Major/Minor talk series: for an introduction to Geology and Earth Systems Science Majors (understanding of course requirements, selection of courses in different areas of interests, etc.

Geology Major
Geology (Intensive) Major /Accredited Pathway
Earth Systems Science Major

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Geology/Geology (Intensive) Major Coordinator
University of Hong Kong
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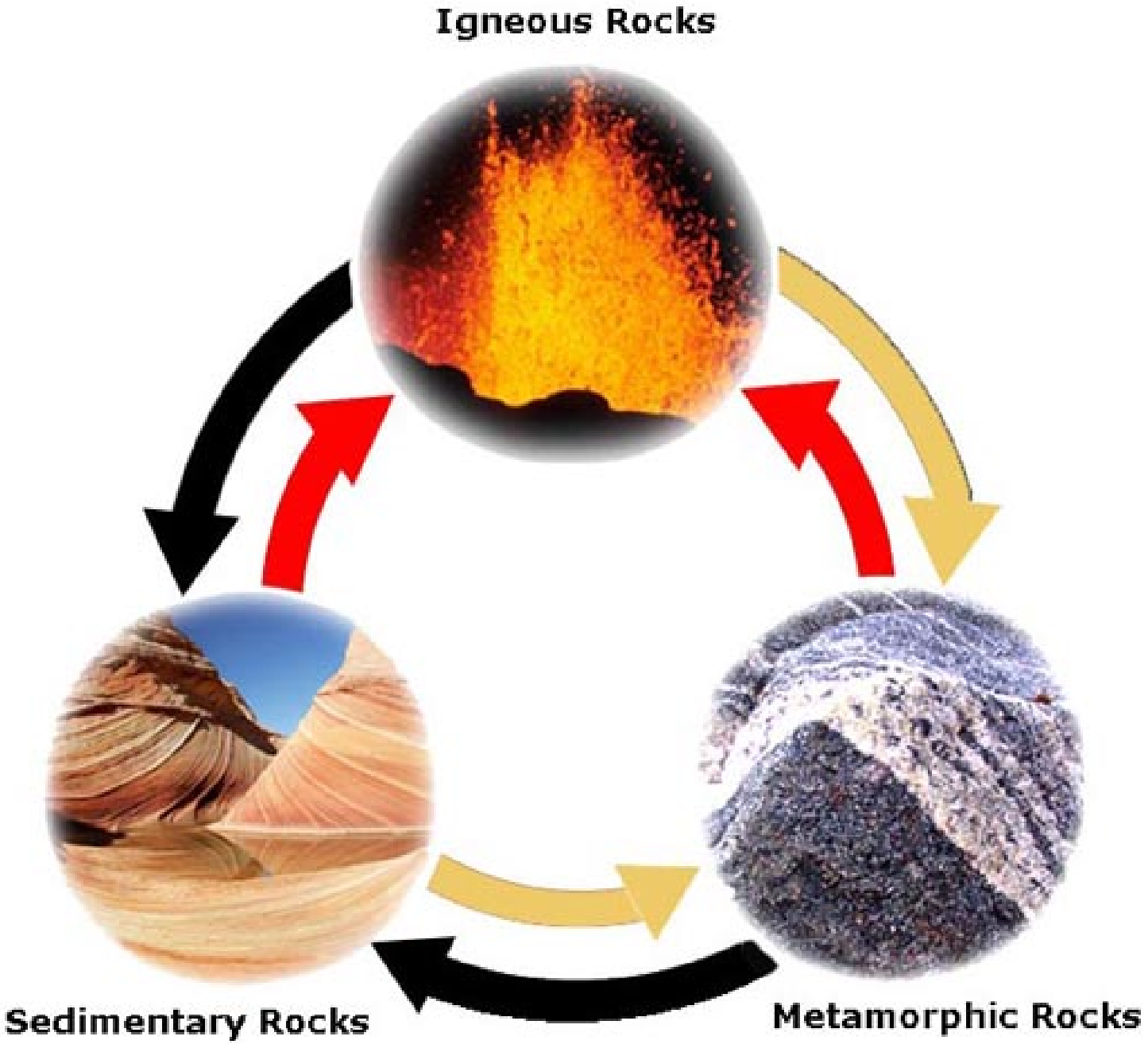
The Department of Earth Sciences

- Established 1995
- Truly International and World Class academic staff
- **Our teaching aim is to produce professional, skilled, happy and highly competent Earth Scientists, compliant with the requirements for professional chartership programs (in the case of HKU, Geological Society of London Accredited pathway), for the scientific community, the professional sector and the benefit of Society.**
- TWO Major discipline areas: Geology/Geology Intensive and Earth Systems Science.

EARTH SCIENCE:

Earth's Dynamic Spheres:

GEOSPHERE
HYDROPHERE
ATMOSPHERE
BIOSPHERE,
etc…



GEOLOGY: The Rock Cycle

We study…

The origins and environments of these crustal rock groups:

How they relate to one and other, and how a change in one component affects the whole Earth system

