

Website Information
Department of Physics
Dayananda Sagar University

Faculty details:

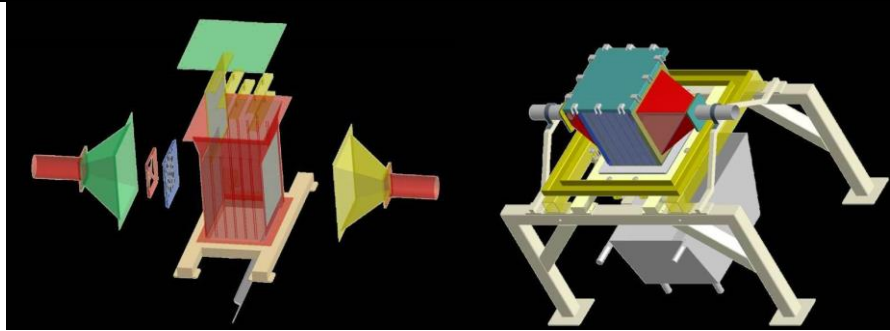
Item	Details
Faculty Name:	Dr. Sudeep Kumara K
Room No:	Cabin No: 125
Designation:	Assistant Professor
Contact No & E-Mail	+919844174416 sudeepphy@gmail.com
Research Area:	Nuclear Experimental Physics: Radiation protection, environmental radioactivity and radioecology, health safety, development of methods for radioactivity monitoring in the environment/radiation protection in the workplaces.
Publications (Past 5 years)	<ol style="list-style-type: none"> 1. Sudeep, Kumara, K., Karunakara, N., Mayya, Y S Development of a “²²²Rn incremented method” for the rapid determination of air exchange rate using soil gas. Journal of Environmental Radioactivity (Elsevier), Volume 257, February 2023, 107076. https://doi.org/10.1016/j.jenvrad.2022.107076 2. Sudeep Kumara K., Karunakara Naregundi., Mayya Y S., Pratim Biswas Assessment of health risk due to the inhalation of respiratory particulate matter generated in the community kitchens Environmental Monitoring and Assessment (Springer) - Under Review 3. Mirosław Janik, Shinji Tokonami , Kazuki Iwaoka , Naregundi Karunakara ,Shetty Trilochana, Mandya Purushotham Mohan, Sudeep Kumara, Indaje Yashodhara, Weihai Zhuo, Chao Zhao, Fangdong Tang, Supitcha Chanyotha, Chutima Kranrod , Darwish Al-Azmi and Osamu Kurihara Comparison of Radon and Thoron Concentration Measuring Systems Among Asian Countries. International Journal of Environmental Research and Public Health 2019, 16(24), 5019. https://doi.org/10.3390/ijerph16245019

