

ACCESS TO REMOTE Laboratories:

What are the benefits?

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Definitions

- Physical Laboratory (You can touch)
- Online Laboratory
 - Virtual Laboratory (Simulation)
- Remote Laboratory (Access physical gear)



Examples of iLabs

- Examine some use cases
- Explore common characteristics

A Simple experiment



ELVIS (EECS, displayed 2006)

Expensive Equipment



Polymer Crystallization (Chem. E., deployed 2003)



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One Laboratory - Distributed Students



Benefits of Using a Remote Laboratory?

- Time Accessibility
- Physical Accessibility
- Resource Accessibility
- OH&S Issues
- Location Accessibility
- Scalability



Requirements

- Experiment must be (or be able to be) computerised
- Must have access to the Internet
- Minimal software requirement at the user end
- Minimal use of consumables



When **NOT** to Use a Remote Laboratory?

- To replace laboratory experiments
- Cheap, commonly available equipment
- Replaceable consumables requiring human intervention
- Continuous human intervention required
- Experiment requires proximity and haptic interface
- Experiment can't be computerised



how to find an experiment

UQ OpenLabs ServiceBroker Version 3.0.1

Home

Welcome to iLab at The University of Queensland, Australia

iLab is dedicated to the proposition that online laboratories - real laboratories accessed through the Internet - can enrich science and engineering education by greatly expanding the range of experiments that the students are exposed to in the course of their education.

Unlike conventional laboratories, iLabs can be shared across a university or across the world. The iLab vision is to share lab experiments as broadly as possible within higher education and beyond. The ultimate goal of the iLab project is to create a rich set of experiment resources that make it easier for faculty members around the world to share their labs over the Internet.

- [Read more about iLab](#)

ON THIS SITE

- Home
- Help

Username:

Password:

Don't have an account yet?

Forgot your [password](#)?

System News and Messages

The UQ OpenLabs ServiceBroker has been upgraded to the latest release of the iLabs Merged architecture. Since the databases have changed significantly, you will need to register for an account again if you had one on the previous version of the ServiceBroker.

Date Posted: 9/04/2010 5:06:51 PM

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<http://openilabs.ilab.uq.edu.au/>

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UQ iLabs

UQ OpeniLabs ServiceBroker
Version 3.0.1

User: e3mschul Group: OpeniLabs Users Group

My Labs

Group: OpeniLabs Users Group

Labs for OpeniLabs Users Group

- [TimeOfDay LCH](#) - TimeOfDay Example
- [Radioactivity LCH](#) - Radioactivity Measurements
- [AC Machine LCH](#) - UQ ITEE Machines Lab - AC Machine
- [DC Machine LCH](#) - UQ ITEE Machines Lab - DC Machine
- [TimeOfDay Farm LCH](#) - TimeOfDay LabServer Farm Example
- [MIT ELVIS LCH](#) - NI-ELVIS Board - Electronic Circuits
- [MIT DSA LCH](#) - Dynamic Signal Analysis
- [MIT HDL LCH](#) - Microelectronics Device Characterization
- [Radioactivity LCH](#) - Radioactivity LabClient: Flex

Messages for OpeniLabs Users Group
No messages at this time.

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- [Labs Featured in Northwestern News Center](#)
- [Labs Featured in National Science Foundation Discoveries](#)
- [More...](#)

Join the iLabCentral community!

iLabCentral is where people come to share and access real lab devices over the internet. [Learn more...](#)

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The iLab Network is supported in part by the National Science Foundation under grant CCI-0753324. However, any opinions, findings, conclusions, and/or recommendations are those of the investigators and do not necessarily reflect the views of the Foundation.

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Browse iLabs by Subject Area

Biology | Chemistry | Math | Physics

 = Curriculum Materials and Assessments Available

Biology



Inductively Coupled Plasma-Optical Emission Spectrometer

Subject(s): Biology, Chemistry, Physics

Grade Level(s): 9-12, Undergraduate

Device: Inductively Coupled Plasma-Optical Emission Spectrometer

Status: Coming Soon

Description: This lab allows students to detect trace metals in solutions through optical emission spectroscopy.



Radiation and Cancer: Cure or Cause? (New)

Subject(s): Biology

Grade Level(s): 9-12

Device: Radioactivity

Status: Available

Description: This curriculum is based upon the Radioactivity Lab. Students learn about radiation as therapy for cancer, but also as a cause for cancer.

