

## VIII. OPTICS AND PHOTONICS SECTOR

### A. Optics and Photonics R&D Program

#### Call Rationale

Photonics is the physical science of light (photon) generation, detection, and manipulation through emission, transmission, modulation, signal processing, switching, application and detection/sensing. Photonics technology detects light emission, then converts lights into electric signals through integrated fiber optics. The global photonics market has reached more than \$600 billion and is continually growing. Countries such as Europe, United States, China, Singapore and Taiwan have heavily invested in photonics to further their economic development through science and technology. Given its current local capacity, the Philippines can benefit from the use of photonics. Our primary industries in agriculture, manufacturing and services as well as public goods such as utilities, environment and healthcare have photonics applications.

#### Call Objective

Proposals to be submitted should develop technologies aligned with the call scope within 2-3 years.

#### Call Scope

Proposals to be submitted should be aligned to the indicators specified under the **OPTICS AND PHOTONICS R&D ROADMAP** including the following priority topics:

- Delivery and processing of Information (e.g. LiFi and quantum communication)
- Fiber-optic sensors (for energy, biomedical, smart structures, security, military, and process control, etc.)
- Biomedical Applications (*i.e.* micro-fluidics, optical trapping, optical tweezers, etc.)
- Imaging and sensing applications for food authenticity and safety (e.g. sensors and lasers)
- Imaging and Instrumentation (*i.e.* gamma imaging, neutron imaging, automatic data gathering, etc.)
- Terahertz R&D Program including design and fabrication of novel materials and devices; imaging and image processing; delivery of Information; other agricultural, pharmaceutical, and human security applications, among other areas
- Nuclear Science

**Specific Requirements:** To ensure that the research output will be utilized by the target industry, a letter of interest together with a 3- to 5-year technology pathway must be submitted. PCIEERD will fund one project per topic, not exceeding P15 Million budget for 2 years.

## **B. Nuclear Science R&D Program**

### **Call Rationale**

Nuclear techniques are used to identify and assess the properties of different materials, measure pollution levels, sterilize and disinfect components, monitor and optimize industrial processes and change chemical, physical and biological properties to produce novel materials. Radiation can be used for analysing and processing a range of substances.

Currently, the Philippine Nuclear Research Institute, a government entity mandated to serve as an R&D Institute under DOST is maintaining several facilities that offer products and services to the industries. Products irradiated in the Multi-Purpose Irradiation Facility include spices, herbal products, dehydrated vegetables, flavors, cosmetic raw materials and accessories (talc, brushes, applicators), Orthopedic implants, surgical gloves, empty gelatin capsules, empty eye dropper bottles, and frozen fruits. While its electron beam irradiation facility irradiates strips of abaca and polypropylene non-woven fabric, honey alginate wound dressing, mangoes for export, plant growth promoter, radiation grafted abaca fiber, and food for the immuno-compromised patients and calamity victims.

Over the years, there has been increasing awareness by Philippine industries on the benefits they can derive from the use of radiation technology.

### **Call Objectives**

DOST needs to promote the use of nuclear science towards industry competitiveness. This can be achieved by providing support for its research and development initiatives on the following areas:

- Development of radiotracer applications for blockage location, flow rate measurements, leak detection, and geothermal studies
- Development of sealed source applications including level gauging, radiography, column scanning, computed tomography, gamma sterilization, and cargo inspection
- Establishment of irradiation and R&D facilities in other parts of the country (for possible funding under HRIDD)

### **Call Scope**

**Specific Requirements:** To ensure that the research output will be utilized by the target industry, a letter of commitment with counterpart (in cash or in kind) contribution must be secured. PCIEERD will fund one project per topic, not exceeding P20 Million budget for 2 years.