	<ol style="list-style-type: none"> 4. Trilochana S, Somashekarappa, H M, Sudeep Kumara, K., Mohan M P, Rashmi Nayak S, Renita Shiny D'Souza, Srinivas S Kamath, BK Sahoo, Gaware J J, Sapra B K, Mirosław Janik, Darwish Al-Azmi, Y.S. Mayya. A walk-in type calibration chamber facility for ^{222}Rn and progeny measuring devices and inter-comparison measurements. Radiation Protection Dosimetry (Oxford Academic Journal), Volume 187, Issue 4, December 2019, Pages 466–481. https://doi.org/10.1093/rpd/ncz188 5. Darwish Al-Azmi, Sudeep Kumara, M.P. Mohan, N. Karunakara. Gamma dose rates in the high background radiation area of Mangalore region, India. Radiation Protection Dosimetry (Oxford Academic Journal), Volume 184, Issue 3-4, October 2019. https://doi.org/10.1093/rpd/ncz063 6. Primal V. Pinto, Sudeep Kumara K., and Karunakara N. Mass exhalation rates, emanation coefficients and enrichment pattern of radon, thoron in various grain size fractions of monazite rich beach placers. Journal of Radiation Measurement (Elsevier) Volume 130, January 2020, 106220. https://doi.org/10.1016/j.radmeas.2019.106220 7. M.P. Mohan, Renita Shiny D'Souza, S, Rashmi Nayak, Srinivas S. Kamath, Trilochana Shetty, K. Sudeep Kumara, Y.S. Mayya, N. Karunakara Influence of rainfall on atmospheric deposition fluxes of ^7Be and ^{210}Pb in Mangaluru (Mangalore) at the Southwest Coast of India. Journal of Atmospheric Environment (Elsevier) 202, 281-295, 2019. https://doi.org/10.1016/j.atmosenv.2019.01.034 8. S. Trilochana, H. M. Somashekarappa, K. Sudeep Kumara, Y. S. Mayya, N. Karunakara. CFD-based simulation and experimental verification of ^{222}Rn distribution in a walk-in type calibration chamber. Journal of Radioanalytical and Nuclear Chemistry (Springer) 323, 507–513(2020). https://doi.org/10.1007/s10967-019-06957-0 9. Tarun Kumar Agarwal., Jitendra J Gaware., Bijay Kumar Sahoo., Balvinder Sapra., Trilochana Shetty., D. Datta., Sudeep Kumara K., Karunakara Naregundi Numerical simulation of ^{222}Rn profiling in an experimental chamber using CFD technique.
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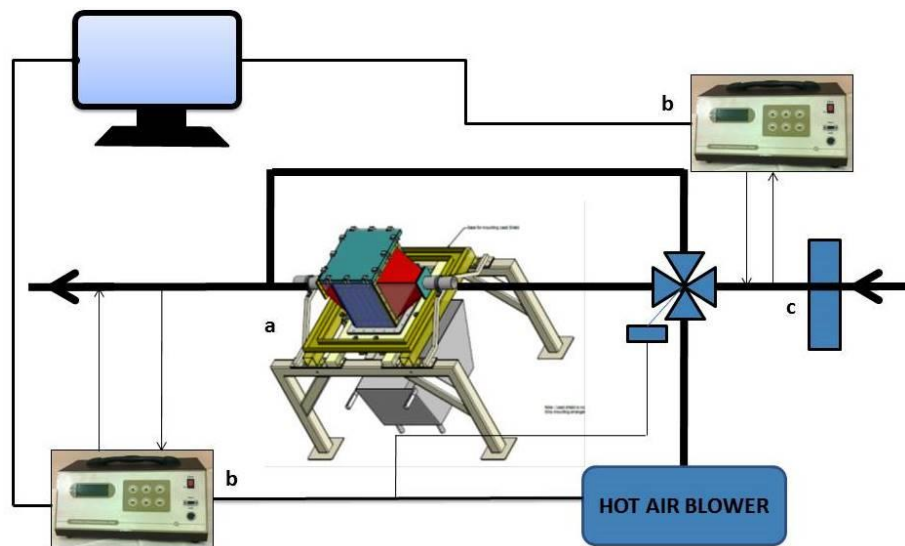
	<p>Journal of Environmental Radioactivity (Elsevier) Volumes 220–221, September 2020. https://doi.org/10.1016/j.jenvrad.2020.106298</p>
	<p>10. Trilochana Shetty, Y. S. Mayya, K. Sudeep Kumara, B. K. Sahoo, B. K. Sapra & N. Karunakara A periodic pumping technique of soil gas for ²²²Rn stabilization in large calibration chambers: Part 2 – theoretical formulation and experimental validation. Nature-Scientific Reports-(2020) 10:16548. https://doi.org/10.1038/s41598-020-71872-4</p>
	<p>11. N. Karunakara, Trilochana Shetty, B. K. Sahoo, K. Sudeep Kumara, B. K. Sapra Y. S. Mayya An innovative technique of harvesting soil gas as a highly efficient source of ²²²Rn for calibration applications in a walk-in type chamber: part-1 Nature-Scientific Reports-(2020) 10:16547. https://doi.org/10.1038/s41598-020-73320-9</p>
	<p>12. Srinivasan, R., Pandit, S.A., Karunakara, N., Deepak, Salim., Sudeep, Kumara, K., Rajesh Kumar, M., Ganesh, Khatei., Kavitha, Devi Ramkumar. High uranium concentration in groundwater used for drinking in parts of Eastern Karnataka State, India. Current Science, ISSN 0011-3891, 2021. https://doi.org/10.18520/cs/v121/i11/1459-1469</p>
	<p>13. Debajit, Chaudhury., Utsav, Sen., Bijay, Kumar, Sahoo., Nagesh, N Bhat., Sudeep, Kumara, K., Karunakara N., Siddhartha, Biswas., Sudheer, Shenoy., Bipasha, Bose. Thorium promotes lung, liver and kidney damage in BALB/c mouse via alterations in antioxidant systems. Chemico-Biological Interactions (Elsevier) Volume 363, 25, August 2022, 109977. https://doi.org/10.1016/j.cbi.2022.109977</p>
	<p>14. Ujwal P., Yashodhara I., Sudeep Kumara K., Ravi P. M. and Karunakara N. Evaluation of soil to grass transfer factor (Fv) and grass to cow milk transfer coefficient (Fm) for strontium for equilibrium condition in a tropical monsoonal climate region of the Indian subcontinent. Nature-Scientific Reports-(2022) 12:7528). https://doi.org/10.1038/s41598-022-11388-1</p>

