Granite

Tuff

Marble

Sandstone - red

Geology Laboratory

Room Z520, Block Z

Department of Civil and Environmental Engineering,

The Hong Kong Polytechnic University

THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學

DEPARTMENT OF
CIVIL AND ENVIRONMENTAL ENGINEERING
土木及環境工程學系

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Introduction

The geology laboratory was established in 1974 and it was set up for teaching and research purpose. Owing to the needs of the industry and the expansion of research activities in the geotechnical engineering, geology laboratory provides material testing services and facilitated research projects to solve various geotechnical problems including soil rock slope and geotechnical design.

The Geology laboratory acquires different varieties of rock and mineral specimens, which are collected from Hong Kong, China and other countries for the training of students who are able to gain practical experience through rock and mineral identification.

The laboratory can also provide the training on map reading and aerial photo interpretation for studying landslides, landforms and structural geology for geotechnical engineering projects and fabricates thin section of rock samples for microscopic study of rock minerals.

Main Equipment

10 Inch Slab & Trim Lapidary Unit

Ten inch saws allow you to slice rock in pieces of rough up to about 3 inches in thickness into slabs.

The PetroThin Thin Sectioning System

The PetroThin Thin Sectioning System is a precise, easy-to-use instrument for re-sectioning and thinning a wide variety of samples, such as rocks and minerals for performing rocks and minerals characterization.

Polarizing Microscope

Polarized light microscopy can be used to examine rock structures and their optical characteristics. This method can also be used to identify minerals inside rocks.

Main Equipment

High Speed Camera

The Fast Imaging IL3 high speed camera is equipped with a CMOS 1.3 megapixel (10 bit) sensor for capturing high resolution images.

Ground Investigation Borehole Sampling Box

Students can learn Ground Investigation Borehole sampling techniques and field analysis of groundwater from this Borehole Sampling Box.

VJ Compression machine

- VJ TECH VJT5100 Compression Machine
- Max Load =100KN
- Used for the Brazilian Test
- Displacement control

Main Equipment

Biaxial compression machine
Four steel loading platens placed along the axial and horizontal directions. The load is applied by two sets of hydraulic oil pumps which is further connected to a Y-shaped tube such that hydraulic pressure diverges to two separate tubes enabling pressure to be applied simultaneously to both ends of the specimen. The steel loading platens are installed on a sliding ray and thus travel freely on the tray during loading process. The loading is manually controlled at a rate of 0.0015kN/s. Two displacement transducers are attached to opposite edge of the platen to monitor the displacement with the applied load. All the loading and displacement records are transferred to and stored in a PC computer through a data logger.

