GeoLab:

Shared Digital Learning Resources for Petrology

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GeoLab The Geoscience e-Laboratory

Developing Digital Teaching and Learning Resources for the Virtual Microscope

Funded by the National Forum for the Enhancement of Teaching & Learning in Higher Education

University College Dublin Ireland's Global University · The Open University · UCC · Trinity College Dublin · NUI Galway OÉ Gaillimh · National Forum

Higher Education Network Annual Meeting
Geological Society of London
Burlington House, London
17th January 2017

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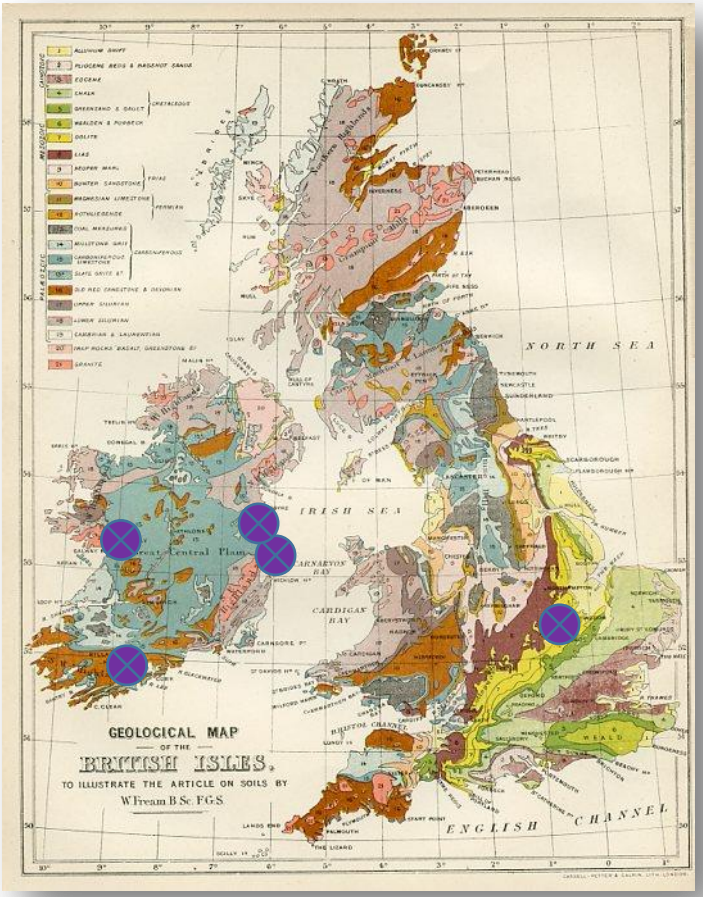
The Geoscience e-Laboratory (Ge-LAB):

Developing Digital Teaching & Learning Resources for the Virtual Microscope



Project Partners:

- University College Cork *(Lead)*
  - School of Biological, Earth & Environmental Sciences
- National University of Ireland Galway
  - School of Natural Sciences
- University College Dublin
  - School of Earth Sciences
- Trinity College Dublin
  - School of Natural Sciences
- The Open University
  - Department of Environment, Earth & Ecosystems

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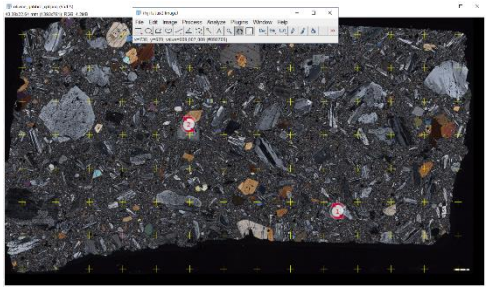
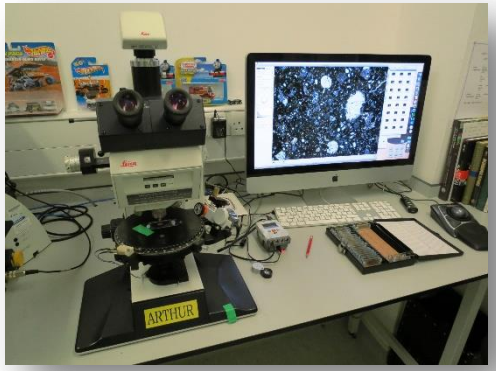