	<p>15. Srinivasan, R., Pandit, S.A., Ganesh, Khatei., Karunakara, N., Sudeep, Kumara,K., Jean Riotte., Hemant Moger., P. Amala David., Manoj Jindal., G. Gowri Sankar., Kavitha Devi Ramkuma. Reverse osmosis units in groundwater based public water supply system in rural eastern Karnataka: an analysis. Current Science, VOL. 123, NO. 12, 25 DECEMBER 2022. https://doi.org/10.18520/cs/v123/i12/1493-1498</p> <p>16. Girish, Gopinath., T. R. Resmi., N. Karunakara., P. Manjula., N. P. Jesiya., K. Sudeep Kumara., Reji Srinivas. How Long a Tropical Mountainous Lake Can Survive? Inferences from Geochemistry and Radiometric Measurements of Pookode Lake, Kerala, India. Journal of the Geological Society of India, 99, pages 840–846 (2023). https://doi.org/10.1007/s12594-023-2391-0</p> <p>17. Manoj Kumar Jindal., S. A. Pandit., N. Karunakara., M. S. Chandrashekhara., Sudeep Kumara., Vipin Kumar., Deepak Salim., R. Srinivasan. High uranium dose from the groundwater in a granitic terrain in the eastern part of Karnataka, India Journal of Radioanalytical and Nuclear Chemistry (Springer), https://doi.org/10.1007/s10967-023-09053-6.</p>
Sponsored Projects (Past and Ongoing)	<p>Project title: Iodine aerosol facility for studies on generation, characterization, evolution and deposition in context of severe nuclear reactor accident PI: Prof. Karunakara N (Professor, Mangalore University) CI: Dr. Sudeep Kumara K, Dr. Yashodara I, Dr. Rashmi Nayak Sponsored Agency: Board of Research in Nuclear Sciences (BRNS), Govt of India</p> <p>Project title: Studies on Site Specific Environmental Transfer Factors for Radionuclides around IGCAR, Kalpakkam PI: Prof. Karunakara N (Professor, Mangalore University) CI: Dr. Sudeep Kumara K, Sponsored Agency: IGCAR-MU MoU research project, Govt of India</p> <p>Project title: Development of a method for the estimation of indoor air change rates through radon (^{222}Rn) time series measurements PI: Dr Sudeep Kumara K Sponsored Agency: Council of Scientific and Industrial Research (CSIR), Govt of India (completed)</p>

