in, $U(1)$ gauged supergravity as natural laboratory for high energy particle collisions. *Classical and Quantum Gravity*, 37(22), 225010. [IF 3.853]
26. Chatterjee, A. K., Flathmann, K., **Nandan, H.**, & Rudra, A. (2019). Analytic solutions of the geodesic equation for Reissner-Nordström-(anti-) de Sitter black holes surrounded by different kinds of regular and exotic matter fields. *Physical Review D*, 100(2), 024044. [IF 5.407]
27. Kishore, N., Srivastava, A. K., **Nandan, H.**, Pandey, C. P., Agrawal, S., Singh, N., ... & Srivastava, M. K. (2019). Long-term (2005–2012) measurements of near-surface air pollutants at an urban location in the Indo-Gangetic Basin. *Journal of Earth System Science*, 128, 1-13. [IF 1.9]
28. Deep, A., Pandey, C. P., Singh, N., **Nandan, H.**, Dhaka, S. K., Dimri, A. P., & Purohit, K. D. (2018). Study of ambient air pollutants over Rishikesh at foothills of north-western Indian Himalaya. *Indian Journal of Radio and Space Physics*, 47, 49. [IF 0.22]
29. Uniyal, R., **Nandan, H.**, & Jetzer, P. (2018). Bending angle of light in equatorial plane of Kerr–Sen Black Hole. *Physics Letters B*, 782, 185-192. [IF 4.95]
30. Kuniyal, R. S., **Nandan, H.**, Papnoi, U., Uniyal, R., & Purohit, K. D. (2018). Strong lensing and observables around 5D Myers–Perry black hole spacetime. *Modern Physics Letters A*, 33(23), 1850126. [IF 1.594]

31. Uniyal, R., **Nandan, H.**, & Purohit, K. D. (2017). Null geodesics and observables around the Kerr–Sen black hole. *Classical and Quantum Gravity*, 35(2), 025003. [IF 3.853]
32. Kuniyal, R. S., Uniyal, R., Biswas, A., **Nandan, H.**, & Purohit, K. D. (2018). Null geodesics and red–blue shifts of photons emitted from geodesic particles around a noncommutative black hole space–time. *International Journal of Modern Physics A*, 33(16), 1850098. [IF 1.475]
33. Tripathi, B. V., **Nandan, H.**, & Purohit, K. D. (2017). Global monopole in a broken-symmetric theory of gravitation. *Modern Physics Letters A*, 32(13), 1750061. [IF 1.594]
34. **Nandan, H.**, & Uniyal, R. (2017). Geodesic flows in a charged black hole spacetime with quintessence. *The European Physical Journal C*, 77(8), 552. [IF 4.994]

Proceedings

35. Sindhu, D. G., Ranjan, A., & **Nandan, H.** (2022). Regge trajectories of tetraquarks with massive quarks. In Proceedings of the DAE Symp. on Nucl. Phys (Vol. 66, p. 865).
36. **Nandan, H.**, Sharma, P., Uniyal, R., & Jetzer, P. (2022). Geodesics in a rotating black hole spacetime surrounded by quintessence. In The Fifteenth Marcel Grossmann Meeting: On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics, and Relativistic Field Theories (In 3 Volumes) (pp. 849-854).
37. Uniyal, R., **Nandan, H.**, & Jetzer, P. (2022). Deflection of light in equatorial plane of Kerr-Sen black hole. In The Fifteenth Marcel Grossmann Meeting: On Recent Developments in Theoretical and Experimental General Relativity, Astrophysics, and Relativistic Field Theories (In 3 Volumes) (pp. 1870-1875).
38. Ranjan, A., & **Nandan, H.** (2018). Regge Trajectories of Some Recently Observed Pentaquarks. In Proceedings of the DAE International Symp. on Nucl. Phys (Vol. 63, p. 856).
39. Ranjan, A., & **Nandan, H.** (2018). Heavy Flavor Hadrons in Quark - Gluon Plasma. In Proceedings of the DAE International Symp. on Nucl. Phys (Vol. 62, p.932-933)

Books: NA

Total Number of Research Publications: 110

Total Citation, h-index, i10 index (Scopus/WoS/Google Scholar): 695, 15, 29.