The past, present and future behavior of the Solid Earth

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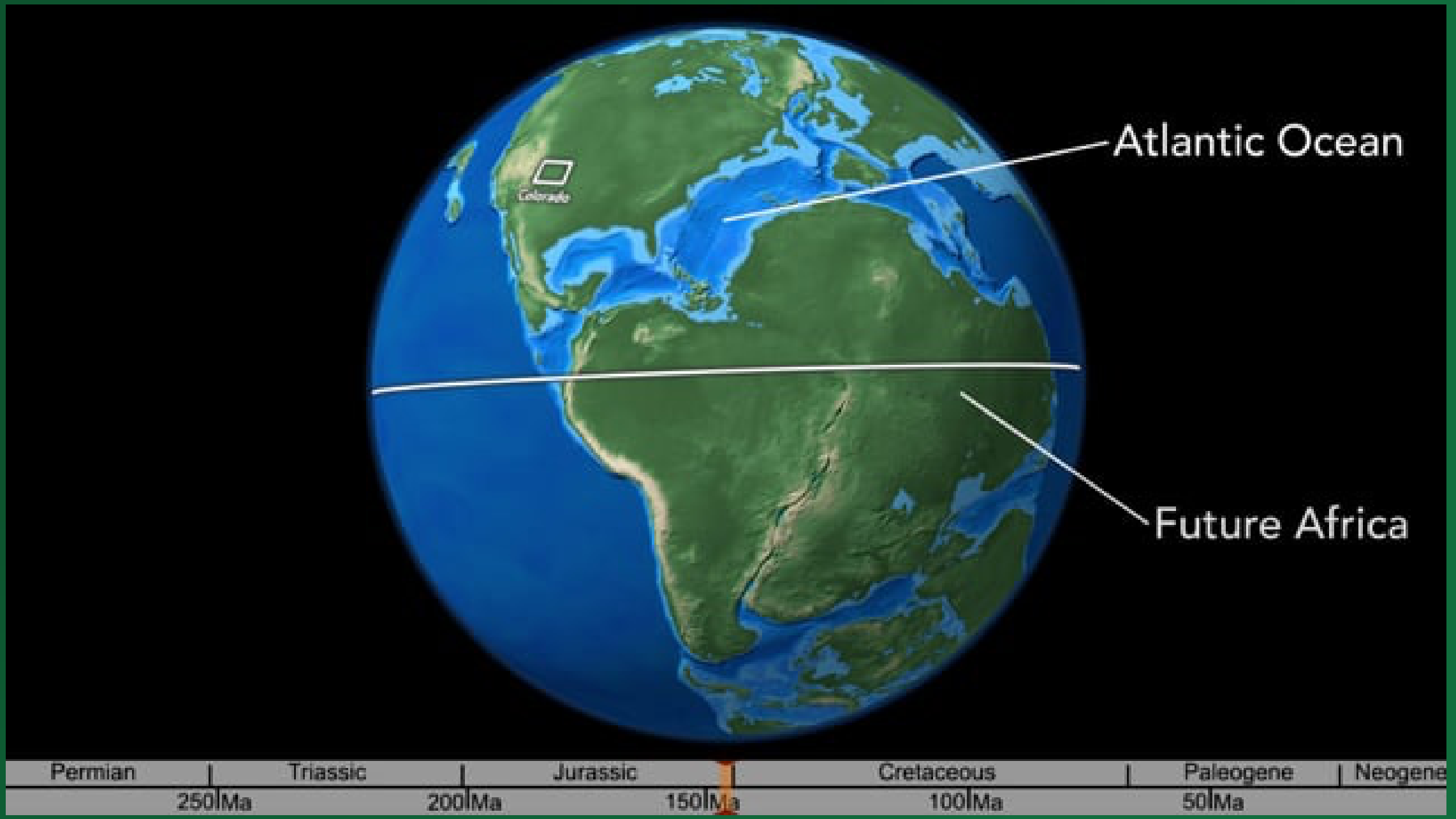
