# THE USE OF An Am-Be NEUTRON SOURCE FOR TEACHING AND APPLIED RESEARCH

Sunday. A. Jonah
Centre for Energy Research and Training,
Ahmadu Bello University, P. M. B. 1041, Zaria, Nigeria
E-mail: jonahsa2001@yahoo.com
Phone: 234-803-7037172

## ABSTRACT

In the African region, nuclear science and technology is regarded as a high technology area by majority of individuals and governments, therefore it must not be ventured into. In most African countries, nuclear education was never part of university curricula until they became member states of the IAEA. Because of lack of necessary infrastructure, degree-awarding nuclear science departments in the region are very few and are mostly at post-graduate level. Support for infrastructural developments in countries with nuclear education mainly came from membership of the IAEA. This enabled member states to establish Nuclear Research Centres where in most cases the country's only experimental facilities involving ionizing radiation sources are installed. This is in addition to other radiation facilities used in health care delivery and the oil industries, which might have been in existence even before the establishment of the Nuclear Research Centre.

Of all IAEA Member countries in Africa, the following eight countries have at least one Research Reactor in operation or in shutdown state: Algeria, DR Congo, Egypt, Ghana, Libya, Nigeria, Morocco, and South Africa. As at today, a few other countries have signified interest through the IAEA to acquire Research Reactor Facility. Considering that some of these countries became member states of the IAEA as far back as 1970, the status of applied nuclear physics education can be considered to be backward in the African region. This is also evident in the number of laboratories producing peer-reviewed publications leading international scientific journals in the field of basic and applied nuclear physics from 1990 to date.

Consequently, because of cost, flexibility, safety and ease of handling, it is proposed that isotopic neutron sources can be acquired and installed in laboratories for teaching and applied nuclear physics research. In this presentation we outline some applications of a 5 Ci Am-Be neutron source facility via the neutron activation analysis and neutron scattering techniques for the evaluation of some important mineral resources for the socio-development of the society. The various experimental arrangements and procedures that have been developed in our laboratory and elsewhere for the quantification of gold ore, alumino-slilcates, and oil samples are discussed. Results obtained for these minerals and the benefits of using low-level isotopic neutron sources for teaching and research are enumerated.