

GATSBY PLANT SCIENCE SUMMER SCHOOL

MONDAY 29 JUNE - WEDNESDAY 1 JULY

CONTENTS

08.

N 14 🙅

ABSTRACT & BIO Details of our opening talk from Professor Nick Talbot on plant health, his research and career

03. ONLINE ACCESS

A reminder of where to find your Zoom meeting links and essential through the icebreaker, talks and information

03-04. PROGRAMME

The most important pages. Find out what's on and when each day

05. **ABOUT US**

Meet the team who put the GPSSS together: the Gatsby Plant Science Education Programme and find out about other plant science education projects they are leading

06-07. PLENARY TUTORS

Meet the tutors who'll guide you **O&A** sessions

09. ABSTRACT & BIO

An introduction to Tuesday's speaker Professor Claire Grierson and her plant science journey talk

10. ABSTRACT & BIO

Find out about our final speaker Professor Pete Smith, and the role of land in tackling climate change

11. NEXT STEPS PANEL

Meet four GPSSS alumni in preparation for the Q&A session. All are early career researchers. Ask them anything!

12-13. CAREERS PANEL

Biographies of the six careers panellists, some of whom are **GPSSS** alumni

14. AFTER THE GPSSS & **STAYING IN TOUCH**

The feedback survey and ways to keep the enthusiasm going

15-16. HANDY TIPS

Tips for researching your career and networking

17. UNDERGRADUATES

A list of all the students regsistered to attend the GPSSS along with contact details for each university's Gatsby Mentor

ONLINE ACCESS







CLICK ON THE ZOOM MEETING CONFIRMATION LINK YOU RECEIVE VIA EMAIL FOR THE RELEVANT DATE BY 13:30 EACH DAY

- YOU WILL BE PLACED IN A WAITING ROOM UNTIL THE HOST INVITES YOU IN
- EACH DAY WILL START PROMPTLY AT 13:45
- ENSURE YOUR MIC IS MUTED, VIDEO TURNED OFF AND YOUR NAME IS CLEAR -PREFERRED FIRST NAME AND LAST NAME

<u>PROGRAMME</u>

CPSSS20 DAY 1 MONDAY 20 JUNE	BY 13:30	Log onto the Zoom meeting confirmation link you received when registering Ensure your mic is muted, video off and your name clearly identifies you as preferred first name and last name
	13:30 - 13:45	The host will admit you into the meeting from the waiting room
	13:45 - 14:30	WELCOME talk, housekeeping, meet the team, your tutors, introduction to the GPSSS
	14:30 - 15:00	ICEBREAKER: you will be automatically placed into a breakout room in a small tutorial group of about 10 with a tutor and take part in an activity to get to know your group. You'll be in the same group for all group activities Unmute mic, turn video on
	15:00 - 15:30	PLENARY TALK: Professor Nick Talbot, The Sainsbury Laboratory, Norwich ' The International Year of Plant Health - what can a cereal killer teach us about sustainable crop disease control?' Mute mic, stop video

- 15:30 15:40 BREAK
- **15:40 16:20 TUTORIALS:** you will be automatically placed into a breakout room with your tutorial group and tutor to explore the ideas presented in the plenary talk and discuss their implications. At the end of the tutorial, your tutor will help you formulate a question or two to take back to the lecture theatre for the Q&A session. One person will be nominated from each group to ask the speaker the group's question. Unmute mic, turn video on
- 16:20 17:00Q&A SESSION with Professor Nick TalbotMute mic, stop video if prompted, unmute mic and turn video on
- 17:00 CLOSE OF DAY REMARKS and acknowledgements

<u>PROGRAMME CONT.</u>

^{CGPSSS20}	BY 13:30	Log onto the Zoom meeting confirmation link you received when registering Ensure your mic is muted, video off and your name clearly identifies you as preferred first name and last name
TUESDAY 30 JUNE	13:30 - 13:45	The host will admit you into the meeting from the waiting room
	13:45 - 14:00	WELCOME: introduction to the day
	14:00 - 14:30	PLENARY TALK: Professor Claire Grierson, University of Bristol 'Adventures of a scientifically promiscuous plant biologist'
	14:30 - 15:10	TUTORIALS: you will be automatically placed into a breakout room with your tutorial group and tutor to explore the ideas presented in the plenary talk and discuss their implications. At the end of the tutorial, your tutor will help you formulate a question or two to take back to the lecture theatre for the Q&A session. One person will be nominated from each group to ask the speaker the group's question. Unmute mic, turn video on
	15:10 - 15:20	BREAK
	15:20 - 16:00	Q&A SESSION with Professor Claire Grierson Mute mic, stop video - if prompted, unmute mic and turn video on
	16:00 - 17:00	NEXT STEPS SESSION Q&A Mute mic, stop video - if prompted, unmute mic and turn video on
	17:00	CLOSE OF DAY REMARKS and acknowledgements
eGPSSS20	BY 13:30	Log onto the Zoom meeting confirmation link you received when registering Ensure your mic is muted, video off and your name clearly identifies you as preferred first

