

Dr Ankit K. Verma

Postdoctoral research fellow

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Summary

Climate Change – Earth and Planetary Surface Processes – Remote Sensing – GIS – Planetary Geology – Renewable Energy

- A focused and forward-thinking early-career Earth and Planetary Scientist with extensive experience in mapping, analysing and visualising earth and planetary GIS and remote sensing dataset, photogrammetry, arid geomorphology, rock breakdown, impact cratering, solar prospecting and light pollution.
- Excellent team player and a strong builder of prolific collaborations in different areas of pure and applied Earth and Planetary research, and effective and confident science communicator, both oral and written, making complex scientific concepts accessible to audiences of various backgrounds, thereby engendering trust and respect of peers and collaborators.
- A creative and self-motivated individual with easy-integration in a multicultural environment with a unique combination of detail-oriented mindset, driven personality, analytical skills and proven ability to meet tight deadlines by working in a fast-paced work environment leading to the discovery of novel methods and furthering understanding in Earth and Planetary Sciences.

Education

2014 – 2018

PhD in Geography

Trinity College Dublin, Ireland

Supervisory panel: [Dr Mary Bourke](#) | [Dr Juan Diego Rodriguez-Blanco](#) | [Prof Gordon Osinski](#)

Thesis title: [An investigation of the effect of low impact shock processes on the breakdown of sandstone at Meteor Crater](#)

Summary: My PhD work investigated the effect of the asteroid impact processes on rock breakdown. It used a combination of field and laboratory approach to examine rock breakdown on impacted and non-impacted rocks of the same lithology exposed at Meteor Crater site in Arizona, USA.

- Excellent **project management** and **creative problem-solving** skills demonstrated by designing and managing a PhD research project in a novel research area, resulting in 18 international presentations and 3 publications.
- Outstanding **time manager** with **commercial acumen** as evidenced by managing PhD research project under tight budgetary constraints with 3 international collaborations.
- **Adapted** promptly to experimental and financial challenges that arose and adjusted priorities and approach as necessary by winning 19 out of 25 research and travel grants applied.
- Developed verbal and writing **communication skills**, including technical reports, grant proposals, annual progress reports, peer-reviewed scientific research articles, poster and oral presentations and doctoral thesis.
- Carried out **innovative research** to advance the understanding of rock breakdown by providing insight into the influence of impact processes on subsequent rock breakdown processes, including developing methods to generate and analyse sub-mm resolution topographic data of rock surfaces.

2011 – 2014 **BSc (Honours) Geology**, *with dist. (79.44%)* **University of Delhi, India**

Achievement: Overall ranked second in the course at the University of Delhi.

Professional Experience

Research

May 2020 – Mar 2021 **Postdoctoral Fellow** **Insight SFI Research Centre for Data Analytics, Dublin City University**

I work on [SolarMap](#) project with [Prof. Noel O'Connor](#) and [Dr. John Connolly](#). The project is funded by the [SFI ENABLE](#) spoke 'Connecting communities with smart urban environments through the Internet of Things'. SolarMap project focuses on the use of ICT and geospatial technologies to develop solutions for urban solar farms.

- Used **GIS** techniques and **Earth Observation** dataset to map suitable building rooftops for urban solar farms in Dublin.
- Produced a very high-resolution solar radiation models for building rooftops in Dublin using [Met Éireann](#) solar radiation, **OSi Prime 2** and [Bluesky](#) Dense Surface Models (DSMs).
- Excellent **teamwork** and **collaboration** skills demonstrated by managing an interdisciplinary SolarMap research project.
- Engagement and collaboration with large companies for solar prospecting work advanced **negotiation skills**.
- Strong **leadership** skills and experience in **liaising with stakeholders** in [Smart DCU](#) and [Smart Dublin](#).

- **Knowledge of current industry trends** in renewable energy and experience in communicating complex research methods to technicians from different research area, as evidenced by the successfully managing first-ever large-scale solar prospecting research project in Ireland.
- Competent in: Information management, leading a team or working independently, relationship building, organisational skills, client-facing, professional awareness, conflict resolution, emotional intelligence, legal and regulatory aspects.

Dec 2018 – Feb 2020

Postdoctoral Fellow

Trinity College Dublin, Ireland

I worked on the '[Quantifying Light Loss across Ireland and Identifying Patterns of Energy Use](#)' research project funded by [Sustainable Energy Authority of Ireland](#) within [Dr Brian Espey](#)'s research group in the School of Physics. I also worked with [Dr Ainhoa Gonzalez Del Campo](#) (Co-PI) at University College Dublin.

