Phytobytes

Botany's newsletter, Trinity College Dublin

COVER BY

SATE AHMAD

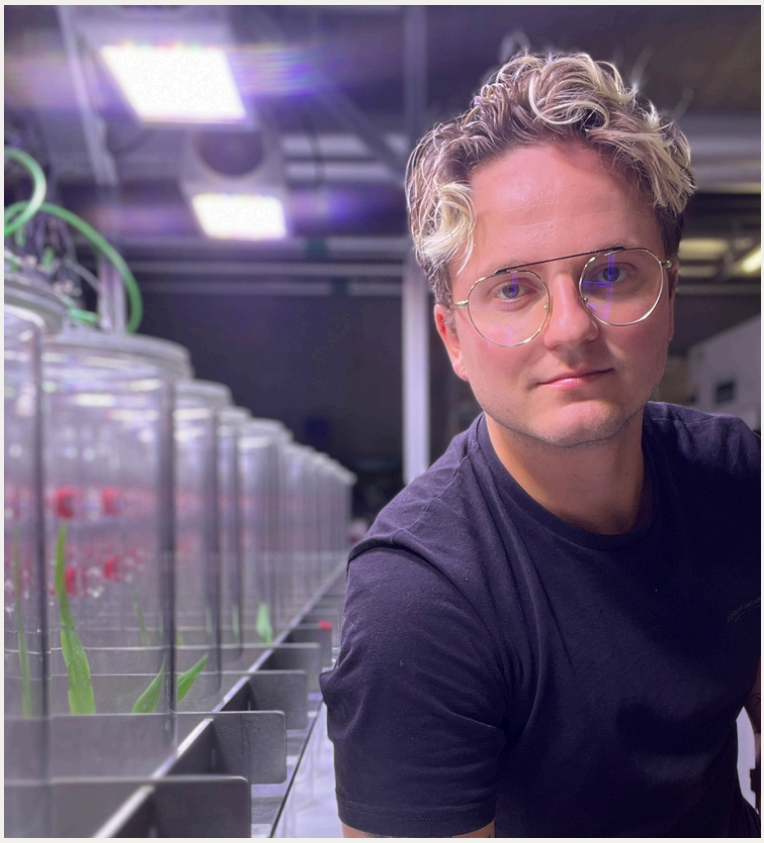
October - November 2024

People

We're thrilled to welcome all the new postgraduate students and staff members joining the Botany Department! Your fresh perspectives, enthusiasm, and passion for the natural world are invaluable additions to our community. Here's a quick introduction.

Jamie Waterman

Jamie is a chemical ecologist and ecophysiologist who aims to understand how chemical, morphological and developmental plant traits shape interactions between plants and their environment, with a particular focus on herbivory. Jamie uses techniques spanning analytical chemistry, molecular biology and behavioural ecology to understand these interactions on a mechanistic level. Jamie received his PhD in Ecology from Western Sydney University in 2021. During his PhD, he explored how silicon accumulation and deposition integrate with defence pathways in silicon hyperaccumulating plant species, and how these silicon-based defences impact herbivores. After his PhD, Jamie joined the Biotic Interactions Group at the University of Bern, Switzerland, where he investigated the dynamic patterns of stress-induced plant volatile production, emission and perception. Currently, Jamie is building kinetic models to understand the relationship between complex damage patterns and plant defence responses, as well as actively seeking funding to continue exploring the physiological mechanisms underlying the dynamic patterns and processes of plant-environment interactions across scales.



Luke Daly

Hi, my name is Luke, and it is a pleasure to make your acquaintance. I began my time at Trinity in October, so some of you are already aware of my arrival, however, for those of you who are not, hopefully a Phytobyte introduction will suffice.