Academic Staff

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Research Spotlight

The Geology Lab acquires Varies Rock specimens

The Geology Lab acquires Hong Kong Rock specimens
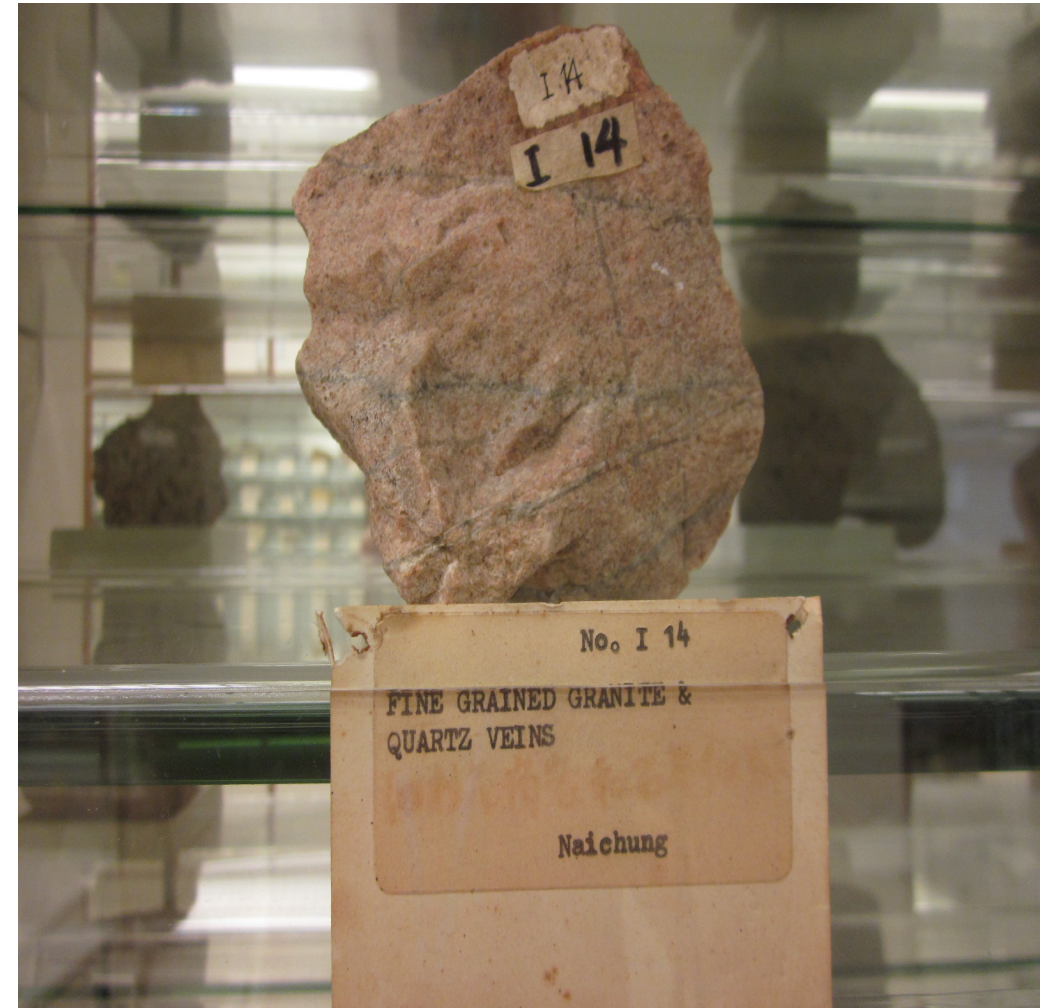
Research Spotlight

The Geology Lab acquires Igneous Rock, Sedimentary Rock, Metamorphic Rock and Fossil specimens
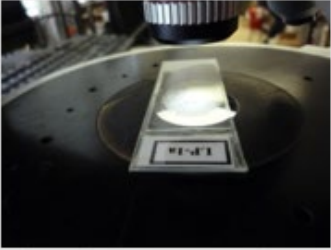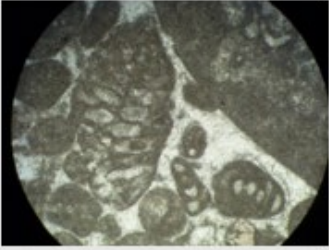
The Geology Lab acquires Mineral specimens

Research Spotlight

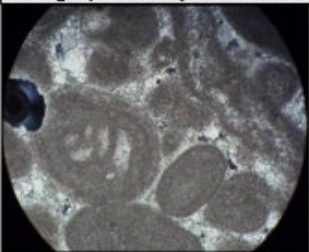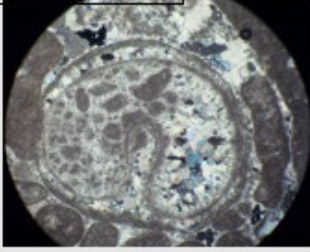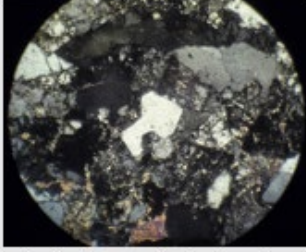The Geology Laboratory fabricates thin section of rock samples for microscopic study of rock minerals.