- Utilised night-time Earth Observation data and International Space Station imagery to examine lighting energy use and waste using GIS and remote sensing techniques.
- Analysed Earth Observation datasets, designed, maintained and updated GIS databases, digitised and edited raster, vector, topographic and 3D data.
- Produced a database of georeferenced and calibrated night-time satellite images for Ireland in ArcGIS, QGIS, and R from which historical and on-going energy use was obtained for the first time in Ireland. This aids in developing solutions from both the public and private sectors and transition Ireland to a more sustainable lower carbon economy.

Sept 2017 – Nov 2018

Research Assistant

Trinity College Dublin, Ireland

Part-time research assistant to [Dr Mary Bourke](#) in the Department of Geography. I contributed to GIS and photogrammetry dataset generation and analysis. I build high-resolution digital elevation models (DEMs) of coastal cliffs and shore platforms using structure from motion technique from images taken by an Unmanned Aerial Vehicle (UAV). I analysed these DEMs utilising a range of roughness and surface texture parameters in ArcGIS. I also created digital media content for modules in Physical Geography.

April 2018 – Nov 2018

Exam Invigilator

Trinity College Dublin

July 2017 – Sept 2018

Academic Visitor

University of Oxford, UK

Host: [Prof Heather Viles](#)

I independently conducted rock breakdown experiment in terrestrial semi-arid condition at [Oxford Resilient Buildings and Landscapes Laboratory](#) in the School of Geography and Environment.

Jul 2017 – Sept 2018

Visiting Researcher

Natural History Museum, U.K.

Hosts: [Dr Tobias Salge](#) (SEM), [Dr Farah Ahmed](#) and Dr Amin Garbout (X-ray CT), [Dr Jens Najorka](#) (XRD)

I worked at the Imaging and Analysis Centre in Natural History Museum to analyse impacted rock samples from Meteor Crater, USA and West Clearwater Impact Structure, Canada using SEM, XRD, and X-ray CT.

Sept 2015 – Aug 2016

Events Coordinator

Trinity College Dublin, Ireland

My responsibility included organising official and social events in the Department of Geography at Trinity College Dublin. As an events coordinator, I helped organise workshops, international lecture seminars and postgraduate symposia in the department. I organised the official Christmas Party of the Geography Department in December 2015. I was also on the organising committee of the School of Natural Science, Third Lightning Talks.

2013 – 2014

Campus Ambassador

United Nations Rio+21 IYWC

I coordinated and promoted United Nations Rio+21 International Year of Water Cooperation, India Certification Program in Ram Lal Anand College, University of Delhi, India.

- Excellent **relationship builder** and **interpersonal skills** demonstrated by a successful outreach campaign by motivating 50 students to join this program.

Jun 2013 – Jul 2014

Digital volunteer

Government of India

I worked as a digital volunteer under the 'My India' initiative programme of Ministry of Information and Broadcasting, Government of India. My job included social media content creation and promotion of the government's Social Media policies such as Twitter and Facebook.

Jun 2012 – Jul 2012

Research Intern

National Geophysical Research

Institute, India

Project: Remote and field geological observation of planetary surface changes

Supervisor: [Dr P. Senthil Kumar](#).

I worked as a joint summer research fellow of Indian Academy of Sciences – Indian National Science Academy – National Academy of Sciences at National Geophysical Research Institute, Hyderabad, India. During this internship, I conducted a literature survey on inner solar system planets and moons' geology. This project also included the study of planetary bodies like asteroids and the impact craters formed when they collide with planetary surfaces. I went to Lonar Crater for fieldwork during this internship. I did field mapping and collected samples at Lonar Crater, one of the youngest and best-preserved craters on Earth. Lonar Crater is the only crater known in

basaltic target rocks on Earth, so it is a perfect analog for simple craters on Earth and Mars. A report based on this research project was submitted to the Indian Academy of Sciences.

Teaching and Mentoring

Sept 2014 – Mar 2018

Teaching Assistant

Trinity College Dublin, Ireland

Deserts of our solar system (Third Year, Undergraduate Geography Module): I worked as a Teaching Assistant to Dr Mary Bourke for this module. My responsibilities included conducting GIS lab and planetary mapping classes and grading GIS assignments.