I completed my Bachelor of Science in Maynooth University. The courses' structure was such that my studies were divided across four subjects (Biology, Mathematics, Experimental and Mathematical Physics) in first year and became narrower as the course progressed (ending with a complete focus on Biology). After completing my Bachelor I wanted to continue my academic journey, however, I decided that it would be prudent to earn some more research experience before diving into a Ph.D. (especially given the interruption of Covid during much of 2*nd* and 3*rd* year), so I decided to work as a research assistant for a time. I worked in UCD for almost two years as a research assistant with the Crop Stress Interactions (CSI) lab under one Assistant Professor Dr. Sonia Negrao, which was thoroughly enjoyable. Finishing my time at UCD brings us to October of this year and my start here at Trinity.

I am currently working with Assistant Professor Dr. Silvia Caldararu on the Quincy Terrestrial Model. More specifically, I am working to improve the representation of plant plasticity (within individuals and across generations) of the plants modelled during Quincy simulations.

To those of whom I am already acquainted, I should like to say thank you for the kind welcome. To those of whom I am yet to meet, I should hope to do so. Finally, to all of you I should like to say that I have immensely enjoyed my time at Trinity thus far and I look forward to working with you all into the future.

Ailbhe Brazel

Ailbhe recently joined Botany as a teaching fellow. She is a molecular biologist and is particularly interested in how plants switch on and off gene expression to overcome stress events and progress their development. Ailbhe will be collaborating on the ERC-funded TERRAFORM project during her time here.

Emily Symington

My name is Emily, I recently graduated from botany at Trinity and have just started my postgrad here this September. I'm doing a two years Research Master's which I hope to transfer to a PhD. My project is looking at the species distributions of the chocolate tree and its crop wild relatives, and consequently, how their future distributions may be impacted by climate change. Chocolate, the delicious treat which we all know and love, comes from the tree *Theobroma cacao* L. Unfortunately, this species is sensitive to drought, making it particularly vulnerable to climate change. As a result, I aim to investigate the distributions of the closely related species within the genus Theobroma using occurrence data of preserved specimens from herbaria. The resulting species distribution models will provide insight into which species possess potential genetic material for drought tolerance, while also informing about the conservation status across the genus.

Fernanda Azevedo

Hi, my name is Fernanda Azevedo, but you can call me Fern!
I started my PhD journey in September 2024 as a TRDA (Trinity Research Doctorate Award) award winner, supervised by Dr. Jessica Knapp and Prof. Jane Stout. My project, "Ask a Farmer: Socio-ecological Factors Affecting Pollinator Conservation in Agricultural Landscapes", will integrate social and ecological sciences to enhance pollination conservation in agricultural landscapes. Understanding social factors (beyond finances) that influence farmers' decision-making process can expand the comprehension of the behaviour around pollinator interventions and policies and help strengthen them.
This project is somewhat a continuation of my MSc dissertation, also supervised by Dr. Knapp here at TCD, titled "Farmer Questionnaires – Collecting Socio-economic Information on Farmer's Perceptions of Pollinator Conservation".
Before moving to Ireland, I had an online business, teaching about and selling houseplants (majorly tropical ones). I have a Postgraduate degree in Sexuality, Race and Human Rights from ENSP/FIOCRUZ (National School of Public Health / Oswaldo Cruz Foundation) and two undergraduate degrees from UFRJ (Federal University of Rio de Janeiro), one in Genetics and the other in Education (science teaching). During my undergraduate studies, I worked in different labs at UFRJ and JBRJ (Botanic Garden of Rio de Janeiro). My research focused on plant biotechnology, mainly developing coffee resistant to drought. I also studied evolutionary phylogenetics and epigenetics, investigating genes responsible for the ripening process in the Solanaceae family. Additionally, I explored the possible coevolution between plant hosts (Piptocarpha sp.) and fungi parasites (Pucciniales). Alongside my research, I worked as an Assistant Teacher at a prestigious school in Rio de Janeiro.

Gayathri Girish Nair

Hi! I am a new (Sep 2024) full-time PhD. Botany student at Trinty College Dublin. I am extremely grateful for the opportunity to pursue research and work on the fringe of science as my research group and I try to expand the horizons of existing botanical and climate science knowledge. We aim to make the existing wealth of plant trait, climate, and remote sensing data usable, and investigate the plant trait space as well as responses to climate change through the application of data science, deep learning, and machine learning.

