Fully funded 4-year PhD studentship in fault zone modelling

Fault Analysis Group, School of Earth Sciences, University College Dublin

Applications are invited for a full-time 48-month structured PhD project entitled: "A three-dimensional segmented fault zone model". The project is funded by iCRAG, the SFI Research Centre in Applied Geosciences, and will be based within the Fault Analysis Group, University College Dublin, Ireland. The studentship guarantees EU or UK fees, a tax-free stipend of €18,500 per year, and research costs (fieldwork, conferences). Non-EU students will also be considered, and non-EU fees may be covered. The studentship must start by 1st January 2023 but may start earlier.

Project description

The project will develop new approaches for building three-dimensional gridded geological models of segmented fault zones for use in subsurface fluid flow modelling. Flow properties of faults and fault-related fractures are of interest to a range of subsurface application areas, including the groundwater and geothermal sectors, subsurface storage and waste disposal sectors, as well as natural resource exploitation. This project is focused on creating a new code underlain by a proven, but not-yet developed, flexible grid structure which will allow an unprecedented level of model realism. The aim is to use modern open-source programming practices to develop a general code, which can then be used to accurately model specific faults. Geologically, the project will be backed by quantitative and conceptual understanding of fault zones gained by multiple studies of 3D fault zone structure from outcrop, mine and subsurface datasets, and some geological fieldwork may be included.

Candidate profile

The successful applicant will have at least a 2.1 (or equivalent) BSc Honours or MSc degree in an appropriate physical science or engineering discipline. A strong mathematical background, enthusiasm for thinking about three-dimensional geometry, prior experience in scientific computing and coding, and some knowledge of structural geology are essential. Good communication and reporting skills are also key. The supervisory team are experienced in all aspects of the project from geomodel code development to geological characterisation of fault zones, and training within the structured PhD programme will be tailored to the requirements of the successful applicant. The student will also be required to demonstrate to undergraduate classes as appropriate and participate in iCRAG education and public engagement (EPE) activities.

Application Procedure

If you are interested, apply by email to Dr Tom Manzocchi (tom.manzocchi@ucd.ie) including: (1) a full CV, (2) details of two academic referees, and (3) a cover letter explaining your interest in the project and justifying your goodness-of-fit to it. The deadline for applications is 24th August 2022.