

Faculty Profile

Name: Dr. Harinandan Kumar

Designation: Assistant Professor

Teaching Area: Mining Engineering



Research Interest: Rock Mechanics, Soil Mechanics, Reservoir Engineering, Coal Bed Methane Production Technology, Fluid Mechanics, Thermal Engineering, Strength of Material

Experience (In Years): Teaching: 9 Years; Research: 04 Years

Academic qualifications: Ph.D. (2018; NIT Rourkela), B.E.

Major Research Publications / Presentation:

Publications in International Journal

1. **Harinandan Kumar (First and Corresponding Author)**, S. Ravi Kumar “An approach to CO₂ capture technology for Mitigating Global Warming and Climatic Change - An Overview”, DOI: 10.1109/RSTSCC.2010.5712870, IEEE Explore, pp. 364-371, 2010. (**Scopus Indexed**), **Citation 10**, DOI: 10.1109/RSTSCC.2010.5712870
2. **Harinandan Kumar (First and Corresponding Author)**, Susmita Mishra, M. K. Mishra, A. Parida, “Petrographic Characteristics of Bituminous Coal from Jharia Coalfield India: It's Implication on Coal Bed Methane Potentiality” Procedia Earth and Planetary Science, Science Direct, Vol. 11, pp. 38-48, 2015. (**Scopus Indexed**), **Citation 18**, <https://doi.org/10.1016/j.proeps.2015.06.006>
3. **Harinandan Kumar (First and Corresponding Author)** and M. K. Mishra, “Optimization and Evaluation of Fly Ash Composite Properties for Geotechnical Application” Arab. Journal of Geo-science, Vol. 8, pp. 3713-3726, 2015. **ISSN 1866-7538**, **Citation 11**, <https://doi.org/10.1007/s12517-014-1502-z>
4. **Harinandan Kumar (First and Corresponding Author)**, M. K. Mishra, and S. Mishra, “3D Modelling of Coal Deformation under Fluid Pressure using COMSOL Multiphysics”, Journal of Engineering Science and Technology Review. Vol. 10, pp. 62-69, 2018. (**Scopus Indexed, Q4**), **ISSN: 1791-2377**, **Citation 1**, doi:10.25103/jestr.106.09
5. **Harinandan Kumar (First and Corresponding Author)**, M. K. Mishra, and S. Mishra, “Laboratory Investigation of Gas Permeability and its Impact on CBM Potential”, Journal of Petroleum Exploration and Production Technology, Springer, Vol. 8, pp. 1183-1197, 2018. (**SCI Indexed, Q2**) (**Citation 11**) **Impact Factor: 2.508**, <https://doi.org/10.1007/s13202-017-0425-0>
6. **Harinandan Kumar (First and Corresponding Author)**, M. K. Mishra, and S. Mishra, “Effect of Permeability and Geo-mechanical Properties on Coal Matrix During CBM Production – An Overview”, Journal of Engineering Science and Technology Review, Vol. 11, pp. 160-173, 2018. (**Scopus Indexed, Q4**), **ISSN: 1791-2377**, **Citation 10**, doi:10.25103/jestr.112.22
7. M. Muralidhar Singh, K. V. Nagesha, T. M. Gurubasavaraju; **Kumar Harinandan**; K. M. Ajay; G. Vijaya, “Evaluation of Mechanical Properties of Polymer Composites Profiles for Marine Applications”, Grenze International Journal of Engineering & Technology, Vol. 4, pp. 343-347, 2018.
8. M. Muralidhar Singh, **Harinandan Kumar (Corresponding Author)**, G. Hemath Kumar, P. Sivaiah, K. V. Nagesha, K. M. Ajay, G. Vijaya, “Determination of Strength Parameters of Glass Fibers Reinforced Composites for Engineering Applications”, Silicon, Vol. 12(1), pp. 1-11, 2019. (**SCI Indexed, Q2**) **Impact Factor: 3.4**, **ISSN 1876-9918**, **Citation 21**, <https://doi.org/10.1007/s12633-019-0078-3>