I've completed an MSc. Computer Science (Data Science) at Trinity College Dublin (graduation 14 Apr 2022) and a BSc. (Honours) in Computer Science at Heriot-Watt University (graduation 05 Jul 2022), where I had a blast acquiring a large wealth of practical knowledge and skills.

During my time as a Machine Learning Engineer at Commtel Networks [2022-23], I worked in Research and Development, applying theory and skills to real-world problems in a thriving work environment. Here, I gained corporate skills and discovered excitement around translating research into a product/service that others may benefit from; very fullfilling an experience indeed.

Coming from a non-IT background, pursuing Computer Science with specialization in Artificial Intelligence, was a gutsy move, especially for someone with largely average math scores in high school. I took the leap purely due to curiosity regarding technology (AI, Internet) and the desire to understand concepts that mystify me (though, I must say, the more I learn, the more I realize just how much continues to baffle me).

So far, it has been a great journey. I've been blessed to have been surrounded by good people who value effort. Professors at HWU chose to grant me the highest undergraduate award, the WattClub Medal (School of Mathematics and Computer Science). My current supervisor at TCD, Dr. Silvia Caldararu, saw it fit to offer me a place in her research group. Further, the moving to another new country for studies has left me all the more wealthier in life experience and friendships! For this, I'm grateful.

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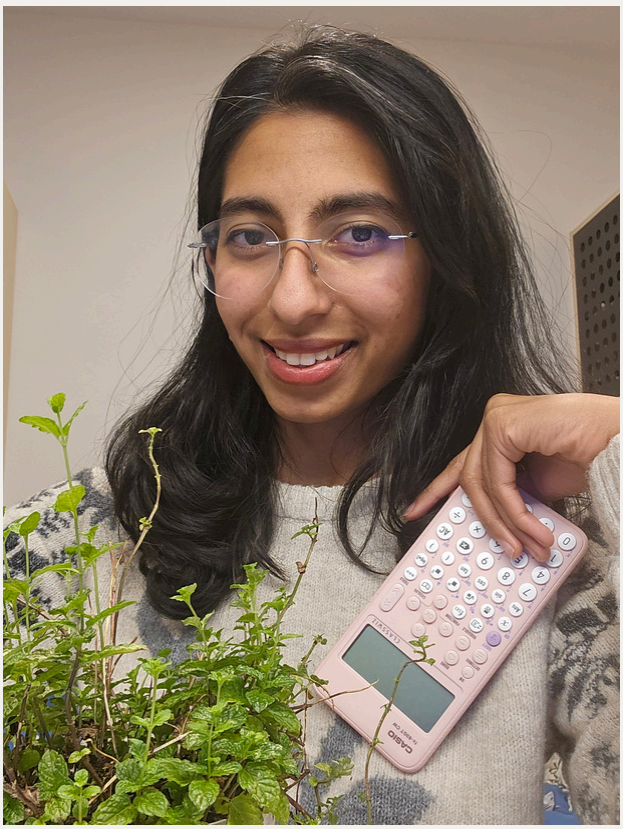
I identify as a multipotentialite with a variety of interests ranging from technology and the natural sciences to art, visual storytelling, animals, and psychology. Responsibility for our planet has always been a prime directive that I now have more means to follow through. I hope to learn and grow while harvesting all current skills and my thinking that draws from many an intersection of different schools of inspiration to arrive at new solutions to real-world needs.