- **13:30 13:45** The host will admit you into the meeting from the waiting room
- 13:45 14:00 WELCOME: introduction to the day

name and last name

- 14:00 14:30 PLENARY TALK: Professor Peter Smith, University of Aberdeen 'The role of land in tackling climate change'
- 14:30 15:10 TUTORIALS: you will be automatically placed into a breakout room with your tutorial group and tutor to explore the ideas presented in the plenary talk and discuss their implications. At the end of the tutorial, your tutor will help you formulate a question or two to take back to the lecture theatre for the Q&A session. One person will be nominated from each group to ask the speaker the group's question. Unmute mic, turn video on
- 15:10 15:20 BREAK
- 15:20 16:00 Q&A SESSION with Professor Pete Smith Mute mic, stop video - if prompted, unmute mic and turn video on
- 16:00 17:00 CAREERS SESSION Q&A Mute mic, stop video - if prompted, unmute mic and turn video on
- 17:00 CLOSE OF GPSSS REMARKS and acknowledgements

ABOUT US

GATSBY PLANT SCIENCE EDUCATION PROGRAMME (GPSEP)

Plant science has never been more important. Some of the greatest challenges posed by population growth and climate change can only be met in the context of a strong fundamental understanding of plant biology, and the translation of this knowledge into field-based solutions.

The <u>Gatsby Plant Science Education Programme (GPSEP)</u> is funded by the <u>Gatsby Charitable Foundation</u> to make a demonstrable difference to the teaching and learning of plant science at all ages in the UK, supporting the development of a pipeline of plant science inspired future scientists and a plant science aware generation of citizens.

The Gatsby Plant Science Summer School (GPSSS) is one of a number of higher education (HE) projects managed by the GPSEP team and aims to nurture interest, confidence and engagement of the best and brightest undergraduate students with plant science.

Working closely with schools, colleges and universities, the GPSEP project <u>Science and Plants for Schools (SAPS)</u>, advocates for the presence of relevant and inspiring plant science in the school curriculum and qualifications, and develops free plant science teaching resources to support this. Each year a group of teachers of post-16 biology participate in the Gatsby Plant Science Summer School, offering them a unique opportunity to engage with contemporary plant science to inspire their classroom teaching.



Stephanie Smith HE Project Manager GPSEP sjs249@cam.ac.uk



Claire Pennycuick HE Project Coordinator GPSEP cp536@cam.ac.uk



Celia Knight Academic Advisor GPSSS celia@ckconsult.co.uk



Dan Jenkins Head of GPSEP dmj25@cam.ac.uk



Alex Jenkin SAPS Project Manager GPSEP aej34@cam.ac.uk



Jamie Biggs SAPS Project Coordinator GPSEP jb2152@cam.ac.uk

PLENARY TUTORS

For group activities in breakout rooms you will be placed in a small group with a tutor. You will remain in the same group for all group activities.

Your plenary tutors are selected from participating universities and research centres. They are all plant scientists, but they may not be specialists in the same field as the lectures you will have just heard.

Whilst they will certainly be able to answer basic questions, they are not there to explain all the parts of the lecture you didn't understand, but rather to help you identify the key concepts contained in the talk.



DR VERENA KRIECHBAUMER Oxford Brookes University

Research interests:

The structure and function of the plant endoplasmic reticulum (ER), membrane proteins and auxin biosynthesis using biochemical techniques as well as high-resolution live cell imaging.



DR ANDREA HARPER University of York

Research interests:

The genetic factors controlling complex traits in plants. Focussing on traits that are important for the protection of the environment, the sustainability of agriculture or food security. @Andrea_L_Harper



PROF ANDREW HUDSON University of Edinburgh

Research interests:

The Hudson Group research examines the genetic basis for plant diversity and adaptation using two taxa - Antirrhinum (snapdragons) and Arabidopsis thaliana.



DR MATT JONES University of Glasgow

Research interests:

Working to understand how plants integrate light signals to optimise responses to abiotic stress.



PROF ADAM PRICE University of Aberdeen

Research interests: Genetic variation in rice at the breeding, physiological and molecular level.

PLENARY TUTORS CONT.



DR JILL HARRISON University of Bristol

Research interests:

Identifying the developmental and genetic basis of two such innovationsthree dimensional shoot growth and branching - in a range of model systems representing different stages of plant evolution.



DR MIKE ROBERTS Lancaster University

Research interests:

Plant stress responses. The regulation of responses to plant-insect and plantpathogen interactions. Focusing on priming; the long-term 'memory' of plant stress and its impacts on future defence responses both within and between generations.