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9. **Harinandan Kumar (First and Corresponding Author)**, M. K. Mishra, and S. Mishra, "Sorption capacity of Indian coal and its variation with rank parameters", *Journal of Petroleum Exploration and Production Technology*, Vol. 9, pp. 2175-2184, 2019. (SCI Indexed, Q2) **Impact Factor: 2.2, ISSN 2190-0566, (Citation 6), DOI:10.1007/s13202-019-0621-1**
10. Muralidhar Singh M., **Harinandan Kumar (Corresponding Author)**, G. Hemath Kumar, P. Sivaiah, K. V. Nagesha, Ajay K M, Vijaya G, "Evaluation of Multilayer Thin Film Coatings for Solar Thermal Applications", *Arabian Journal for Science and Engineering*. Vol. 44, pp. 7789-7797, 2019. (SCI Indexed, Q1) **Impact Factor: 2.9, ISSN 2191-4281, Citation 5, DOI:10.1007/s13369-019-03904-9**
11. **Harinandan Kumar (First and Corresponding Author)**, M. K. Mishra, and S. Mishra, "Experimental and numerical evaluation of CBM potential in Jharia Coalfield India", *Geomechanics and Geophysics for Geo-Energy and Geo-Resources*, Vol. 5 (3), pp. 289-314, 2019. (SCI Indexed, Q1), **Impact Factor: 5.0, ISSN 2363-8427, Citation 15, DOI:10.1007/s40948-019-00114-3**
12. K. V. Nagesha, **Harinandan Kumar (Corresponding Author)**, M. Muralidhar Singh, "Development of statistical models to predict Emission rate and Concentration of Particulate Matters (Pm) for drilling operation in opencast mines", *Journal of Air Quality, Atmosphere & Health*, Vol. 12, pp. 1073-1079, 2019. (SCI Indexed, Q2) (Citation 7) **Impact Factor: 5.1, ISSN 1873-9326, Citation 9, DOI:10.1007/s11869-019-00723-7**
13. Upendra Singh Yadav, **Harinandan Kumar (Corresponding Author)**, Vishnu Roy, Saurabh Juyal, Anurag Tripathi, Anveshika Shanker, "Experimental evaluation of partially hydrolyzed polyacrylamide and silica nanoparticles solutions for enhanced oil recovery", *Journal of Petroleum Exploration and Production Technology*, Vol. 10, pp. 1109-1114, 2019, (SCI Indexed, Q2) (Citation 8) **Impact Factor: 2.2, ISSN 2190-0566, Citation 12, DOI:10.1007/s13202-019-00749-8**
14. **Harinandan Kumar (First and Corresponding Author)**, Upendra Singh Yadav, Subhash Kumar, Kishan Kumar, Ravi Yadav, Anveshika Shanker, Anurag Tripathi, Gitiksha Khandelwal, "Comparative study of coal rocks compressive behaviors and failure criteria", *Arabian Journal of Geosciences*, Vol. 12(23), pp. 710, 2019. **ISSN 1866-7538, Citation 7, DOI:10.1007/s12517-019-4914-y**
15. P Sivaiah, Venkata Ajay Kumar G, Muralidhar Singh M, **Harinandan Kumar**, "Effect of novel hybrid texture tool on turning process performance in MQL machining of Inconel 718 superalloy", *Journal of Materials and Manufacturing Processes*, Vol. 35, pp 61-71, 2019. (SCI Indexed, Q1), **Impact Factor: 4.8, ISSN: 1532-2475, Citation 68, <https://doi.org/10.1080/10426914.2019.1697444>**
16. Upendra Singh Yadav, **Harinandan Kumar (Corresponding Author)**, Vikas Mahto, "Experimental investigation of partially hydrolyzed polyacrylamide-hexamine-pyrocatechol polymer gel for permeability modification", *Journal of Sol-Gel Science and Technology*, Vol. 94, pp. 335-346, 2020. (SCI Indexed, Q2), **Impact Factor: 2.5, ISSN 1573-4846, Citation 11, DOI:10.1007/s10971-020-05248-5**
17. Koneti Nagesha, **Harinandan Kumar (Corresponding Author)**, Muralidhar Munisingh, "Influence of rock properties on emission rate of Particulates Matter (Pm) during drilling operation in surface mines", *Iranian Journal of Earth Sciences*, Vol. 13, pp. 14-20, 2020. (Scopus Indexed, Q2) **Impact Factor: 0.8, ISSN 2008-8779, Citation 1, 10.30495/IJES.2021.677471**
18. Muralidhar Munisingh M., **Harinandan Kumar (Corresponding Author)**, P. Sivaiah, "Alumina Thin film Coatings at Optimized Conditions using RF Magnetron Sputtering Process", *International Journal of Thin Films Science and Technology*, Vol. 10, pp. 13-30, 2020. (SCOPUS Indexed) **Impact Factor: 0.15, ISSN 2090-9519, doi:10.18576/ijtfst/100103**
19. **Harinandan Kumar (First and Corresponding Author)**, Muralidhar Munisingh M., P. Sivaiah, "Characterization of Aluminium and Alumina Thin Films Coatings using different Deposition Methods for Enhancement of Optical Properties", *International Journal of Materials Engineering Innovation*, Vol. 12, pp. 165-187, 2021. (Scopus Indexed, Q4) **Impact Factor: 0.9. ISSN 1757-2762, DOI: 10.1504/IJMATEI.2021.10039979**
20. Prashant Saini, **Harinandan Kumar (Corresponding Author)**, Tarun Gaur, "Cement bond evaluation using well logs: A case study in Raniganj Block Durgapur, West Bengal, India", *Journal of Petroleum Exploration and Production Technology*, Vol. 11, pp. 1743-1749, 2021. (SCI Indexed, Q2) **Impact Factor: 2.2, (Citation 2). ISSN 2190-0566, Citation 5, DOI <https://doi.org/10.1007/s13202-021-01151-z>**
21. **Harinandan Kumar (First and Corresponding Author)**, M. K. Mishra, S. Mishra, Muralidhar Singh M., D. K. Srivastava, "Determination of Methane Sorption Capacity using microstructural analysis in coal of Jharia Coalfield, India", *Arabian Journal of Geosciences*, Vol. 14, pp. 690, 2021. **ISSN 1866-7538, Citation 6, DOI:10.1007/s12517-021-07051-0**