Geoscience e-Laboratory (Ge-LAB) project designed to:

- deliver **teaching & learning resources** for geoscience programmes in Ireland which have an optical microscopy and petrology component

- introduce novel methods to deliver **technology enhanced learning (TEL)** programmes at the national geoscience centres

- provide students with unlimited **access to high-quality digital rock thin sections** and associated **learning support guides** to foster the development of essential petrological skills



Teaching & Learning Enhancement Fund

- **National Forum for the Enhancement of Teaching and Learning in Higher Education**
- Fund supports building **digital capacity** in higher education in Ireland
- To enhance teaching and learning for all students in higher education
- 2012 Report: ***"Teaching and Learning in Higher Education; A roadmap for enhancement in a digital world 2015-2017"***

http://www.teachingandlearning.ie/

Teaching & Learning Enhancement Fund

Report Recommendations:

1. Develop consistent & coherent **digital experience** for HE students

2. Engage with students & teachers to **develop their digital skills & knowledge**

3. Strengthen & support **collaboration** within different parts of **HE sector**

4. Develop **shared policies & infrastructure** that reflect emerging digital technologies

5. Develop a strong evidence base for **enhanced pedagogy**

Petrology Programmes

http://www.geolab.ie/learning/

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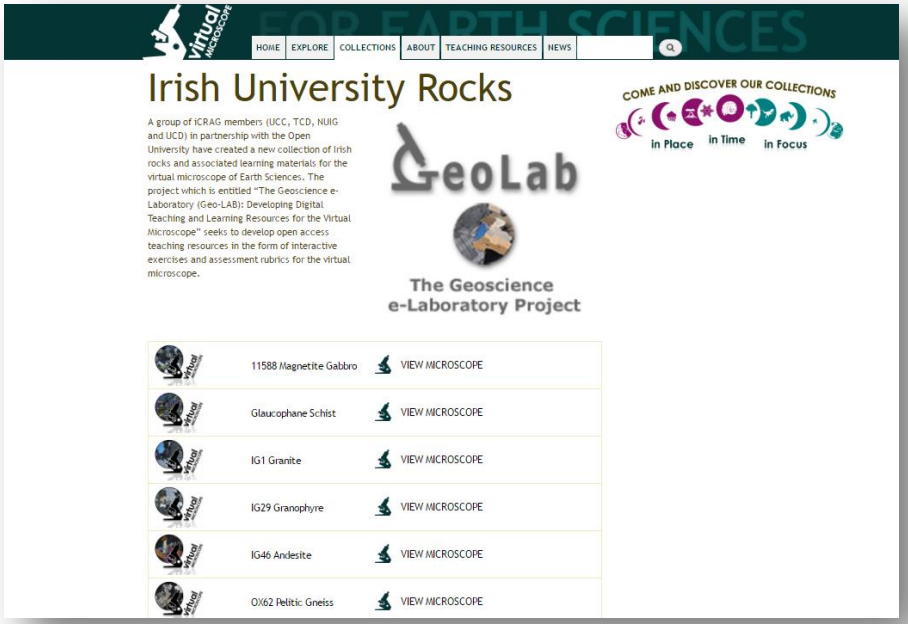
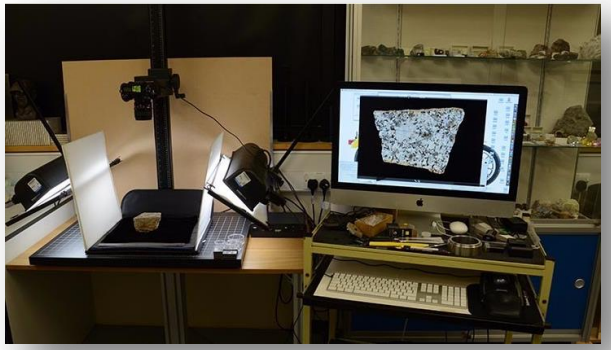
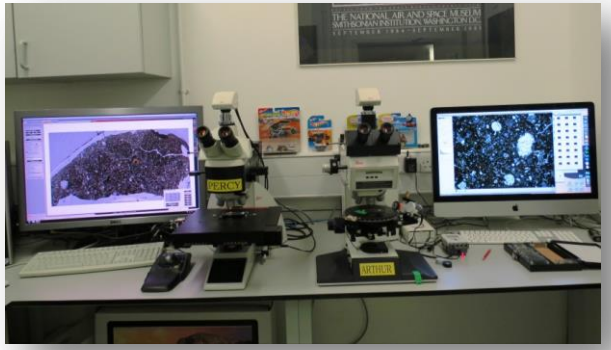
Open University Virtual Microscope Project

