

Joint Research and Project Development for Radiation Detectors, High Energy X-Ray and Gamma Ray Sources and Neutron Sources Focused on Homeland Security and with Applications to Fundamental Physics Research in Nuclear and Particle Physics

Jean Paul Allain, Assistant Professor of Nuclear Engineering
Ahmed Hassanein, Professor of Nuclear Engineering
Igor Jovanovic, Assistant Professor of Nuclear Engineering
David Koltick, Professor of Physics
Yeong Kim, Professor of Physics

**Applied Physics Laboratory, 740 Navco Drive, Lafayette, Indiana
Purdue University**

The Applied Physics Laboratory Research Group invites Purdue faculty to discuss research opportunities for the purpose of research proposal development focused in the area of the generation of radiation and the detection of radiation for application in Homeland Security and applications in fundamental physics. Concepts accepted for proposal development will have the support of the APL Research Group's resources and the APL laboratory space and instrumentation.

Introduction

A significant group of physicists and engineers has formed to study both science and engineering problems focused on the development of radiation detectors, laser-driven charge particle acceleration, plasma physics, particle sources, and novel particle accelerators, at the Applied Physics Laboratory, with the goal of developing significant proposals in the area of homeland security and fundamental physics. The group intends to study both applied problems and fundamental problems in engineering and physics and form larger collaborative efforts outside Purdue with colleagues at Argonne National Laboratory, Lawrence Livermore National Laboratory, Oak Ridge National Laboratory as well as others. Targeted agencies will include DARPA, DTRA, DOE, DOD, NSF and others having a strong interest in advanced technology development. In addition, the laboratory is a well suited teaching environment to develop laboratory skill both in engineering and science students at the graduate and undergraduate level.

The discussion will include 10 minute presentations by APL Research Group members:

Contact: Dr. Koltick: koltick@purdue.edu

The presentations will be in PHYS 242, Thursday, January 31st, 9:30 a.m.– 11:00 a.m

National /Homeland Security:

David Koltick

Search for Special Nuclear Materials

Ahmed Hassanein

Simulation of Neutron and Gamma Ray Interactions for Homeland Security Applications

Jean Paul Allain

Opportunities for Advanced Plasma and Materials Research in National Security

Igor Jovanovic

Direction Sensitive Neutron Detection

David Koltick

Development of Calibration Standards for Chemical, Biological, Radiological, Nuclear, Explosive (CBRNE) Instrumentation

Electron Beam Development

Igor Jovanovic

Generation of Electron Beams Using Laser Acceleration Techniques

Tests of Fundamental Physics

Yeong Kim

Search for Power Law Momentum Distributions in Condensed Matter Systems using the Spallation Neutron Source