

Earth and Planetary Remote Sensing Laboratory

World leaders in earth and planetary remote sensing

The world leading **Earth and Planetary Remote Sensing (EAPRS)** Laboratory is an interdisciplinary research centre directed by Professor Philippa Berry.

The EAPRS laboratory has forged and maintains a substantial world lead in the analysis and interpretation of remote sensing data, with an emphasis on radar instruments, particularly satellite radar altimetry. Key to the lab's continuing success in research and new applications development is the underpinning technical knowledge, vital to understanding both the satellite instrument engineering and the subsequent data processing.

Mission

The primary research focus is analysis and interpretation of remote sensing data, with an emphasis on radar instruments; particularly radar altimetry. The work has a global remit, with studies over land, inland water, ocean and the cryosphere.

Background

The Earth and Planetary Remote Sensing Laboratory is an interdisciplinary research centre with staff drawn from the Faculty of Technology. Established in 1995, under the direction of Professor Philippa Berry the laboratory has, over the last 15 years, established and maintained a world lead in the theoretical modelling of satellite radar altimetry over land and inland water surfaces, and in the development of applications for these unique data.

Expertise

Due to the success of the unique techniques pioneered by the EAPRS Lab, studies have extended from the initial research over land surfaces to encompass measurement and monitoring of inland water through to enhanced measurements over the cryosphere and ocean. The laboratory has also been involved in a number of contracts dealing with future technologies such as the Soil Moisture and Ocean Salinity (SMOS) missions and the next generation of interferometric altimeters.

The flagship programme of the lab is the European Space Agency River & Lake system. This system provides information on the measurement of inland water bodies to users in near-real-time, using data from a number of satellite radar altimeters. Other research focuses on the retrieval of land orthometric heights, altimeter engineering measurement characteristics and the retrieval of surface soil moisture from satellite radar altimetry which is being developed under the ESA SMALT project. The lab currently hosts websites for the ESA River & Lake and SMALT projects and the ESA funded ACE2 Global Digital Elevation Model.

EAPRS delivers contracts to demanding specifications and places a strong emphasis on collaborative research programmes with the expertise and experience to work on large contracts with those in the following industries:

- Water resource management
- Civil engineering
- Space geodesy
- Space systems
- Digital elevation models
- Gravity and the global geoid



Key collaborations

There is a strong emphasis on collaborative research programmes and initiatives, with a network of international links to universities and institutes on four continents. Key collaborators are ESA (European Space Agency) and NASA and the national and international space community.

Academic:

- University of Newcastle Upon Tyne
- Technical University of Denmark
- Technical University of Vienna
- University of Versailles (France)
- Australian National University
- Curtin University of Technology (Australia)
- University of Sao Paulo
- University of Colorado
- University of Copenhagen
- University of Oporto
- University of Taiwan

Institutes:

- Centre d'étude des Environnements Terrestre et Planétaire (CETP) (France)
- Queensland Climate Change Centre
Department of Natural Resources and Water (Australia)
- National Geospatial-Intelligence Agency (NGA) (USA)
- Danish National Space Centre (Denmark)

- SciSys
- STARLAB (Spain)
- SatOC
- National Oceanography Centre
- Danish Hydrological Institute
- ESA TIGER Initiative
- WMO WHYCOS Programme

Research Grants and Projects

- ESA River & Lake: Development and successful 5 year operation for ESA of a system to determine inland water heights globally from ERS-2, ENVISAT and Jason-1/2 altimetry
- ESA CPR: Study of natural calibration sites for the cloud profiling radar
- ESA RAIES: Exploitation of the ENVISAT radar altimeter individual echoes and S-band data for ocean, coastal zone, land and ice/sea-ice altimetry
- ESA ACE-2: Development of new global digital elevation model
- ESA SAMOSA: Study of interferometric altimeter data retrieval over land and inland water surfaces in preparation for CRYOSAT-2
- ESA SMALT (Soil Moisture from Altimetry): System development for soil moisture estimates from Satellite Radar Altimetry and cross-calibration with SMOS
- NGIA/DNSC Global Altimeter ocean height determination for EGM08

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