

# USizeB

matters.

Original thinking at Birmingham has led to the development of a new compact laser method for measuring very small distances and angular rotational changes.

# ‘EUCLID Interferometer’

A compact laser interferometric measuring device capable of sensing at the pico metre level.

## What it is?

EUCLID is an **Easy to Use Compact Laser Interferometric Device** capable of sensing at the pico metre level and over a range of many millimetres.

## How does it help?

- Supplied as a simple plug and play USB compatible unit
- Can also be operated in a completely standalone mode
- Requires no mechanical or electrical connections to the object being tracked
- Quick and easy alignment

## Background

EUCLID has been developed from an optical readout system intended for drag-free satellites such as the space-based gravitational wave observatory, LISA. Its unique combination of high specification, insensitivity to target mirror misalignment and compactness makes EUCLID suitable for a wide range of applications such as integrated circuit manufacture, length metrology, nanophysics (AFM's), seismometer readout, and general applications in physics research such as gravitational wave observatories.

## Prototype Specification

- Ease of alignment  $\pm 1^\circ$  over more than 2 mm of working range
- Working distance 7 mm
- Displacement noise  $\sim 5\text{pm/rt-Hz}$  at 1 Hz
- Measurement linearity  $\sim 2\text{ nm}$
- Compact size 60 x 55 x 22 mm
- Low optical power  $< 50\text{ }\mu\text{W}$
- Integrated laser source at  $\sim 667\text{ nm}$

## Why the University of Birmingham?

- The School of Physics and Astronomy was placed among the leading research institutions in the 2008 Research Assessment Exercise
- The department is well equipped with an extensive range of advanced instrumentation and characterisation facilities, supported and maintained by highly skilled technical staff

## Who's behind it?

Professor of Experimental Physics, Clive Speake, whose research interests lie in precision measurements in fundamental physics in the laboratory and in space.

## What's next?

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