



Science & Technology
Facilities Council

Fourteen years after Career profiles of STFC PhD students

April 2010

ability **able** acquired analysing analytical background
business career collaborators communication competitive complex
computer current data deal **developed**
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mathematical modelling particle **people** period **phd**
physics problem professionals provided qualification
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work

Fourteen Years After: Career profiles of STFC PhD students

April 2010

Acknowledgements

STFC would like to thank all former students who responded to the request for information about their careers and appreciate the time and effort which made the publication of these profiles possible.

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Introduction

In 2009, the Science and Technology Facilities Council (STFC) commissioned DTZ to find out about the career paths that former PhD students have followed and how they have made use of the skills they developed during their study. More information about study is available from the STFC website.

One of the aims of this project was to improve our knowledge about the impact of STFC-funded PhDs working outside of higher education. This was achieved by re-contacting former students who had been working outside of higher education at the time they responded to a previous survey in 2003. These former students completed their PhDs between 1995 and 1999.

A sample of 86 former students was identified. Using the contact details provided in the 2003 survey, they were asked whether they would be willing to provide material for career profiles covering:

- career history from completing PhD
- current employer and what the job involves
- use of the skills acquired during their PhD in their current role
- any advice they would have for current PhD students in planning their careers

Destinations of former STFC students

At the time of the 2003 survey, about half of the former students who responded were working in the private sector, 35% in universities and 12% in other government or public sector organisations.

In the private sector, about three quarters worked in business or financial services: in investment banks, money market traders, fund management companies and companies providing management consultancy services. Former students also worked for large business systems companies and a minority worked in manufacturing companies.

A common feature of these roles was that they require high-level mathematical, computer modelling and information technology skills which are key components of most STFC PhDs.

In the public sector, employment was divided between organisations that are engaged in research, such as UK and international research establishments, and those that did not undertake research directly, such as the mainstream civil service and organisations such as schools, the BBC and NHS.

Career Profiles

The careers of the former students featured in the profiles are well established and several have reached senior positions. Therefore, they are uniquely positioned to reflect on the value and impact of the skills they developed during their PhDs. The material collected provides valuable insights into the impact of astronomy, astrophysics, cosmology, particle physics planetary science and solar & space physics PhDs in the wider economy.

Several of the respondents had embarked on the next stage of an academic career (e.g. postdoctoral research/fellowships) before deciding to leave academia, while others had moved straight into the private or public sector.

Some common threads run through the experiences of these former students. For many, a PhD is not strictly necessary for their current role but the skills developed have often been critical in building their careers: problem solving, creativity, innovation, analytical skills, data manipulation, modelling skills, computer programme, IT skills. However, underpinning these skills are the abilities to communicate and to work with people.

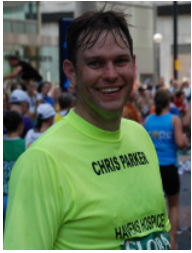
The most common pieces of advice to current PhD students were to:

- make the most of the opportunities to develop and demonstrate transferable skills on offer during a PhD
- be proactive in creating career opportunities, in particular through networking
- be aware that employers are looking for team working and communication skills as much as technical ability

This report contains fourteen career profiles developed from the material provided by former students 10 to 14 years into their post-PhD careers. STFC would like to thank the former students who responded to the survey and appreciate the time and effort which made this publication possible.

Christopher Parker, Senior Manager, Traded Credit Risk Systems at HSBC

PhD: Theoretical Physics, Imperial College, 1992 to 1995



“Develop and maintain contacts in and outside the fields in which you want to work. People move in and out of academia and industry, so the more people you know when you are looking for the next move, the more chance there is of finding the one that will be right for you. Implicit in this advice is that you have to look for the chance to change role, rather than expect it to come to you.”

Career Path

I joined the Royal Bank of Scotland and worked as a Senior Developer within Group Risk Systems. After three years, I joined Credit Suisse as a Project Manager within Global Market Risk Technology. Then I moved to Citigroup where I worked for eight years as a Project and Programme Manager in Global Risk Architecture. In 2008, I joined HSBC.

