

Report from NESC meeting on Thursday 12th February 2026

NESC held a meeting on 12th February on Microsoft Teams with **43** participants online.

GUEST Proposal (Gravitational Universe Exploration with Satellite Tracking)

Diego Blas joined the NESC meeting to present a proposal, called GUEST, to launch a new SLR target to detect gravitational waves. SLR and LLR are suitably sensitive at particular frequencies to do this due to the large orbit distances and high accuracy range measurements. The proposed new target is a LAGEOS sized sphere in a highly eccentric, high altitude orbit. This orbit would be affected by gravitational waves and those that are resonant with the orbit would build up over time and result in a detectable signal. Two orbit placements were discussed, the first has an eccentricity of 0.75, inclination of 75 degrees and a period of 34 hours. This gives a perigee of 6926km and an apogee of 86700km. However, such a satellite could be a hazard to GNSS orbital planes and consequently ESA requires re-entry after 30 years. Alternatively, a more distant satellite above the GNSS constellations is considered. The satellite design is spherical and contains smaller retro-reflectors and larger cubes, which together offer a range of responses to velocity aberration. It was discussed how these satellites would be very difficult targets because of the weak signals and only the LLR capable stations could be confident in getting returns. This project has secured funding and there is an offer of money to upgrade SLR stations to increase tracking capability.

LAGEOS-2 and LARES-2 Signal Strength Investigation

Van Husson has been investigating the signal strengths of the LAGEOS, LAGEOS 2 and LARES 2 satellites by using the number of observations in a normal point and taking averages over 3 years and plotting against elevation. He began with Yarragadee and was able to show that a lot more observations were recorded by the station in the years 1993-1996 compared to 2021-2024 and that the response of LAGEOS and LAGEOS 2 were similar in 1993-1996 but in recent years LAGEOS 2 has a reduced signal. Similar results were shown for other NASA systems in Greenbelt and Monument Peak. Results from Herstmonceux and Graz also suggested a comparatively better response from the LAGEOS satellite.

Outline of the HTV-X experiment

An upcoming ILRS mission called HTV-X will study attitude estimation from SLR returns compared to onboard measurements during different swinging motions of the vehicle. **Shinichi Nakamura** invited colleagues to take part in the analysis of the rotation motion during its flight over the SLR station dense area in Asia. HTV-X will be undocked from the ISS in March this year and JAXA will distribute the CPFs.

Measuring Pressure at the SGF, Herstmonceux

Where best to locate a barometer was discussed previously at the NESC and there were concerns about housing it outside and questions if a true reading could be taken in a closed, air conditioned room. **Matthew Wilkinson** described the addition of a new Vaisala PTB barometer at the SGF joining two long serving Druck DPI 141 barometers. Agreement of the 3 instruments was very close and within the specification of 0.15 mbar. The Vaisala PTB barometer has recently been installed in the SLR dome, which is exposed to the open air during operations, at the height of the telescope. Again very good agreement is seen after removing the height correction applied for the previous location. Some variation due to wind was detected and the device could be further sheltered.

Other Business

Pawel Lejba informed NESC about the status of the Borowiec station, which has been offline. A new PMT detector has been installed and tests are being carried out on external targets. Attempts on satellite targets will begin once the weather improves. New flash lamps were installed in the laser, but the laser did not work until the high voltage power cables were replaced.

The presentation slides from the meeting will be available here

https://ilrs.gsfc.nasa.gov/network/newg/newg_activities.html

The date for the next NESC meeting was set as **Thursday 16th April at 1300 UTC**

If you missed the meeting and would like to catch up, please send me an email (matwi@nerc.ac.uk) and I can provide the recording.