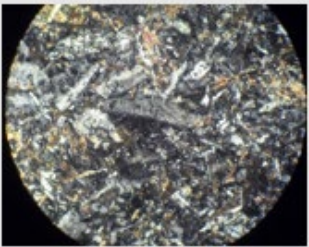
Rock Chip Thin Section Observation Bioclasts Photograph
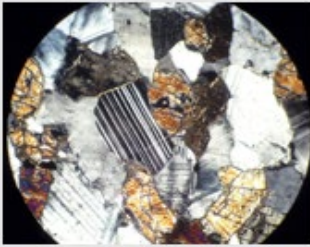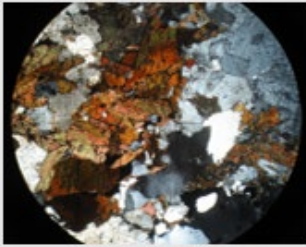
Petrographic analysis and rock identification

Benthic foraminifera in Limestone

Gastropod "G" coiled calcareous shell in Limestone
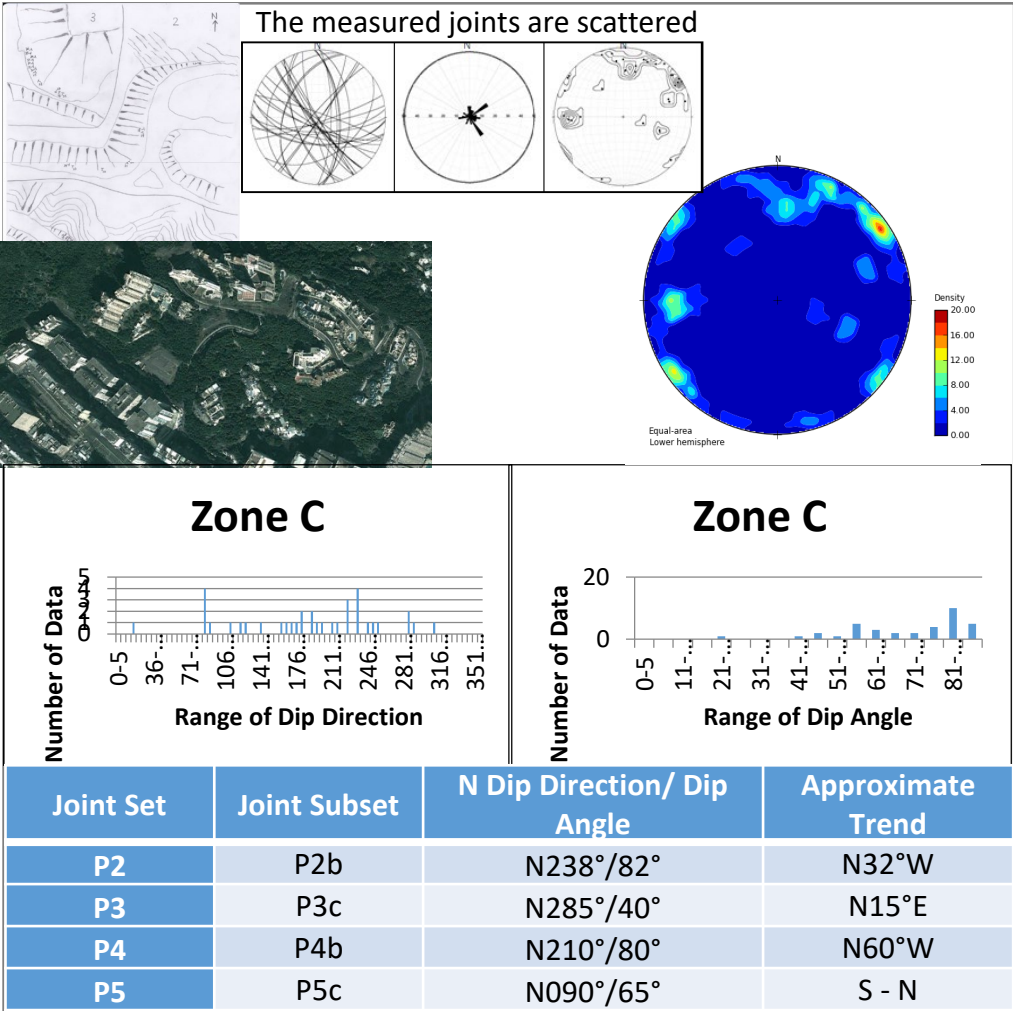
Lath-shape plagioclase in Diabase

