

(C.S.I.R)
NATIONAL PHYSICAL LABORATORY
OPEN DAY VISIT – 30/09/2019



INTRODUCTION

The National Physical Laboratory was conceptualized in 1943 by the Governing Body of Council of Scientific and Industrial Research (CSIR), with a view to pave way for using science and technology as a means for industrial growth and development. Pandit Jawaharlal Nehru, the then Prime Minister of India, laid the foundation stone for the laboratory on January 4, 1947 and it was one of the first National Laboratory to be set-up under the CSIR. On January 21, 1950, Sardar Vallabhbhai Patel, the then Deputy Prime Minister of India, inaugurated the NPL building. Over the years, the Laboratory has more than realized its primary mandate as the keeper of Measurement Standards for the nation while also substantially expanding its research activities to emerge as a leading national institution for research in a whole gamut of areas in the Physical Sciences.

The main aim of the Laboratory is to strengthen and advance physics-based research and development for the overall development of science and technology in the country. In particular, its objectives are:

- To establish, maintain and improve continuously by research, for the benefit of the nation, the National Standards of Measurements and to realize the Units, based on the International System.
- To identify and conduct, after due consideration, research in areas of physics which are most appropriate to the needs of the nation and for advancement of the field.
- To assist industries, national and other agencies in their development tasks by precision measurements, calibration, development of devices, processes and other allied problems related to physics.



A team consisting of 66 students and 5 faculty members of MSIT were privileged to be a part of the visit made to Open House at National Physical Laboratory on the 30th of September 2019.

X-RAY DIFFRACTION

It is one of the most important non-destructive tools to analyze all kinds of matter—ranging from fluids, to powders and crystals. From research to production and engineering, **XRD** is an indispensable method for materials characterization and quality control.



LUX METER

The lux (symbol: lx) is the SI derived unit of illuminance and luminous emittance, measuring luminous flux per unit area. It is equal to one lumen per square metre. In photometry, this is used as a measure of the intensity, as perceived by the human eye, of light that hits or passes

through a surface. It is analogous to the radiometric unit watt per square metre, but with the power at each wavelength weighted according to the luminosity function, a standardized model of human visual brightness perception. In English, "lux" is used as both the singular and plural form.



PORTABLE GENERATORS

They provide electricity by running a gas-powered engine that turns an on-board alternator to generate electrical power. Power outlets on the unit allow you to plug extension cords, electric-powered tools and appliances into it. Portable generators provide electricity by running a gas-powered engine that turns an on-board alternator to generate electrical power. Power outlets on the unit allow you to plug extension cords, electric-powered tools and appliances into it. Portable generators provide electricity by running a gas-powered engine that turns an on-board alternator to generate electrical power.



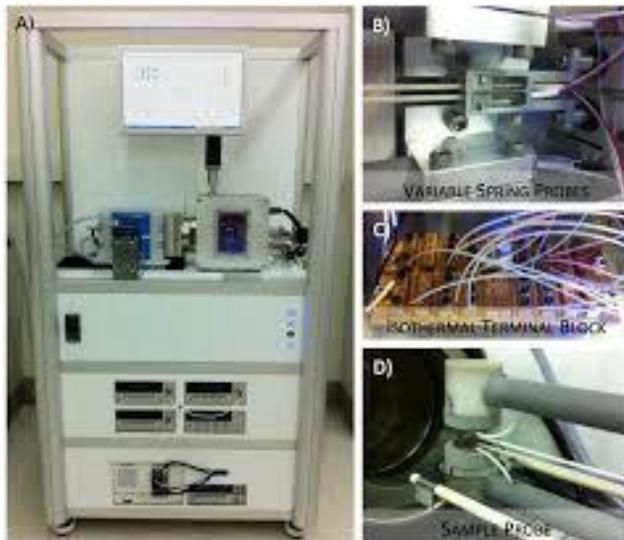
ELECTRICAL RESISTIVITY MEASUREMENTS

Various models and methods have been suggested to measure the electrical resistance. Factors affecting the suitability of various methods and precision attainable include contact resistance and shape of the sample i.e. whether it's in the form of single crystal, thin film, powder pellet or small crystallite.



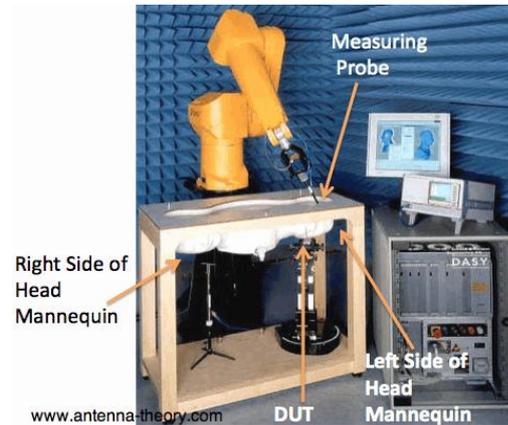
THERMOELECTRIC EFFICIENCY MEASUREMENT SYSTEM

Conventionally, thermoelectric measurements are taken using a two-point technique where the heat is introduced through one of the electrodes, creating a temperature difference. The resulting signal from the small temperature gradients may be compensated for by the large number of very low power measurements.



SAR AND ANTENNA EXPERIMENT

Specific Absorption Rate (SAR) is a measure of the amount of RF power deposited in the human head or body whenever a mobile phone or other wireless radio device transmits. It is the maximum SAR value (in units of Watts/kilogram) that is measured during SAR compliance testing.



Overall the visit to National Physical Laboratory had proved beneficial to the students as it supplemented as a clear vision to theoretical knowledge and exposed students to recent trends in research, challenges and development involved in various studies related to science.

This experience was of great value to the learning curve of the students