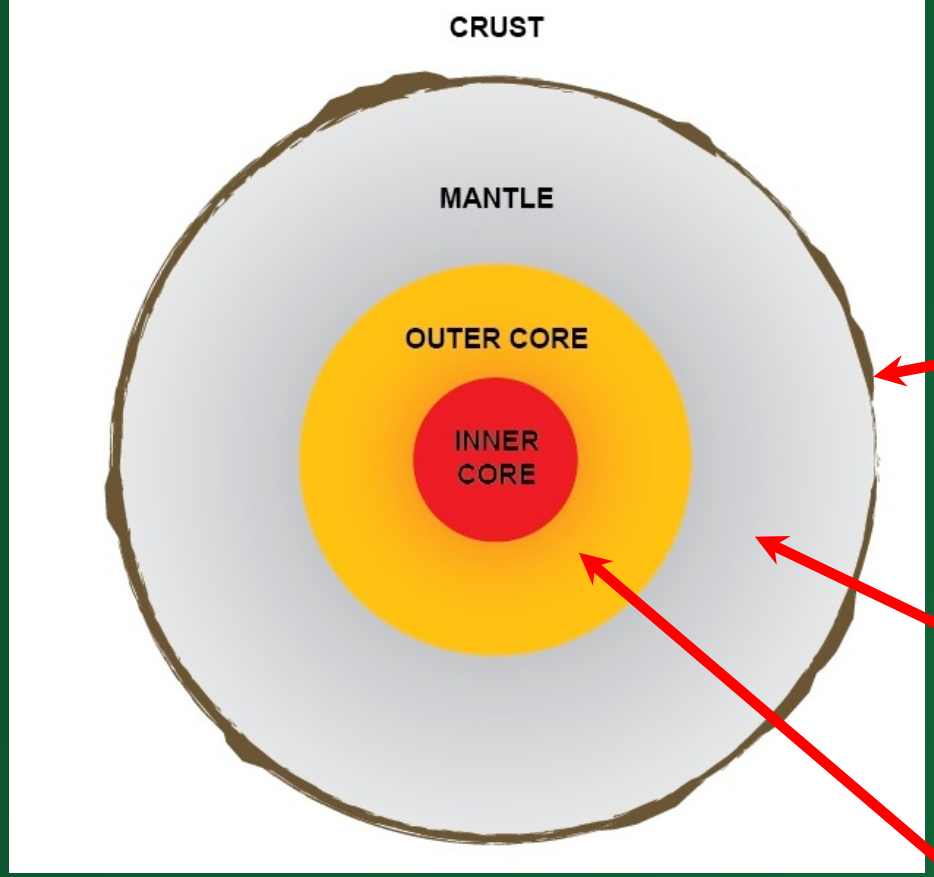
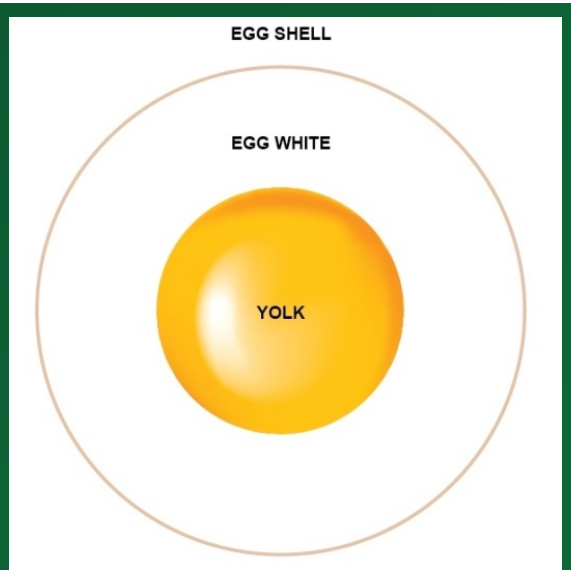
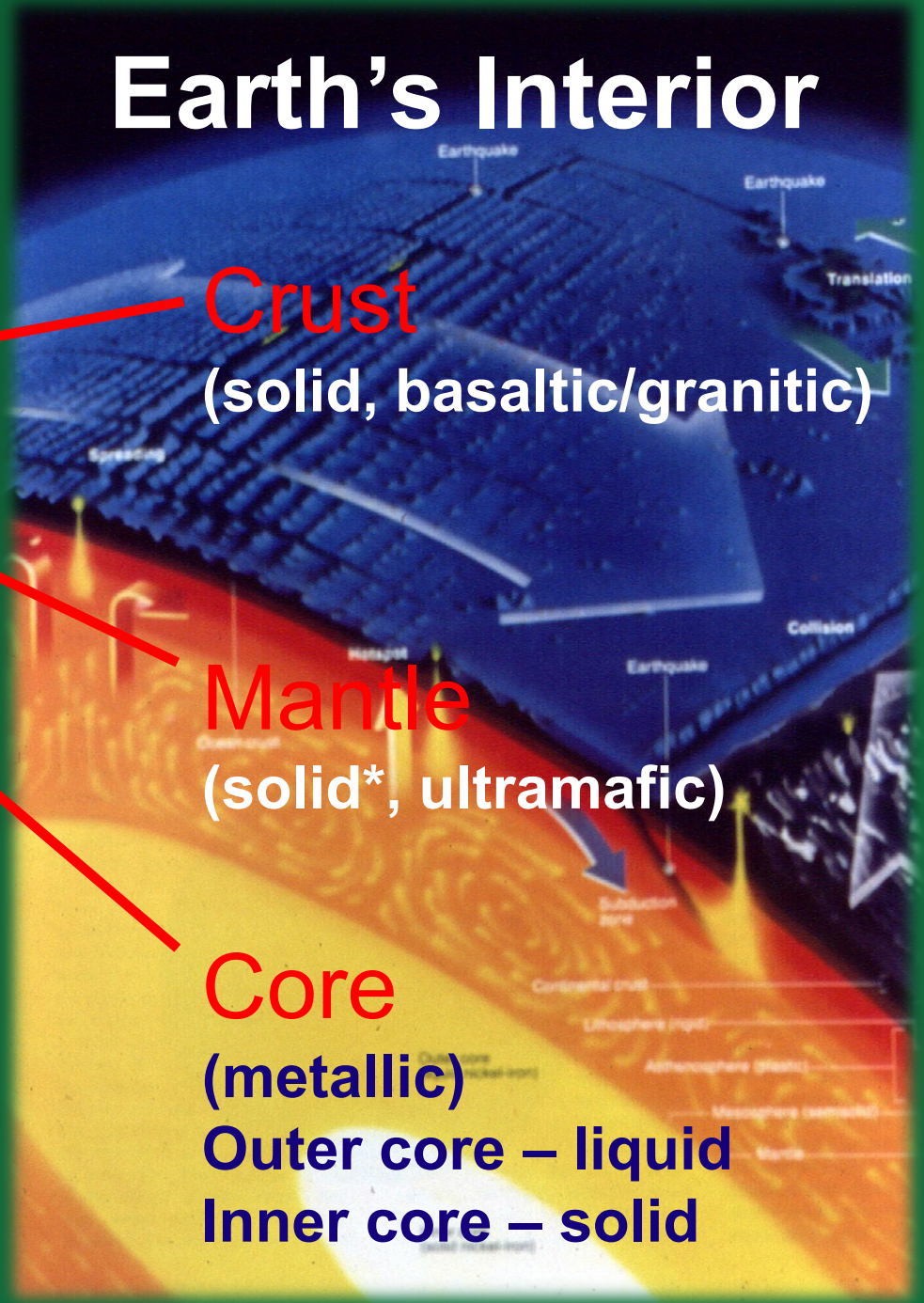