	<p>Project title: Estimation of dose due to radon and thoron progeny and establishing the equilibrium factor distribution for the southern region of India</p> <p>PI: Prof. Karunakara N (Professor, Mangalore University)</p> <p>CI: Dr. Sudeep Kumara K</p> <p>Sponsored Agency: Board of Research in Nuclear Sciences (BRNS), Govt of India (completed)</p> <p>Project title: Study of ^{220}Rn adsorption in charcoal and vegetable oils for ^{220}Rn mitigation application in off-gas stream</p> <p>PI: Prof. Karunakara N (Professor, Mangalore University)</p> <p>JRF: Dr. Sudeep Kumara K</p> <p>Sponsored Agency: BARC-MU MoU research project, Govt of India (completed)</p>
Profile Links : Scopus and Orcid	<p>https://scholar.google.co.in/citations?user=ntNaCg4AAAAJ&hl=en</p> <p>https://orcid.org/my-orcid?orcid=0009-0005-7518-462X</p> <p>https://www.researchgate.net/profile/Sudeep-Kumara-K</p> <p>Scopus id: 55537314600</p>
Research Activities (Write about your best research results max of 2-3 pages including diagrams)	<p>Development of Indigenously Technology for Mitigation of Thoron (Thoron Mitigation System)</p> <p>I am directly participated in design and development of a Thoron Mitigation System in collaboration with the Radiological Physics and Advisory Division (RP & AD), Bhabha Atomic Research Centre (BARC) through a MoU. The development of this simple and inexpensive activated charcoal- based mitigation system will find immense application in the continuous removal of radon and thoron from off-gas streams of uranium and thorium processing facilities. Spin-off applications of the newly developed system include remediation of radon and thoron problem in mining and processing industries, site remediation, and reduction of personal radiation exposures. While the CARER was responsible for the design, fabrication, and characterization of the system, RP & AD, BARC provided the necessary support in the development of the theoretical models and calibration of the system. The characterisation experiments resulted in the generation of breakthrough curves, estimation of breakthrough time, adsorption coefficient, degassing characteristics of activated charcoal for radon, and understanding the effect of flow and pressure drop across the bed on the mitigation factor. A sustained mitigation factor of $> 10^5$ was successfully demonstrated for thoron using the Thoron Mitigation System. The technology and the prototype system were transferred to BARC and the system has been integrated in to the PRTRF facilities of BARC, Mumbai.</p>



Schematic of the TMS set up at PRTRF



Technology Transfer to BARC



	<p style="text-align: center;">Achievement – Technology Transfer to BARC</p>  <p>Developed a Radon & Thoron Mitigation System in collaboration with BARC</p> <p>The system has immense application in thorium processing facilities</p> <p>Technology is now transferred to BARC and integrated to TRPFER</p>
Collaborations	<p>Dr. Mayya Y S, IIT Bombay Dr. Sapra B K (Bhabha Atomic Research Center, Mumbai) Dr. Sahoo B K (Bhabha Atomic Research Center, Mumbai) Dr. Rosaline Mishra (Bhabha Atomic Research Center, Mumbai) Dr. Pandith S A and Dr Srinivasa (IISc, Bengaluru) Dr. Suresh Kumar and Dr Sankar (Indian Institute of Remote Sensing (IIRS), Dehradun) Many other institutions of India and abroad</p>
Invited Talks	<p>Delivered invited talk on "Basics of Radiation and Radioisotopes and their applications" at Sree Siddaganga college of Arts Science and Commerce, Tumkur. February, 2018</p> <p>Delivered a talk on "Activated Charcoal Adsorber Bed as a ^{222}Rn Hold Up System for Application in Uranium Mining Industries" in IARPNC-2018, BARC, Mumbai, June-2018</p> <p>Delivered a talk on "Experimental and theoretical considerations for designing an optimal activated charcoal bed for ^{220}Rn mitigation" in First National Conference on Radiation Awareness and Detection in Natural Environment (RADNET-I). Tehari, HNB University, June, 2015.</p>
Awards and Recognition	<ul style="list-style-type: none"> ISRP-NUCLEONIX young scientist award: Indian Society for Radiation Physics (ISRP) Best experimental research award - 20th National Symposium on Radiation Physics (NSRP-20), Oct. 27-30, 2015, Mangalore University.

	<ul style="list-style-type: none"> • Best Paper Award: National Conference on Radiation Awareness and Detection in Natural Environment (RADNET-I). June 15-17, 2015, Tehari Garhwal. • Best Paper Award: 5thBRNS-DAE Symposium on Nuclear Analytical Chemistry-V, January 20-24, 2014, Mumbai. • Best Paper Award: Indian Association for Radiation Protection (IARP) Conference, March 19-21, 2014, BARC, Mumbai.
<p>Group Members (PhD Students and Projects)</p> <p>Open Positions: If any</p>	<p>Looking for PhD students to work on Nuclear experimental physics, radioactivity etc</p>