Human Geography - Changing Worlds (Second Year, Undergraduate Geography Module): My task was to help students design their survey projects in this Human Geography module and help them statistically analyse the data they collected.

2012 – 2013

Teaching Assistant

University of Delhi, India

I worked as a teaching assistant under Professor Prabhas Pande of the University of Delhi. I demonstrated a workshop on water quality analysis and soil testing at Pathways International School, Gurgaon, India.

Supervision/Mentoring

Undergraduate student supervision in Geography and Physics at Trinity College Dublin

- I co-supervised Blanaid Lowry (2019 – 2020 - fourth year Physics undergraduate student). I advised the student on spatial analysis of night-time image dataset for investigating light pollution in Ireland.
- I co-supervised Niamh Fay (2016 – 2017 - fourth-year Earth Science undergraduate student). I advised the students on Structure from Motion and GIS methods to investigate coastal cliff quaternary cliff erosion in Bray, Ireland.

Awards, Honours, Scholarships and Grants

2020 *The 36th International Geological Congress GeoHost Support* (Covid-19 affected).

2019 *The 36th International Geological Congress Special Registration Support* (value of \$600 – Covid-19 affected).

- 2019 *Europlanet early-career travel fellowship* (value of SEK 9,214)
- 2018 *Irish Geomorphology Group Travel Award* (value of £150)
- 2017 *American Geophysical Union Fall Meeting General Travel Grant* (\$1000)
- 2017 *Trinity Trust Travel Grant* (€500)
- 2017 *Geography Postgraduate Travel Grant*, Trinity College Dublin (€300)
- 2017 *Trinity Association and Trust Travel Grant* (€500)
- 2016 *Geography Postgraduate Travel Grant*, Trinity College Dublin (€300)
- 2016 *Irish Geomorphology Group Travel Award* (€100)
- 2016 *Geological Remote Sensing Group Student Travel Bursary* (£150)
- 2016 *Trinity Trust Travel Grant* (€400)
- 2016 *Europlanet 2020 Research Infrastructure Access Grant* (value of £18,000)
- 2016 *International Association of Sedimentologists Postgraduate Grant* (€990)
- 2016 *British Society for Geomorphology Postgraduate Research Grant* (£500)
- 2015 *Geography Postgraduate Travel Grant*, Trinity College Dublin (€300)
- 2015 *Barringer Family Fund for Meteorite Impact Research* (\$5,000)
- 2015 *The J.N. Tata Gift Scholarship* (₹180,000)
- 2014 *Geography Postgraduate Travel Grant*, Trinity College Dublin (€325)
- 2014 *The Sir Dorabji Tata Trust Travel Grant* (₹30,000)
- 2014 *The J.N. Tata Endowment Scholarship for the higher education of Indians* (₹220,000)
- 2014 *Faculty of Engineering, Mathematics and Science, India (PhD) Scholarship*, Trinity College Dublin 2014 - 2017 (€18, 000)
- 2014 *Trinity Postgraduate Research Studentship Award* 2014 - 2017 (value of €60, 399)
- 2014 *University College Dublin Global Graduate Scholarship* (€2000) – declined
- 2014 *Newcastle University International Postgraduate Scholarship* (£2000) - declined
- 2014 *Silver medal* for securing the second rank in BSc (H) Geology, Ram Lal Anand College, University of Delhi
- 2014 *High Merit Award*, Ram Lal Anand College, University of Delhi
- 2013 *High Merit Award*, Ram Lal Anand College, University of Delhi
- 2012 *High Merit Award*, Ram Lal Anand College, University of Delhi
- 2012 *Partial Scholarship*, Ram Lal Anand College, University of Delhi

2012 *Joint summer research fellowship*, Indian Academy of Sciences - Indian National Science Academy - National Academy of Sciences (₹16,000)

Photography Awards

2017 *Winner*, One of the twelve winners of the Geological Society Earth Science Week Photography Competition [Published - [The Guardian](#) and [Daily Mail](#), [Amateur Photographer](#)]

2017 *Runner-up*, British Society for Geomorphology photo competition [Prize money - £50]

2014 *Winner*, One of the twelve winners of Geographical society, Trinity College Dublin photo competition

Publications

([Google Scholar](#): Citation – 42. h-index – 3. i10-index – 2)