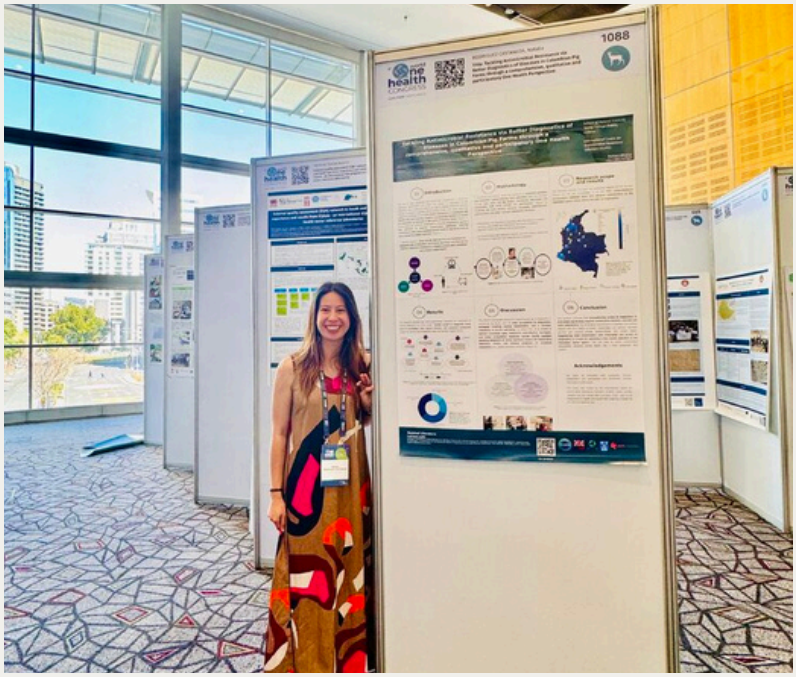


Francesco Martini recently left his position within **Jane Stout's lab**. We wish him all the best in all his future endeavors!

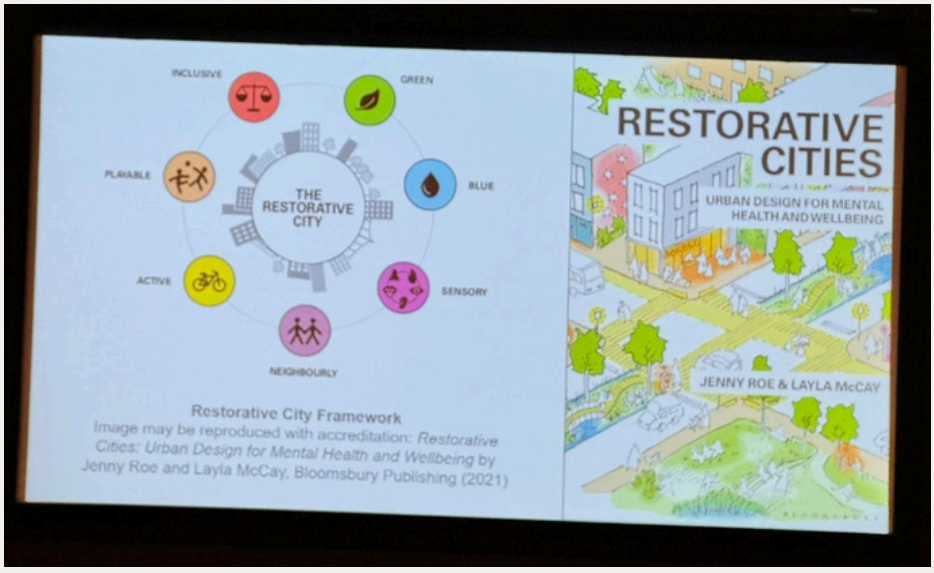
News

Conference

Lots of travelling for **Natalia Castaneda Rodriguez**! She attended to **the 8th World One Health Congress (WOHC)** held from the 20 to 23rd September in Cape Town, South Africa. She shared her research on Antimicrobial Resistance (AMR) in Colombian pig farms and discussed the importance of expanding One Health to urban environments, as well as fostering interdisciplinary dialogue with the social sciences to address global health and environmental challenges



Natalia also attended the conference **Cities and Mental Health (Villes et Santé Mentale)** held from the 19th to the 20th in Lausanne, Switzerland, where she explored the possibility to consider the city as a living and restorative museum through arts and contact with nature.



