

# Physics Department Seminar

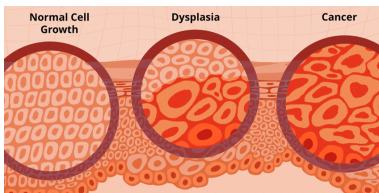
Apr. 11, Friday at 2 PM in Science Building Room 250

## Müller Matrix Polarimetry for Cancer Detection

Katherine Bramasco

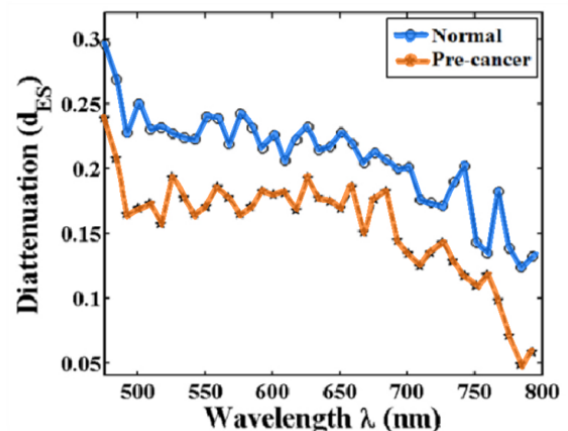


Polarization is a fundamental property of light that describes the orientation of its electric and magnetic fields. Polarimetry involves analyzing the polarization of light after passing through or reflecting off a sample. From astronomy to biology, polarimetry can reveal key information about the composition of a wide range of samples. In biology, cancer detection has historically relied on methods such as ultrasounds, X-rays, or computerized tomography scans. However, many instances of cancer are diagnosed at advanced stages, reducing the number of opportunities for effective treatment.



A novel approach to solving this problem involves polarimetry. In particular, Müller matrix polarimetry is being researched for its ability to account for the opaque nature

of biological tissue and detect precancerous cells. This review discusses the Stokes-Müller formalism used in Müller matrix polarimetry and recent studies on its clinical applications.



The findings from these studies indicate that Müller matrix polarimetry helps discriminate between healthy and precancerous cells based on subtle changes in the usually uniform structure of biological tissue. This method is quicker and more cost-effective, potentially leading to earlier diagnoses and allowing more people to receive treatment.