Published

- **Verma, A. K.** (2019). *An investigation of the effect of low impact shock processes on breakdown of sandstone at Meteor Crater*. PhD thesis, Trinity College Dublin. <http://hdl.handle.net/2262/89544>
- **Verma, A. K.**, and Bourke, M. C. (2019). *A method based on structure-from-motion photogrammetry to generate sub-millimetre-resolution digital elevation models for investigating rock breakdown features*. *Earth Surf. Dynam.*, 7(1), 45-66 doi: <http://doi.org/10.5194/esurf-7-45-2019>
- Cullen, N. D., **Verma, A. K.**, and Bourke, M. C. (2018). *A comparison of structure from motion photogrammetry and the traversing micro-erosion meter for measuring erosion on shore platforms*. *Earth Surf. Dynam.*, 6(4), 1023-1039 doi: <https://doi.org/10.5194/esurf-6-1023-2018>. *Equal contribution*.
- **Verma, A.K.**, Bourke, M.C., Viles, H.A., Osinski, G.R., and Rodriguez-Blanco, J.D. *The effect of impact-generated heterogeneities and discontinuities on the subsequent weathering of impactites: insights from laboratory experiments*. *Icarus* (in review) [Preprint](#)

In Preparation

- **Verma, A.K.**, Bourke, M.C., and Kring, D.A. *The effect of low shock deformation on the subsequent breakdown of Moenkopi Sandstone at Meteor Crater*. To be submitted to *Geomorphology* (paper written, in distribution among co-authors).

- **Verma, A.K.,** Connolly, J., O'Connor, N.E. **Prospecting urban rooftop solar farm potential in Dublin, Ireland.** To be submitted to *Renewable Energy* (all data collected and analysed).
- **Verma, A.K.,** Connolly, J., O'Connor, N.E. **Internet of things (IoT's) and cloud computing for smart solar energy: an application for solar prospecting and monitoring.** To be submitted to *Renewable and Sustainable Energy Reviews*.
- Bourke, M. C., and **Verma, A.K.** **The roughness of Ireland's rock platforms.** To be submitted to *Geomorphology* (all data collected and analysed).
- Espey, B.R. and **Verma, A.K.** **Categorisation and quantification of the source of artificial light at night from Ireland.** To be submitted to *Remote Sensing of Environment* (all data collected and analysed).
- **Verma, A.K.** and Espey, B.R. **A database of the night-time images for Ireland.** To be submitted to *Irish Geography* (paper written, in distribution among co-authors).

Reports

- **Verma, A.K.** **An investigation of the effect of impact processes in subsequent rock breakdown.** International Association of Sedimentologists Postgraduate Grant Scheme – spring 2016.
- **Verma, A.K.** **Rock Breakdown on Earth and Mars.** International British Society for Geomorphology Postgraduate Research Grant Scheme – spring 2016.

Conference Presentations and Talks

International

Invited

- **Verma, A.K.** (2021). **Effect of impact inheritance on subsequent rock breakdown.** International Association of Geomorphology regional webinar for Western Europe and British Isles.
- **Verma, A. K.** (2020). **An investigation of the effect of low impact shock processes on the breakdown of sandstone in the semi-arid environment.** Ram Lal Anand College, University of Delhi, India.
- **Verma, A.K.** (2019). **An investigation of the effect of low impact shock processes on the breakdown of impactites.** Astrophysics seminar, Trinity College Dublin.
- **Verma, A.K.,** and Osinski, G.R. (2019). **The effect of impact-generated heterogeneities and discontinuities on the subsequent weathering of impactites: insights from laboratory experiments.** *International conference on "Impacts and their Role in the Evolution of Life"*. Sweden.

- Bourke, M.C., **Verma, A.K.**, and Cullen, N.D. (2017). [The response of rockscapes to extreme events](#). *Rockscapes seminar*, School of Geography and the Environment, University of Oxford, U.K.

