

StudentShapers Recruitment: Calling all students

ViRSE – Virtual Impact Crater Table-top Laboratory and Excursion (VITAL - VICE)

Bursary: £390/week (8 full time weeks), for two students - £3,120 in total per student.

Who should apply: Students with an aptitude for coding and enthusiasm for creating software, as well as an understanding of planetary remote sensing data and planetary surface processes. We anticipate that students enrolled on programmes in the Department of Earth Science and Engineering (ESE) will be best placed to meet these criteria, but all Imperial undergraduates are eligible. Preference will be given to students who are not in their final year.

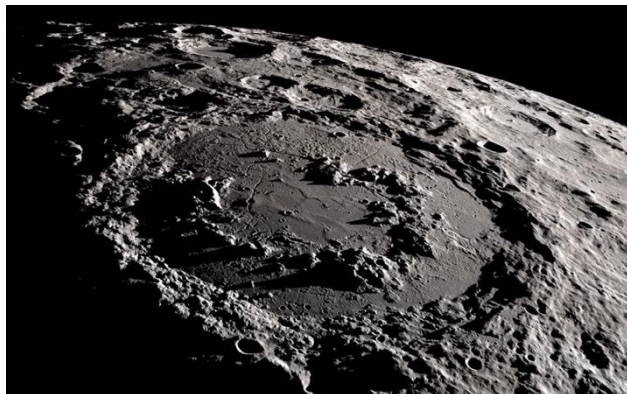
Campus/Location: South Kensington; some work can be done remotely, but on campus attendance will be expected for at least 50% of the project.

Project details:

Impact cratering is a fundamental surface process across the solar system and the dominant agent of surface change on many airless solid bodies. This is an opportunity to help develop two complementary Virtual Reality environments (VREs) to provide an accessible and easy-to-understand overview of the impact process and the anatomy of impact structures of different scales. One VRE will be a Virtual Impact Crater Excursion (VICE) to one (or more) exemplar pristine impact crater(s) on Mars to provide students with greater appreciation of the real-scale morphology and anatomy of impact craters. This VRE will include various field localities with learning activities, such as photogrammetry models of outcrop from Mars rover images; virtual rock samples to illustrate impact metamorphism; and structural deformation associated with impact. The other VRE will be a Virtual Impact Crater Table-top Laboratory (VITAL) where students can view 'table-top'-scale representations of pristine lunar craters of different sizes to illustrate the changes in crater morphology with crater size, as well as immersive 3D visualisations of numerical impact simulations to illustrate the formation of these impact craters and deformation at different depths below the surface.

The VREs will be for use in virtual-reality teaching within the Department of Earth Science and Engineering as well as outreach initiatives. You will be working in partnership with Professor Gareth Collins, Dr Joel Davis and Dr Mark Sutton (ESE) to design, code and test the VREs, as well as to help design learning exercises within the VRE. Undertaking this engagement, you will gain a deeper understanding of impact cratering and remote sensing data, as well as gaining technical skills and experience in coding (in C#/Unity), and in three-dimensional visualisation. You will also gain experience in collaborative software-development as part of a professional team.

This engagement is part of the ViRSE (Virtual Reality Student Experience) project, which is developing a virtual reality platform to ease the development and deployment of 'multi-player' virtual reality into Imperial's teaching across a range of departments and subjects. ViRSE is built on the Unity game engine, and all ViRSE applications (including this project) are also built within Unity; code is written in the C# programming language. Students will not need to build a VR interface, write rendering code, or concern themselves with networking or administrative issues; these are handled by the ViRSE framework and the Unity engine. The development in this engagement will concentrate on the creation of a three-dimensional 'environment' specific to the project, and creating and testing the code necessary to make it function, and to interface with the ViRSE system.



The imposing 320-km Schrödinger impact basin on the Moon is the type-example of a peak-ring impact crater, similar to the buried Chicxulub crater on Earth formed by the dino-killing asteroid 66 million years ago. This project will develop VREs for exploring and learning about this and other craters.

STUDENTSHAPERS

All ViRSE student shaper engagements will commence with a two-week full time training course, which will provide the necessary grounding in the C# language, object-oriented programming, the Unity engine, the ViRSE platform, and 3D modelling tools. This course will take place on-campus July 1st-12th 2024. In subsequent six project weeks the ViRSE student partners will lead on the development of the particular applications within Unity, in collaboration with the academic lead, and with the ViRSE team providing technical support and advice. These six project-development weeks are flexible in precise timing, but should take place over summer 2024, before the start of Autumn term of the 24/25 academic year.

How to apply:



Applications (300-500 words) should be made via the 'Student Expression of Interest' form on the StudentShapers website ([here](#)) or accessed using the QR code. This will then be distributed directly to the appropriate staff partner.

Deadline: 22nd March 2024

Contact details: Contact Professor Gareth Collins (Earth Science & Engineering, g.collins@imperial.ac.uk) for further information