Atlantic Ocean
Future Africa
Colorado
Permian
Triassic
Jurassic
Cretaceous
Paleogene
Neogene
250 Ma
200 Ma
150 Ma
100 Ma
50 Ma

Earth vs. Egg







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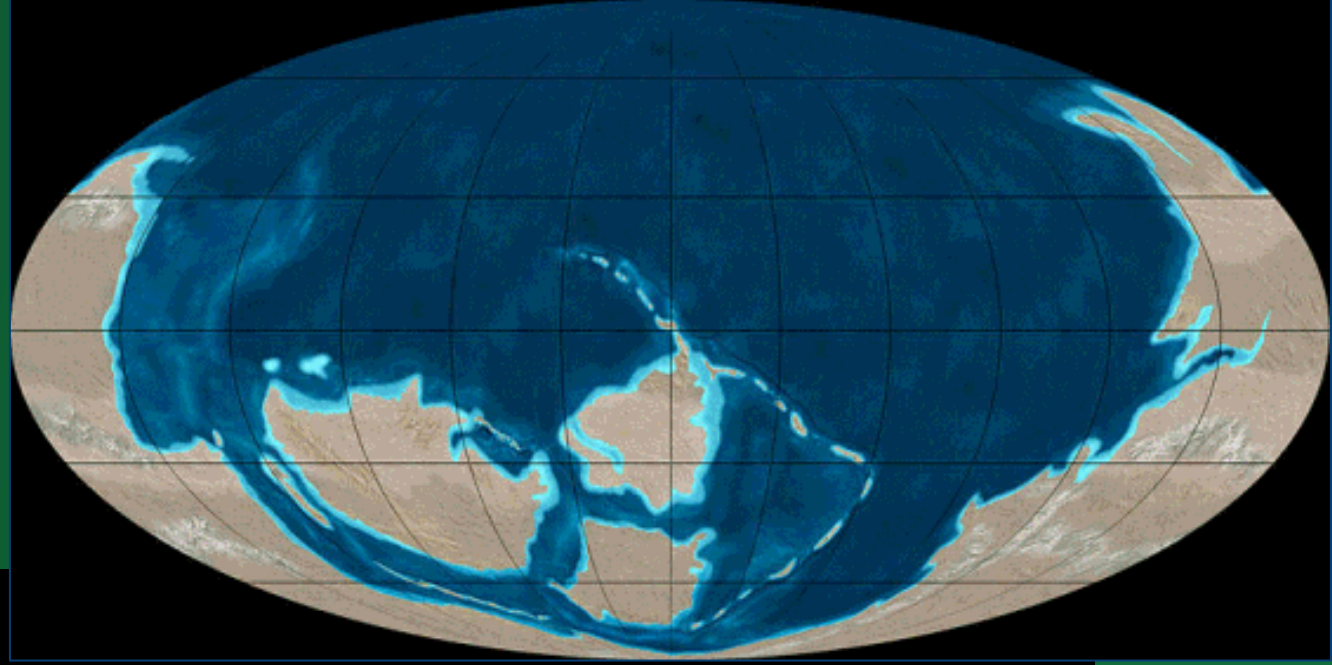
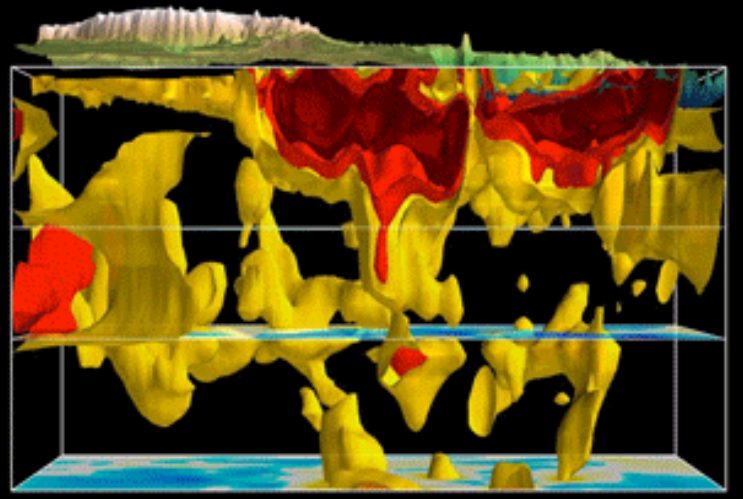




