THE
ROYAL
SOCIETY

Research needs diversity and diversity means diverse people, living diverse lives with diverse approaches and diverse experiences.

Professor Ottoline Leyser

Foreword

In 2008 I put together a booklet called *Mothers in Science – 64 ways to have it all* as part of my Rosalind Franklin award.

The idea was to illustrate the many ways in which women have successfully combined motherhood with a career in academic science. The project was inspired by the need to counter the relentless negativity that seemed to characterise the advice many early career researchers received about the prospects of combining a career in science with anything beyond breathing, eating and perhaps occasionally sleeping.

Careers in science are certainly competitive. They are very exciting and fulfilling, so it is not surprising that more people want them than can have them. However, the correlation between the number of hours a day you spend working and the quality, and even the quantity of the work you do is not nearly as strong as you might imagine. And inspiration can come from the most unexpected places, so a narrow workaholic focus can be counterproductive. Given the joy and satisfaction that researchers get from their work, it is not surprising that many work longer than 9 – 5, but working long hours because of anxiety about the competitive nature of the career is unlikely to yield dividends. Quite apart from its limited impact on productivity, there are many exciting and fulfilling career options for scientists beyond research and those fixated on the academic career path might well be missing their true vocation.

In 2016, careers in research science are no less competitive, but there is perhaps a growing realisation that the pressure cooker atmosphere in which researchers often find themselves has detrimental effects on the quality and integrity of the whole research endeavour, well beyond an impact on the gender ratio of its participants. The issues affect everyone. Myths about what you need to do to ‘succeed’ amplify, and success becomes so narrowly defined that it looks unattractive to the most interesting and imaginative people, who are the very people science needs. Dispelling these myths, for all concerned, is an imperative. This book has therefore widened the focus from mothers to all parents and carers, which includes almost everyone at some point in their career.

Research needs diversity and diversity means diverse people, living diverse lives with diverse approaches and diverse experiences. An optimal scientific community will therefore include people weaving their research activities into their wider lives in different ways. This rich tapestry is reflected in the stories told in this book and online.

Ottoline Leyser

“I don’t think I could have done it without my job as a point of stability, and my colleagues who covered for me many times.”

Professor Ottoline Leyser

Find a supportive environment

Find a supportive environment

Fulfilling the responsibilities of family life may require you to change the way you work. Here, researchers emphasise the importance of having colleagues and an employer who values and supports staff who need to work flexibly.

Working at home can be a great help, and **Professor Claire Carmalt**, Professor of Chemistry at University College London, says she has benefitted greatly from "the highly supportive environment in my department for those wishing to work flexibly. I generally work one day a week at home, which I particularly valued when... managing as a single parent. Being able to work flexibly enabled me to cover family commitments, so I don't feel that I have missed out on any of my children's milestones".

Based in the same department, **Professor Helen Fielding** echoes this sentiment and notes the difference that individuals in senior positions can make. "I have benefitted enormously from very supportive Heads of Departments who have allowed me to work flexibly. My husband and I now work at home one day a week each and on other days I leave work in time to collect my younger daughter from after school clubs... before continuing to work later in the evening!"

University of Reading's PhD Researcher of the Year 2013, **Dr Chimene Laure Daleu**, was able to merit the award thanks partly to the support she received in challenging personal circumstances. "I gave birth at the end of my second year as a PhD student in meteorology. The arrival of my daughter has been professionally disruptive since I was a single mum and I didn't have parents nearby. Childcare was my full responsibility but luckily my PhD research was quite flexible and I was allowed to work part-time from home and part-time from the office. I have benefitted hugely by having supportive mentors and PhD supervisors."

Regular home-working may not be as essential as children grow older, but **Professor Anita Thapar** finds that having the freedom to spend time at home remains important. "I have been lucky in having helpful mentors and working with colleagues in Cardiff who value family life and understand the need for flexibility. I worked part-time when the children were younger but have still at times needed to be flexible with work as demands arise, such as making sure I'm at home when there are important exams."

A test of an institution's commitment to equality is whether those that work part-time or flexibly are able to rise through the ranks. **Professor Eleanor Highwood**, Professor of Meteorology had a positive personal experience at the University of Reading. "I took nine months leave when each of my sons were born and I have worked 0.8 FTE ever since. I do the school run in the mornings and three afternoons per week. My Department takes flexible working and equality of opportunity very seriously and this has allowed me to take on leadership roles on my terms." Professor Highwood took on the role of Dean for Diversity and Inclusion in 2015, to ensure others get the same chances across the wider University.

It's not just the needs of childcare that demand a flexible approach. Personal circumstances can change without warning, and in troubled times, support from employers can help lives and careers stay on track.

