Physics and Society–The Future:

Nuclear and Accelerator Science Education and Research Enhancement

An Overview

Edward Bouchet Abdus Salam Institute (EBASI) of The Abdus Salam International Centre for Theoretical Physics (ICTP)

Milton Dean Slaughter, Florida International University, Miami, FL, USA
Sekazi K. Mtingwa, Massachusetts Institute of Technology, Cambridge, MA, USA
Anthony M. Johnson, University of Maryland, Baltimore County, Baltimore, MD, USA

Abstract

- At A Fundamental Level, Our Understanding Of The Physics And Engineering Technology Which Governs The Construction And Operation Of Various Types Of Accelerators Is Very Good And Has Resulted In The Development Of Many Practical Applications Ranging From Basic Research In High Energy Particle Physics To Oncological Treatments In Humans To The Irradiation Of Food.

- However, It Is Also True That Our Understanding Of How To Create, Utilize, And Incorporate Nuclear And Accelerator Based Methodologies Which Are Operationally Inexpensive, Compact In Size, But Yet Application-effective, Will Clearly Require Much More Effort In The Future. In Addition, Even For Those Current Applications Which Are More Or Less Tested And Proven Such As Proton Therapy, The Requisite Associated Supporting Infrastructure (Administrative/Governmental, Hardware, Software, Educational, And Computational) Is Not Generally Available Or Affordable To Many Member States On A Sufficient Consistent Basis.

Abstract (continued)

- **In this presentation, we provide an overview of issues associated with the enhancement of nuclear and accelerator science education and training with an emphasis on internet–computer-computational related ways which show promise in not only definitively increasing the quantity and quality of people who could go on to become professional well-trained experts, mentors, and researchers in their own right, but who could also constitute the future highly skilled personnel foundation for promulgation of their knowledge to others.**

PRESENTATION OUTLINE

- Generic Accelerator Types
- Accelerator Applications—Basic Research and Practical
  - Particle Beam Related
  - Light Source Related
- Requisite Supporting Infrastructure for “Effective” Accelerator Research and Application Usage
  - Governmental
  - Administrative
  - Hardware-Based
  - Software-Based
  - *Educational*