What I do now

I work in the Group Risk function, which is responsible for Risk Management policy across all business lines and geographies. My role involves taking ownership of the credit risk management systems used for the Global Markets businesses within HSBC. These are responsible for measuring and monitoring exposures to our trading counterparties across the full range of interest rate, foreign exchange, commodity, equity and credit derivative products. I work with the users of the systems to identify their needs for new development, and with the technology teams that support and develop the systems to ensure these changes can be delivered in the most effective and efficient manner.

Skills

A PhD is not essential for my job but many people working in the field of risk management and quantitative finance have a scientific research background, although this is changing as universities offer more specialist degrees.

My work in the finance industry has used many of the skills gained during my PhD: problem solving, communication, researching documentation, analytical skills, data manipulation, computer programming, collaboration and planning. I work very closely with quantitative finance professionals, and have sufficient mathematical skills to understand their "language" and systems needs. I also learned about systems development from the bottom up during my employment in a number of banks. This allows me to act as a bridge between the people responsible for building risk management applications and those that define and use the risk models in the systems.

The high point of my career was achieving regulatory approval for two of the systems I have worked on. The first was the use of Credit Suisse's market risk system for regulatory capital in 2000. The second was for Citigroup's Basel II Counterparty Risk Capital model in 2007. As a fat bloke, I'm proud of my two London Marathon medals, but I am more proud of my family than anything I have achieved as a student, runner or finance professional.

Joanna Hart, Director, global investment bank until 2008, now full-time mother of two children

DPhil: Particle Physics, University of Oxford, 1995 to 1998



“Use all the opportunities you can to meet different people, especially people in business, when you are looking for a job. Make the most of being able to research a pure academic subject – it does bring rewards and skills that can be used in business – you just have to be a bit more creative about how you present them.”

Career Path

I joined the London office of a global investment bank as a Telecoms Equity Research Analyst and worked in this position for around three years. My job involved thorough analysis of company financial statements, detailed financial modelling, and use of a range of valuation metrics and detailed sector knowledge to advise international investors on whether they should buy, sell or hold specific companies. In 2002, I became a Telecoms Specialist Salesperson and was promoted to Director.

In 2004, I left to take up a similar position at Director level in another investment bank, again in London. My role and responsibilities included keeping 40+ international clients up to date with telecoms information and analysis and taking a lead in the organisation of a team of 10+ people.

What I do now

I left in May 2008 and am currently a full time mum of two children. I am now looking to return to the workplace, but would like to take my career in a different direction, ideally in a part time role.

Skills

It was not essential to have a PhD in my job. However, I did make use of skills gained through my PhD and believe they played a role in helping me to progress quickly and develop a successful career in the financial services sector. The skills that were particularly important were computer literacy (being able to use a wide variety of computer applications without training), analytical skills, and the ability I developed through my PhD of being able to work with a range of people, especially across different nationalities.

Barry Laphorn at Research Analyst, Citi (formerly Citigroup)

PhD: Solar Physics, Queen Mary and Westfield College, University of London, 1993 to 1998

“If you are applying for a job in an industry that is even moderately dissimilar to pure science, you should research it. I have interviewed dozens of postgraduates and many have been very underprepared. We do not expect you to be able to do the job straightaway, but some applicants seem to have little knowledge of what it is they are being interviewed for.”

Career Path

After completing my PhD, I accepted a position at Credit Suisse First Boston (CSFB), which is an investment bank. I was also offered a job with a defence contractor, but also CSFB offered a technically interesting job and a way to clear student loans faster. I started in the repo team (repurchase agreement trading IT systems) and my final role was in the infrastructure technology team. After three years, I left to join another investment bank, Citigroup.

What I do now

I still work for Citi as a research analyst in the Quantitative Analysis Group. This involves implementation of interest rate and credit derivative pricing models via C++ and Excel spreadsheets. I am also responsible for the creation and maintenance of C++ infrastructure and libraries to facilitate cross-platform interoperability of analytical libraries. I work on a variety of different projects: interest rate and credit derivative pricing code; spreadsheets; common libraries and underlying infrastructure code.

Skills

I do not use the 'hard' skills from my PhD in my day-to-day job. I no longer use any knowledge of solar physics, or the FORTRAN programming language. However, I do use the transferable skills, in particular, what I was taught during my PhD about having a rigorous and methodological approach to work which is very important in my job. The experience of writing scientific papers and a thesis has also been helpful, although 'business prose' is somewhat different.

In interviews we look for the ability to work as part of a team, technical knowledge and an ability to learn. It may seem old fashioned, but both general appearance and timeliness are indications of the candidate's intention and seriousness towards the job.

