Curriculum Vitae

Dr. NIMELAN VEERASAMY

Ramanujan Fellow
Isotope Geosciences
National Centre for Polar and Ocean Research (NCPOR), India

Email: nimelanv@ncpor.res.in; nimelanveerasamy@gmail.com
Phone: +91-832-2525632

PROFESSIONAL PROFILE

Environmental Isotope Geochemist specializing in environmental radioactivity, heavy metal biogeochemistry, and advanced mass spectrometry (ICP-MS and MC-ICP-MS). Research focuses on radiogenic isotopes, mercury cycling, radionuclide distribution, and contaminant transport in natural systems, integrating isotope geochemistry with environmental risk assessment.

RESEARCH INTERESTS

- Environmental isotope geochemistry
- Radiogenic (uranium) and stable (mercury) isotopes applications
- Environmental radioactivity and radiological risk assessment
- Trace metals and rare earth elements geochemistry
- High background natural radiation areas (HBNRA)
- Contaminant transport and biogeochemical cycling

CURRENT POSITION

Ramanujan Fellow
Anusandhan National Research Foundation (ANRF), India
2025 – Present

Research focus includes isotope geochemistry applications to environmental systems, trace metal contamination, and polar and coastal geochemical processes.

PREVIOUS ACADEMIC APPOINTMENTS

Adjunct Assistant Professor
Queen's University, Canada
September 2024 – November 2025

William E. White Postdoctoral Fellow
Queen's University & Queen's Facility for Isotope Research (QFIR), Canada
June 2023 – November 2025

Researcher
Tokyo Metropolitan University, Japan
October 2020 – March 2021

Research Assistant
Pondicherry University, India
2015 – 2017

EDUCATION

Ph.D. in Radiological Sciences (Environmental Geochemistry & Radioactivity)
Tokyo Metropolitan University, Japan
2017 – 2020

Dissertation focused on uranium isotope disequilibrium, radionuclide distribution, and environmental radioactivity assessment using MC-ICP-MS and gamma spectrometry.

Integrated M.Sc. (5-Year) in Applied Geology
Pondicherry University, India
2010 – 2015

AWARDS AND HONORS

- Ramanujan Fellowship, Anusandhan National Research Foundation, India (2025)
- 2nd Place Oral Presentation Award, DST-ANRF International Conference on Air, Water & Sediments Regime and Climate Change, India (2024)
- William E. White Research Fellowship, Queen's University & QFIR, Canada (2023)
- Best Presentation (Co-Author), 1st International Conference on Radiation Awareness and Detection in Natural Environment, India (2023)

- Best Poster Award (Co-Author), International Symposium on Environmental Dynamics of Radionuclides, Japan (2021)
- Young Researcher Award, Terrestrial Radioisotopes in Environmental Protection Conference, Hungary (2020)
- Tokyo Human Resources for City Diplomacy Fund, Tokyo Metropolitan Government, Japan (2017)

TECHNICAL EXPERTISE

Mass Spectrometry

- ICP-MS trace elemental analysis
- MC-ICP-MS isotope ratio measurements

Radiochemical Techniques

- Clean laboratory protocols (Class 100–1000)
- Chemical separation of U, Th, and trace metals
- QA/QC and metrological validation

Radiation Measurement

- Gamma spectrometry
- Natural Gamma radiation dose assessments

RESEARCH EXPERIENCE SUMMARY

- Developed high-precision analytical protocols for 234U/238U and 235U/238U measurements using MC-ICP-MS.
- Investigated uranium disequilibrium in HNBRA.
- Mercury contamination pathways using mercury stable isotope approaches
- Conducted regional-scale radiological risk assessments in India, Japan, Vietnam, and Serbia.

- Contributed to studies on anthropogenic gadolinium dispersion in aquatic environment.