DR HADRIEN PEYRET John Innes Centre

Research interests:

Currently working on the European Union Horizon 2020 project *'Newcotiana'*, which aims to develop novel *Nicotiana* plant varieties for use in plant molecular farming. <u>@HadrienPeyret</u>



DR DAPHNE EZER University of York

Research interests:

Developing new computational methods for interpreting next generation sequencing data that comes from complex experimental designs, involving time series, combinatorial treatments, spatial analysis etc.



DR ANTHONY DODD John Innes Centre

Research interests:

Investigating the adaptation of plants to fluctuating environments, focusing on circadian regulation and signal transduction. @ant_dodd



DR YOSELIN BENITEZ-ALFONSO

University of Leeds

Research interests:

Cell-to-cell signalling and communication, symplastic transport, plasmodesmata regulation, root organ development, legume symbiosis, physical and biological properties of the cell wall polymer callose. @benitez_lab



DR PIERS HEMSLEY University of Dundee

Research interests:

To understand how protein S-acylation (palmitoylation) acts to control protein function, with particular emphasis on its role in stress responses and development in plants. @Hemsley_Lab Contact details for the tutors are hyperlinked through their name. Keep the conversation going and contact them after the GPSSS. They will be happy to hear from you.

You never know, you could end up working in their lab.

PLENARY TALK

WHAT CAN A CEREAL KILLER TEACH US ABOUT SUSTAINABLE CROP DISEASE CONTROL? Professor Nick Talbot

GPSSS20

DAY 1

The Sainsbury Laboratory, Norwich

The United Nations has designated 2020 as The International Year of Plant Health. The world is therefore focusing some deserved attention on the importance of crop diseases to humanity.

Many resource-poor communities in low income countries suffer enormous hardship when crops fail, as they often do, due to disease outbreaks. Recent advances in our understanding of plant immunity and microbial pathogenesis, however, provide unparalleled opportunities to develop new durable control strategies for plant diseases. Many of these could impact the developing world and make a significant difference to the lives of many of the world's poorest people.

I will review some of these advances and how they can be deployed effectively. I will also use the devastating rice blast disease, caused by the fungus *Magnaporthe oryzae* as an example of how we need to develop an integrated understanding of both fungal pathogenesis and plant immunity, if we are to develop control strategies that are both truly durable and environmentally sustainable, in the face of the climate emergency.

My laboratory is studying the cell biology of infection by the rice blast fungus and learning how it is able to suppress plant immune responses. I will review recent advances in these studies in the context of trying to control one of the most serious crop diseases on the planet.



More about Nick

Nick Talbot is Executive Director of The Sainsbury Laboratory, Norwich. His research is focused on the biology of plant diseases and he utilises a range of cell biology, genetics and genomics approaches in his work. Nick is interested in understanding how fungi are able to invade plants using specialised infection structures called appressoria, how plant tissue is invaded, and how fungi suppress plant immunity. His main contributions have been in understanding

plant infection by the rice blast fungus *Magnaporthe oryzae*. Rice blast disease destroys up to a third of the annual global rice harvest – enough rice to feed 60 million people. It is therefore an important economic and humanitarian problem. Nick received his PhD in Molecular Genetics from the University of East Anglia. After postdotoral research at Purdue University in the USA, he moved to the University of Exeter as a Lecturer, later becoming Professor of Molecular Genetics, Head of the School of Biosciences, and Deputy Vice Chancellor.

He joined The Sainsbury Laboratory, Norwich as Executive Director in 2018. He has authored more than 170 publications. He is a Fellow of the Royal Society of Biology, a member of EMBO, a member of Academia Europaea, and a Fellow of The Royal Society. He is one of the four current Gatsby Plant Science Advisors.

BIOGRAPHY

PLENARY TALK

ADVENTURES OF A SCIENTIFICALLY PROMISCUOUS PLANT BIOLOGIST

GPSSS20

DAY 2

Professor Claire Grierson University of Bristol

I love to assess evidence for myself, rethink beliefs from first principles and weigh things up from fresh points of view. The best way to keep doing that is to talk to "outsiders", by which I mean people from other fields. Some of the most important "eureka" moments of my career have come from talking to people who know very little biology.

I enjoy this, but has it really changed my science? Or have I wasted my time?

What can we gain from talking to people who are not primarily biologists?

And how do we have those conversations well?



More about Claire

Claire studied for her BSc (Hons) in Microbiology and Microbial Technology at the University of Warwick. This involved daily walks up and down the (intimidatingly named) Gibbet Hill. In those days the only students who made this journey were biologists and mathematicians. Conversations she had there showed her how interesting cross-disciplinary discussions can be and she has never stopped having them since.

During her PhD, funded by a Sainsbury Studentship with Professor Mike Bevan FRS at Cambridge University and the John Innes Centre, Claire studied mechanisms controlling potato tuber development. Since then she has worked on root development in *Arabidopsis*, first as a post-doctoral researcher with Professor Liam Dolan FRS and Professor Keith Roberts at the John Innes Centre and later as a Royal Society Dorothy Hodgkin Research Fellow at IACR-Long Ashton.