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22. Nirlipta Priyadarshini Nayak, **Harinandan Kumar (Corresponding Author)**, Shivani Bhist, “Application of Hydraulic Flow Unit for Prediction of Flow Zone in Carbonate Reservoir”, Arabian Journal of Geosciences. Vol. 14, pp. 677, 2021. ISSN 1866-7538, Citation 1, DOI <https://doi.org/10.1007/s12517-021-07052-z>
23. Muralidhar Munisingh M., **Harinandan Kumar (Corresponding Author)**, P. Sivaiah, “Evaluation of Mechanical Properties of Glass Fiber-BMPM/DABAPMC Composite”, Transactions of the Indian Institute of Metals, Vol. 74, pp. 2185–2192, 2021. (SCI Indexed, Q2) Impact Factor: 1.6, ISSN 0975-1645, DOI:10.1007/s12666-021-02314-6
24. **Harinandan Kumar (First and Corresponding Author)**, “An overview of characterization and sorption capacity of coal for CO₂ sequestration”, Arabian Journal of Geosciences, Vol. 15, pp. 1364, 2022. ISSN 1866-7538, Citation 3, <https://doi.org/10.1007/s12517-022-10641-1>
25. **Harinandan Kumar**, Shweta Rai, Ankita Rai, Atif Faheem, Amiya Shankar Naik, Pramod Kumar Rajak, Dilip Kumar Srivastava, Deepak Singh Maurya, Don Chatterjee & Prakash K. Singh “Characterization of composite coal seam III–IV of Ramagundam coalfield, Godavari Basin (India): an attempt to evaluate CBM prospects”, Arabian Journal of Geosciences, Vol. 15, pp. 1400, 2022., ISSN 1866-7538, <https://doi.org/10.1007/s12517-022-10681-7>
26. Nirlipta Priyadarshini Nayak, **Harinandan Kumar (Corresponding Author)**, Suhel Ahmed, “Study of Development Cycle of down ramp in Underground Metal Mine”, Iranian Journal of Earth Sciences, 2023. (SCOPUS Indexed, Q2) Impact Factor: 0.8, ISSN 2008-8779, 10.30495/ijes.2022.1955510.1739
27. Sankari Hazarika, Annapurna Boruah, Harinandan Kumar, “Study of pore structure of shale formation for CO₂ storage”, Materials Today: Proceedings, 2023. (SCOPUS Indexed, Q2), Impact Factor 24.2, ISSN: 1873-4103, Citation 3, <https://doi.org/10.1016/j.matpr.2023.06.014>
28. **Harinandan Kumar (First and Corresponding Author)**, “Effect of sorption isotherm on CO₂ storage capacity in Indian coal seam”, Arabian Journal of Geosciences, Vol. 16, Article number: 75, 2023. ISSN 1866-7538, Citation 2, <https://doi.org/10.1007/s12517-022-11167-2>
29. **Harinandan Kumar (First and Corresponding Author)**, Nirlipta Priyadarshini Nayak, Ashish Aggarwal & M. Muralidhar Singh, “Geomechanical characteristics and failure analysis of the limestone slope at Sahastradhara–Chamasari road Dehradun Uttarakhand India”, Innovative Infrastructure Solutions, Vol. 8, Article number: 253, 2023. (SCOPUS Indexed, Q2) Impact factor 2.4, ISSN 2364-4184, <https://doi.org/10.1007/s41062-023-01214-6>
30. **Harinandan Kumar (First and Corresponding Author)**, Muralidhar Singh Munisingh, “Development and Characterization of Fly Ash-BFS-Cement Composite for Engineering Applications”, Journal of Pavement Research and Technology, 2024. (SCOPUS Indexed, Q2) Impact factor 3, ISSN 1997-1400, <https://doi.org/10.1007/s42947-024-00439-7>
31. Sankari Hazarika, Annapurna Boruah, Ramen Das, **Harinandan Kumar**, “Characterizing Barail shale rock for CO₂ storage potential in the Assam Arakan Basin, India”, Petroleum Science and Technology, pp. 1–22, 2025. (SCIE Indexed, Q3) Impact factor 1.3, ISSN 1091-6466, <https://doi.org/10.1080/10916466.2025.2464028>
32. **Harinandan Kumar (First and Corresponding Author)**, Mandira Agarwal, Siddiqui Mohammad Saadat, “Numerical Modelling for Microfracture Treatment in Unconventional Reservoir based on Fluid Injection”, Iranian Journal of Earth Sciences, Accepted, 2025. (SCOPUS Indexed, Q2) Impact Factor: 0.8, ISSN 2008-8779.