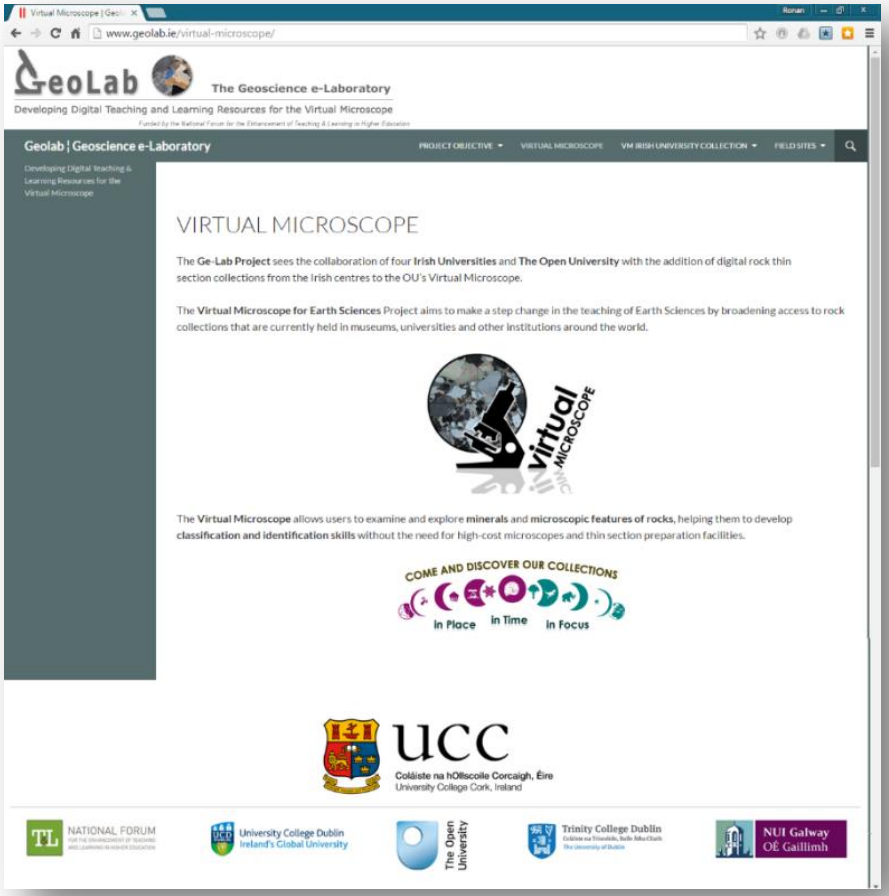






- www.virtualmicroscope.org

Project Website



www.geolab.ie

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Deliverables

- Collection of **digital and openly accessible** petrological rock thin sections
- **Templates** for **exercises and assessments** via standard Internet browser (HTML5)
- E-tutorials (movies, PDFs) served via each university **VLE (Blackboard Learn**)
- Feedback on student **performance** and student/teacher **sentiment** towards TEL learning compared to 'traditional' petrology methods

