

Report from NESC meeting on Thursday 11th December 2025

NESC held a meeting on 11th December on Microsoft Teams with 35 participants online.

Lasers for Ranging and Satellite Tracking – Photonics Industries

Photonics Industries, <https://www.photonix.com>, manufactures lasers in the United States and exports them worldwide for many applications. **Hans Taylor** joined the NESC meeting to tell us about the company and the lasers available. The lasers that were designed for SLR are the RGLX series that have a pulse duration of 30ps, repetition rates up to 5kHz and 2-4mJ @1064nm and 1.5-2.5mJ @532nm pulse energies. The lasers are compact and the laser unit contains the controlling electronics also. Another high pulse energy lasers operate at 1064nm and sends 10ps pulses with 650μJ (or 900μJ) at 100kHz. This uses an acousto-optic modulator pulse picker and an AOM attenuator. A new design in development would have space debris applications which has a 10ns pulse at 10Hz with energies 4J @1064nm and 2J @532nm. When these lasers come to the end of their usage lifetimes, they can be restored by replacing the diodes and will continue operating.

Omni-SLR in 2025: What's New and What's Next?

Toshi Otsubo and his team have developed the compact and low-cost Omni-SLR system to show what can be achieved and to encourage other institutions to build SLR systems to enhance the global SLR network. The new station is in Ishioka, Japan alongside VLBI, GNSS and gravimetry facilities. It uses a 1ns, 10kHz, 5.7μJ laser, a 20cm diameter telescope, an un-gated Hamamatsu C11202-100 detector and a Swabian Instruments Time Tagger. Toshi estimates that the system link budget is 0.2% of Yarragadee's and 0.5% of Herstmonceux. Nevertheless, it has tracked many passes including the EO satellites and some Lares, Lares-2, LAGEOS and LAGEOS 2 passes. Station coordinates have been estimated and the data is available through the ILRS Data Centers. A new laser and new mount is planned and tests are underway to prepare for daytime operations and setting up a new station in Antarctica.

Ekagaku1 Mission Update

The Ekagaku1 satellite was launched from the ISS on October 10th and the ILRS began attempts at tracking from early November. Unfortunately no station has been successful. **Shinichi Nakamura** joined us to explain a few of the problems that have hindered tracking so far. The object was first given the wrong TLE number and so for a time stations were tracking the wrong object. A new TLE number has been assigned. Unfortunately, there is a problem in the satellite design in that the reflectors are not pointing towards the Earth, but are instead aligned to the Earth's magnetic field lines. It might still be possible to track the satellite in the South for stations in the northern hemisphere and in the North for stations in the southern hemisphere. SLR observing begins again on 16th December.

Recent Discussion Topics of the ASC Connected to NESC

Mathis Bloßfeld shared some topics that came up for discussion at a recent meeting of the Analysis Standing Committee. A review is planned for the criteria for the list of ILRS Core Sites, which is used to check the quality of the results from solutions and Mathis invited NESC participation in this process. Mathis also highlighted station performance and how only 25% of stations are meeting the ILRS standards. He suggested that the priority list does not give a clear message on the importance of the geodetic satellites, particularly LAGEOS etc. It was suggested that the priority list could be split in to groups. Finally, Mathis mentioned that stations should send a wider spread of full-rate data around the SLR track so that normal point calculations can be tested.

Astronomical Techniques and Instruments - Deadline

You Zhao promoted the Special issue on Satellite Laser Ranging of the Astronomical Techniques and Instruments journal, <http://www.ati.ac.cn>. The deadline for submissions has been revised to 31st July 2026.

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 12th February 2026 at 1400 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.