

Report from NESC meeting on Thursday 25th June 2026

NESC held a meeting on 25th June on Microsoft Teams with **56** participants online.

Celeste - First European LEO-PNT In Orbit Demonstrator

The satellite LPNTSAT-001 was recently launched and approved for ILRS support. **César Pisonero Berges** and **Marc Fernández Usón** from GMV joined the meeting to present the new satellite and the [Celeste](#) project. Celeste is an ESA project that will launch a series of positioning, navigation and timing satellites in to low-Earth orbit to complement the Galileo GNSS constellation. The satellites will be able to compute their own orbits and clock corrections in space using GNSS signals and then broadcast their own 'GNSS-like' signals to the ground segment. This will give the user on the ground more visibility and more satellites to determine their position and timing. The LPNTSAT-001 satellite is the first demonstrator satellite and will test innovative signals across various frequency bands. It will use SLR data to validate the GNSS determined orbits. More satellites will be launched and it is undecided whether or not they will carry retro-reflectors. Some stations have tracked LPNTSAT-001, but the predictions are not yet as accurate as required.

Single-point positioning of cis-lunar spacecraft with tri-static common-view laser ranging

Zhi-Peng Liang presented an idea for simultaneous SLR by 3 stations that can quickly and accurately yield a satellite's position, with possible application for spacecraft around the Moon, see [here](#). The technique was validated using LAGEOS data during times when 3 different stations recorded a laser range observation in a normal point window. The results were compared to the published SP3C precise orbits. The tri-static method would require the coordination of 3 SLR stations and would quickly produce positional results at the 1 metre level. Stations separated by longer baselines would have greater precision, but shorter baselines have longer common view times. A planned mobile transmitter system would allow for larger, existing telescopes to be quickly adapted for these activities.

Updates of Beijing SLR Station (7249)

The Beijing station is co-located with VLBI, GNSS and gravimetry. It also has a second, mobile SLR station on site. **Yuanchen Fu** gave an update on recent developments. Last year it observed 1636 LEO passes, 509 LAGEOS passes and 1458 HEO satellite passes and reached the ILRS standard. Performance has improved following updates in 2022. Updates included telescope control hardware, changes to the transmit and receive paths, a new 2kHz laser and new data acquisition software. This has enabled HEO tracking and daytime operations. A local tie survey between the techniques has been completed with a formal error of 0.25mm. A recent paper was published with Yuanchen Fu as the lead author, see [here](#), which looked at the tropospheric delay corrections for SLR measurements. The commonly used Mendes and Pavlis model was compared to a vertical integration method using the ERA5 dataset and millimetre differences were seen, which impacts the ITRF geocenter and scale. Van Husson suggested that the Beijing station could improve its LAGEOS tracking by observing more normal points per pass. Also, normal points should contain a minimum number of returns to be submitted. Van pointed out that a range bias is present at the station and perhaps the calibration distance could be remeasured.

The New 1 kHz Laser System in Zimmerwald

Pierre Lauber gave an update on the status of the Zimmerwald station and the work undertaken to upgrade the laser and its throughput to bring this station back to full operations. The new laser is 1kHz with low pulse energy, however the existing rotating shutter could only operate at a maximum speed of 100Hz, which limits the capability for SLR. Removing the rotating shutter and installing a

mirror with a transmitting hole in its coating has allowed for 1kHz operations, while still preventing laser photons reaching the detector, this is reported [here](#). A camera was used to check that no light was seen at the detector port when the laser was fired. Zimmerwald is an automated SLR station and this includes data selection, which is now more challenging with the reduced signal and increase in noise.

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 10th September 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.