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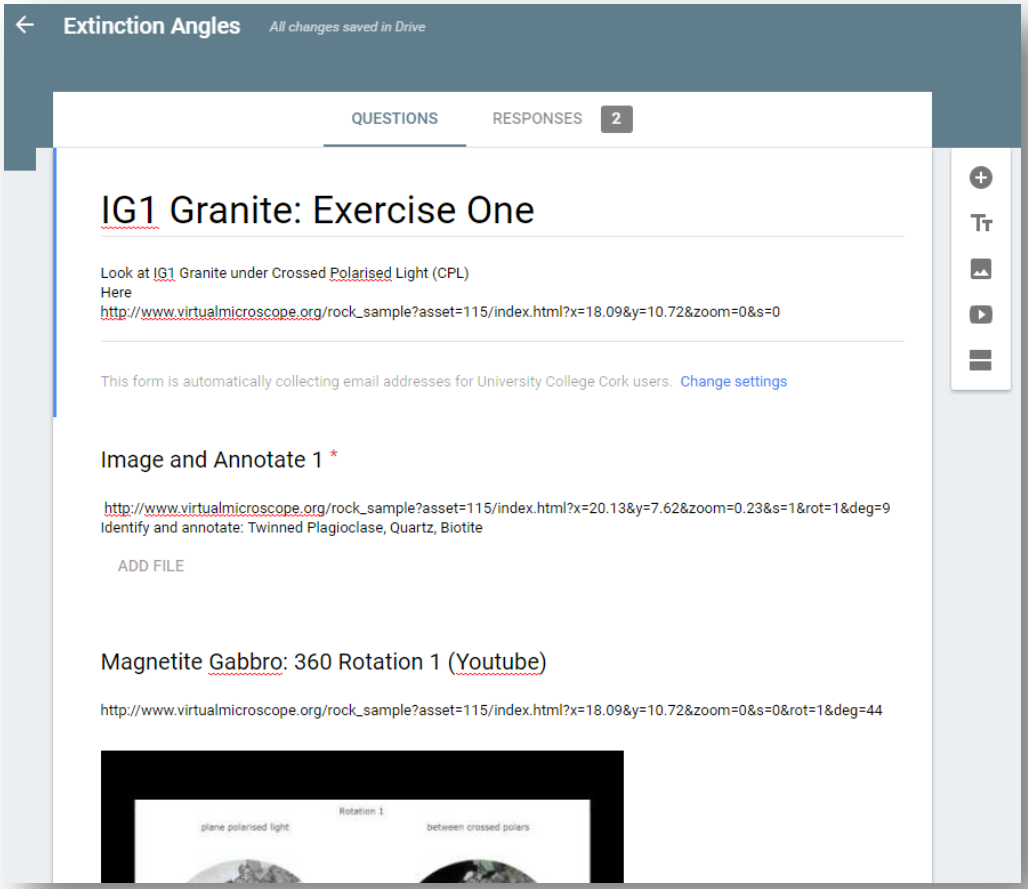
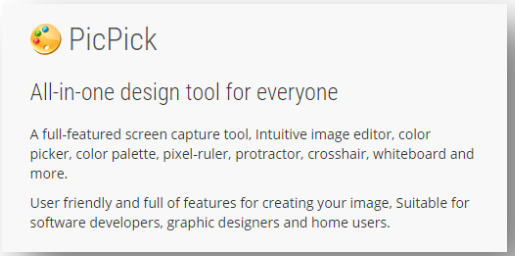
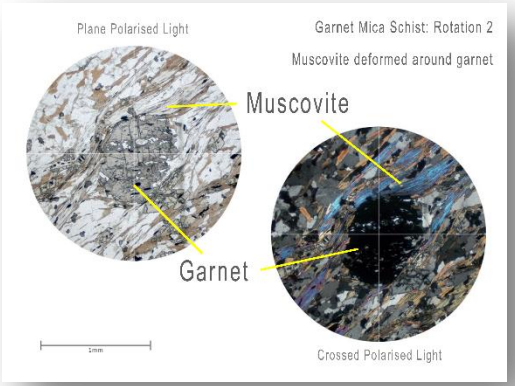
Google Forms (G Suite for Education)







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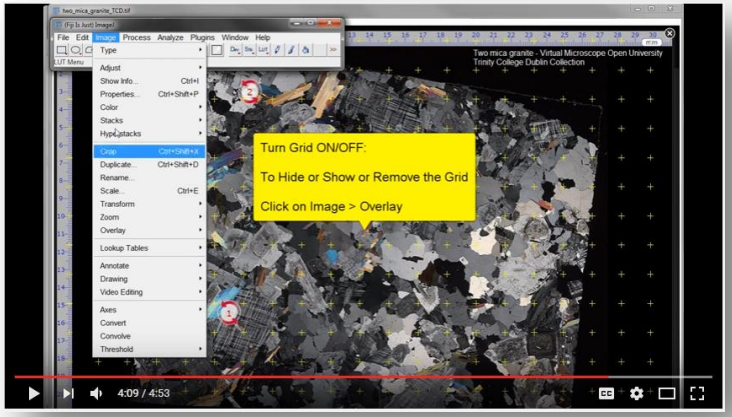
Instructional Movies - VM