Preparation for interviews is vital. The internet is now a huge resource (unlike when I graduated), and there are many sites that give you a good idea of what different jobs involve.

Debbie Morgan, Senior Consultant, Ernst & Young

PhD: High Energy Physics, University of Sheffield and CERN, Switzerland, 1995 to 1998



“Use every opportunity to refine your transferable skills through writing papers, attending and presenting at conferences and working with international colleagues. The international experience I got through my PhD has certainly helped my career progression as so much business is conducted globally. Do not be afraid to change direction. My decision to leave academia was very difficult but it is also one of the best decisions I ever made.”

Career Path

I worked as a postdoctoral research fellow at the University of Cambridge for around six months before being awarded a PPARC Research Fellowship (also at Cambridge). My research focussed on developing semi conductor detectors for the inner tracker of the ATLAS experiment at the Large Hadron Collider at CERN. By the second year of my fellowship award I felt that academia was not for me and resigned my fellowship. I wanted to take my career in a different direction as a technical consultant, and it was better to get started on this sooner rather than later.

In June 2000, I joined a small telecoms consultancy company in Cambridge. I was made redundant a year later but was lucky to find a similar consultancy role quickly with Cooperative Financial Services. My role in the company was to develop IT strategy across the business and to manage key IT projects within the business. After three years, I left to join IBM Business Consulting as a Financial Services strategy consultant. This involved working with clients in the financial services sector to improve the efficiency and effectiveness of their IT organisations.

In 2006, I left IBM to join Ernst & Young as a Senior Consultant and this is where I am still employed.

What I do now

I work for a variety of FTSE 100 clients across the UK in the financial services sector on consultancy projects, with my key client being the largest Retail Bank in the UK. I assess and advise on the effectiveness of IT operations in client organisations, looking at everything from people and processes to systems, technology and the overall cost of IT. I typically manage a team of around five people in Ernst & Young, reporting to senior executives at the client which at times includes the CEO.

Skills

It is not necessary to have a PhD for my job but most of my colleagues have some sort of higher qualification such as a Masters, MBA or PhD so in that respect it is invaluable. My job is all about analysing complex, technical information and communicating it to business professionals in an understandable way - I am often described as providing the ‘glue’ between business and IT. My PhD was ideal training for this. The advanced IT and professional skills I developed gave me the technical knowledge, as well as the softer skills, I need in this job.

During my research career, I became interested in activities relating to public understanding of science. I found I was good at translating complex technical information for a lay audience and this is when I started to think about a career where I could use these skills as a technical consultant outside of academia.

Danny Heron, Director, Business Modelling Group, Deloitte

PhD: Theoretical Astrophysics, University of Leicester, 1992 to 1995



“When you are undertaking a PhD, you tend to spend a lot of time working on your own or in small teams. In the commercial world, the ability to work in teams and to communicate with a range of people is really important. So grasp any opportunities you get to develop presentational and communication skills during your PhD, as they will really help you later.”

Career Path

During my PhD, I developed complex mathematical and computer models to reflect theories on the dynamics of material close to black holes. I was interested in the idea of developing models to forecast the performance of businesses. However, the feedback from several management consulting firms was that modelling skills were not enough and I needed to learn about business.

Therefore, I joined Coopers & Lybrand (now PricewaterhouseCoopers), the accountancy firm, and trained for three years as an auditor, qualifying as a professional chartered accountant in 1998. Armed with some business experience I was able to secure a move to the Corporate Finance department of Ernst & Young, joining their specialist Business Modelling Group. This group supports blue chip companies and large organisations in evaluating big decisions, such as the viability of new investments or products, the disposal of non-core businesses, or the restructuring of financing structures, through the development of complex financial models. This job shaped the rest of my career.

In 2001, I left Ernst & Young with several colleagues to set up a new Business Modelling Group at Deloitte. I joined as an Assistant Director and was promoted to Director in 2006.

What I do now

Today I am part of the senior team responsible for managing a group of 40 specialists. My average day is split between identifying and winning new business, managing ongoing projects, and building client relationships, typically within the energy, infrastructure and transport industries.

Skills

Although my PhD did not open doors immediately, the specialist skills I developed through my PhD have helped me to progress quickly once I had the foot in the door.

