Parliamentary and Scientific Committee

‘Celebrating 125 years of impact and innovation from the UK’s National Physical Laboratory – what might the next 125 years bring?’

A discussion meeting held in partnership with the National Physical Laboratory

Our meeting this month coincided with World Metrology Day, 20th May, celebrating 150 years of the Metre Convention. Viscount Stansgate, President of the P&SC, welcomed guests, and congratulated NPL on their 125th birthday, before introducing our 4 expert speakers.

Celebrating the 125 years of NPL’s existence, UK’s National Metrology Institute, Professor Gareth Hinds, Senior NPL Fellow in Electrochemistry, described the rich history and present activities of this government owned (under DSIT) PSRE; with a Teddington HQ, 5 other regional laboratories, and a staff of 1400+ and 200+ visiting researchers, NPL provides world-leading expertise in science, engineering and metrology, that underpins UK prosperity and quality of life, and gives independent and impartial advice to government and public and private sectors. 4,500 businesses use NPL each year, and a further 74,000 organisations are indirectly supported through provision of calibration services via accredited laboratories. Accurate measurement is essential for appliance of science in the real world; NPL works to improve people’s lives, grow UK industrial prosperity, and help our changing planet.

Stressing the importance of materials in modern life, Dr Andrew Pollard, Principal Scientist in Advanced Materials, NPL, told us that materials innovation contributes £45b to the UK economy each year. Illustrating NPL’s contribution, he used graphene as an example; great properties and potential, but needs metrology to identify which graphene is appropriate for different industrial challenges. A large amount of graphene is produced in the UK, e.g. for cars, phones, and cement; NPL enables this innovation.

Dr Ana Lourenço, Principal Scientist in Radiotherapy and Radiation Dosimetry Health, NPL, reminded us that 1 in 2 people develop cancer, with radiotherapy costing 5% of the NHS budget. Fine targeting by state of art machines, and trusted measurement to get the correct dose is essential, or risk tissue damage. NPL has been working on this for many years, now comparing high-energy X-rays vs protons to develop better targeting of tumours, producing the world’s 1st dedicated measurement standard for proton radiotherapy, using the new ultra-fast FLASH cancer treatment, now on clinical trial. For the future she sees more personalised cancer care, accelerating adoption of advanced treatments, and use of AI, but there must be safe standards, tailored to individuals.

Looking at the next 150 years for metrology, Professor Josephine Bunch, NPL Fellow in Biomolecular Analysis, proposed new approaches to tackle our highly complex interconnected world systems, uncertainty calculation, improved SI-traceable methods, and trusted AI. There are so many global developments in all subjects, from air quality monitoring, earthquake monitoring, and cell structure and health measurement. Unified measurements in the future will reduce uncertainties, save money, and save lives.

Our experts then responded to varied Q&A topics.
FLASH radiotherapy cancer treatment was discussed further, also the NPL methodology for calibration of accurate doses of radiotherapy; the oncologist ultimately decides, based on government guidelines. Potential AI developments in nutrition and weight measurement, and the level of defence research were raised, as was NPL outreach work; they described current school and student STEM programmes, and their plans for future projects.
NPL work ensures accuracy in the metric world, including time accuracy; the National Time Centre is run by them, with redefinition of the second due shortly. Standardisation of measurement is essential, with most countries (apart from the USA) now using the metric system.
What funding is needed to make advances? And what are the biggest challenges in the next 10 years? NPL researchers have the knowledge to address issues, but need to be vocal, have confidence in what they are doing, and ensure we can trust AI. The rise of populism, and attacks on science is a concern, damaging public trust and confidence in research

Sue Wharton,
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20th May 2025