All video credited to original authors

HKU Landslide 2010

Mid-level Landslide 1972

The 2011 tsunami in Japan

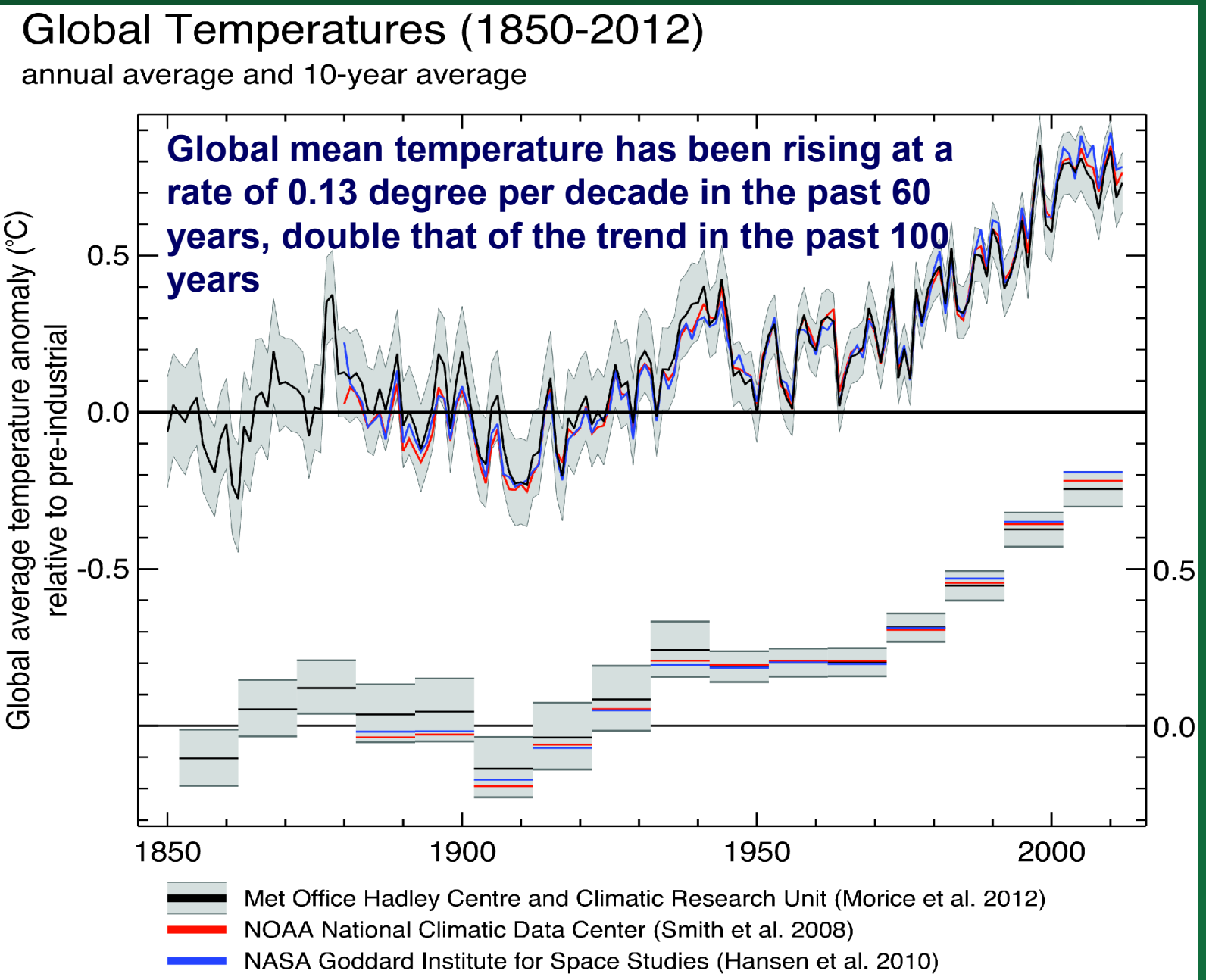
All photos credited to original authors

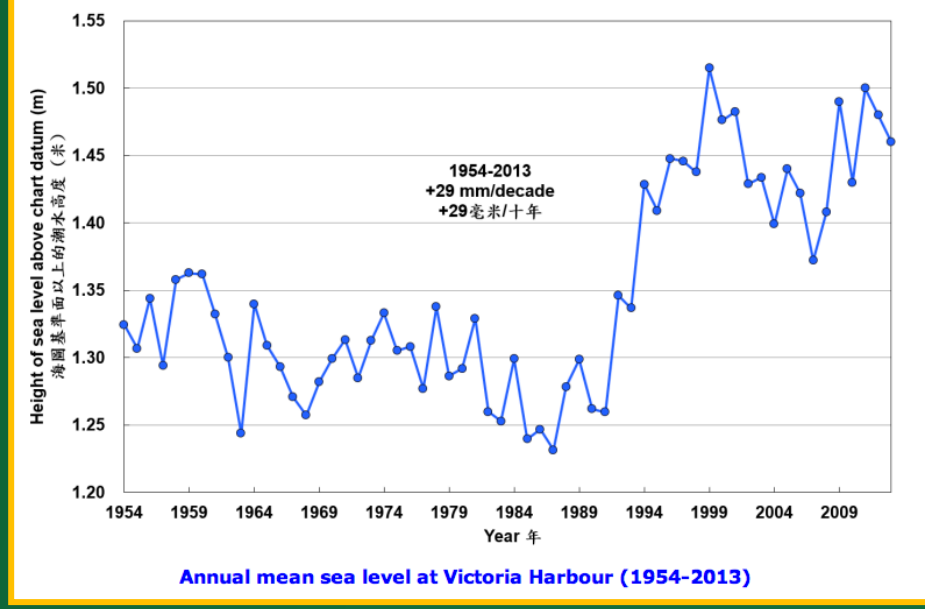
Earth's Dynamic Spheres

EARTH SYSTEMS SCIENCE : We study…

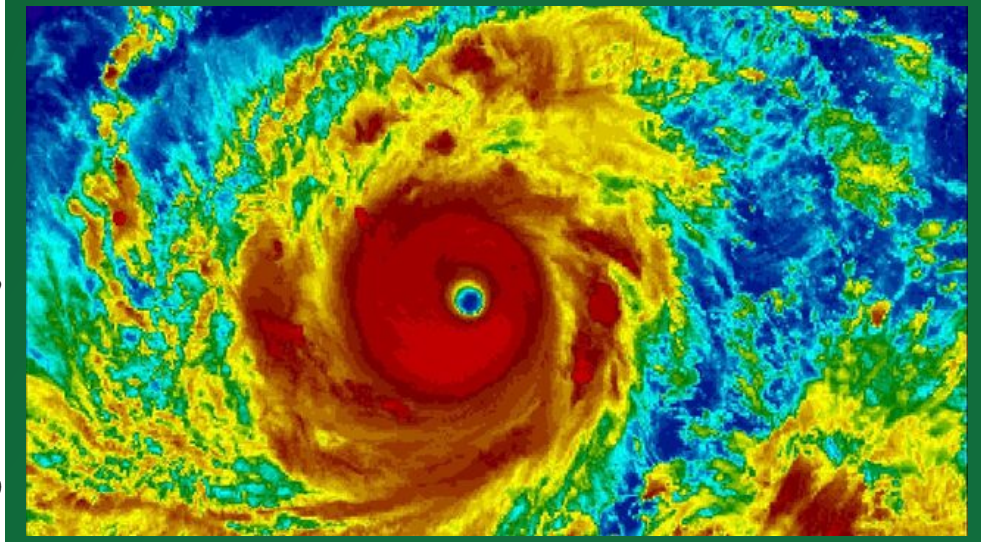
- Changes and interactions within and between the atmosphere, hydrosphere, biosphere, and geosphere.
- how a change in one component affects the whole Earth system
- the past, present and future behavior of these dynamic spheres

Earth's Crisis: Climate Change





Annual mean sea level at Victoria Harbour (1954-2013)



Typhoon Mangkhut (2018)

