



# How can a PhD help me and my career?



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NERC SENSE CDT and NERC Panorama DTP

## What is a PhD?

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A PhD is a doctoral research degree – this means that you'll do research to find out something totally new in your field. You'll generally start a PhD by reviewing current literature, then gather data and results to analyse. Using this data you'll draw conclusions, and present these through writing and graphs. A PhD typically takes between 3 and 4 years, and to complete a PhD you write up all your work into a final thesis and have a final oral examination ('viva' or 'defence'). When you pass you will be a Doctor of Philosophy in your research field – and change your title to 'Doctor'! In studying a PhD, not only will you be the leading expert in your chosen research topic, but your PhD will also equip you with a diverse skillset, and contacts in your field that could lead to a multitude of different careers. This document will outline some such skills, and provide career insights from some of our industry partners.

## What are DTPs and CDTs?

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These are the main ways that PhDs are funded in the UK. A DTP is a 'Doctoral Training Programme', which fund PhD students in cohorts and usually involve a number of organisations and subject areas. A CDT is a 'Centre for Doctoral Training', which differs from a DTP because it is subject specific (e.g. Earth Observation) and there is extensive training within the programme. There are also many other sources of funding for PhD programmes.

## What are the benefits of doing a PhD in the NERC SENSE CDT?

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The Satellite Data in Environmental Science CDT (**SENSE CDT**) is a Centre for Doctoral Training in Earth Observation, offering fully funded PhD opportunities at the University of Leeds, University of Edinburgh, National Oceanography Centre and British Antarctic Survey. The SENSE CDT offers **extensive training**, both when you start your PhD to equip you with skills you need and throughout your PhD. This includes specialist workshops, hackathons and training in the UK and abroad. Every SENSE PhD student will have the opportunity to collaborate closely with the **space and environmental science industry**, through annual industry symposiums and 3-month funded industry placements (CASE partnership). All of our students will have the

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opportunity to work closely with international space agencies, including ESA, DLR and NASA, with study visits available for students.

## What are the benefits of doing a PhD in the NERC Panorama DTP?



PANORAMA

The Panorama NERC Doctoral Training Partnership (DTP) is a collaboration of the University of Leeds, the University of York and the University of Hull. The DTP is hosted by six academic departments across the University of Leeds, the Wolfson Atmospheric Chemistry Laboratories at the University of York and the Energy and Environment Institute at the University of Hull and represents a wide range of research in the natural environment. Panorama prepares the next generation of environmental science leaders for industrial, governmental, NGO and academic careers through exceptional training across multi-disciplinary research teams and industrial placements. The programme will equip you with the skills necessary to understand the complex interactions within the Earth system, so you can contribute to the development of scientific, policy and industrial solutions for the national and global scale problems we face in coming decades.

## What skills can I get from a PhD?

You will develop both technical, subject specific scientific skills, but also broader skills that will be transferable to any future career. These are not soft skills, they are power skills! Here are just some of these skills a PhD will enable you to develop:

**Project planning** – Your PhD is a substantial piece of work, where you often address multiple research questions, that enables you to develop good project management skills. You will design, plan and carry out your own work.

**Problem solving** – You will solve many problems throughout your PhD. You will be answering research questions, and tackling subsequent problems along the way.

**Communication** – You will learn to communicate your research to different audiences. By writing your thesis, or research papers, you will be communicating complex ideas to scientific audiences. You will most likely also present your work at conferences, maybe even international conferences, where you may be presenting to wide audiences. You may also enjoy teaching, science communication and outreach activities, delivering your science to more broad audiences such as young people and communities.

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**Independence** – While you will have support from your PhD supervisors, ultimately the PhD project is your own. You will learn to work confidently independently, with continued support from your research group.

**Critical thinking** – You will develop these skills whereby you consider the source and legitimacy of information. As a scientist, you learn to look at data critically. You will also learn to think about the strengths and limitations to your own work, to produce reputable results you can be proud of.

**Time management** – With PhD you have several years to complete a substantial research project. You will need to develop good time management to enable efficient use of your time, to get the most out of your research.