Claire became a lecturer at the University of Bristol in 2000, Professor in 2009, a Director of the Bristol BioDesign Institute in 2017 and Head of School in 2018.

She really enjoys collaborating with researchers in other disciplines, especially engineering, environmental science, computer science and maths, because talking to smart people from outside her field really helps her to understand biology better.



PLENARY TALK

THE ROLE OF LAND IN TACKLING CLIMATE CHANGE Professor Pete Smith University of Aberdeen

GPSSS20

DAY 3

The land, and the food system, have a vital role to play in tackling climate change. While land has an important role to play, it can't do it all - immediate and aggressive greenhouse gas emission reduction is needed across all sectors.

Many options for climate mitigation within the land sector and the food system deliver a range of co-benefits for ecosystem services and also contribute to delivery of the UN Sustainable Development Goals. Options that have potential negative side-effects need to be managed to minimise such effects. Some interventions enhance the potential of many other mitigation options.



More about Pete

Pete Smith is Professor of Soils and Global Change at the Institute of Biological and Environmental Sciences at the University of Aberdeen and Science Director of the Scottish Climate Change Centre of Expertise (ClimateXChange).

He has served in various roles for the Intergovernmental Panel on Climate Change (IPCC). His main interests are in climate change mitigation and impacts, soils, agriculture, bioenergy, food security, greenhouse gases, ecosystem services and ecosystem modelling. He is a former member of Defra's Science Advisory Council, and DfID's Science Advisory Group and the Global Food Security Science Advisory Board and has been an advisor to the Committee on Climate Change. He currently chairs the Royal Society's Global Environmental Research Committee and sits on a number of other Royal Society Committees. He is a Fellow of the Royal Society of Biology, a Fellow of the Institute of Soil Scientists, a Fellow of the Royal Society of Edinburgh, a Foreign Fellow of the Indian National Science Academy, a Fellow of the European Science Academy, and a Fellow of the Royal Society (London).

He has published more than 500 peer-reviewed journal papers with total citations of over 30,000 and has an H-index (WoK) of 90 (120 on GS). He has been a Highly Cited Researcher each year since 2015.

BIOGRAPHY

NEXT STEPS PANEL



LINDSAY WILLIAMS

I am a Gatsby-funded, second-year PhD student at the University of Edinburgh in Professor Steven Spoel's lab, looking at the impact of harvest on a plant's immune system.

My undergraduate degree was Plant Science Honours at the University of Edinburgh, with my focus on molecular biology and biotechnology. I attended the Gatsby Plant Science Summer School, and later got funding from Gatsby for a summer project. THE NEXT STEPS SESSION IS AN OPPORTUNITY FOR YOU TO ASK QUESTIONS TO A PANEL OF PHD STUDENTS AND EARLY CAREER RESEARCHERS WHO ARE GPSSS ALUMNI. FEEL FREE TO ASK THEM ANYTHING ABOUT THEIR EXPERIENCES IN RESEARCH

I retrained as a plant biologist in my late twenties, and now part-time study enables me to balance my work in the lab with my parental responsibilities.



ANDREA PATERLINI

I am a 4th year PhD student at the Sainsbury Laboratory, University of Cambridge. My research project focuses on cell-cell communication in plants. I am about to submit my PhD thesis before moving abroad for a postdoctoral research position.

I did my undergraduate

degree, in Plant Sciences, at the University of Edinburgh and attended the Gatsby Plant Science Summer School in 2014. That experience and the connection with the Gatsby community profoundly shaped my academic career. The following year, I competed and secured a Sainsbury Undergraduate Studentship funded by the Gatsby Charitable Foundation at the Sainsbury Laboratory.

CHRIS WHITEWOODS

My undergraduate degree at the University of Edinburgh, was Biology with honours in Plant Science. I did not expect to leave with a Plant Science degree, but I was won over by excellent lectures and the GPSSS.

I did an undergraduate

summer research project at the University of Oxford, funded by Gatsby. That convinced me that I loved doing research.

I completed my PhD at the University of Cambridge. I investigated the genes that control plant meristem growth and how they evolved to let plants grow on land. I then moved to the John Innes Centre in Norwich, where I am today. I am having a great time and hoping to start my own lab in the next couple of years.

At 33 I'm a little older than most PhD students. I chose not to begin my University education until I was 27. Prior to this I had a career as a Police Officer for 6 years.

Initially I registered for a Zoology undergraduate degree at the University of Leicester but graduated with a general Biosciences degree, to reflect my future career aspirations towards plant science and genetics. I attended the GPSSS14 which helped consolidate my interest in plant science.

I was awarded funding for an undergratuate summer project from Gatsby. My work on this project later resulted in becoming a named author on a publication and excellent lab experience.



