

## PhD in Environmental Radioactivity and Analysis

**“The application of passive sampler technology for the *in-situ* measurement of actinides in natural waters”**

**Dr Gary Fones and Prof Graham Mills, University of Portsmouth, UK,  
Dr Jonathan Burnett and Mr Sean Amos, AWE, UK**

**Full Funding (~£13K a year) for a full-time PhD is available at the University of Portsmouth in collaboration with AWE (Atomic Weapons Establishment) for a UK student. Applicants should have at least an upper second class (2(i), or equivalent) undergraduate degree or a Master’s degree in a relevant Chemistry/Environmental Chemistry discipline. Preference will go to candidates with knowledge and experience of the theory and practice of radioanalytical chemistry and the measurement of radionuclides; also an awareness of health and safety regulations relating to working with radioactive materials.**

A variety of natural and artificial radionuclides are found in the solution or dissolved phase in natural waters due to a result of authorized and accidental waste discharges, nuclear accidents, nuclear weapons testing and natural occurrence. However conventional sampling methods do not easily provide mean concentrations values over protracted periods of time when concentrations are changing or if concentrations are below conventional detection limits. Passive sampler devices such as Diffusive Gradients in Thin-films (DGT) or the Chemcatcher<sup>®</sup> accumulate chemicals continuously from water and can provide time-weighted average (TWA) concentrations of pollutants over the exposure period. The major objectives of this project are: To develop a robust passive sampler for the measurement of actinides and its potential for long-term use in a number of natural waters ranging from surface waters to ground waters and open oceans. Identify and determine the concentration of actinides in natural waters, including uranium (<sup>238</sup>U, <sup>235</sup>U, <sup>234</sup>U), plutonium (<sup>240</sup>Pu, <sup>239</sup>Pu), thorium (<sup>232</sup>Th, <sup>230</sup>Th) and americium (<sup>241</sup>Am). Assess the contribution of actinides to the measured background radioactivity of natural waters. This PhD project will aim to bring together technologies and expertise that exist in water monitoring and radionuclide measurement by developing robust passive samplers for the measurement of *in-situ* time-weighted average concentrations of dissolved actinides in fresh and marine waters.

*The incumbent of this post will work closely with researchers at AWE under the Corporate Technical Outreach programme and is for a fixed-term of 3 years. Due to the nature of the work associated with this post, it is subject to special nationality rules and is open only to BRITISH CITIZENS. All selected candidates will be required to undergo security clearance for work at AWE.*

**Candidates should send an application letter, full CV and two academic references, to:  
Dr. Gary Fones, School of Earth & Environmental Sciences, University of Portsmouth, Burnaby Building, Portsmouth, PO1 3QL, UK**

**Applications should be received by June 19, 2009. Interviews will be held on 3<sup>rd</sup> July and the student will have to start no later than October 5th, 2009.**

**For more information please email: [sees.enquiries@port.ac.uk](mailto:sees.enquiries@port.ac.uk)**