A PhD is not essential for my job but the skills I developed through my PhD are the ones on which I have built my career: problem solving, mathematical and computer modelling skills as well as data analysis and the ability to ‘think outside the box’.

My advice to current postgraduates is to remember that there are opportunities for people like you outside academia. However, I learnt the hard way that if you are thinking about a career outside academia that has no direct link to your research, do not expect people to immediately value your PhD qualification. You may have to take a ‘step down’ initially. As I said above, I was told to go away, learn about business and then come back - which is what I did.

Martin Millmore, Director, Oracle Corporation

PhD: Particle Physics, Imperial College London, 1992 to 1995



“Any PhD student who goes into a career for motivations other than enjoyment will spend their time wishing they were doing something else, and neither put the most in nor get the most out of their job. There are careers in industry doing just about anything, and an enthusiastic PhD candidate will always do well in them.”

Career Path

After my PhD, I got a job with Oracle Corporation and have remained there ever since, progressing from a junior developer to a Director.

What I do now

My current job involves running a team that is designing Oracle’s next generation Human Resources applications. In the past, many HR systems focused on recording employees’ names and addresses, recording appraisals, and so on. They often did this on well-designed web pages, but it was still very much recording data.

As part of our next generation of products, we are radically improving the way that we then present that information back to the business user. Using the most modern analytic capabilities available, we aggregate information from many systems to provide managers with real time intelligence about the current and predicted performance of their talent pool. This kind of analysis is quite dauntingly difficult, but is exactly the kind of complex evaluation that my PhD prepared me for.

I have seven patents and patent applications to my name: two already granted and five at the application stage.

Skills

My job requires a great degree of innovation as this is a very competitive and fast moving part of the market. The ability to think laterally and to be creative is essential in producing new products that are better than the competition. My PhD taught me a great deal about finding novel solutions to problems and instilled a mentality of always looking for opportunities to innovate. Thus, it provided an excellent training for what I do now. My job also requires working with a large number of different people around the globe. Working with lots of international collaborators as part of my PhD was an excellent introduction to this - teaching me to work with people from different cultural backgrounds, in different locations around the world.

I think that if you want a good career as opposed to a good job, it is important to do what you enjoy. The other advice I would give is to work really hard on your communication skills. Take every opportunity to give presentations to your colleagues, to present at conferences, even volunteer to go to talk at schools. Employers respond well to people who can communicate their messages effectively, and a PhD is a great opportunity to practice that.

Coreena Lofting, Senior Patent Attorney, British Telecom (BT)

PhD: Space Physics, Imperial College London, 1994 to 1997



“If you feel you lack a skill, ask around about courses and additional projects that might help you to develop wider experience, whilst still undertaking your PhD. This will definitely develop your “can-do” attitude and be something you can talk about to employers during interviews.”

Career Path

After my PhD, I began training as a patent attorney at a private practice. I worked in small private practices for 2-3 years before joining Nortel Networks, where I stayed for another 2-3 years. In 2003, I joined BT and qualified as a professional UK and European Patent Attorney.

What I do now

I am now a Senior Patent Attorney at BT, heading up a small team of other attorneys which looks at particular areas of the business. My job involves liaising with research and technology teams to identify and protect intellectual property. It involves a mix of science and law as well as commercial skills.

Skills

Many patent attorneys have a PhD qualification and people with a PhD qualification are generally preferred by employers in the profession. It is a highly valued qualification in this field of work as apart from familiarity with a particular academic discipline the general skills you acquire through a PhD are very relevant to the job. For example, I need to be able to understand inventions created by people who are global experts at the forefront of research and development in their field. This requires assimilating very complex technical material and would be more challenging without the skills developed as part of my PhD. The experience of reviewing the content of academic papers has been really

useful for this, as have the general analytical skills I developed from working independently on assembling and distilling information as part of my PhD.

A PhD is a tremendous opportunity to develop not only specific subject knowledge but a broader set of transferable skills as well. My advice to current postgraduate students is to realise that these other skills are just as important as developing your academic knowledge and to actively pursue all opportunities that come your way through your PhD. I attended a CRAC Management Skills training course during my PhD which started me thinking about how my skills could be applied outside academia and this helped me understand how a prospective employer might regard me. It also helped me realise that I would need to think carefully about how to present myself to employers.