International Conference (published)

1. **Harinandan Kumar**, S. Mishra, and M. K. Mishra, “Experimental Evaluation of Geo-mechanical properties of Coal using Sonic Wave Velocity”, International Conference on Advances in Agricultural, Biological & Environmental Sciences, July 22 - 23, London (UK), 2015. [Best Paper Award] (Citation 7)
2. **Harinandan Kumar**, S. Ravi Kumar, “Keep Working after Sundown by Energy Storage from Solar Power - An Overview”, International Conference, GTEC – 2011, 15-17 Dec 2011. [Best Paper Award]

National Conference (Presented/Published)

1. **Harinandan Kumar**, S. Ravi Kumar, “An Innovative Approach to Save Energy in Converting Solar Power to Hydrogen Fuel” National Conference on Trend in Renewable Energy Sources, Applications & Climatic Change, July 23 - 25, 2010. [Best Paper Award]
2. **Harinandan Kumar**, S. Ravi Kumar, “A review of FSW Mechanical Property Study of Aluminum Based Composite”, Aagma - 10, NLTPC, Sept. 17 - 18, 2010. [Best Paper Award]

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3. **rinandan Kumar**, M. K. Mishra, S. Mishra, K. T. Parida, "Petrographic and Dynamic behaviour of coal for CBM production in Jharia coal field", National Seminar on Recent Practices and Innovations in Mining Industry, NIT Raipur, Feb 19 - 20, 2016.
4. **rinandan Kumar**, "Review of Experimental studies on Heat Transfer Augmentation", National Conference on Development in Mechanical Engineering – An Impact on Ecology and Environment, March 09 - 10, 2013.
5. **rinandan Kumar**, "Nitinol: A Smart Material of Advance Technology", National Conference on Development in Mechanical Engineering – An Impact on Ecology and Environment, March 09 - 10, 2013.
6. **Harinandan Kumar**, "Effect of Process parameter of Friction Stir Welding on Macro and Microstructure of dissimilar material – An Overview", National Conference on Process and Characterization of Materials, Dec. 07 - 08, 2012.
7. **rinandan Kumar**, S. Ravikumar, "Metallurgical study in Friction Stir Welding for Aluminum Alloy – An Overview", National Conference on Recent Trend in Manufacturing and Industrial Engineering, April 09 - 10, 2010.
8. **Harinandan Kumar**, S. Ravikumar, "A review of FSW microstructure studies on dissimilar Aluminum Alloys", National Conference on Emerging Trend in Mechanical Engineering, August 09 - 10, 2010.
9. **Harinandan Kumar**, M. K. Mishra, S. Mishra, "Laboratory Investigation of Gas Permeability and its impact on CBM Production", National Conference on Waste to Energy, Carbon Capture and Storage, August 03 - 05, 2017.
10. **Harinandan Kumar**, Mandira Agarwal, Nachiket Parate, Ebin Thomas Joseph, "Evaluation of CBM Prospects in Singareni Coal Field India", International Conference on Material for Energy Storage and Conservation (MESC 2022), August 23 - 24, 2022.