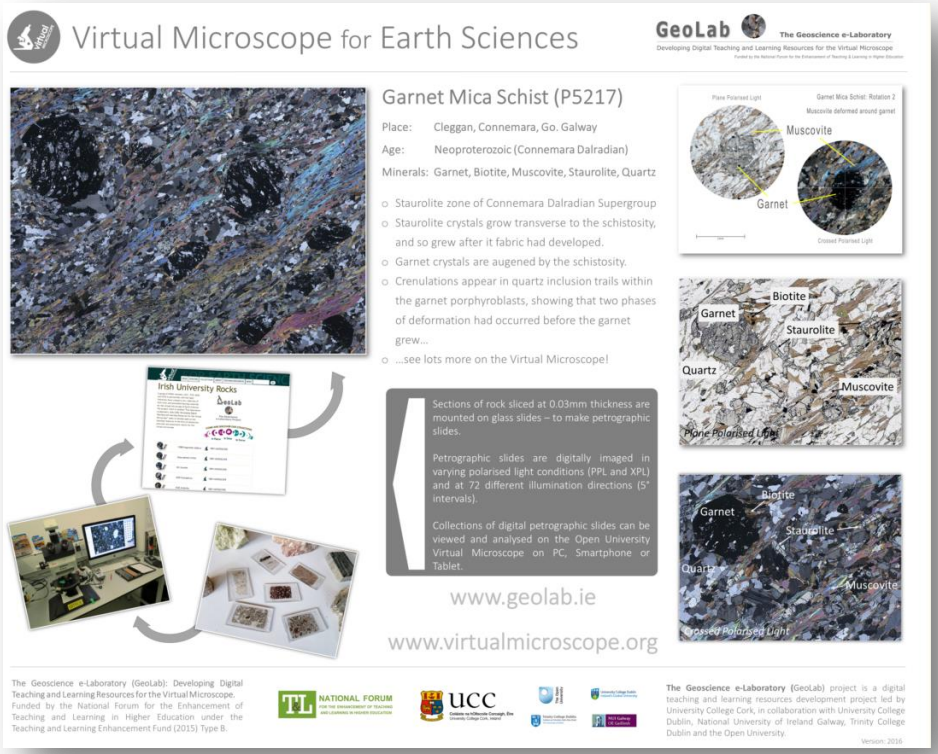
- How-to Guides
- Annotated & Narrated
- Created with Screencast-O-Matic software

Software Tutorials

- Free Open Source Software (FOSS)
  - ImageJ
- GoogleApps



Promotion


Virtual Microscope for Earth Sciences
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Garnet Mica Schist (P5217)
Place: Cleggan, Connemara, Co. Galway
Age: Neoproterozoic (Connemara Dalradian)
Minerals: Garnet, Biotite, Muscovite, Staurolite, Quartz
Staurolite zone of Connemara Dalradian Supergroup
Staurolite crystals grow transverse to the schistosity, and so grew after it fabric had developed.
Garnet crystals are augened by the schistosity.
Crenulations appear in quartz inclusion trails within the garnet porphyroblasts, showing that two phases of deformation had occurred before the garnet grew...
...see lots more on the Virtual Microscope!
Muscovite
Garnet
Biotite
Staurolite
Quartz
Plane Polarised Light
Crossed Polarised Light
Irish University Rocks
Sections of rock sliced at 0.03mm thickness are mounted on glass slides – to make petrographic slides.
Petrographic slides are digitally imaged in varying polarised light conditions (PPL and XPL) and at 72 different illumination directions (5° intervals).
Collections of digital petrographic slides can be viewed and analysed on the Open University Virtual Microscope on PC, Smartphone or Tablet.
www.geolab.ie
www.virtualmicroscope.org
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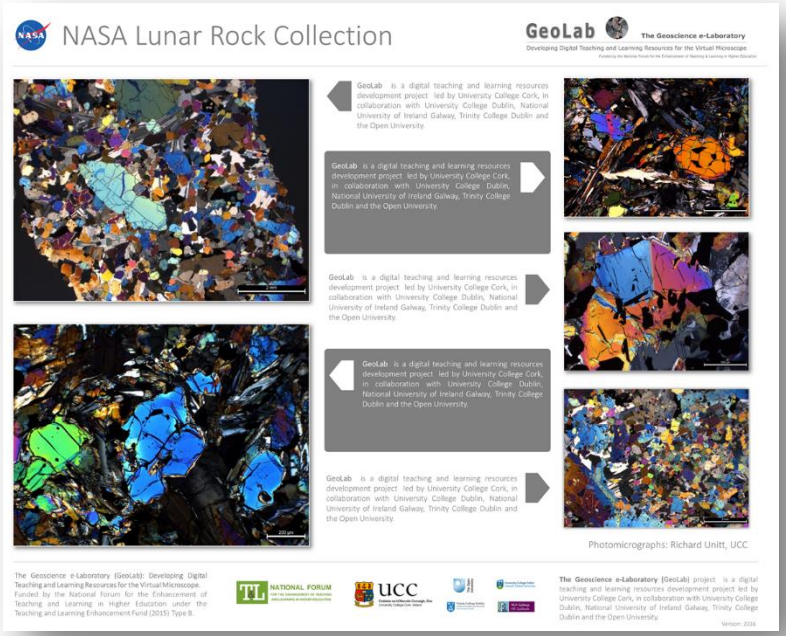
Version: 2016