Quartz fragment in Crystal Tuff

Polysynthetic twinning texture in Granite

Biotite in Granite

Geological Mapping

The measured joints are scattered

Equal-area
Lower hemisphere

Density
20.00
16.00
12.00
8.00
4.00
0.00

Zone C

Number of Data

Range of Dip Direction

Zone C

Number of Data

Range of Dip Angle

Joint Set	Joint Subset	N Dip Direction/ Dip Angle	Approximate Trend
P2	P2b	N238°/82°	N32°W
P3	P3c	N285°/40°	N15°E
P4	P4b	N210°/80°	N60°W
P5	P5c	N090°/65°	S - N

Research Spotlight

Geological Investigation
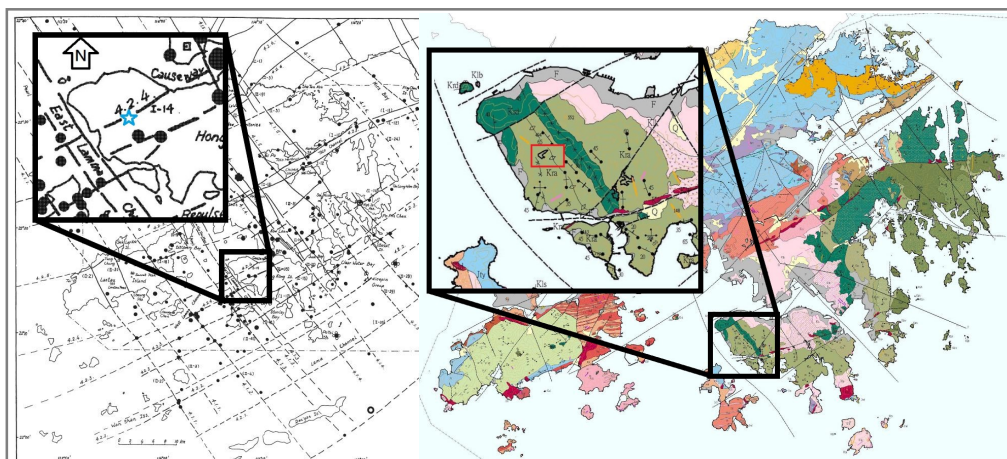
Petrographic Analysis

(Great circle & contour of joints)
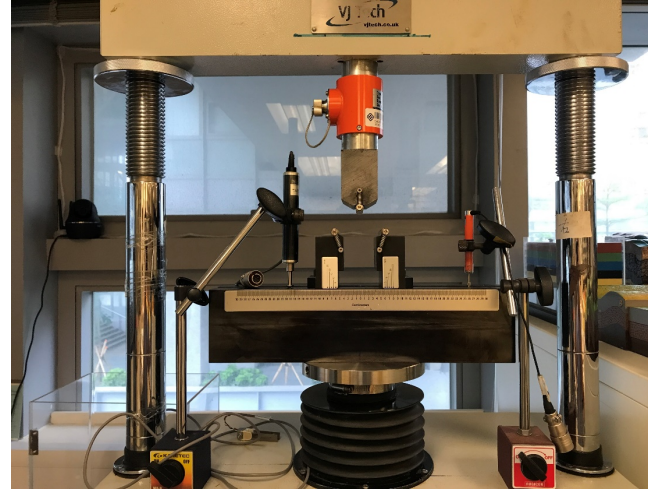
> 24 data of joints

