

# Experimental Plasma Collaborations and Diagnostics Development Laboratory

## Description

The ORNL Fusion & Materials for Nuclear Systems (FMNS) Division is involved in research activities that are conducted around the world: onsite at ORNL, at domestic institutions, and at international locations. Some of these activities involve the construction and testing of diagnostic systems, which will be installed on experiments elsewhere. The Experimental Plasma Collaborations and Diagnostics Development Laboratory provides a space where diagnostic systems can be staged in preparation for deployment. A central feature of the laboratory is a large optical table and an extensive cache of optical components for configuring diagnostics systems. Facilities to the room include compressed air, cooling water loops, and safety interlocking for lasers. Cabinets in the room contain a wide variety of hardware, tools, fixtures, and instrumentation, which are at-hand for the needs of researchers and technicians.

## Applications

- Optical Emission Spectroscopy diagnostic development for use on the proto-MPEX (Material Plasma Exposure Experiment) at ORNL (Bldg. 7625).
- Charge-Exchange Recombination Spectroscopy (CXRS) systems were designed and assembled in this space prior to deployment to the Joint European Torus (JET) in Oxfordshire, UK.
- The In-vessel Calibration Light Source (ICLS) underwent initial development before deployment to JET.
- ORNL-designed "Filterscope" technology is assembled and verified before sending to ORNL collaborations around the world: NSTX (PPPL), DIII-D (General Atomics), EAST (China), KSTAR (Korea), etc.
- The Diagnostic Residual Gas Analyzer (DRGA) System for ITER is being prototyped in this laboratory space.
- Digital Holography techniques have been developed here through LDRD partnership with Third-Dimension Technologies, prior to deployment on proto-MPEX.

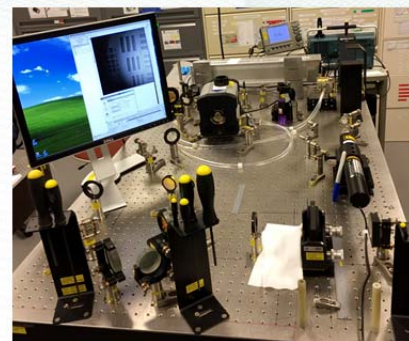
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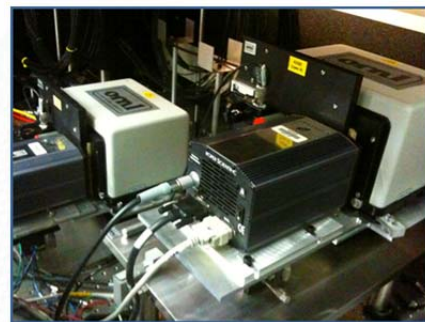
ORNL is managed by  
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*D-115 Diagnostic Development Laboratory configured for testing of the Digital Holography optics.*



*In-vessel Calibrated Light Source (ICLS) for the JET Facility (developed at ORNL)*



*ORNL-developed Helium Ash Spectrometers employed on JET*