NASA Lunar Rock Collection
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Photomicrographs: Richard Unitt, UCC
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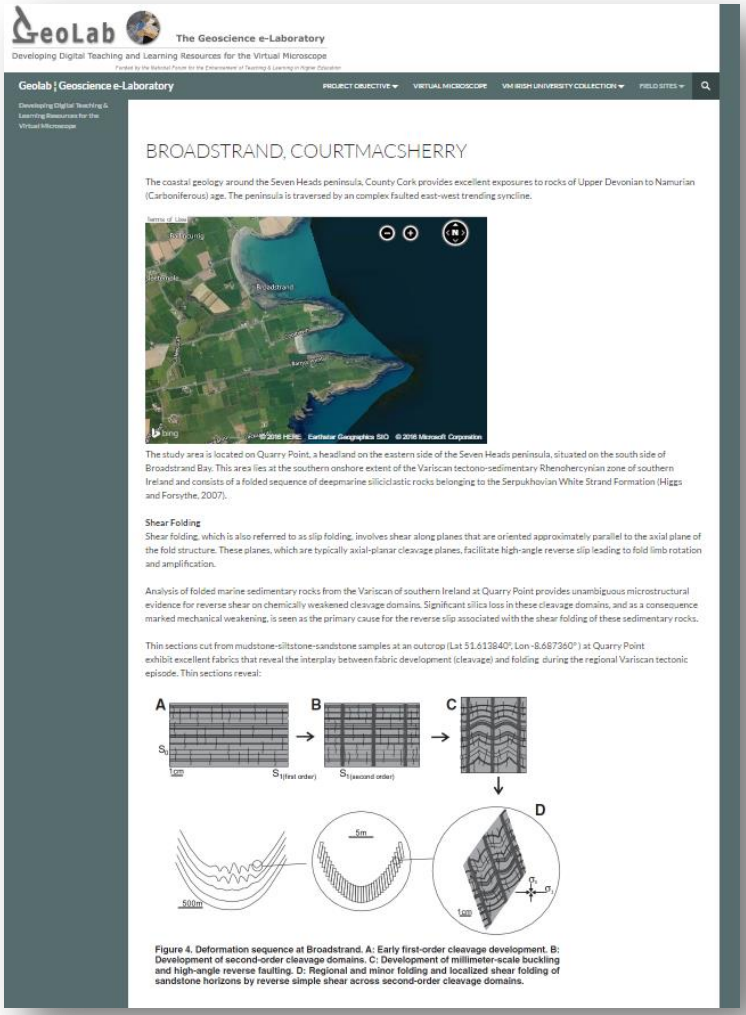
Research-informed Teaching & Field Study

- Integrate Virtual Microscope into undergraduate teaching
- E.g. Connemara Field Studies Week – Uni. College Dublin



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Adoption and Sustainability

- Continuation into the Future:
  - Participation \ contribution by **all Irish geoscience centres** secure ✓
  - Potential adaptation to other **geoscience programmes** ?
  - Integration into **Blended** & **Distance Learning / Adult & Continued Education** ✓
  - **iCRAG**: Irish Centre for Research in Applied Geosciences 2015 – 2020 ✓

iCRAG IRISH CENTRE FOR RESEARCH IN APPLIED GEOSCIENCES

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