**Social skills** – While studying for your PhD you will belong to a research group, and will also develop networking skills to work with and discuss ideas with colleagues in your field of research.

**Data analysis** – In your PhD you will collect data, and need to interpret, draw conclusions and present your findings. This is a valuable skill in many fields.

**Programming** – This is an extremely versatile skill which teaches problem-solving, logical thinking and persistence. Many scientific jobs require coding in at least one programming language.

**Scientific expertise** – You will receive tailored training to conduct your research. You will become a leading expert in your own field.

## What careers could a PhD lead me to?

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A PhD could lead to almost any career imaginable! Throughout the course of a PhD, you have autonomy over what you study. Therefore, you have the opportunity to develop the skills that you need and want. These skills may be subject specific, for example analysing satellite data or conducting geochemical analyses. You will also develop transferable skills as discussed previously, which will make you a desirable candidate to a wide range of employers.

### **Academia**

One career path that some PhD graduates pursue is academia. This is continuing research in a University setting. Typically, if you wish to work in academia following a PhD you will conduct a Postdoctoral Research Position, in which you work with other academics on their research projects. Following on from Postdoctoral Research positions, you may go on to become a Research Fellow, a Lecturer, and then may progress on to Associate Professor and Professor.

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### Industry

Many PhD students go onto pursue careers in industry, using the skillsets and knowledge gained in their PhD. The SENSE CDT, Panorama DTP, and many PhD programs will support you in exploring industrial career paths, through placements with an industrial partner. For an idea of some of the careers our past PhD students have pursued, please see here some of SENSE's industrial partners.



SENSE CDT's industry partners

### Any career you want!

Ultimately, the skills you will develop during a PhD will be tailored to you. If there is a career you know you would enjoy in the future, then think about the skillset that would be required for this position, and consider how to incorporate those skills suitably into your research project.



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### Meet some of our industrial partners

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As Cryosphere Scientist for the European Space Agency's Climate Office, my role is to analyse the needs of the scientific community for satellite observations of the cryosphere and the climate system, to decide how these fit into the Agency's wider strategy and to then derive the technical specifications needed for setting up and managing R&D contracts on satellite retrievals of snow and ice. I am a physicist by training, who side-stepped into radar remote sensing. My PhD at the Scott Polar Research Institute was the stepping stone for a technical career at the European Space Agency. Although perhaps my career path wasn't clear to me from the start - and certainly still confuses family and friends ("so you are no longer an astrophysicist but you work for the space agency?") - I feel very lucky that little by little I picked up the skills that helped me piece together an exciting career. I often attribute my love for cold climates to my childhood in Russia.



**Dr Anna Maria Trofaier**  
Cryosphere Scientist  
European Space Agency



**Dr Tom Ingleby**  
Earth Observation  
Specialist SatSense

I'm part of a small team working on the technical side of the company. My main focus is processing satellite data, developing new products, improving our algorithms and automation of workflows. The small nature of the team means I end up doing a little bit of everything, and the variety is one big positive of my job. I've also really enjoyed working as part of a team to solve problems and learned a lot from others in the process. Doing a PhD has set me up really well for this job: the technical expertise were pretty much essential, but the ability to solve problems, work independently and write clearly have all been really useful.

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I am an academic in the School of Geosciences (University of Edinburgh) seconded to lead Earth Blox (CEO). Earth Blox is a SaaS with a vision to democratise access to planetary scale geospatial data. I enjoy my work as there is not a single day like the other. I'm also working with a fantastic team. Together, we are innovating, creating a solution that helps the world address some of its greatest challenges. What's not to like? As an employer, I'm looking for entrepreneurship. The ability to convert a problem into an opportunity, and to enthusiastically work to find, develop and deliver a solution.



**Dr Geneviève Patenaude**  
Academic &  
CEO of EarthBlox



**Dr Craig Poku**  
Postdoctoral Researcher  
University of Leeds

I'm a Postdoctoral Researcher in Climate Sciences. My current role investigates how we can improve fog forecasts over Northern India by improving the representation of fog microphysics in models. Although I enjoy the science, I am passionate about science communication and how I can engage in particular under-represented groups in climate and atmospheric sciences. Doing a PhD was helpful, as it gave me the opportunity to develop my critical thought and gain the confidence to be the next leader in my chosen field.

