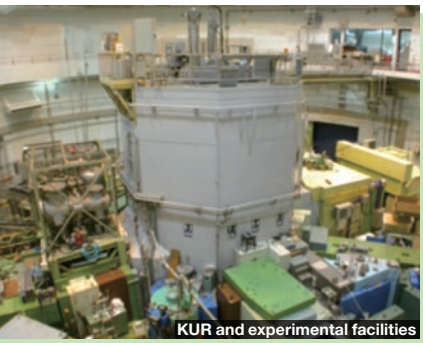
CUTTING-EDGE EXPERIMENTAL EQUIPMENT

Facilities for High Quality Research

The Kyoto University's state-of-the-art laboratories and research facilities provide students and researchers with the hands-on practical experience vital to their development as world-class scientists and scholars.

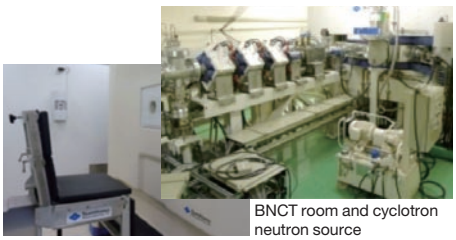

KUR and experimental facilities

Research Reactors and Radiation Facilities for Joint Use Program

Kyoto University Research Reactor Institute

The Kyoto University Research Reactor Institute (KURRI) was established in 1963 for joint use programs between Japanese universities to promote research and education in the fields of nuclear energy and radiation application. The main facility, called the Kyoto University Research Reactor (KUR), is a light-water moderated tank-type reactor of 5MW, which is widely used for various experiments, as are the Kyoto University Critical Assembly (KUCA) and accelerators.

In the 2012 fiscal year, 5,858 man-day researchers and students visited the KURRI to use research facilities or attend scientific meetings. The facility's activities cover a large number of research subjects in various fields of nuclear science and technology, material science, radiation life science, and radiation medical science.


BNCT room and cyclotron neutron source

Particularly remarkable progress is being made in clinical studies of Boron Neutron Capture Therapy (BNCT) for a new effective cancer treatment, which enables the selective destruction of only cancer cells. The number of patients treated so far is the largest in the world. Based on the successful results obtained at the KUR, the world's first clinical trial of BNCT began last fall using a cyclotron neutron source, which was developed through collaborative research with the industrial sector.

Other research is also being conducted using the Accelerator Driven System (ADS), which has recently been receiving much attention due to its potential to improve the flexibility and safety of future nuclear systems. By combining a 150MeV proton accelerator with the KUCA, the world first and most successful ADS experiment began in March 2009.

Conveniently located close to Kansai International Airport, the KURRI has been developing into a center of excellence to promote leading research on the efficient multidisciplinary utilization of nuclear science and technology.

Dr. Hirotake Moriyama

Professor/Director, Kyoto University Research Reactor Institute and Graduate School of Engineering

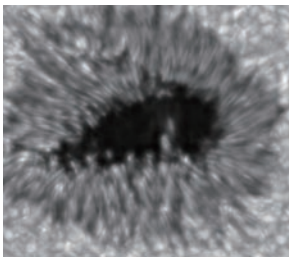
WEB www.rri.kyoto-u.ac.jp/en

Taking a Close Look at the Sun

Advanced Solar Telescopes at the Hida Observatory

The Hida Observatory, a facility of the Graduate School of Science of Kyoto University, was constructed in 1968 on the mountain area in the northern part of Gifu-prefecture of Japan. The observatory is equipped with a 65cm refractor telescope (the largest refractor in Asia) and two advanced solar telescopes. The observatory's current main research target is to unveil the origin of the solar magnetic activities that govern the space environment surrounding the Earth.

The Domeless Solar Telescope (DST) is a 60 cm aperture vacuum telescope installed on a tower 22 m high from ground level. The DST is used for high spatial resolution observations of solar atmosphere with detailed spectroscopic diagnosis of magnetized plasma. A high precision spectro-polarimeter, an adaptive optics system for suppressing the atmospheric turbulence effect and a universal tunable filter for spectroscopic imaging observations are new technical features that promote advanced solar observations. The Solar Magnetic Activity Research Telescope (SMART) is a set of refractive telescopes with apertures of 20 cm and 25 cm. The SMART observes the full disk sun and also active regions on a regular basis, aiming to capture flare explosions and mass ejections that influence the earth's space environment. Unique features of the SMART are that the system can measure the velocity of plasma clouds erupting from the sun, image the dynamic evolution of flares with the highest (sub-second) time resolution, and obtain magnetic fields of active regions with the highest sensitivity and time resolution. With these instruments, the Hida Observatory provides unique solar research data that is highly compatible with those of solar observing satellites and other ground-based solar observatories in the world.



A sunspot image taken in blue light at 430 nm. The field of view covers approximately 45 x 45 arcsec^2 (42000 x 42000 km^2 on the sun).

◀ SMART

Dr. Kiyoshi Ichimoto

Professor, Hida Observatory, Graduate School of Science

WEB www.kwasan.kyoto-u.ac.jp/general/facilities/index_en.html

Ujigawa Open Laboratory

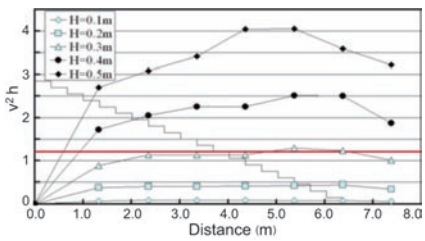
Ujigawa Open Laboratory

The Ujigawa Hydraulics Laboratory (UHL) of the Disaster Prevention Research Institute (DPRI) was established in 1953. The laboratory is located near the southern edge of Kyoto City, near the right-hand levee of the Uji River on a site covering an area of 68,700 m^2. The main purpose of the laboratory is the investigation of various problems concerning natural disasters caused by floods and sediments. In 2002, the UHL has changed its name to the Ujigawa Open Laboratory (Ujigawa OL). The inclusion of "open laboratory" in the name refers to the fact that the laboratory facilities are available for use by every researcher and student in the world.

The real scale model of staircase

The Ujigawa OL is one of the world's leading experimental laboratories. It is equipped with many observational and experimental facilities, where different kinds of hydraulic and sedimentation experiments are carried out. In addition to the various research activities by the academic staff of the DPRI, the facilities installed at the laboratory are also used for faculty and graduate school education, industry-government-academia collaborative research, international academic cooperation, and other purposes. Additionally, experimental facilities are available to researchers throughout Japan, and events such as simulated disaster experiences have been carried out for the public with the help of technical staff.

One of the most unique devices in the laboratory is a real scale model of a staircase, which is used to investigate the flow characteristics and evacuation methods for urban floods. The model has frequently been featured in the media. When an urban flood occurs, underground spaces like shopping malls and subway stations are inundated with water, endangering human lives and properties. As quick evacuation from underground spaces is one effective measure to reduce damage by flood disaster, water flow characteristics over stairs and evacuation from underground spaces have been investigated using this model.



Distribution of unit width momentum of the flow on the staircase taking with a parameter of inundated water depth on the ground [v = flow velocity(m/s) and h = flow depth(m) on the staircase, respectively]

Dr. Hajime Nakagawa

Director, Ujigawa Open Laboratory / Head, the Research Center for Fluvial and Coastal Disasters / Professor, Disaster Prevention Research Institute

WEB www.dpri.kyoto-u.ac.jp/openlab/