NoveEco

The research group **NoveEco** also donated to the foundation Cerros de Bogota with whom they collaborated, to continue promoting urban biodiversity conservation, and demonstrating how these spaces contribute to the physical and mental well-being of all. Read more about their project here **https://noveleco.eu/contemplating-los-cerros-in-bogota-from-the-nature-reserve-el-umbral-cultural-horizontes-a-therapeutic-landscape-experience/**

The European Researchers' Night

On September 27, 2024, **the Botany Department** joined **the European Researchers' Night** with an interactive performance titled *Storytelling Your Science*. The event was organised by intern student **Yoshii Jawei Xu** of **the Plant Climate Lab** and delivered by members of the department including **Catarina Barbosa**, **Antonietta Knetge**, **Katie O'Dea**, **Sate Ahmad** and **Thibault Dureaux**.

For the event, researchers were transformed into "audio books," sharing brief personal narratives about their scientific journeys, including both achievements and challenges. By emphasizing the emotional and subjective aspects of their work, the event sought to challenge the common perception of scientists as detached or unemotional. Instead, it highlighted the deep commitment and emotional resilience required to pursue a career in research. The event attracted approximately 200 attendees, including both casual passersby and those who came specifically for the Human Library experience.

ReFarm

In October the project **ReFarm** was launched.
ReFarm is a new national initiative aimed at making farming for nature sustainable and scalable, while providing businesses with an opportunity to fund nature-positive actions on Irish farms in a way that can be reported on under new EU sustainability reporting directives.
ReFarm is a collaboration between Trinity College Dublin, Burrenbeo Trust and local and international organizations. Researchers from Trinity College, including **Jane Stout** from Botany will examine long-term funding structures for businesses to invest in nature-positive actions on Irish farms. ReFarm has raised over one million euro.
https://www.irishexaminer.com/lifestyle/outdoors/arid-41500547.html

Talks

Dr. Wuu Kuang Soh spoke about the important uses of herbarium specimens in scientific research, conservation, and education with National Botanic Gardens in Glasnevin this November. https://www.gov.ie/en/press-release/78db1-join-us-for-an-exciting-autumn-science-lecture-series-at-the-national-botanic-gardens/

Dr Jamie Waterman gave an amazing talk on his previous work the "Dynamic patterns that shape plant-herbivore interactions" as part of the Ecology, Evolution and Environment seminar series.

Upcoming

Botany seminar series

The aim of the seminar is to showcase all of the exciting research going on in Botany at TCD. Drop a line to Richard Nair if you would like to do a seminar in future

Tuesday 17-Dec-24	Botany Lecture Theatre	Renata Asprino	The Advances in systematics of Chrysobalanaceae using phylogenomics

Quantitative Botany Journal Club

The journal club is held every month, where researchers meet and discuss a recent paper, focused on data analysis and/or modelling across the broad spectrum of plant research in the department. Everyone welcome – it doesn't matter if you're an expert on the paper topic, or want to learn more or simply want to chat science and complain about bad figures.
You can also suggest paper you want to discuss, the criteria are: focused on plants or ecosystem science, quantitative (large meta-analysis, machine learning, process based models) and recent (ideally last 6 months, no older than 2 years)

Every second Wednesday of the month at 15:00 in the Botany Library. Join the Teams here TCDGroup-QBot Journal Club | General | Microsoft Teams

This is a place where to be informed on every event going on in the department. If you are promoting or organizing any, please let us know!

Publications

Chu, J., **T Durieux**, and A. M. F. Tomescu. 2024. An early cladoxylopsid with complex vascular architecture: Paracladoxylon kespekianum gen. et sp. nov. from the Lower Devonian (Emsian) of Quebec, Canada. *American Journal of Botany* 111(10): e16418. https://doi.org/10.1002/ajb2.16418

Yiotis, C. and **Chondrogiannis, C**. 2024. Reduced diffusional limitations in carnation stems facilitate higher photosynthetic rates and reduced photorespiratory losses compared with leaves. *Physiologia Plantarum*, 176(5), e14573. Available from: https://doi.org/10.1111/ppl.14573