PATENT/DESIGN GRANTED

Si. No.	Name of the Author, and Designation	Title of the patent	Patent No.	Date of filing	Indian/ International patent	Author status 1st/ 2nd Author	Date of Grant	Status
01	Harinandan Kumar	Utilization of Waste Poly Ethylene Bags and Fly Ash for Engineering Application	356746	11/05/2018	Indian Patent	Sole Inventor	27/01/2021	Granted
02	Harinandan Kumar	New Design of Portable and Detachable Vice for Engineering Application	Application Number: 320476-001 Cbr Number: 14969	07/08/2019	Indian Patent	Sole Inventor	05/02/2021	Granted
03	Harinandan Kumar	Apparatus for determining time dependent deformation as well as fracture propagation of different rock specimens at variable temperature and environmental conditions	438782	12/02/2019	Indian Patent	Sole Inventor	13/07/2023	Granted
04	Harinandan Kumar	Cutting device for cutting tubular work pieces	457705	30/08/2019	Indian Patent	Sole Inventor	09/10/2023	Granted
05	Harinandan Kumar	Low cost creep testing machine with variable temperature and environmental and environmental conditions for composite material (pmmc)	505166	26/12/2017	Indian Patent	Sole Inventor	30/01/2024	Granted

BOOK CHAPTER PUBLISHED

Mohit Hemath, Arul Mozhi Selvan Varadhappan, Hemath Kumar Govindarajulu, Sanjay Mavinkere Rangappa, Suchart Siengchin, **Harinandan Kumar**, "Mechanical and Physical Test of Hybrid Fiber Composites", Hybrid Fiber Composites: Materials, Manufacturing, Process Engineering, Print ISBN:9783527346721, Online ISBN:9783527824571, DOI:10.1002/9783527824571, Publisher Wiley, Published on 03 July 2020.

ACADEMIC IDENTITY

1. Vidwan-ID: 96793
2. Vidwan Score: 10

Faculty Profile

PROFESSIONAL MEMBERSHIP

- Editorial Board Member of “Journal of Autonomous Intelligence”, 21 Serangoon North Avenue 5, #03-03 Ban Teck Han Building, Singapore (554864)
- Editorial Board Member of “Journal of Geological Research”, Bilingual Publishing Co., Singapore
- Editorial Board Member of “BOHR International Journal of Civil Engineering and Environmental Science (BIJCEES)”, BOHR Publishers, Plot No 2, 1st Floor, 8th Main Road, Ram Nagar, Velachery, Chennai - 600042, Tamil Nadu, India
- Reviewer of “Iranian Journal of Earth Science”, Department of Geology, Faculty of Science, Islamic Azad University, 7th Elahiyeh Ave, Mashhad Branch, Mashhad, Iran.

REVIEWER OF RESEARCH PAPER IN INTERNATIONAL JOURNAL

- International Journal of SN Applied Sciences, Powered by Springer
- Arabian Journal of Geoscience, Powered by Springer
- Journal of Visualized Experiments, SCI and SCOPUS Indexed, Powered by Springer
- Iranian Polymer Journal, SCI and SCOPUS Indexed, Powered by Springer
- Journal of Geological Research
- Iranian Journal of Earth Sciences, SCOPUS Indexed
- Geotechnical and Geological Engineering, SCOPUS Indexed, Powered by Springer
- Greenhouse Gases: Science and Technology, SCI and SCOPUS Indexed, Powered by Wiley