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My job is to maintain and improve the use of satellite observations in the Met Office numerical weather prediction systems, with a focus on observations relating to atmospheric dust. Following my first degree in Natural Sciences (Physics) at Cambridge I worked in industry for 2 years and then did a PhD at the University of Bordeaux, France, working on the ESA Soil Moisture and Ocean Salinity (SMOS) satellite mission. I very much enjoy working in satellite data assimilation and feel lucky to have found this career path. I enjoy being able to do projects that are both cutting-edge research and lead to concrete outcomes such as improving forecasts for users. I also enjoy the teamwork and being able to travel internationally to conferences and interact with other scientists around the World. Without my PhD I would not have been able to follow the path that I have, particularly the EUMETSAT fellowship that started off a career in weather forecasting. I have also found it to be very valuable to have a strong research basis and it is an advantage to have a personal area of expertise, developed during a PhD.



**Dr Heather Lawrence**  
Senior Scientist  
Met Office



**Dr Ekbal Hussain**  
Remote Sensing Geoscientist  
British Geological Survey

I'm a remote sensing geoscientist at the British Geological Survey. I specialize in using satellite radar techniques to monitor ground movements around the world, whether that's from earthquakes, volcanic inflation, landslides, or ground compaction. I also work on trying to understand multi-hazard frameworks. The most rewarding part of my job is when I get to work on disaster risk problems with friends and colleagues in low-income countries. Plus, I get to travel to lots of interesting places a lot! Because my job is quite a specialist role, I wouldn't have been able to do it without a PhD. Also, the networks and scientific acumen is something that you really start at your PhD and develop throughout your research career.



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# Highlights from our careers panel

The six scientists we have just introduced joined us in November 2020 for a live streamed discussion on how a PhD could help you and your career. This discussion can be viewed from [SENSE's YouTube channel](#). We wanted to present just some of the highlights from our discussion here.

Some of our panellists expressed their initial motivations for studying a PhD. Our panellist Craig studied his undergraduate degree in Maths. During his Masters, Craig quit, deciding that he was done with academia and went on to work in government. This work however made Craig realise that getting a PhD would enable him to have the impact he needed for the changes he wanted to achieve. Likewise, Anna Maria stated that is she wanted to be useful in this world, she felt she needed more of a specialism; which a PhD provided.

We discussed how broader 'soft skills' may be the most important thing you can take from a PhD. Genevieve is a CEO of an enterprise, and explained how the ability to synthesis information and the self-confidence you develop are the foundation you need through your PhD and future careers. Anna Maria, reminded us all that these are not soft skills at all, they are power skills!

One specific skill we did discuss however, was coding. Coding is one skill that many people find intimidating. Panellist Tom did not know how to code at all before starting his PhD, but found his PhD to be a great opportunity to learn. Heather actually found coding as a nice way to bond with colleagues she was sharing an office with. You are not on your own when studying a PhD. Postdocs and other PhD students can be one of your best resources.

We asked the panel if a PhD would make you stand out from the crowd. As there are now more and more graduates, a PhD is definitely a differentiator that would make you stand out from the crowd. A PhD is also a wonderful thing. There are no parallels in the private sector. An employer would not give you 3 or 4 years to work on your own research questions, however a PhD does. This leads us onto the fact that you should not just do a PhD because you need one to get a job. You do a PhD because you want to. It is certainly a journey, and you need to decide whether you would like to spend this time researching a problem.

One of the major themes we did discuss, was that at times every single one of our panellists felt like they were 'not good enough' to do a PhD. Imposter syndrome is a very real thing, that can affect anyone. You may be asking yourself whether or not you a smart enough to do a PhD, however if you are willing to put in the work and effort, and have a passion for your research, then you most certainly are.

**How can a PhD help me and my career?**

Have you considered doing a PhD?  
Join us for a live webinar where we'll discuss how studying a PhD could help you in a multitude of different careers.