Kalachanis, D., **Chondrogiannis, C**., Petropoulou, Y. 2024. Photosynthetic Traits of *Quercus coccifera* Green Fruits: A Comparison with Corresponding Leaves during Mediterranean Summer. *Plants*, *13*, 2867. https://doi.org/10.3390/plants13202867

Ahmad, S., Yiotis, C., Xu, W., Knappe, J., Gill, L., and McElwain, J. 2024. Lower grass stomatal conductance under elevated CO2 can decrease transpiration and evapotranspiration rates despite carbon fertilization. *Plant Direct*, 8(10), e70013. https://doi.org/10.1002/pld3.70013

Brazel, A.J., Manoj, N.S., Turck, F. and Ó'Maoiléidigh, D.S., 2025. Measuring CO2 assimilation of Arabidopsis thaliana whole plants and seedlings. *Plant Science*, *350*, p.112295.

Martini, F., **Conroy, K.**, **King, E.**, **Farrell, C. A.**, Kelly-Quinn, M., Obst, C., Buckley, Y. M., **Stout, J. C**. 2024. A capacity index to connect ecosystem condition to ecosystem services accounts. Ecological Indicators, 167, 112731, https://doi.org/10.1016/j.ecolind.2024.112731.

Phytoart

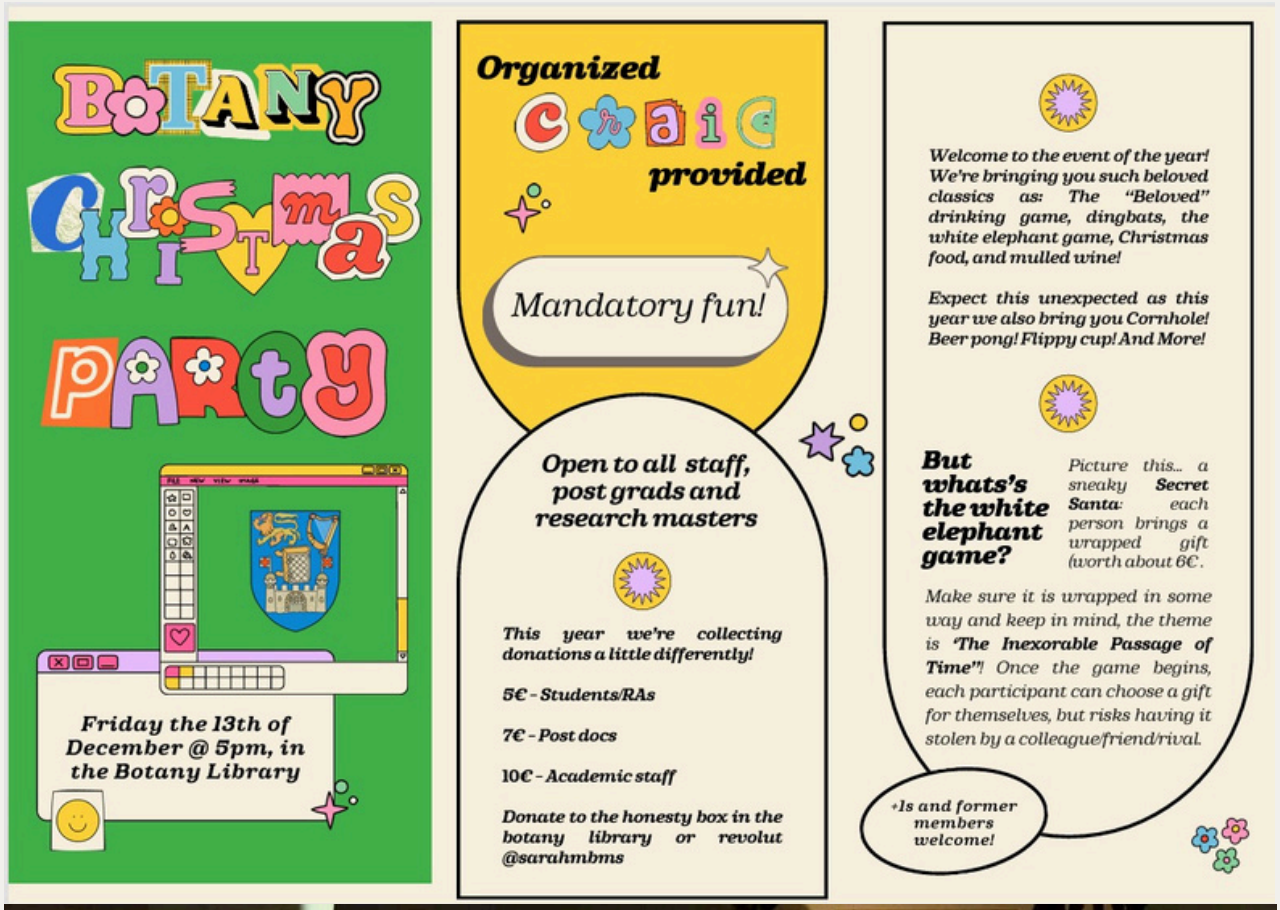
Keith Ladzinski is a National Geographic Photographer and Emmy-nominated director. His journey began in the spring of 1995 when he ventured to a Pawn Shop to use his earnings from a summer of mowing lawns to buy a secondhand camera. This seemingly modest acquisition sparked a creative awakening in him, reshaping his perspective with newfound imagination and potential. Initially drawn to capturing the untamed beauty of Colorado's wilderness and his fellow skateboarding friends, Keith quickly began harboring dreams of pursuing photography professionally.