Many employers will question the ability of a PhD student to function better than other graduates in a business environment. It is a great advantage if you can demonstrate the additional experience acquired through your PhD that is relevant to business, for example, being able to manage projects, analyse complex information, work in a team, achieve goals and cope with the pressure of deadlines. These are transferable skills which are highly valued in the workplace, as are being reliable and self-sufficient.

Peter Kightley, Senior Laser Scientist, QinetiQ

PhD: Experimental Solar Physics, University of Birmingham, 1994 to 1997

“People who have developed a range of transferable skills during their PhD such as computer programming, quantitative analysis, team working, communication and self-motivation will always be in demand.”

Career Path

After my PhD, I joined the Defence Evaluation and Research Agency (DERA) in Malvern. The part of DERA in which I worked became QinetiQ in 2001. Today I still work for QinetiQ although my role has changed over that time.

The reason I decided to join QinetiQ was because I wanted to continue using my skills in a technology and science environment. Initially, I was employed as an Air Systems Operational Analyst. This involved advising customers on the operational effectiveness of air systems equipment in different situations and scenarios, all on the basis of simulation. After four years, I joined the Laser Remote Sensing Team and this is where I still work today.

What I do now

The team I work in designs and builds different types of laser equipment. I am involved in projects to design, build, test and deploy 3D laser imaging equipment. More recently, I am spending a greater proportion of my time bidding for projects and managing client relationships. This reflects the increasing seniority of my role in QinetiQ.

Skills

The key skills I developed through my PhD were conceiving, designing, building, testing and deploying solar instruments, and I continue to use these in my day-to-day job. I no longer look at the sun but I am using these skills to develop other types of scientific instrumentation. The experience I gained in communicating research results (both written and verbal through presentations) is highly relevant in a client-facing scientific career.

Make the most of opportunities to gain transferable skills because I foresee fewer scientific opportunities (both within and outside academia) in the future. Do not shy away from opportunities to improve your communication skills by making presentations. You may not like the thought of doing this but it will be good experience.

Use your PhD to become proficient in at least one computer programming language. It does not really matter which one you choose. Once you have mastered one language, you have the basic tools to write software.

Keith Norman, Account Manager, Tessella plc

PhD: Particle Physics, University of Birmingham, 1993 to 1996



“Don’t forget that, as well as intelligence, employers look for the ability to work in a team, communication skills and enthusiasm, as there is nothing worse than a bright person who cannot work with other people ”

Career Path

After finishing my PhD, I joined Tessella plc, which provides IT and consulting services for the R&D, science and engineering sector. I joined in 1996 as a Software Engineer. I then worked as an Internal Systems Manager before becoming a Project Manager and then an Account Manager. Today I still work for Tessella.

What I do now

My current job as an Account Manager means I have sales responsibility for around £2million revenue per year. My clients are largely "big science" (e.g. Rutherford Appleton Laboratory, JET, ITER, Diamond) or commercial R&D accounts. The work we do is software consultancy, which includes software development, business analysis, and specialist consultancy.

Skills

While I am no longer directly involved in "doing" physics, it certainly helps to have a background in particle physics for the clients that I deal with. It is really important to be able to speak the same language! Over 50% of Tessella staff hold PhDs.

Senior Systems Analyst, Atomic Weapons Establishment

PhD: Particle Physics, University of Liverpool and CERN (Switzerland), 1992 to 1996

“Be patient. UK jobs outside academia involving a good deal of physics are hard to come by but there are opportunities.”

Career Path

After finishing my PhD, I worked as a postdoctoral research fellow at the University of Liverpool for a year. In 1998, I started a Science PGCE but realised this was not for me and later withdrew. I was unemployed for a while before I joined the MoD's Defence Evaluation Research Agency (DERA) at Farnborough, Hampshire as a Scientific Officer in 1999. My role was to work on modelling the electronic reliability of communication satellites. In 2001, DERA was reorganised. I was transferred into the part of the organisation that was established as a private company, now known as QinetiQ. The other part became the Defence Science and Technology Laboratory (DSTL). I continued my previous work until joining the Atomic Weapons Establishment (AWE) in 2003, where I am currently employed.

What I do now

Today I work as a Senior Systems Analyst involved in computational modelling of atmospheric disturbances.

Skills

The skills I acquired during my PhD training, such as knowledge of atomic and nuclear physics, software design, analytical thought and critical evaluation are crucial in my current job.