I started my PhD, as part of a Doctoral Training Partnership (DTP), at the University at Nottingham in 2016. The DTP allows you to select three different research projects that interest you and complete a short placement within each group, before making a final decision on your PhD project. My project uses an African rice species, which is exceptionally drought tolerant, to explore droughtrelated traits and try to identify the genes responsible, with the aim for future crop improvement.

CAREERS PANEL



DR LAURA VICKERS Senior Lecturer in Plant Biology Harper Adams University Ivickers@harper-adams.ac.uk

I have had a very broad research career. having worked on the distribution and physiology of wild Caiman crocodilius yacare in Brazil as part of my undergraduate degree (as well as attending the Gatsby Plant Science Summer School), before completing a PhD at the University of Birmingham on the response of aphids to drought (combining entomology and plant physiology). During my PhD I was awarded a Small Ecological Project Grant from the BES (British Ecological Society), to investigate the distribution of invertebrates in an underground canal system in an inner city area of the Black Country.

After my PhD I took up a postdoc role at Harper Adams University, within the Fresh Produce Research Centre. My research involved investigating the use of deficit irrigation in lettuce and onion crop systems to save water. I then returned to the University of Birmingham for a year to undertake a teaching focused lecturing role before leaving to take up a permanent lectureship in the Crops Department at Harper Adams University, as well as being awarded a NERC Knowledge Exchange Fellowship in Horticulture.

I lead the Urban Farming theme within Harper Adams University and manage the MSc in Agricultural Sciences and Production Systems.



JACK CLOUGH Plant Health and Seeds Inspector Animal and Plant Health Agency jack.clough@apha.gov.uk

I attended the Gatsby Plant Science Summer School in 2015 whilst studying for my degree in Natural Sciences. The range of talks were highly enjoyable and the school was influential in my choosing to specialise in Plant Sciences during later years at university.

During my degree I carried out a number of research placements at the Sainsbury Laboratory, Cambridge University (SLCU) investigating hypocotyl development in *Arabidopsis thaliana* and polysaccharide extraction from seaweed cell walls.

I now work as a Civil Servant for the Plant Health and Seeds Inspectorate (PHSI), within Defra's Animal and Plant Health Agency (APHA). The role of the Inspectorate is to enforce plant health policy in England and Wales. This involves carrying out a variety of activities aimed at protecting plants from pests and disease, whilst facilitating trade in plants and plant products.

Whilst working for the PHSI I have been involved with handling outbreaks of Oak Processionary Moth, Asian Longhorn Beetle, tobacco whitefly, Plum Pox Virus and Tomato Brown Rugose Fruit Virus. Other day to day activities include issuing phytosanitary certificates for plant exports, surveillance for quarantine pests at garden centres/nurseries, and conducting crop inspections for certification purposes.



PROF KATIE FIELD Professor of Plant-Soil Processes, BBSRC Translational (David Phillips) Fellow **University of Sheffield** k.j.field@sheffield.ac.uk

My research interests are focused on the widespread interactions between plant roots and symbiotic fungi, together known as mycorrhizas. I use isotope tracers, environmental physiology and metabolomics to explore the exchanges of plant-carbon and fungalacquired nutrients between mycorrhizal symbionts which occur in >80% plants.

My particular interests, and those of my team, lie in how mycorrhizas respond and interact with changes in environment, in both evolutionary and applied contexts. Our research is helping us to understand the role mycorrhizal fungi may have played in the colonisation of Earth's terrestrial environment by plants >500 million years ago, and how we might be able to use mycorrhizal fungi to reduce future agricultural usage of chemical fertilisers and pesticides. We are also helping to inform crop breeding programmes to produce the next generation of mycorrhiza-friendly crops.

I completed my PhD in environmental physiology in 2009 at the University of Sheffield before getting into mycorrhizas during my postdoctoral studies (2009-2015), also at Sheffield. I got my first academic post at the University of Leeds in 2015, moving there as a University Academic Fellow and becoming Professor in 2019. I moved back to the University of Sheffield this summer (2020) as Professor of Plant-Soil Processes.

CAREERS PANEL CONT.



DR BENNETT YOUNG Managing Editor Plants, People, Planet (Journal)

b.young@lancaster.ac.uk

I am Managing Editor of Plants, People, Planet, which is a cross-disciplinary open access journal that publishes plant-focussed research within the wider context of its relevance to people, society and the planet. Plants, People, Planet is owned by the New Phytologist Trust, which is an independent, notfor-profit organisation dedicated to the promotion of plant science.

Within my role I oversee all aspects of the journal's operation from commissioning and peer review, to production and promotion. The position of Managing Editor is incredibly varied and I love working for an exciting new journal and organisation that is passionate about the importance of plants.

