APC Laboratory's

Gravitation Group

Shivani HARER

21.05.2026

TDLI Delegation Visit

Our Projects

- Advanced VIRGO and Einstein Telescope (ET)
- LISA (Laser Interferometer Space Antenna)
- Pulsar Timing Array
- Moon-GW

AdVirgo and ET

ground-based detectors

AdVirgo and ET activities

I. **Data Analysis** :
Interpretation of GW observations within LVK/IGWN — testing GR with ring-down part of the CBC signal (O4A data).

R&D — model-free and ML-based reconstruction of GW polarisations

II. **Instrumental Activities** :
Noise reduction — frequency squeezing for quantum noise, study of acoustic and atmospheric newtonian noise

AdVirgo+ (O5) — design and testing of an optical bench for stable recycling cavities

LISA

space-based detector

LISA activities

I. **Data Analysis** :
Building of LISA Global Fit and source cataloging

Interpretation of GWs — in astrophysics (models) and fundamental physics (testing GR, dark matter)

Use of ML in data analysis

II. **Instrumental Activities** :
Verification of interferometer core with optical bench prototypes

Development of the ‘Beams Simulator’ bench and setting phasemeter specification

Performance modelling of the detection system

Pulsar Timing Array

PTA activities

Data Analysis :

Search, modelling and analysis of resolvable in spiralling SMBHB binaries

Interpretation of the stochastic GW background (Early Universe, SMBHBs)

Modelling of pulsar noise

Building continuous data analysis pipeline (overlap with LISA)

Moon GW

minor project

Moon GW detection activities

Data Analysis :

Moon Response to GWs

Study of feasibility of suspended interferometer and suspension thermal noise

Noise budget for non-suspended interferometer (strain meter)

thank you for listening!