



The logo for the BIPM 150th anniversary. It features the acronym "BIPM" in a large, bold, blue sans-serif font. Below the acronym, the years "1875 - 2025" are written in a smaller, blue sans-serif font. To the right of the text is a vertical line with a diamond-shaped ornament at the bottom. To the right of the line is the number "150" in a large, blue sans-serif font. Above the number "150", the word "CELEBRATING" is written in a small, blue sans-serif font. To the right of the number "150" is another vertical line with a diamond-shaped ornament at the bottom. The entire logo is set against a white background.

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Motivation

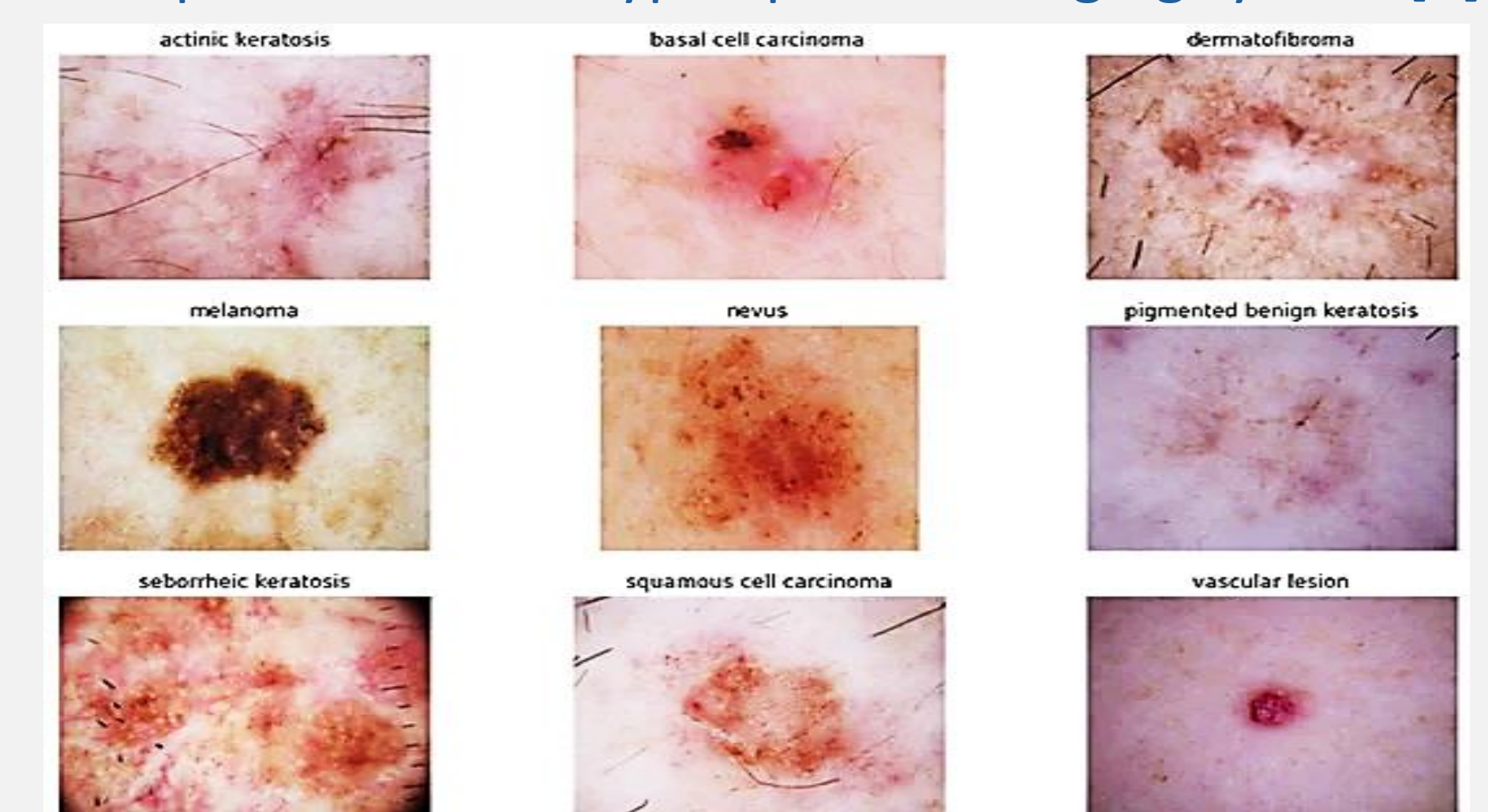
Imaging spectrophotometry is a medical tool that can be used for early cancer detection, tissue characterization, oxygenation, hemoglobin mapping, wound healing, and tissue regeneration. It provides detailed understanding of tissue properties, enabling the detection of micro-scale abnormalities and small variations in tissue characteristics. Real-time data collection during procedures provides immediate feedback for clinicians, enhancing decision-making and treatment accuracy. Imaging spectrophotometry can complement other imaging technologies like CT scans, MRI, or ultrasound by providing additional spectral data. However, successful integration requires addressing data complexity, standardization, integration into existing systems, regulatory approval, and future developments. Spectral data requires advanced processing algorithms, requiring machine learning models to identify patterns and automate diagnostics. Standardization protocols ensure reliability and accuracy across different clinical settings. Future developments in imaging spectroscopy could include portable spectroscopy devices, multimodal imaging, and AI and machine learning.

Instrument and Automation

The schematic diagram illustrates the experimental setup for the photonic quantum circuit. The setup includes an LDLS controller and LDLS lamp emitting 170-2500 nm light, which passes through a collimating lens and an order sorting filter wheel (6 filters + open). The light then enters a double-grating monochromator. A multi-mode fiber carries the light to a beam splitter. The beam splitter directs light to a monitor detector (with two color photodiodes) and a transmittance mode detector. A reflectance sample or port plug is placed at the entrance port with collimation. The light is then directed to a 2D translational stage. The stage is connected to a DAQ/control (buses) and a DAQ line detector/sensor/camera. The stage also outputs to a DAQ line detector/sensor/camera and a DAQ line detector/sensor/camera. The DAQ line detector/sensor/camera is connected to a Control PC via a GPIB (bus).

Metrology Role: Toward improving the Target Medical Application

actinic keratosis basal cell carcinoma dermatofibroma



Type of skin cancer retrieved from the ISIC dataset [6]

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