I have a BSc in Biochemistry from the University of Manchester, during which a BBSRC funded lab internship introduced me to the amazing world of plant science. I completed my final year degree project and postgraduate studies in the same lab, graduating with a PhD in plant sciences in 2010. I then spent 14 months in industry working for a medical devices company called Alere, before returning to the world of plants as Assistant Editor at the Journal of Experimental Botany, where I worked for six years before joining the New Phytologist Trust family.



DR LAURA BOUVET Knowledge & Innovation Facilitator Agri-Tech East & AHDB

laura.bouvet@agri-tech-e.co.uk

I was first interested in plants and agriculture as a career during my undergraduate degree in Biology at the University of York. There I was also able to do a Year in Industry and worked in a lab that was producing cocoa plantlets to replace dying trees in cocoa plantations. This led onto a Masters in Crop Improvement at the University of Nottingham. One of the first roles in my career was as a research technician at NIAB monitoring wheat pathogens.

I couldn't get enough of plant pathogens so this experience turned into a PhD on wheat yellow rust resistance at the University of Cambridge and NIAB, where I got to work more closely with the plant breeding industry and often spoke with farmers about plant disease resistance.

I started my role as Knowledge & Innovation Facilitator towards the end of my PhD, while writing up my thesis. In this role, I've been working more closely with researchers, farmers and tech entrepreneurs on a variety of projects and branching out into potato research, too. Projects include translating research outputs from potato research into relevant and practical information for farmers. I also coordinate a research project led by farmers who are interested in improving the quality of their soils.



CALLUM GILHOOLEY Consultant Ecologist Environmental Resources Management (ERM) callum.gilhooley@erm.com

I am an ecology and biodiversity consultant for ERM's Capital Project Delivery team, based in London. I specialise in habitat assessment and management, working on projects at all stages and scales, from largescale infrastructure projects to the low carbon economy transition, providing technical input, field survey and project management. I'm experienced working within large, multi-disciplinary teams, engaging with stakeholders in the design of strategic ecological mitigation and delivering achievable solutions.

I graduated from the University of Sheffield in 2009, and gained experience in land management and conservation through a series of full-time voluntary posts with the Yorkshire Wildlife Trust, National Trust for Scotland, and University of Edinburgh, before finding my first paid environmental role. I've spent several years working as a Ranger in Glencoe and southern Cairngorms National Park in Scotland and I took up a role in environmental consultancy in 2013. Focusing on deer management and the restoration of peatland and montane habitats, I've eventually found my way to London and ERM in 2016.

When not practicing social distancing, I enjoy getting into the countryside, with a preference for visiting the hillier National Parks and AONBs to ride my mountain bike or (increasingly less frequently) indulge a love of fell running.

AFTER THE GPSSS

BY THE END OF THE GPSSS WE HOPE YOU'LL HAVE A REAL INSIGHT INTO CONTEMPORARY PLANT SCIENCE, THE CHALLENGES AND THE POSSIBILITIES. YOU'LL ALSO HAVE SEEN PEOPLE WITH VERY DIFFERENT CAREERS. PLEASE TAKE THIS OPPORTUNITY CONTACT ANY OF THE TEAM ABOUT YOUR NEXT STEPS, TO HELP YOU FEEL BETTER EQUIPPED TO MAKE THEM.

FEEDBACK AND ACTION PLAN

After the GPSSS20 you'll be asked to complete a feedback survey which will include an 'Action Plan'. The survey will be emailed to you. Your Action Plan should consist of three commitments that you will make as a result of attending the GPSSS.

Some questions you might like to ask yourself to help you come up with ideas include:

- Is there anyone I've seen at the GPSSS that I'd like to get in touch with?
- Is there a subject area in plant science that I'd like to learn more about?
- What plans would I like to put in place for next summer ideally?
- How can I share my experience of the GPSSS with my peers?

Do I have any ideas of what I'd like to be doing longer term e.g. postgraduate study or careers?

Your Action Plan will be shared with your Gatsby Mentor at your university on your return to your studies, so that they can support you with fulfilling your commitments. Your Gatsby mentor may be able to help provide further information and support in fulfilling your Action Plan. We strongly encourage you to contact your Gatsby Mentor on returning to your studies to discuss this.

STAYING IN TOUCH

THANK YOU FOR JOINING US AT THE GATSBY PLANT SCIENCE SUMMER SCHOOL (GPSSS) WE HOPE THIS IS JUST THE START OF OUR JOURNEY TOGETHER

Facebook

We'll be sharing news, insights and opportunities for your career in science via the 2020 Facebook group.

YouTube

Videos and interviews with past GPSSS speakers, careers case studies, careers tips and more are all available on our <u>YouTube channel</u>. Feel free to share the YouTube channel with fellow biology students at your university.