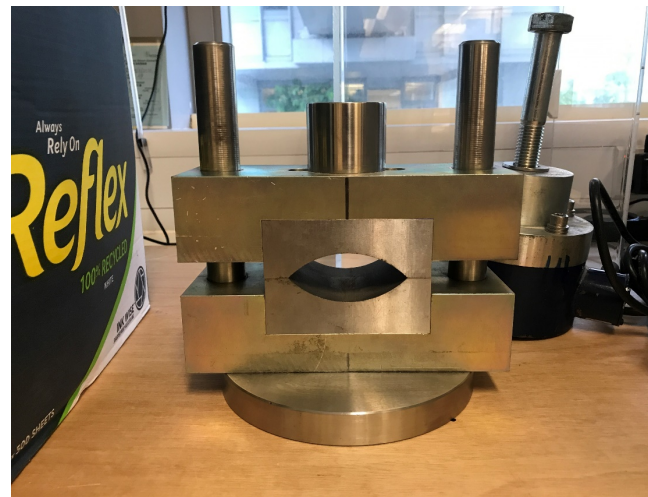> 1 Major joint set : N101/90
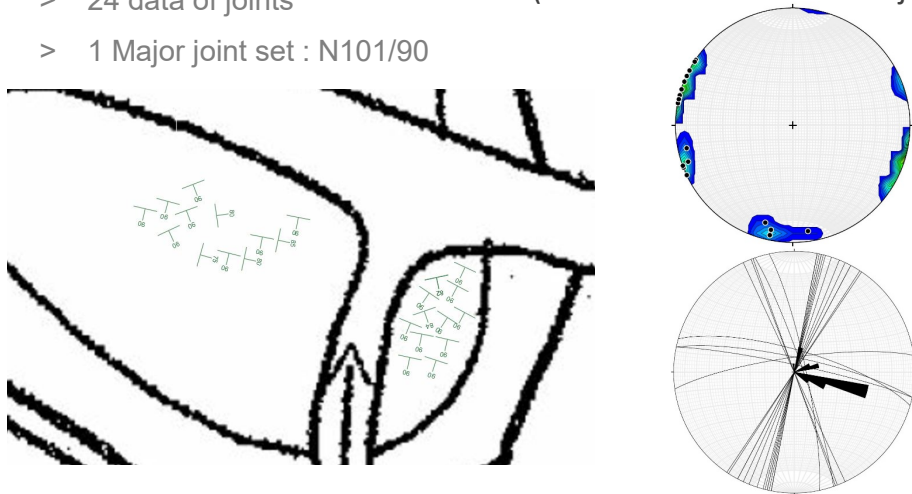