Other presentation and talks

- **Verma, A.K.**, Connolly, J., O'Connor, N.E (2021). [Prospecting urban rooftop solar farm potential in Dublin, Ireland](#). *European Geosciences Union General Assembly*. EGU21-13081. Virtual.
- Espey, B.R., **Verma, A.K.**, and Breen, C. (2020). Energy Loss Measurement Using Irish Public Lighting. *6th International Conference on Artificial Light at Night*. Spain.
- **Verma, A.K.**, Bourke, M.C., and Kring, D.A. (2020). [The effect of low impact shock deformation on the subsequent breakdown of sandstone in a semi-arid environment](#). *36th International Geological Congress*. India (Covid-19 affected).
- Espey, B.R., **Verma, A.K.**, McEnroe, P. (2019). [Categorisation and quantification of the source of artificial light at night from Ireland](#). *Light Pollution: Theory, Modelling and Measurements*. Hungary. (Oral presentation).
- **Verma, A.K.**, Bourke, M.C., Viles, H.A, Osinski, G.R., and Rodriguez-Blanco, J.D. (2018). [The effect of impact-generated heterogeneities and discontinuities on the subsequent weathering of impactites: insights from laboratory experiments](#). *Sixth Irish Geomorphology Group annual workshop*. Northern Ireland. (Oral presentation).
- Cullen, N.D., **Verma, A.K.**, and Bourke, M.C. (2018). [A new approach for measuring microscale platform erosion: A comparison of the Transverse Micro Erosion Meter and Structure from Motion Photogrammetry](#). *European Geosciences Union General Assembly*, Vienna, Austria.
- **Verma, A.K.**, Bourke, M.C., Viles, H.A., Osinski, G.R., and Rodriguez-Blanco, J.D. (2017). [An experimental investigation of the effect of impact generated micro-deformations in Moenkopi and Coconino Sandstone from Meteor Crater, Arizona on subsequent weathering](#). *American Geophysical Union Fall Meeting*, New Orleans, USA. ([Poster](#))
- Cullen, N.D., **Verma, A.K.**, and Bourke, M.C. (2017). [Measuring shore platform erosion: A direct comparison between Structure from Motion Photogrammetry and the Transverse Micro Erosion Meter](#). *Fifth Irish Geomorphology Group annual workshop*. University College Dublin, Ireland. (Oral presentation).
- **Verma, A.K.**, and Bourke, M.C. (2017). [An in-situ Investigation of the Effect of Impact Processes on Rock Breakdown Using sub-mm Resolution DEMs at Meteor Crater, Arizona](#). *International Conference on Geomorphology*, India. (oral presentation).
- Bourke, M. C., Nash, C., Cullen, N.D., and **Verma, A.K.** (2017). [The roughness of Ireland's rock platforms](#). *European Meteorological Annual Meeting*, Dublin, Ireland.
- **Verma, A.K.**, and Bourke, M.C. (2016). [A photogrammetry-based method for morphometric analysis of rock breakdown forms near Meteor Crater, Arizona](#). *Geological Remote Sensing Group 27th Annual Conference' Future of Geological Remote Sensing: Innovation and Challenges'*, London, UK. (oral presentation).
- **Verma, A.K.**, Bourke, M.C. (2016). [A photogrammetry-based approach to generate sub-millimetre resolution Digital Elevation Models for investigating rock breakdown in the](#)

field. *Fourth Irish Geomorphology Group annual workshop*, University College Cork. (oral presentation).

National

- **Verma, A.K.** (2017). *A search for impact shock features in Moenkopi Sandstone from Meteor Crater, Arizona*. *Geography Postgraduate Symposium*, Department of Geography, Trinity College Dublin. (oral presentation)
 - **Verma, A.K.** (2016). *An investigation of the effect of the meteorite impact on rock breakdown at Meteor Crater, Arizona*. *Geography Postgraduate Symposium*, Department of Geography, Trinity College Dublin. (oral presentation)
 - **Verma, A.K.** (2016). *An innovative approach to interpreting rock surface texture*. School of Natural Science, Trinity College Dublin *Lightning Research Talks*. (oral presentation)
 - **Verma, A.K.** (2015). *Rock breakdown on Earth and Mars*. *Geography Postgraduate Symposium*, Department of Geography, Trinity College Dublin. (oral presentation)
 - **Verma, A.K.** (2014). *Why Explore Mars? Geological Perspective*. School of Natural Science, Trinity College Dublin *Lightning Research Talks*. (oral presentation)
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Professional services and Public Outreach