LinkedIn

LinkedIn can be a valuable way to start building your professional profile. We encourage you to create a profile on LinkedIn: do include your attendance at the GPSSS. Please link to Stephanie Smith, Celia Knight or Claire Pennycuick. This will enable you to see the profiles of all Stephanie, Celia and Claire's connections, including many of the speakers and tutors at the GPSSS. There is also a <u>GPSSS alumni group</u> you can join.



Twitter

Do you use Twitter? Our handle is @ <u>GatsbyPlantScEd</u>. Follow us for updates, opportunities and to see what else we're up to. You'll find #plantsci useful too.

Be an Ambassador

If you've enjoyed this week and want to share your enthusiasm with fellow students, why not apply to be a Student Plant Science Ambassador at your university? We offer starter packs to help spread your enthusiasm amongst your peers and have grants of up to £200 for alumni to set up plant science societies or events in your own universities. Past Ambassadors have organised behind-the-scenes visits to Kew, workshops inspired by the GPSSS, visiting speakers, and of course plenty of socials! Look out for an email from us about this in the new academic year.

Surveys

As an alumnus of the GPSSS, we'll survey you once a year about the longterm impact the GPSSS has had on you: please look out for these surveys. We very much welcome your views as to how together we can continue to raise the profile of plant science.

HANDYTIPS

RESEARCHING YOUR FUTURE: 10 TIPS TO GET YOU STARTED

1. Follow your interests and passion

Aim for jobs based on your interests but don't expect careers to always reflect study very closely e.g. you may be interested in plant pathology, but a job that uses this knowledge, such as plant breeder, may only draw on it fairly infrequently.

2. Know your skill strengths

Consider the skills required in various jobs – these are most likely going to occupy more of your daily work routine than the knowledge base. For example, do you prefer a numbers-based analytical job involving data collection and analysis which could be equally as satisfying applied to work for an environmental consultancy agency or large scale genome project analysis; or maybe you prefer practical laboratory work or communicating with people?

3. Get experience

Use your time as an undergraduate to try out one or two careers if you can. Summer studentships or work-based employment are great ways to find out if you like, or equally as important dislike, some jobs – and the experience will look good on your CV.

4. Consider summer vacation studentships as a taster

If you think you want to do a PhD or work in scientific research, doing a summer studentship next year is a good way to give you a hint of what's involved and will help you network. Some of these require a tutor to apply on your behalf so take a look at the details and discuss it with someone at your university. The Gatsby Charitable Foundation fund up to seven Sainsbury Undergraduate Studentships.

5. Read the job adverts

Look at the jobs section in New Scientist or Nature regularly, just to get an idea of the sorts of jobs available, their salaries and locations. You don't have to wait until you need a job to do this. Also take a look at #plantscijobs on Twitter.

6. Write a CV

Try writing a CV for a job that you like the look of. It will help you focus on where the gaps are while you still have time to plug them. Be brave and show it to as many people as possible; your tutors, your university careers service, even your friends. The more feedback you get at an early stage, the better your CV will be when you really need it.

7. Let people know your interests and network

Many people's career choices are made by chance recommendations and networking. Talk with your tutors about what interests you – they might suggest names or opportunities that get things going for you.

8. Consider further study – Masters or PhD?

At this stage, you might be quite clear that you want to do further study either (or both) because you don't yet want to stop full time education, or because you realize that the jobs you are interested in require an MSc or PhD. Databases and admissions details are available at findamasters.com for Masters degrees and at findaphd.com for PhDs. Masters courses (MSc) can be normally 1 year taught courses and a useful way to enhance your knowledge in a specific area. Masters in Research (MRes) are normally 2 year courses involving extended research projects. Masters courses can be useful in confirming your interest in a subject, expanding your expertise in a given area and helping you to compete for certain jobs. Many students go on to study a PhD for a further 3 or 4 years, but entry to PhD studentships can be directly from BSc for those with first or upper second class degrees. Increasingly, PhD study is a 4 year Doctoral Training Project (DTP) and the university providing it includes a range of training opportunities.

9. Be clear what a PhD is

Although a PhD is a period of study and you gain a qualification at the end if successful, it is unlike a BSc or MSc in the way it is funded. UK students taking PhD studentships at UK universities normally receive a grant from a funding agency, e.g. a research council, which pays the fees and a stipend for living costs. Find further information at <u>www.findaphd.com/funding</u>. The stipend of around £14-15K per year is effectively equivalent to a starting salary of around £20K as it is tax-free and some agencies add supplements to this. Rules for overseas students differ.

10. Find out how to choose the best PhD studentships and where to study

To be a career research scientist, you will need a PhD and many people who find themselves ultimately in different professions say that studying for their PhD gave them invaluable skills. You won't need the detail of how to apply until the start of your final year, but it's a good idea to start talking with your tutor about the process as early as possible and your university should have lots of information to help you. Making the right choice will involve you having specific interests and good grades in relevant subjects. Factors to consider nclude the funding and publication record of the supervisor as well as their record in supervising PhD students; the location; do you want to study in the UK or abroad:

how much will you get paid etc.? The move from undergraduate to postgraduate study is an ideal opportunity to move institution and broaden your experience, which can sometimes be seen positively by employers. You may love your undergraduate university and its location, but ask yourself if it would be the same once all of your friends have graduated and moved on.



