



**UNIVERSITY OF NAIROBI
FACULTY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF CHEMISTRY**

DATE: 26/09/2022

ARISE PROJECT

The Department of Chemistry, University of Nairobi through the African Research Initiative for Scientific Excellence (ARISE) Project is recruiting 2 M.Sc. students, 1 Ph. D student and a laboratory technician as outlined below;

Two (2) MSc Projects in Chemistry

- Applicants must be a holder of First or Upper Second Class Honours degree in Chemistry or an equivalent qualification from an institution recognized by the University of Nairobi (UoN) Senate.
- Applicants can either be those who have completed their first year (MSc theory – Chemistry option) or new applicants.

Project description: This project involves research on nanoplastic and microplastic waste from Nairobi and the western Indian Ocean region in Kenya. Plastic pollution is a nuisance not only for urban areas but also for coastal communities as it negatively affects the economic development of coastal cities. With the rise in the COVID-19 pandemic, plastics (single-use masks and hand sanitiser bottles) have increased plastic waste generation. These plastics readily degrade into microplastics and nanoplastics which can be ingested by marine organisms and affect their physiological functions. The microplastics and nanoplastics can also be transferred to the soil as well as to the human body further causing health and environmental issues. This calls for a need to reduce plastic pollution by focusing on nanoplastics and microplastics. The work will involve determining the distribution and abundance of nanoplastic and microplastic waste as well as the composition and characterization of the nanoplastic and microplastic waste using a wide-range of analytical techniques.

One (1) PhD Project in Chemistry

- Applicant must be a holder of a Master's degree in Chemistry, materials science related disciplines or an equivalent qualification from an institution recognized by University of Nairobi (UoN) Senate.
- The applicants can be either those who have enrolled for PhD in Chemistry and are in year one of their study or fresh applicants.

Project description: This project will involve the conversion of plastic waste to low-carbon nanoreactors for use in degradation of environmental pollutants and nanoplastics. Plastic pollution is a worldwide menace because of the increased use of plastics (single-use masks, gloves and bottles for sanitizers) due to COVID-19. The utilization of plastic waste as carbon sources for generation of low-cost carbon reactors for use in photocatalytic degradation of environmental pollutants and nanoplastics provides a solution for sustainable production and consumption of materials and waste recycling. Carbon nanomaterials are excellent catalyst supports owing to their tunable surface area, electrical conductivity and surface chemistry. The carbon nanomaterials will be coupled with heterogeneous photocatalysts and be used to degrade environmental pollutants and nanoplastics and hence help curb the plastic menace. The work will involve conversion of plastic waste to carbon nanostructures, development of heterogeneous photocatalysts, coupling of metal oxides with carbon nanomaterials, and monitoring degradation efficiency over time.

Application documents

- A letter of motivation
- Curriculum Vitae giving details of their qualifications and three (3) referees, as well as indicating their telephone and email-contacts
- Publication list
- Copies of relevant certificates

The applicants must be Kenyan citizens

The deadline for application is 07/10/2022

Application should be sent through the Department of Chemistry, University of Nairobi to; Email: bridget@uonbi.ac.ke and copied to kkariuki@uonbi.ac.ke