Chemistry



Heat Exchanger

Subject(s): Chemistry, Physics

Grade Level(s): Undergraduate

Device: Heat Exchanger

Status: Unavailable to Public

Description: This lab allows users to study the dynamics of heat transfer between fluids.



Inductively Coupled Plasma-Optical Emission Spectrometer

Subject(s): Biology, Chemistry, Physics

Grade Level(s): 9-12, Undergraduate

Device: Inductively Coupled Plasma-Optical Emission Spectrometer

Status: Coming Soon

Description: This lab allows students to detect trace metals in solutions through optical emission spectroscopy.



Investigating the Safety of Nuclear Energy Using Real Radioactivity Data (New)

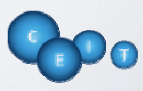
Subject(s): Chemistry

Grade Level(s): 9-12

Device: Radioactivity

Status: Available

Description: This curriculum is based upon the Radioactivity Lab. Students investigate



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Radioactivity

Located at: University of Queensland, Australia

The Radioactivity Lab examines the intensity of radiation over distance, demonstrating the effects of the inverse square law. Students investigate the intensity of radiation being emitted from a radioactive Strontium-90 source, by setting distances at which a Geiger counter measures radiation, and collecting radioactive particle counts at each of these distances. A table holding the radioactive source is rotated until the source is aligned with a hole in a thick lead plate. The head holding the Geiger-Muller tube is moved to these distances from the radioactive source. Students receive data in the form of a .csv file to be analyzed in Microsoft Excel, or a similar data analysis tool.

Topics/Standards it Teaches: Inverse Square Law, Nuclear Theory

Correlating High School Course: Physics, AP Physics B, Pre-Calculus, Calculus, Biology, Chemistry

Interaction Mode: Asynchronous

Current versions:

Name	Description	Access
Undergraduate	Developed by the University of Queensland, this version is for undergraduate students with a familiarity with the scientific process.	Start Lab
High School	Several curricula developed by both Northwestern University's Office of STEM Education Partnerships, and Chicago-area high school science and math teachers.	Start Lab



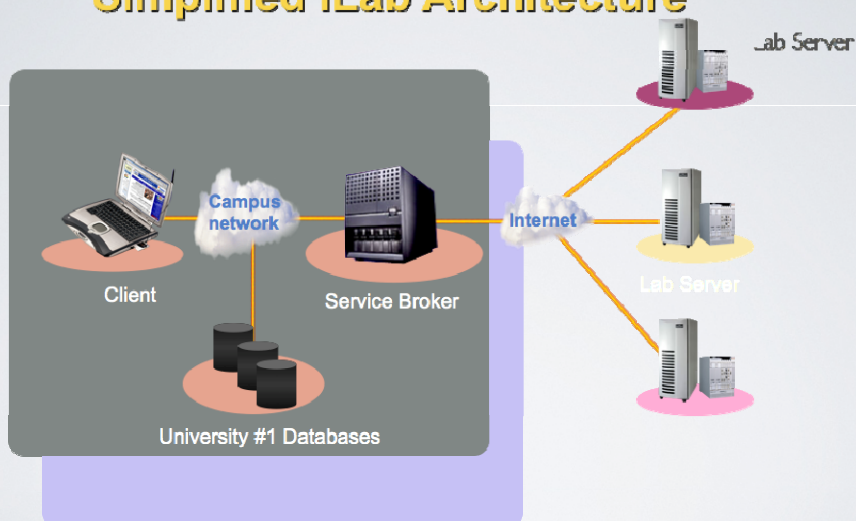
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What's "Under the Hood"?

Simplified iLab Architecture



iLabs Use Around the World



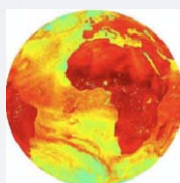
iLabs has been used by
22 universities on five continents.

YOUR NEXT ACTION?

- What is the experiment you want to make available remotely?

**“If You Can’t Come to the Lab...
the Lab Will Come to You!”**

Jesús del Alamo – MIT, Professor Department of EECS



(Earth at 89 GHz; courtesy of J. Grain, Chalmers U.)



THANK YOU

• Questions?