MORE HANDY TIPS

<u>A GUIDE TO</u> Networking



FOR WHEN FACE-TO-FACE MEETINGS & EVENTS ARE PERMITTED!

BE PREPARED

If you know there are going to be networking opportunities at an event, take a few minutes to look over the list of attendees and think about who you might like to approach. Ask the organisers to help if you can't find the person you are looking for. Adopt a positive mental attitude, particularly if you find networking daunting, tedious or difficult. Other people are probably just as daunted by the prospect of networking as you are.

HAVE AN ELEVATOR PITCH READY

If you are looking for a placement or work experience, practice a succinct pitch introducing who you are and what you are seeking or can offer.

START CONVERSATIONS WITH A PLEASANTRY OR AN OBSERVATION

An easy way to start a conversation with a stranger is with a general observation or question e.g. 'wasn't that a great talk!' or 'what did you think of that talk?' but move swiftly to business. If you are networking with potential supervisors or employers, think about the questions you can ask to find out more about what they do.

LISTEN

Once you've asked a question, show you are listening to the answer by nodding or adding small comments. Summarising their answer or asking a follow up question is a good way to show you understood, and to find ways of working together.

FINISH WITH A BUSINESS CARD

Wait until the current topic of conversation lulls a little, tell your companion that it's been a pleasure to have spoken to them and you hope they enjoy the rest of the event. Shake hands and always proffer a business card if you think you might be useful to each other at some point in the future.

FOLLOW UP

If someone has given you their contact details, follow up in a day or two via email. Simply tell your contact that it was a pleasure to meet them, and politely remind them about anything they offered to share e.g. a research paper or website address. If they haven't responded in a couple of weeks, you could remind them ('Just wondered if you'd had a chance to?'). If they still don't respond, leave it. Always be appreciative even if they give you very little, and be ready to give back whenever you can.

FINALLY

Be yourself! Networking is most successful when your real personality shines through with confidence.

NDERGRADUAT

Durham University Gatsby Mentor: Keith Lindsay

- Eve Blar
- Lottie Keyse
- shua Southworth

Imperial College London Gatsby Mentor: Pietro Spanu

Lancaster University Gatsby Mentor: Mike Roberts

Newcastle University Gatsby Mentor: Anne Borland

Oxford Brookes University Gatsby Mentor: Verena Kriechbaumer

Royal Holloway, University of London Gatsby Mentor: Alessandra Devoto

University of Aberdeen Gatsby Mentor: Adam Price

University of Bath Gatsby Mentor: Paula Kover

University of Birmingham Gatsby Mentor: Dan Gibbs

University of Bristol Gatsby Mentor: Jill Harrison

University of Cambridge **Gatsby Mentor: Julian Hibberd**

Service Carl Annual Carl

Univerity of Dundee Gatsby Mentor: Claire Halpin

University of Edinburgh Gatsby Mentor: Andrew Hudson

University of Essex

Gatsby Mentor: Tracy Lawson

University of Exeter Gatsby Mentor: David Studholme

University of Glasgow

Gatsby Mentor: Matt Jones

University of Leeds Gatsby Mentor: <u>Stefan Kepinski</u>

Buffs Bornaght Julia Fibiti Dera Hernardez

Roma Long Had Roberts Particle Balls Strategy

University of Leicester Gatsby Mentor: David Twell

University of Liverpool Gatsby Mentor: James Hartwell

Telescol Tagorie Halffers Halfer Array Resolution

University of Manchester Gatsby Mentor: Jon Pittman

University of Nottingham **Gatsby Mentor: Zoe Wilson**

University of Oxford

Gatsby Mentor: Liam Dolan

University of Reading

Gatsby Mentor: Jonathan Mitchard

University of Sheffield **Gatsby Mentor: Andrew Fleming**

University of Southampton **Gatsby Mentor: Matthew Terry**

University of Warwick **Gatsby Mentor: Lorenzo Frigerio**

University of York Gatsby Mentor: Richard Waites

ACKNOWLEDGEMENTS

We gratefully acknowledge the generous funding from the Gatsby Charitable Foundation for the Plant Science Summer School. The Gatsby Charitable Foundation aims to support the best fundamental plant science research in the UK, particularly in the areas of pathology and development. People are at the heart of their plant science programme, and they aim to nurture, sustain and increase the supply of excellent plant biologists.

We also wish to thank all the participants listed for their valued input and support, especially the speakers and plenary tutors.



And finally, we would like to thank all of you, the students, for taking part in the first ever online Gatsby Plant Science Summer School