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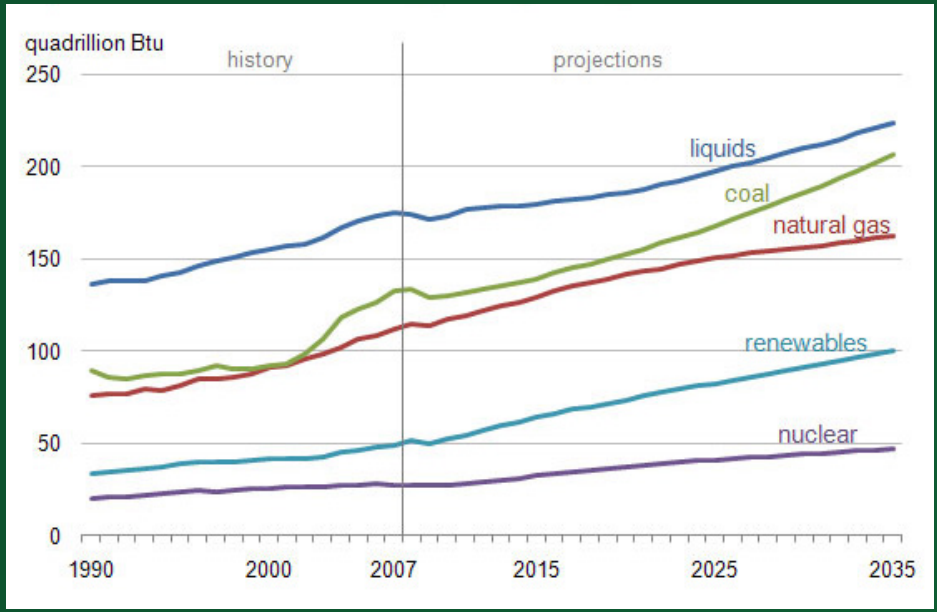
Earth's Crisis: energy and food supply and sustainability!



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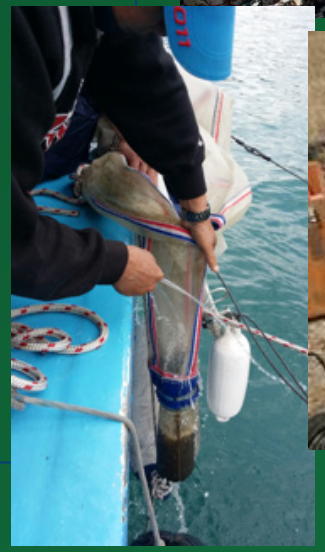
Earth Scientists are in demand **globally**

Since 1996, ~500 graduates…

- Engineering/geotechnical Firms
- Survey Companies
- Mining Companies
- Government
- Education (Schools)
- Resource management and planning;
- Disaster management
- Environmental testing
- Geotourism



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HKU Geology Major (84 EASC credits/240 total)

Training in solid Earth geology and related disciplines:
to prepare students for careers as professional geologists pursuing geotechnical investigations, mining, resource development, etc.

- Disciplinary Core Courses in field geology, mineralogy, geochemistry, petrology, geophysics, structural geology, Including intensive **field camp with independent field work component**
- Elective courses in engineering geology, hydrogeology, soil and rock mechanics and other more applied or specialized areas
- The new Intensive version of the major is accredited by the Geological Society of London

photo credited to Cody Colleps

Accredited Pathway → Professional Registration

Chartered Geologist

- Graduate of Geology who follows accreditation pathway
- 4 years of relevant work experience
- Membership, Geological Society, UK

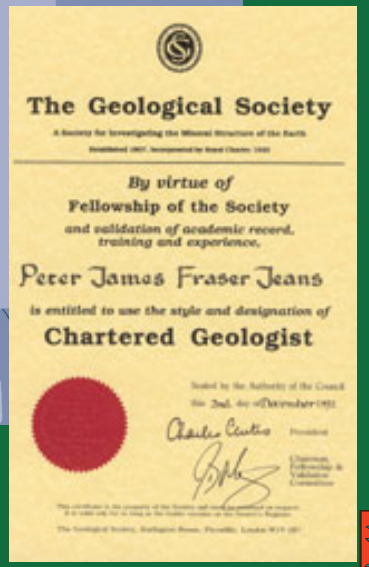
Building Department: "Competent Person for Ground Investigation"

- Graduate with Earth Sciences degree
- 5 years relevant work experience including 3 years with contractor(s)

Registered Geologist with GEO

HK Institution for Engineers (as an Engineer)

- BSc in Earth Sciences + MSc in Applied Geosciences
- 5 years relevant work experience



Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111	Scientific method and reasoning (6)
SCNC1112	Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

EASC1402	Principles of geology (6)
EASC2401	Fluid/solid interactions in earth processes (6)
EASC2402	Field and laboratory methods (6)
EASC2406	Geochemistry (6)
EASC2407	Mineralogy (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (36 credits)

EASC3402	Petrology (6)
EASC3403	Sedimentary environments (6)
EASC3404	Structural geology (6)
EASC3408	Geophysics (6)
EASC3409	Igneous and metamorphic petrogenesis (6)
EASC4406	Earth dynamics & global tectonics (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

EASC3406	Reconstruction of past climate (6)
EASC3410	Hydrogeology (6)
EASC3412	Earth resources (6)
EASC3413	Engineering geology (6)
EASC3414	Soil and rock mechanics (6)
EASC3416	Advanced geochemistry and geochronology (6)
EASC3417	Earth through time (6)
EASC3999	Directed studies in earth sciences (6)
ENVS3007	Natural hazards and mitigation (6)
EASC4403	Biogeochemical cycles (6)
EASC4407	Regional geology (6)
EASC4408	Special topics in earth sciences (6)
EASC4999	Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4955	Integrated field studies (6)

HKU Geology Major
96 Faculty of Science credits

All photos credited to original authors

Required courses (150 credits)

1. Introductory level courses (54 to 66 credits) (Note 1)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111	Scientific method and reasoning (6)	(Note 2)
SCNC1112	Fundamentals of modern science (6)	(Note 2)

Disciplinary Core Courses (42 credits)

EASC1401	Blue Planet (6)	
EASC1402	Principles of geology (6)	(Note 2)
EASC2401	Fluid/solid interactions in earth processes (6)	(Note 2)
EASC2402	Field and laboratory methods (6)	(Note 2)
EASC2406	Geochemistry (6)	(Note 2)
EASC2407	Mineralogy (6)	(Note 2)
EASC2409	Regional field studies (6)	

2. Advanced level courses (78 to 90 credits) (Note 1)

Disciplinary Core Courses (60 credits)