PEER-REVIEWED PUBLICATIONS

1) Eboigbe, E.O., **Veerasamy, N.**, Odukoya, A.M., Anene, N.C., Sonke, J.E., Mendez, S.S., McLagan, D.S., **2025**. Mercury contamination in staple crops impacted by Artisanal Small-scale Gold Mining (ASGM): Stable Hg isotopes demonstrate dominance of atmospheric uptake pathway for Hg in crops. *Biogeosciences*, 22, 5591-5605. https://doi.org/10.5194/egusphere-2025-1402
2) Sahoo, S.K., Zunic, Z.S., **Veerasamy, N.**, Natarajan, T., Zhukovsky, M., Jovanovic, P., Veselinovic, N., Janicijevic, A., Onischenko, A., Yarmoshenko, I. and Ramola, R.C., **2024**. Distribution of radionuclides and associated radiological risk assessment of soils from Niška Banja, Serbia. *Journal of Radioanalytical and Nuclear Chemistry*, 333(5), pp.2605-2613. https://doi.org/10.1007/s10967-023-09017-w
3) Natarajan, T., Sahoo, S.K., Nakajima, T., **Veerasamy, N.**, Yamazaki, S., Inoue, K. and Ramola, R.C., **2024**. Distribution of 226Ra, 232Th and 40K in Kanyakumari beach placer deposits along Tamil Nadu coast, India. *Journal of Radioanalytical and Nuclear Chemistry*, 333(5), pp.2587-2595. https://doi.org/10.1007/s10967-023-08940-2
4) **Veerasamy, N**., Kasar, S., Murugan, R., Inoue, K., Natarajan, T., Ramola, R.C., Fukushi, M. and Sahoo, S.K., **2023**. $^{234}U/^{238}U$ disequilibrium and $^{235}U/^{238}U$ ratios measured using MC-ICP-MS in natural high background radiation area soils to understand the fate of uranium. *Chemosphere*, 323, p.138217. https://doi.org/10.1016/j.chemosphere.2023.138217
5) **Veerasamy, N**., Sahoo, S.K., Natarajan, T., Inoue, K., Fukushi, M. and Ramola, R.C., **2023**. Distribution of naturally occurring radionuclides and gamma dose rate assessment in the soils of high background natural radiation area Odisha, India. *Radiation Protection Dosimetry*, 199(18), pp.2194-2198. https://doi.org/10.1093/rpd/ncad254
6) Shimizu, H., Inoue, K., Tsuruoka, H., **Veerasamy, N**., Saito, K. and Fukushi, M., **2022**. Distribution of Radiocesium Concentrations of Soils in the Eight Izu Islands After the Fukushima Daiichi Nuclear Power Plant Accident. *Radiation Protection Dosimetry*, 198(13-15), pp.879-885. https://doi.org/10.1093/rpd/ncab190
7) Inoue, K., Fukushi, M., Sahoo, S.K., **Veerasamy, N**., Furukawa, A., Soyama, S., Sakata, A., Isoda, R., Taguchi, Y., Hosokawa, S. and Sagara, H., **2022**. Measurements and future projections of Gd-based contrast agents for MRI exams in wastewater treatment plants in the Tokyo metropolitan area. *Marine Pollution Bulletin*, 174, p.113259. https://doi.org/10.1016/j.marpolbul.2021.113259
8) **Veerasamy, N**., Sahoo, S.K., Murugan, R., Kasar, S., Inoue, K., Fukushi, M. and Natarajan, T., **2021**. ICP-MS measurement of trace and rare earth elements in beach placer-deposit soils of Odisha, East Coast of India, to estimate natural enhancement of elements in the environment. *Molecules*, 26(24), p.7510. https://doi.org/10.3390/molecules26247510

9) **Veerasamy, N**., Murugan, R., Kasar, S., Inoue, K., Kavasi, N., Balakrishnan, S., Arae, H., Fukushi, M. and Sahoo, S.K., **2021**. Geochemical characterization of monazite sands based on rare earth elements, thorium and uranium from a natural high background radiation area in Tamil Nadu, India. *Journal of Environmental Radioactivity*, 232, p.106565. https://doi.org/10.1016/j.jenvrad.2021.106565
10) Murugan, R., **Veerasamy, N**., Zhao, Y., Aono, T. and Sahoo, S.K., **2021**. Precise measurement of uranium isotope ratios in Fukushima soils using multi-collector inductively coupled plasma mass spectrometry (MC-ICP-MS). *International Journal of Mass Spectrometry*, 467, p.116623. https://doi.org/10.1016/j.ijms.2021.116623
11) Ichihara, M., Inoue, K., Fukushi, M., Shimizu, H., Tsuruoka, H., Veerasamy, N., Tsukada, M., Soyama, S., Hosokawa, S., Kato, T. and Sagara, H., 2021. Changes on distribution of absorbed dose rates in air in an urban area after the Fukushima Daiichi Nuclear Power Plant accident. *Journal of radioanalytical and nuclear chemistry*, *329*, pp.427-435.
12) **Veerasamy, N**., Sahoo, S.K., Inoue, K., Arae, H. and Fukushi, M., **2020**. Geochemical behavior of uranium and thorium in sand and sandy soil samples from a natural high background radiation area of the Odisha coast, India. *Environmental Science and Pollution Research*, 27, pp.31339-31349. https://doi.org/10.1007/s11356-020-09370-3
13) **Veerasamy, N**., Takamasa, A., Murugan, R., Kasar, S., Aono, T., Inoue, K., Fukushi, M. and Sahoo, S.K., **2020**. Chemical separation of uranium and precise measurement of $^{234}U/^{238}U$ and $^{235}U/^{238}U$ ratios in soil samples using multi collector inductively coupled plasma mass spectrometry. *Molecules*, 25(9), p.2138. https://doi.org/10.3390/molecules25092138
14) **Veerasamy, N**., Sahoo, S.K., Inoue, K., Fukushi, M., Tsuruoka, H., Arae, H. and Balakrishnan, S., **2019**. Natural radioactivity measurement and dose assessment of beach placer sands in the coastal region of Tamil Nadu (India). *Radiation Protection Dosimetry*, 184(3-4), pp.409-412. https://doi.org/10.1093/rpd/ncz109
15) Inoue, K., Fukushi, M., Van Le, T., Tsuruoka, H., Kasahara, S. and **Veerasamy, N**., **2020**. Distribution of gamma radiation dose rate related with natural radionuclides in all of Vietnam and radiological risk assessment of the built-up environment. *Scientific reports*, 10(1), p.12428. https://www.nature.com/articles/s41598-020-69003-0
16) Inoue, K., Sahoo, S.K., **Veerasamy, N**., Kasahara, S. and Fukushi, M., **2020**. Distribution patterns of gamma radiation dose rate in the high background radiation area of Odisha, India. *Journal of Radioanalytical and Nuclear Chemistry*, 324, pp.1423-1434. https://doi.org/10.1007/s10967-020-07176-8
17) Inoue, K., Fukushi, M., Furukawa, A., Sahoo, S.K., **Veerasamy, N**., Ichimura, K., Kasahara, S., Ichihara, M., Tsukada, M., Torii, M. and Mizoguchi, M., **2020**. Impact on gadolinium anomaly in river waters in Tokyo related to the increased number of MRI devices in use. *Marine pollution bulletin*, 154, p.111148. https://doi.org/10.1016/j.marpolbul.2020.111148