- I convened a session '[GIS and Photogrammetry: Application in Geography and Environmental Science](#)' at Conference of Irish Geographer in Dublin, Ireland. May 2020 (Postponed to 2021 due to Covid-19).
 - Reviewer for Earth Surface Processes and Landforms and Springer Nature Applied Sciences.
 - Co-organiser of the [Mercury Transit](#) event at Trinity College Dublin. Nov 11, 2019.
 - Co-organiser of space outreach camp for astrophysics research group for [PROBE](#) at Trinity College Dublin (PROBE is part of This European Researchers' Night project is funded by the European Commission under the Marie Skłodowska-Curie actions). September 27, 2019.
 - Talk and discussion titled 'Research Career in Earth and Planetary Science' delivered at Ram Lal Anand College, University of Delhi. November 8, 2017.
 - Dublin PubhD. Can you explain your PhD in the pub? March 1, 2017.
 - [Mercury Transit outreach with Astrophysics Group](#) at Trinity College Dublin. May 9, 2016.
 - Solar Eclipse outreach with Earth and Planetary Surface Processes Group at The Children's House School Stillorgan, Dublin. March 20, 2015.
 - Blogger for [Earth and Planetary Surface Processes](#) Group and [PlanetGeog blog](#).
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Academic Training and Short courses

- Developing your research funding plan. Dublin City University. 2021.
- Intellectual Property. Dublin City University. 2021.

- Developing your professional portfolio in teaching and learning. Dublin City University. 2021.
- Starting out teaching: A teacher's toolkit. Dublin City University. 2021.
- [Solar radiation training 9th edition](#). [Mines ParisTech](#). 2021.
- Media training and interview preparation. Dublin City University. 2020.
- Recruitment Skills - Interviewing and Unconscious Bias. Dublin City University. 2020.
- Education support worker training. Trinity Disability Service, Trinity College Dublin. 2017
- How to Write and Publish a Scientific Paper. Ecole Polytechnique on Coursera. Online course. 2016.
- Attended Masterclass for PhD students with [Professor Richard Ellis](#) at Royal Irish Academy. April 13, 2016.
- Postgraduate certificate in Statistics. Trinity College Dublin. 2015 - 2016.
- Attended Masterclass for PhD Students with [Professor Mike Hulme](#) at Royal Irish Academy. September 29, 2015.
- Attend Masterclass for PhD Students with [Professor Monica Grady](#) at Royal Irish Academy. June 25, 2015.
- United States Geological Survey (USGS) Photogrammetric Processing of Planetary Stereo Imagery using ISIS and SOCET SET®. USGS Astrogeology Science Centre, Flagstaff, Arizona, USA. July 27-29, 2015.
- The Irish Geoscience Graduate Programme (IGGP) Level 2: Advanced Skills in ArcGIS. National University of Ireland, Maynooth. May 25-28, 2015.
- The Irish Geoscience Graduate Programme (IGGP) Level 1: Introduction to ArcGIS. National University of Ireland, Maynooth. May 18-22, 2015.
- Third Year Geography undergraduate module 'Deserts in our Solar system'. Trinity College Dublin. 2014 - 2015.
- PhD transferable skills modules including Endnote training; 'Planning and managing your research and your career generic skills'; and 'Postgraduate T.A.s: Introduction to teaching at Trinity'. Trinity College Dublin. 2014.
- Introduction to Teaching workshop. Centre for Academic Practice and Learning CAPSL, Trinity College Dublin. 2014.
- The Science of Solar System. California Institute of Technology on Coursera. Online course. 2014.
- Water Cooperation. United Nations Rio+21 IYWC India. University of Delhi. Awarded 'A' grade. 2013 - 2014.
- Water Conservation and Sustainable Management of Ground Water in the National Capital Region. Central Ground Water Board, India. March 25, 2014.
- The role of Atomic Mineral Directorate in radioactive elements exploration and working mechanism of various types of nuclear reactors in India. Atomic Minerals Directorate (AMD) for Exploration and Research, New Delhi, India. April 2013.