Yet it wasn't until 2003 that the real journey would begin. While rock climbing in Aspen, Colorado, Keith sustained a ground fall that resulted in a broken neck, and a long list of catastrophic injuries, an accident that nearly took his life. But this brush with mortality didn't deter him. It became a defining moment. Within six months, he was back at the cliffs, with a camera in hand and a newly defined objective, to document. Over the preceding decades, climbing expeditions would take him across the seven continents multiple times over, and through his lens, Keith would capture the feats of the world's most elite rock climbers for esteemed publications like the Washington Post, New York Times, and National Geographic.

It was during these climbing adventures that Keith found himself uniquely immersed in diverse cultures and exotic ecosystems, which offered a natural transition into the realms of natural history, cultural, and environmental storytelling. His tenure at National Geographic is marked by a rich portfolio of comprehensive stories that include documenting The Great Lakes of North America, Krill Harvesting in Antarctica, The State of the Planet's Forests, Climate Change in America's National Parks, Paleontology Discoveries in the Sahara Desert, to Storm Chasing in Tornado Alley.

Keith's work extends beyond capturing images; it aims to provoke introspection and drive change. His stories have sparked viral conversations on critical issues such as mass algae blooms in Lake Erie to unique and rare animal sightings. In addition to his National Geographic endeavors, Keith co-founded Triage Creative, is a founding member of the Sea Legacy Collective and an acclaimed documentary film director. His clientele includes global brands such as Apple, Google, Nike, and National Geographic TV.

Find more at https://www.ladzinski.com



We hope the Christmas party was as jolly as a lab full of successful experiments! May your holiday season be filled with love, laughter, and just enough family drama to keep things interesting—without requiring peer review. Wishing you a Happy New Year that's as exciting as discovering a new element!

Need help?

TCD has a dedicated space for student and staff health and wellbeing, from physical to mental. Find all the resources here: https://www.tcd.ie/healthytrinity/

All staff, students and visitors have a role to play in making Trinity an inclusive and egalitarian community. The university has also developed dedicated offices who specialize in equality-related matters. The EDI representatives for the Discipline of Botany are **Silvia Caldararu (caldaras@tcd.ie)** and **Rebecca Riveira (riverar@tcd.ie)**

Thanks for reading!

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Call for cover art

We are looking for different art (preferably related to botany) for the cover every issue. Please do not hesitate to send us a photo of your drawing/arts! There is no deadline for this. Email us anytime!