ADMINISTRATIVE RESPONSIBILITY

- Course Coordinator of UG Students
- Activity coordinator of UG Students
- Member of University Research Core Committee
- DRC Member
- Laboratory In charge
- NAAC Accreditation Process
- Students Placement Support
- Students Internship Support

SUBJECTS HANDLED

- Engineering Mechanics (B.Tech Course+ M.Tech Course)
- Advanced Strength of Materials (B.Tech + M.Tech Course)
- Mechanical behavior of Engineering Materials (B.Tech + M.Tech Course)
- Rock Mechanics (B.Tech + M.Tech Course)
- Material Handling Systems (B.Tech + M.Tech Course)
- Soil Mechanics (B.Tech + M.Tech Course)
- Engineering Stress Analysis (B.Tech + M.Tech Course)
- Theory of Metal cutting and Tool Design (B.Tech + M.Tech Course)
- Finite Element Method (B.Tech + M.Tech Course)
- Introduction to Composites (B.Tech + M.Tech Course)

SOFTWARE HANDLED

- AutoCAD (B.Tech Course)
- Creo-3.0 (B.Tech + M.Tech Course)
- Catia (B.Tech + M.Tech Course)
- Ansys (B.Tech + M.Tech Course)
- Comsol (B.Tech + M.Tech Course)
- Solid Work (B.Tech + M.Tech Course)
- GEM Reservoir Simulation (B.Tech + M.Tech Course)
- Design Xpert (B.Tech + M.Tech Course)
- LISA (B.Tech + M.Tech Course)
- Google Sketch up (B.Tech + M.Tech Course)

STUDENTS GUIDED

Programme	Department	No. of Students	Year
Ph. D.	Petroleum Engineering	1 (ongoing)	2022
Programme	Department	No. of Students	Year
M.Tech.	Petroleum Engineering	1	2021
	Petroleum Engineering	2	2022
	Petroleum Engineering	1	2023

Faculty Profile

	Petroleum Engineering	1	2024
Programme	Department	No. of Students	Year
B.Tech.	Mechanical Engineering	5	2018
	Mining Engineering	8	
	Geo Science Engineering	12	
	Mining Engineering	16	2019
	Petroleum Engineering	18	
	Mining Engineering	12	2020
	Petroleum Engineering	8	
	Petroleum Engineering	18	2021
	Mining Engineering	6	
	Petroleum Engineering	20	2022
	Petroleum Engineering	22	2023
	Petroleum Engineering	30	2024
	Petroleum Engineering	10	2025
Programme	Department	No. of Students	Year
M.Sc.	Petroleum Geoscience	6	2022
	Petroleum Geoscience	6	2023
	Petroleum Geoscience	2	2024
	Petroleum Geoscience	3	2025
Programme	Department	No. of Students	Year
B.Sc.	Geology	4	2024

WORKSHOP/SEMINAR/TRAINING PROGRAMME

- One-day workshop on *New Materials and Applications* at Sathyabama University, Chennai, September 2010.
- One-day workshop on *Trends in Material Joining Technologies* at Sathyabama University, Chennai, September 2011.
- Three days' workshop on *design of experiment: An optimization tool* at National Institute of Technology, Rourkela, December 2013.
- Three days' workshop on *Multi-objective Optimization methods and Applications in Manufacturing* at National Institute of Technology, Rourkela, June 2014.
- Two days' workshop on *Aesthetics of Scientific Documentation* at National Institute of Technology, Rourkela, July 2014.
- Five days Executive Training Programme on *Best Practice in Coalbed Methane Exploration and Production (ETP: CBM E&P 2010)* at Central Institute of Mining and Fuel Research, Dhanbad, Jan. 9-13, 2017.
- Three days Exhibition on *Research Scholars' Week* at National Institute of Technology, Rourkela, Feb. 21-23, 2017.
- Three days Faculty Development Program on *Outcome Based Education (OBE)* at School of Engineering, UPES Dehradun, May 25-27, 2020.

PATENTS PUBLISHED

Si. No.	Name of the Author, and Designation	Title of the patent	Application No.	Date of filing	Indian/ International patent	Author status 1st/ 2nd Author	Remarks	Status
01	Harinandan Kumar	Development of New Thermal Absorber Coatings for Enhanced Solar Application	201841005118 A	12/02/2018	Indian Patent	Co-Inventor	Published on 16/02/2018	Under Examination