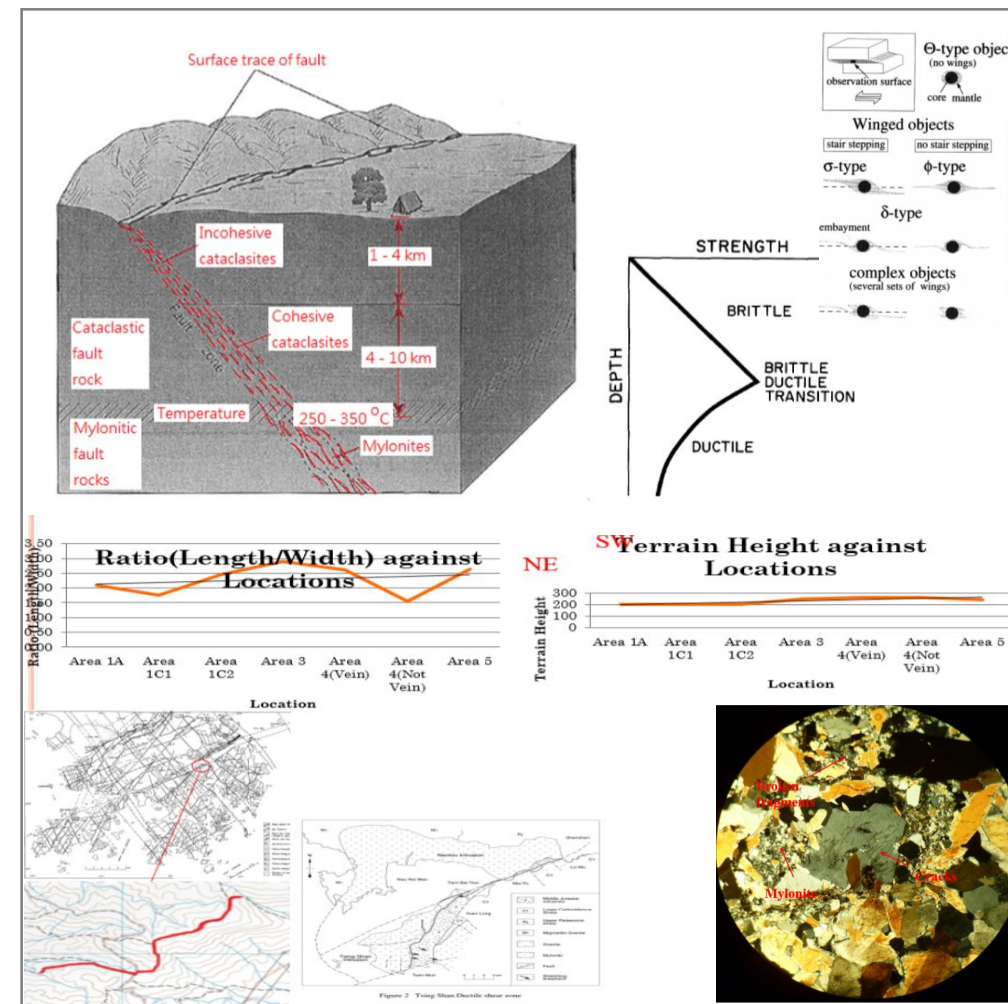
Research Spotlight
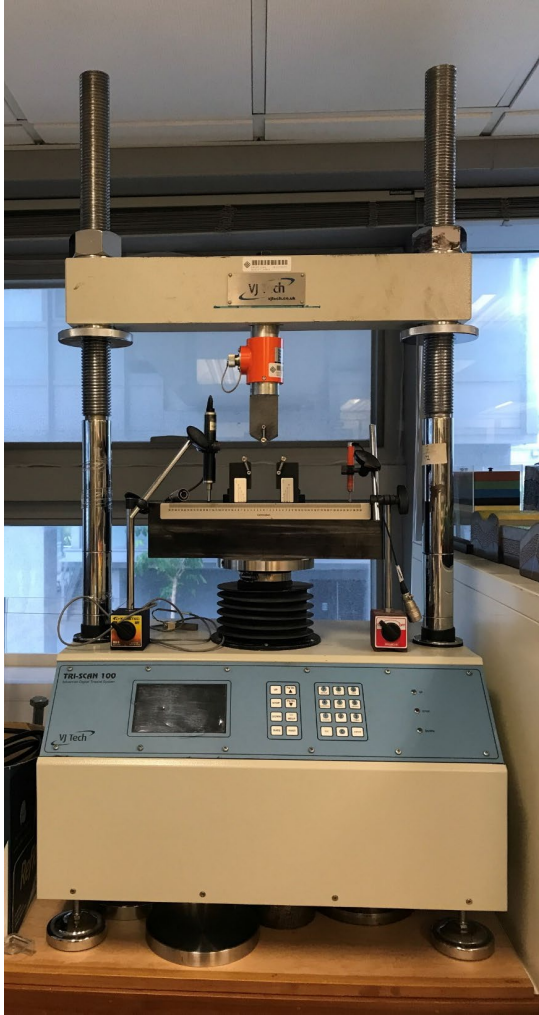
VJ Tech TriSCAN 100 Compression Machine

