# **Optics & Photonics Roadmap**

#### **OVERALL STRATEGIES**

#### Needs for Government Facilities and Lab

- Continuous support for ADMATEL and **AMCEN**
- Establishment of irradiation facilities in Visavas and Mindanao to cater to the industry sector in the region

#### **Needs for Human Resources**

- Increase awareness of Optics and Photonics in STEM curriculum, in industry and among consumers
- Send 10 researchers abroad to raise local talent to global standards by providing exposure and training in renowned research laboratories
- Establish programs to obtain visibility into industry needs and open channels for collaboration (e.g. internships, immersions)
- Introduce targeted training electives in Optics and Photonics to promote employment readiness of graduates for certain industry applications
- Balik Scientist Program to consolidate resources and lead R&D and collaboration efforts in the field
- Improve workforce preparation for opportunities with multinational partners

### **R&D Program / Project Needs**

- Build and publish database with information regarding technology researches, publications, laboratories and equipment, and skills developed
- Partner with at least 10 entities for R&D applications and infrastructure codevelopment
- PATHS Center R&D project: THz Measurements for Quality Assurance of Semiconductor and Aerospace Devices (2022-2024)

### **S&T Policy Initiatives**

• Ensure communication of government policy incentives and benefits to stakeholders

# **R&D SOLUTIONS**

50 M

es and applications

wiring, Optical

Fiber-optic sensors &

THz spectroscopy, devic

communication networks

Hyperspectral imaging;

imaging, laser scanning,

2022

Developed

capabilities in

imaging, Lasers,

and Information

Processing, and

manufacturing

Infrared night vision

systems; sensitive

2020-2021

capabilities in

Developed

imaging

10 M

LIDAR

Gamma imaging

Image Mapping

Spectrometry.

Fluorescence

spectroscopy

### 60 M

Photonic integrated cir THz spectroscopy, dev ices and applications Laser specific materials development: Adjusted light for urban farming (Special LEDs, UV LEDs), Optical

metrology Manufacturing: light sources from indigenous materials, space division multiplexing, Neutron imaging and FIR imagi ng for wear and tear testing

2023

Enhanced capabilities, functionalities and applications

# 10 M

(bessel beam) **Delivery of Information:** Optical Fiber Networks, Optical Wireless Access, Optical cross-connects Imaging: switching: Photodetectors,

photosensors, ranging, visual sights, periscopes **Information Processing:** Optical Field Programmable Gate Arrays

Manufacturing: photolithography, optical amplifiers, holographic interferometry, neutron scattering

2024

Enhanced capabilities. functionalities and applications

# 320 M

Imaging: Beam shaping Information Processing: Photonic neural networks: Ultra dynamic photonic devices, Optical packet **Photonic Integrated Circuits** Monolithic Integration Manufacturing: materials synthesis through high flux radiation, solar cells with nanostructures for solar power harvesting



# 2025

Enhanced capabilities. functionalities and applications Establishment of Irradiation facilities in the country

# 57 M

LiFi, optical beamforming and steering, analog radio over fiber; Imaging and Image Processing, Terahertz imaging, Nuclear Imaging



# 2026

Enhanced capabilities, functionalities and applications Establishment of Irradiation facilities in the country

## 10 M Laser beam distribution.

parallelized beam sources. laser beam sources (diode, solid state, high-energy), beam guidance, beam shaping, optimization by multispace algorithms; Nuclear Science applications; aerospace instrumentation



# 2027

Advanced capabilities, functionalities and applications

# 54 M

Information Processing: Quantum communication, computing, and cryptography; Neuromorphic photonics; **Nuclear Science applications** 



# 2028

Advanced capabilities, functionalities and applications

# **VISION**

Provision of enabling technologies for applications beneficial to society.

# **MILESTONES**

# **OVERALL OUTCOME**

Locally-developed products and services intended for wide-range of applications