EASC3402	Petrology (6)	(Note 2)
EASC3403	Sedimentary environments (6)	(Note 2)
EASC3404	Structural geology (6)	(Note 2)
EASC3408	Geophysics (6)	(Note 2)
EASC3409	Igneous and metamorphic petrogenesis (6)	(Note 2)
EASC3417	Earth through time (6)	
EASC4406	Earth dynamics & global tectonics (6)	(Note 2)
EASC4407	Regional geology (6)	
EASC4999	Earth sciences project (12)	(Note 3)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following introductory and advanced level courses in List A and List B, among which at least 6 credits from List A:

List A

EASC3405	Environmental remote sensing (6)
EASC3413	Engineering geology (6)

List B

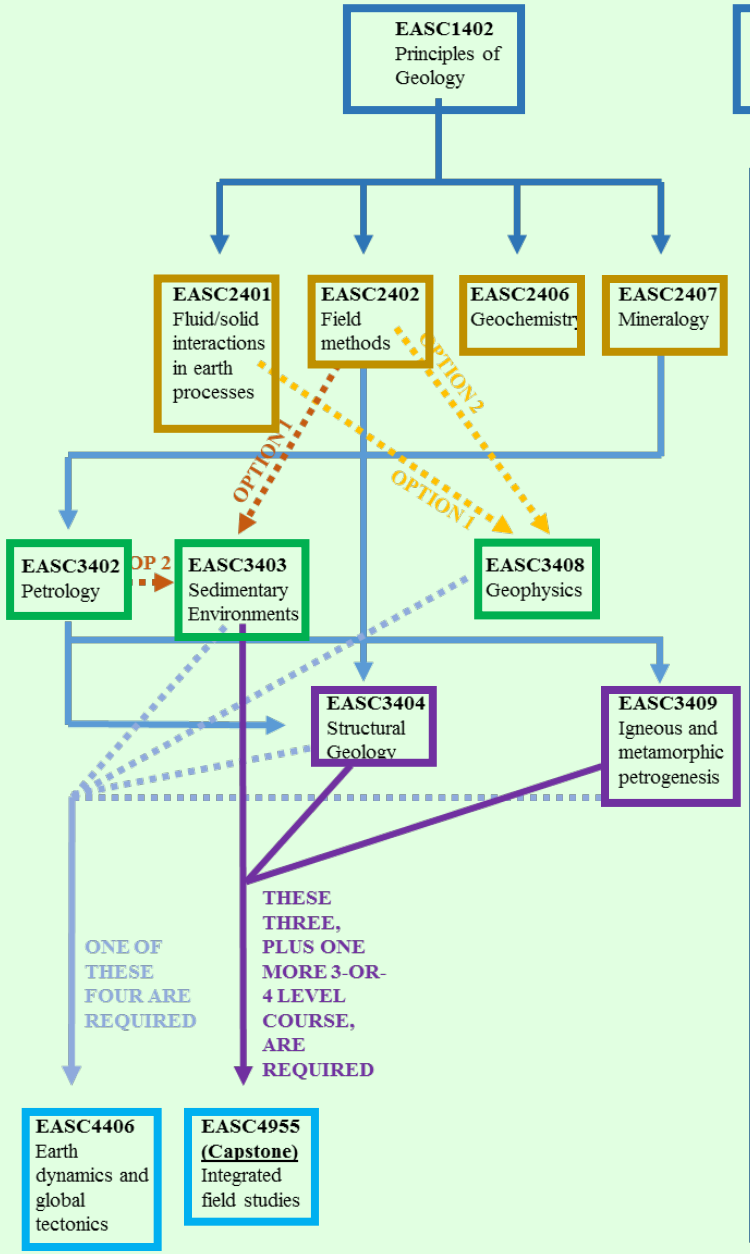
EASC2404	Introduction to atmosphere and hydrosphere (6)
EASC2408	Planetary geology (6)
EASC3020	Global change: anthropogenic impacts (6)
EASC3406	Reconstruction of past climate (6)
EASC3410	Hydrogeology (6)
EASC3412	Earth resources (6)
EASC3414	Soil and rock mechanics (6)
EASC3416	Advanced geochemistry and geochronology (6)
EASC3999	Directed studies in earth sciences (6)
ENVS3007	Natural hazards and mitigation (6)
ENVS3313	Environmental oceanography (6)
EASC4403	Biogeochemical cycles (6)
EASC4408	Special topics in earth sciences (6)
EASC4911	Earth system: contemporary issues (6)
EASC4966	Earth sciences internship (6)

3. Capstone requirement (6 credits)

EASC4955	Integrated field studies (6)	(Note 2)

photo credited to Cody Colleps

HKU Geology (Intensive) Major
150 Faculty of Science credits



SCNC1111 Scientific method and reasoning

SCNC1112 Fundamentals of modern science

12 CREDITS SELECTED FROM THESE COURSES

EASC3406 Reconstruction of past climate

EASC3410 Hydrogeology

EASC3412 Earth resources

EASC3413 Engineering geology

EASC3414 Soil and rock mechanics

EASC3416 Advanced geochemistry and geochronology

EASC3417 Earth through time

EASC3999 Directed studies in earth sciences

ENVS3007 Natural hazards and mitigation

EASC4403 Biogeochemical cycles

EASC4407 Regional geology

EASC4408 Special topics in earth sciences

EASC4999 (12 credits) Earth sciences project

You can do it in three years!

	Fall	Spring
Y1	1402, 1111	1112, 2401
Y2	2402, 2406, 2407	3402, 3408, 3403
Y3	3404, ????, ????	3409, 4955, 4406

Geology Major Pathway

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111	Scientific method and reasoning (6)
SCNC1112	Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

EASC1401	Blue Planet (6)
EASC1406	Introduction to the earth-life system (6)
EASC2401	Fluid/solid interactions in earth processes (6)
EASC2402	Field and laboratory methods (6)
EASC2404	Introduction to atmosphere and hydrosphere (6)
EASC2410	Data analysis and modeling in earth sciences (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (6 credits)

EASC4403	Biogeochemical cycles (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from Lists A and B, among which at least 18 credits from List A:

List A

EASC3410	Hydrogeology (6)
EASC3415	Meteorology (6)
EASC3418	Coasts and coastal change (6)
ENVS3313	Environmental oceanography (6)

List B

EASC3020	Global change: anthropogenic impacts (6)
EASC3403	Sedimentary environments (6)
EASC3405	Environmental remote sensing (6)
EASC3406	Reconstruction of past climate (6)
EASC3412	Earth resources (6)
EASC3417	Earth through time (6)
EASC3419	Earth System Science Field Studies (6)
EASC3999	Directed studies in earth sciences (6)
ENVS3007	Natural hazards and mitigation (6)
EASC4408	Special topics in earth sciences (6)
EASC4999	Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4911	Earth system: contemporary issues (6)

Earth Systems Science Major (96 EAS/ENV credits)

Field work is essential and fun!