Three-point bending fixture

Brazilian disc test fixture

The VJ TECH TriSCAN 100 compression machine can be used to conduct:

> Uniaxial compression test
> Three-point bending test
> Brazilian disc test or indirect tensile test

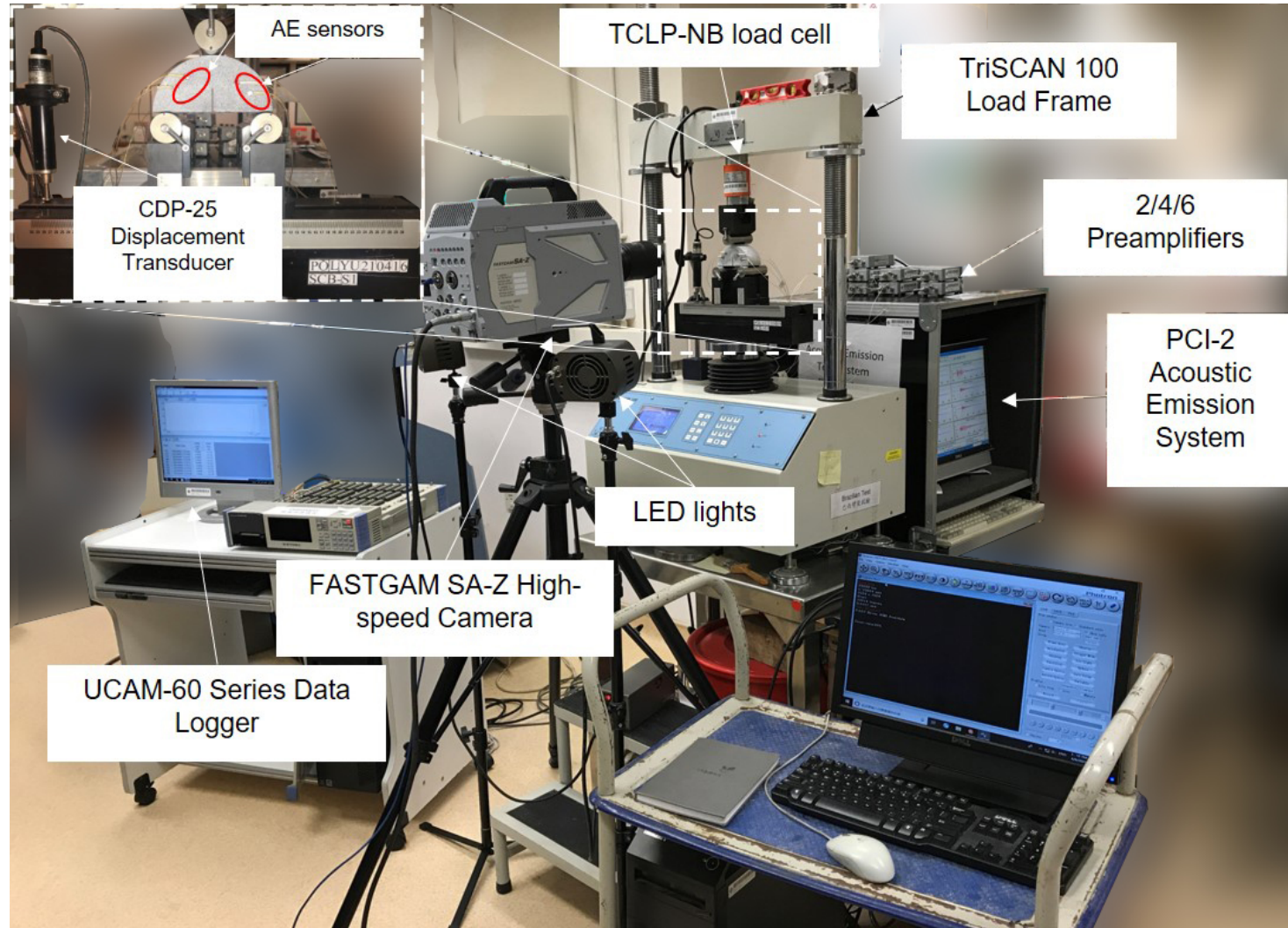**Detailed product specifications**
Load Capacity：　100kN
Platen Diameter：　158 mm
Platen Adjustment Speed: 0-99.9 mm/min
Dimensions (W x D x H):630x450x1630mm
Weight：　180 kg