Research techniques and skills

Computing skills

- **Applications:** Agisoft Photoscan+Lens, Adobe Photoshop, Adobe Illustrator, Adobe Lightroom, Adobe Premiere, Adobe InDesign, Meshlab, Cloud Compare, Landserf, Avizo, MountainsMap, EndNote, Microsoft Office Suite, GIMP, Image J, Gwyddion, ArcGIS, QGIS, Google Earth, SocetSET, Blender, SPSS, Minitab, HOMER Pro
- **Programming languages:** Matlab, R
- **Operating System:** Windows, Mac

Laboratory and equipment skills

- X-ray Diffraction, Scanning Electron Microscope (CL, BSE, S.E., and EDS), X-ray Computed Tomography, Petrographic microscope, Resistivity meter, pH meter, conductivity meter, petrographic microscope, GPS, Schmidt's hammer, Equotip, iButtons, Moisture meter, Karsten tubes, Unmanned Aerial Vehicle (UAV), DSLR Camera, Infrared thermometer, high-temperature oven.
- Environmental cabinet with Eurotherm 2704 Controller: experienced in simulating terrestrial environment conditions for rock weathering experiments in an environmental cabinet.
- Experienced in chemical weathering and hydrothermal dissolution experiments in an autoclave reactor vessel at high temperature and pressure.

Fieldwork experience

- Barringer Meteorite Crater Aka Meteor Crater, Arizona, USA (team member - Dr David Kring of Lunar and Planetary Institute, USA).
- Lonar Crater, Deccan, India (team member – Dr Senthil Kumar of National Geophysical Research Institute, India and Mr Sathish Sathasivam of Ministry of Earth Sciences, India).
- Coral Pink Sand Dunes State Park, Utah, USA (team members - Dr Candice Hansen and Dr Jim McElwaine of Planetary Science Institute, Dr Mary Bourke of Trinity College Dublin, Dr Jo Nield of University of Southampton).
- Clear Creek Reservoir (team member – Ms Niamh Cullen of Trinity College Dublin).
- Ballard Bay, County Clare, Ireland (team member - Ms Niamh Cullen of Trinity College Dublin).
- Coasts in Cork, Ireland (team member – Professor Robert Devoy of University College Cork, Dr Mary Bourke and Ms Niamh Cullen of Trinity College Dublin)
- Bray, County Wicklow, Ireland.
- Mussoorie, Lower Himalayas, India (fieldwork during undergraduate degree led by Dr Prabhas Pande and Dr Sarbari Nag of University of Delhi).
- Chittorgarh and Kumbhalgarh, Rajasthan, India (fieldwork during undergraduate degree led by Professor A.M. Bhola, Dr Prabhas Pande and Dr Sarbari Nag of University of Delhi).

- Jhamarkotra Rock Phosphate Mines, Udaipur, India (fieldwork during undergraduate degree Professor A.M. Bhola, Dr Prabhas Pande and Dr Sarbari Nag of University of Delhi).

Languages

- English (bilingual proficiency)
- Hindi (native)
- Sanskrit (limited working proficiency)

Other skills

- **Knowledge of research methodologies:** Structure from Motion photogrammetry, stereo photogrammetry, image processing, GIS and raster data analysis, facet mapping (mapping rock weathering features), areal surface roughness analysis.
 - **Data and information collection:** Earth observation satellite dataset (e.g. Landsat, DMSP-OLS, SNPP-VIIRS, LuoJia 1), Eurostat, Environment Protection Agency, Central Statistics Office (Ireland), NASA Gateway to Astronaut Photography of Earth, GIS database management, NASA Planetary Data System, Mars observation satellite dataset (e.g. HiRISE, HRSC, THEMIS, CTX, MOLA etc), Mars Science Laboratory Curiosity Analysts Notebook (MastCam, MAHLI, and NavCam dataset), Mars Exploration Rover Analysts Notebook (PanCam, NavCam, MI and APXS dataset).
 - **Statistical Software:** SigmaPlot, Minitab, SPSS.
 - Graphic design and photography (professional level). [\[Redbubble Store\]](#)
 - Event organisation and management.
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Professional memberships

- American Association of Petroleum Geologists
- Society of Exploration Geophysicists
- British Society for Geomorphologists
- International Association of Sedimentologists
- Irish Geomorphology Group
- International Association of Mathematical Geosciences
- Geological Remote Sensing Group
- Society of Sedimentary Geology
- American Geophysical Union
- SEPM (Society for Sedimentary Geology)
- The Mars Society
- The Planetary Society
- The Geological Society
- Irish Solar Energy Association

References

Dr Mary C. Bourke

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Dr Juan Diego Rodriguez-Blanco

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Prof Noel O'Connor

Postdoctoral advisor

Professor and CEO

the Insight SFI Research Centre for Data

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Dr John Connolly

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Assistant Professor

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Prof Heather A. Viles

Research collaborator and Mentor

Professor

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Environment

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Prof Gordon R. Osinski

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