Students Earth Sciences Society also run fieldtrips & career talks!

All photos credited to original authors

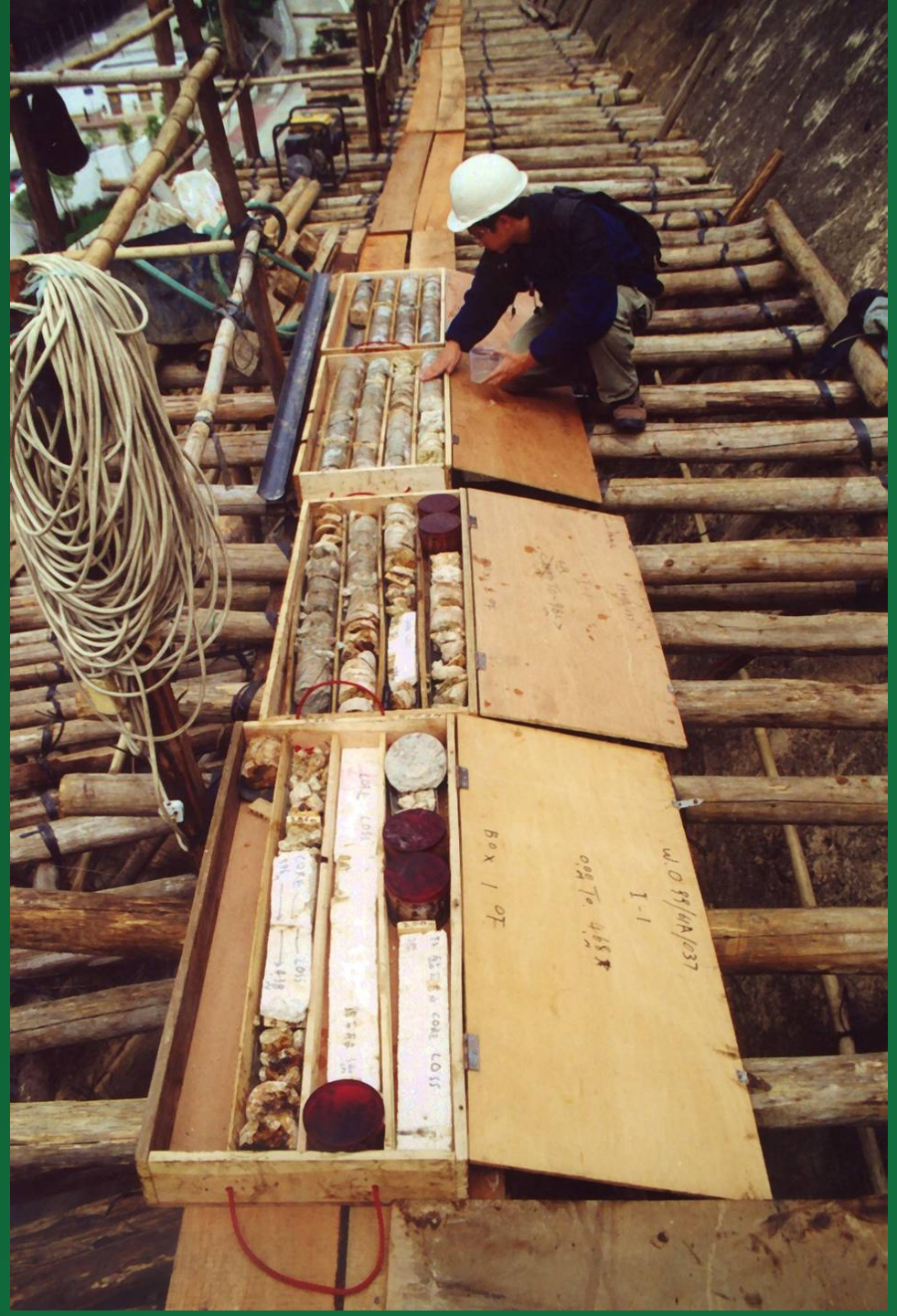
Practical Field Experience (Field Camps)

56 days required for accreditation

- Lai Chi Chong: Geology, environment (5 days)
- Zhaoqing: Gold mining, fossils, rocks (4 days)
- Wuhan: Sedimentary rocks, Engineering geology (7 days)
- Taiwan: Active tectonic zones, subduction boundary (7 days)
- USA/Australia/Europe: Geological mapping, tectonic evolution, economic resources (26 days) (GEOLOGY Capstone)
- Tibet/USA: Earth Systems field studies, Geomorphology (ESS Advanced elective)
- Numerous 1-day trips around Hong Kong: Ping Chau, Sai Kung, Ninepins, Po Toi, Lantau …

Placement:
Credit bearing internship

- Government
(e.g. GEO, CEDD, Housing, HK Observatory)
- Geotechnical Contractors
(e.g. Gammon, AECOM, Lam Geotechnics, MTR)
- Consultants
(e.g. Ove Arup, Halcrow, Bunnie)
- Mining Companies
(BHP, Dragon Mining, BMI)



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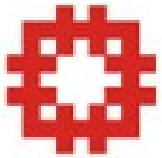
Employers of HKU Earth Science students: a few examples

Public bodies



Commercial Earth Sciences

Commercial outside the Earth Sciences

For more details contact:

https://www.earthsciences.hku.hk/