18) Inoue, K., Fukushi, M., Kurokawa, M., Kondo, H., Shimizu, H., Tsuruoka, H., Ichimura, K., Tanifuji, H., **Veerasamy, N**., Nakazawa, S. and Taguchi, Y., **2020**. Ecological half-lives of radiocesium on Izu-Oshima Island related with the Fukushima Daiichi nuclear power plant accident. *Journal of Radioanalytical and Nuclear Chemistry*, 324, pp.291-300. https://doi.org/10.1007/s10967-020-07040-9

19) Inoue, K., Fukushi, M., Furukawa, A., Sahoo, S.K., **Veerasamy, N**., Kurokawa, M., Kondo, H., Shimizu, H., Tsuruoka, H., Mitsumoto, T. and Koyama, K., **2020**. Detection of anthropogenic gadolinium in river waters in Hokkaido, Japan. 診療放射線学教育学= *Japanese journal of education for radiological technology*/日本診療放射線学教育学会機関誌編集委員会 編, 8, pp.11-16.

20) Inoue, K., Tsuruoka, H., Shimizu, H., Arai, M., **Veerasamy, N**., Tsukada, M., Ichimura, K., Nakazawa, S., Taguchi, Y. and Fukushi, M., **2019**. Changes of absorbed dose rate in air in metropolitan Tokyo relating to radiocesium released from the Fukushima Daiichi Nuclear Power Plant accident: Results of a five-year study. *Plos one*, 14(10), p.e0224449. https://doi.org/10.1371/journal.pone.0224449

21) Inoue, K., Arai, M., Tsuruoka, H., Saito, K., Fujisawa, M., Nakazawa, S., **Veerasamy, N**. and Fukushi, M., **2019**. Impact on absorbed dose rate in air in Kanto region by Fukushima Daiichi Nuclear Power Plant accident. *Radiation Protection Dosimetry*, 184(3-4), pp.500-503. https://doi.org/10.1093/rpd/ncz073

22) Mishra, S., Kasar, S., Takamasa, A., **Veerasamy, N**. and Sahoo, S.K., **2019**. Measurement of uranium distribution coefficient and 235U/238U ratio in soils affected by Fukushima dai-ichi nuclear power plant accident. *Journal of environmental radioactivity*, 198, pp.36-42. https://doi.org/10.1016/j.jenvrad.2018.12.019

23) Inoue, K., Shimizu, H., Tsuruoka, H., **Veerasamy, N**., Somboon, S., Nozawa, H. and Fukushi, M., **2018**. Impact on absorbed dose rate in air in the Izu Islands from long half-life radionuclides released by the Fukushima Daiichi Nuclear Power Plant accident. *Radiation Protection Dosimetry*, 182(3), pp.335-344. https://doi.org/10.1093/rpd/ncy070

INTERNATIONAL COLLABORATIONS

- Canada – Queen's University
- Japan – Tokyo Metropolitan University, Fukushima Research Institute
- India – Pondicherry University, VOC college, India
- France- Géosciences Environnent Toulouse & Mediterranean Institute of Oceanography

CONFERENCE PRESENTATIONS

- International Symposium on Environmental Dynamics of Radionuclides, Japan
- Terrestrial Radioisotopes in Environmental Protection Conference, Hungary
- DST-ANRF International Conference on Air, Water & Sediments Regime and Climate Change, India
- International Conference on Radiation Awareness and Detection in Natural Environment, India

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PROFESSIONAL SERVICE

- Reviewer for international peer-reviewed journals in environmental radioactivity and geochemistry
- Contributor to isotope laboratory method development and quality control protocols

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TEACHING EXPERIENCE

Adjunct Assistant Professor, Queen's University (2024–2025)
- Contributed to instruction in isotope geochemistry and environmental analytical techniques
- Mentored graduate students in ICP-MS and isotope ratio measurements

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LABORATORY MANAGEMENT EXPERIENCE

- Operation and maintenance of ICP-MS and MC-ICP-MS systems
- Clean lab supervision and contamination control
- Method validation and inter-laboratory calibration

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