Research Spotlight

Experimental setup of the semi-circular bending (SCB) test

The SCB tests are conducted to investigate the cracking and microcracking behavior of different rocks under mode I loading. The TriSCAN 100 load frame is used to conduct the SCB tests. The applied axial load and axial displacement are measured using TCLP-NB load cell and CDP-25 displacement transducer which are logged using the UCAM-60 Series Data Logger.

Research Spotlight

Biaxial loading machine

Biaxial loading machine

Loading capacity: 20 kN
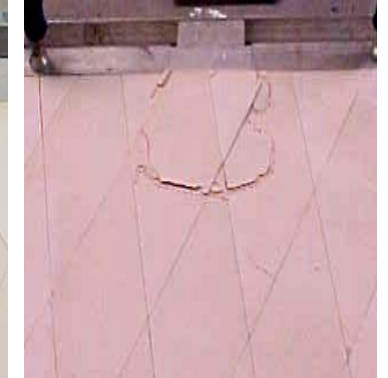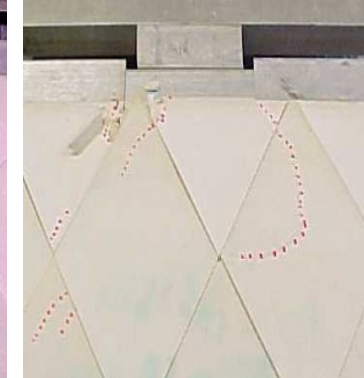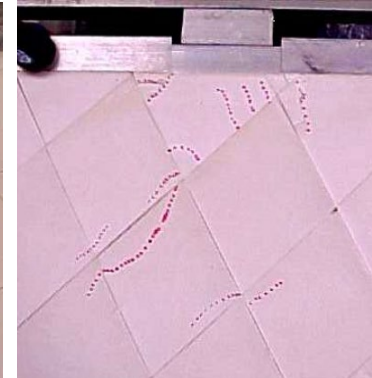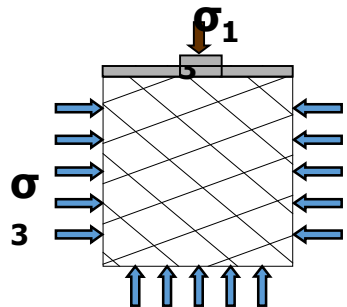**Sample size:** no larger than 400 mm

Measurements:
Displacement of platens via LVDTs and loading force via load cells, in both loading directions.

Additional measurements:
Acoustic emission (AE)
High-speed camera

Lab-in-charge and Technical Staff
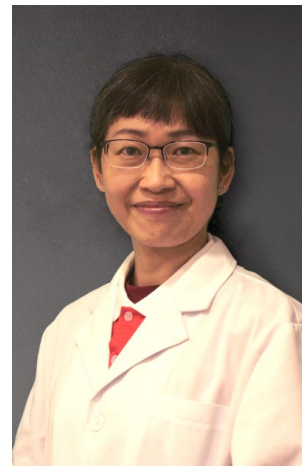
Lab-in-Charge

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Tuesday to Friday 8:45am – 12:30pm, 1:30pm – 5:30pm
(excluding Saturday, Sunday & public holidays)