My most important achievement to date is the successful construction of an analytical software code for AWE that determines the severity of atmospheric ionisation and its spatial and temporal variation. The software is extensively used by others in conjunction with other specialist bespoke codes, which compute the effectiveness of electromagnetic wave propagation through a disturbed ionised environment.

Heidi Munn, Civil Servant, Department for Business Innovation and Skills (BIS)

DPhil: Particle Physics, University of Oxford, 1995 to 1998

“Look a bit further ahead than the next post-doc. I saw some really excellent colleagues not getting tenure and having to settle for jobs that were not what they had hoped to do. I didn’t want that and so decided to step out of academia at a relatively early stage to develop a whole new career.”

Career Path

I spent two years as a postdoctoral research fellow, also at Oxford University, working on the same experiment as I had worked on for my DPhil - the Sudbury Neutrino Observatory. I spent much of my post-doc on-site in Canada.

While I was completing my DPhil, I attended a graduate training course. It was excellent and opened my eyes to non-academic career options. In the end I applied to the Civil Service Fast Stream, more for the challenge of the application process than because I actively wanted the job - at that point I was still fairly committed to an academic career. However, the final stage of the process was an assessment centre and I absolutely loved the different exercises we were set. I decided that, if the job was only half as interesting then, I wanted it. And the rest, as they say, is history. I deferred entry for a year to complete my post doc and then, in 2000, I started my new career in the Civil Service, in what was then called the Department for Trade and Industry (now BIS).

What I do now

It is now almost 10 years since I left academia and I am convinced it was the right decision for me. Academic research can be rather narrow and I find as a civil servant, I am stretched in far more ways and find opportunities to use and develop more of my skills. The big advantage of

being in a large Government department is that you can change posts every few years and, in effect, end up doing an entirely different job! I have worked on science policy, environmental issues, international trade, digital television, better regulation and consumer policy, often on issues that you then see in the papers or that come up in everyday life. I’ve also taken opportunities to be seconded to Brussels for several months at a time and attended a few United Nations meetings in other countries.

I have made a real difference to how international negotiations have turned out. I remember one United Nations meeting in Nairobi where I had to update officials at Number 10 every day on how things were going whilst trying to come up with something that everyone could agree to, which still met our aims. It was very hard going (particularly as I also came down with food poisoning in the middle!) but I got there in the end.

Skills

The Civil Service may not suit everyone but if you like variety then it is definitely worth a look. It is very different to academic research but once you get used to the way things are done, it can be very rewarding. Skills that come naturally to a researcher, such as reasoning and evidence-gathering, are really sought-after in Government. And it is such a kick to see something you are working on being reported in the media.

Ian Brawn, Electronics Design Engineer, Rutherford Appleton Laboratory, STFC

PhD: Particle Physics, University of Birmingham, 1992 to 1996



“Opportunities arise from the people you impress, so invest time in developing good networks and delivering high quality work”

Career Path

After finishing my PhD, I won a fellowship in Applied Physics at CERN, in Geneva, and I worked there for two years. I then moved back to the UK in 1998 and accepted a job at STFC Rutherford Appleton Laboratory, where I still work.

What I do now

Today I work as an electronics design engineer, designing data-acquisition systems for particle physics, nuclear, and medical experiments.

Skills

This work is in much the same field as my PhD and thus the skills I acquired in that period are crucial for my current job. Whilst much of the technical knowledge I acquired during my PhD is now dated, it provided the essential foundation of the knowledge I use today. In addition, the communication and organisational skills and self-sufficiency I developed during that period have proved invaluable.

The most important achievement in my career to date is my contribution to ATLAS, one of the Large Hadron Collider experiments at CERN. I developed a number of complex and technically challenging electronic systems that are essential to the operation of that important, high-profile experiment.

Lucy Wenham, Advanced Skills Teacher in Mathematics, Uxbridge High School

PhD: Theoretical Physics, Imperial College London, 1992 to 1996



“A PhD is fundamentally training in developing problem-solving skills. You are given difficult challenges and the onus is on you to find solutions, through identifying and breaking down the issues, effective modelling, refining and extrapolating. This type of problem solving is a key skill you gain through PhD training which is transferable to all types of jobs.”