Hosted by the SENSE CDT  
Tuesday 17th November 2020 @3pm

Logos: SENSE CDT, ESA, Satsense, Met Office, BGS, EARTH BLOX, UNIVERSITY OF LEEDS

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**How can I choose between academia and industry?** Sometimes it is not necessarily one or the other! Many people choose to do a PhD after working in industry for a few years, and some of our panelists say time in industry helped with their PhD, and also gave them a better appreciation of why they wanted to do a PhD. Deciding on a future career between academia and industry will be a personal decision, however once you complete your PhD, you will have the skillset to equip you for both. You would likely develop an idea throughout your PhD if you would like to continue pursuing a further career in academia, as it is the surrounding you spend most of your time. Conducting a placement in industry during your PhD is a great opportunity to try both fields.

**Is it a bad idea to start a PhD just because you are finding it hard to get a job?**

It is not recommendable to do a PhD because you need one to get a job. You should do a PhD because it's something you're passionate about. A PhD is a big commitment, and you want to be sure you are enthused by what you will be studying.

**Am I smart enough to do a PhD?**

Genevieve from our panel suggested that a PhD was 5% talent, and 95% effort! If you put the work in, you will succeed. Many people in academia doubt their abilities, with 'imposter syndrome' affecting many people. Have belief in yourself, and if you think you will enjoy the journey of a PhD, apply!

**Will I get paid more if I enter a job with a PhD?**

This may depend on what type of job you want to get. If you are hired as a scientist, it is possible you may be paid more with a PhD. For example if you enter the Met Office with a PhD you enter at a higher grade and are paid more.

**How can I know if I want to do a PhD?**

Taking up research opportunities wherever possible would give you a good insight as to whether you would enjoy a PhD. For example, if you get chance in your undergraduate degree, complete a research project.

**How do you balance a PhD with family life?**

Our panellist Tom recommended that boundaries are important, and he found that treating his PhD like a 'normal job' worked pretty well (i.e. work 9 - 5, Monday - Friday). The flexibility of a PhD is also helpful - if you have kids and you need to pick them up at 3 pm, you usually can without any issues.

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**What is the main challenge after finishing PhD degree?** For some people including Heather from our panel, the main challenge was somewhat of a mental challenge – you may not have completed your PhD to your own satisfaction which you might need to come to terms with, and the final year of the PhD is quite tough so you might need to recover. I would say that if you want to stay in research it can take a while before you are able to secure a permanent position. You might need to work on temporary contracts for a while, which can be stressful.

**With PhDs being often in a specific or niche field, would this make applying to jobs asking for broader experience more difficult?**

Our panel member Heather said she has actually found the opposite to be the case. During your PhD you become a world leader in a particular area and gain specialist knowledge that can be very valuable. For example Heather now works on atmospheric satellite data but knowledge of land surface radiative transfer, gained during their PhD, has been very valuable in the current role and made Heather stand out from the crowd. Heather also found that an employer will be very aware of what they can themselves teach you and sometimes they are keen to hire someone who doesn't have knowledge of the job they will do, but has other experience/knowledge that could be very valuable to the organisation. Panel member Tom also wanted to highlight the value of the 'soft skills' such as working independently and critical thinking; broad skills that enable you to pick up specific skills an employer may want you to learn.

**Do I get paid for doing a PhD?**

Funded PhDs through DTP or CDT programmes provide funding for usually 3 years and 6 months at the standard UKRI rate (currently £15,285 in Session 2020/21), which is not subject to UK income tax or national insurance. Your University fees are also paid. In addition, you will receive a Research Training and Support Grant (RTSG) to cover conference attendance, fieldwork, any additional research visits to other institutions, and other miscellaneous costs.

**How do I apply to a PhD?**

You can find PhDs on websites like 'FindaPhD' and this will give details on how to apply. Please also check [SENSE](#) and [Panorama](#)'s websites for their current positions and how to apply.

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*'A PhD will give you lots of skills that will help you succeed in your future career. But don't do a PhD just to help you with your future career – do it because you love research, you want to find out something new and you want to be a scientist.'*