Career Path

After my first degree, I had completed a PGCE as I felt that teaching was the lifelong career for me. However, I also had an urge to pursue the more abstract and academic aspects of theoretical physics. It was clear to me that postgraduate studies were best embarked upon as soon as possible, before the undergraduate skills I had acquired began to lapse! I completed a Masters Degree at Imperial College in Quantum Fields and Fundamental Forces, and stayed on to do a PhD.

After my PhD I became a mathematics teacher in a comprehensive school in a multi-cultural and socio-economically diverse area of London.

I spent seven years at my first school and had roles as Key Stage 4 Coordinator, Deputy Head of Sixth Form, and Deputy Head of Mathematics. I then moved to become Head of the Mathematics Faculty at another inner-city comprehensive school in London. I had more exposure to the strengths and weaknesses of our education system, the pressures on management due to the tensions within it and how policies could enhance or hinder the life chances of individual pupils. I became curious about how other societies approach these issues. Two years into this job I took a year out to undertake a Masters Degree in Comparative Education.

After the Masters, I decided that I wanted to have a direct positive influence on education in the classroom itself. Therefore, I accepted a position as Advanced Skills Teacher in Mathematics at Uxbridge High School.

What I do now

As an Advanced Skills Teacher I have a reduced timetable in order to build capacity, within and outside my school, to enhance teaching and learning in mathematics. I work with designated primary school teachers in the local area and mentor new teachers within my own school.

I love this role as I am able to effect change and engender enthusiasm, irrespective of many of the broader policies. Instilling confidence and passion for the subject in my students is something I see as a key objective, and I am particularly proud that four individuals have gone on to become mathematics teachers themselves! My PhD was a deeply enriching and satisfying experience, but from the start I knew that inner-city teaching was the career for me in the long run.

Skills

I did not need a PhD to become a teacher. However, the fact that I have a PhD which would enable me to do many other things, but have chosen to pursue a career in teaching, means my students generally have a greater respect for the profession. They see that I find teaching rewarding and enjoyable, and it has motivated several of them to consider teaching.

Think carefully about your personal strengths and weaknesses and be self-critical. STFC postgraduates are bright people who will not enjoy being second-rate in their career. Identify what you can excel at and pursue this. You never know where these skills may lead you but it is likely to be somewhere stimulating.

Jon Woodcock, freelance scientific writer and consultant

PhD: Space Plasma Physics, Queen Mary and Westfield College, 1993 to 1996



“If you are thinking of moving outside academia, consider getting your first job in a large company because this will give you more opportunity to move around, experience different types of work and see what you like best. Do not be afraid to change tack to find work that is rewarding. My experience is that an STFC PhD student has a very saleable set of skills that has currency for some time.”

Career Path

My first job was as Research Engineer at Snell & Wilcox, a video and electronics company based in Hampshire. I was involved in mathematical modelling of signal processing for television and video. During my PhD, I spent a lot of time modelling space plasmas and this job used similar techniques in a different context.

After three years, I moved to Microsystems Engineering Ltd, which specialised in signal processing consultancy work and trading software for financial institutions. My interest was primarily in signal processing but this part of the business was subsequently sold. I ended up working in the other part of the business, which was really full-blown software development. I stayed with the company for four years but was yearning to return to a more scientific role.

In 2005, an R&D opportunity arose as a Senior Navigation Engineer with a small satellite navigation company called Nottingham Scientific Ltd. This involved ionospheric modelling relating to the European Space Agency Galileo global navigation satellite system – essentially an R&D role. Again, this linked directly to my PhD research. I left in 2007 because I needed to find more flexible work that I could combine with caring for my three young children.

What I do now

The driver for my career in recent years has been finding ways of working flexibly. My main focus now is freelance scientific writing and consultancy. I work for publishing companies, particularly on astronomy, science, and technology books for children. I find this very rewarding work as it is inspiring the next generation of scientists. I also undertake research and programming work from time-to-time with my old PhD supervisor at Queen Mary.

Skills

The subject and technical knowledge I gained through my PhD were essential for my R&D roles in the electronics sector with Snell & Wilcox (video / television) and Nottingham Scientific Ltd (satellite navigation). My job at Microsystems Engineering Ltd was mainly in software development, but even here the software engineering skills I developed through my PhD were important. I still make use of my PhD in my current freelance writing role as much of this relates to space and astronomy.