Oxford zoologist, **Professor Ben Sheldon**, tells how it's helped his family "Once we had children, my partner Niki's career involved a lot of travel abroad. A supportive department coupled with the flexibility of research made that possible. Our younger son was taken ill and diagnosed with a serious medical condition in 2008, which has emphasised even more the need for flexibility and support – from many sides of my department and University – in our lives."

During his PhD, **Dr Michael Morrissey**'s wife, Sheena, suffered two severe strokes, which left her having to learn how to walk again. A decade on, Dr Morrissey says flexibility from the University of St Andrews has been invaluable. "With Sheena's long term health considerations – and the addition to our family of our son Richard – I have to contribute substantially to home-life. My career to date, and my specific needs, have been greatly supported by the School of Biology, as well as by specific colleagues here and elsewhere."

Director of the Sainsbury Laboratory at the University of Cambridge, **Professor Ottoline Leyser**, concludes "my husband died of cancer last year, which was certainly the hardest of my life, trying to look after all four of us during his illness. I don't think I could have done it without my job as a point of stability, and my colleagues who covered for me many times."

Professor Claire Carmalt

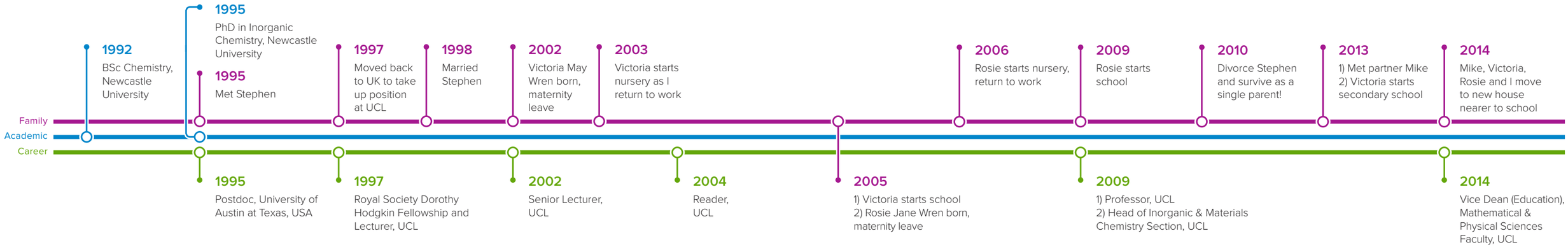
MY RESEARCH

Research in my group is concerned with developing innovative new routes to technologically important inorganic materials. We have a strong interest in the synthesis and characterisation of novel molecular precursors for use in the deposition of thin films of materials especially metal oxides and nitrides. The aim is to develop new highly volatile, non-toxic precursors, which are then used to grow thin films. The group is involved in research in Aerosol Assisted Chemical Vapour Deposition (AACVD) including scale up development for industrial applications and combinatorial CVD. The development of transparent conducting oxides, photocatalysts and superhydrophobic paints are of key interest.

MY JOURNEY

I have greatly benefitted from the highly supportive environment in the Department for those wishing to work flexibly and I generally work one day a week from home. I particularly valued this in 2010 when going through a divorce and managing as a single parent (I now have a very supportive partner which has helped a great deal). Being able to work flexibly, whether at weekends or evenings, enabled me to cover family commitments and so I do not feel that I have missed out on any of my children's milestones. One bonus has been that I go into their schools to give lecture demonstrations and help with Science days! Support from my postdocs has helped me maintain a very active research group.

"Being able to work flexibly enabled me to cover family commitments, so I don't feel that I have missed out on any of my children's milestones."



Professor Helen Fielding

MY RESEARCH

Our group studies the spectroscopy and ultrafast dynamics of excited states of neutral biomolecules and protein chromophore anions in the gas-phase, using a combination of nanosecond and femtosecond lasers, molecular beams, electrospray ionisation mass-spectrometry and photoelectron spectroscopy. We are just beginning to study ultrafast dynamics of protein chromophores and proteins in the solution phase, using femtosecond lasers and liquid microjet photoelectron spectroscopy. We also carry out complementary quantum chemistry calculations to support our experiments and have strong collaborations with a number of theoretical chemistry groups.

MY JOURNEY

After the birth of each of our children, I took the maximum maternity leave we could afford before returning to work full-time. All three children have attended day nurseries, but we have also employed nannies at various stages to manage childcare after school and in the holidays. I have benefitted enormously from very supportive Heads of Departments who have allowed me to work flexibly. My husband and I now work at home one day a week each and on other days I leave work in time to collect my younger daughter from after school clubs before continuing to work later in the evening.

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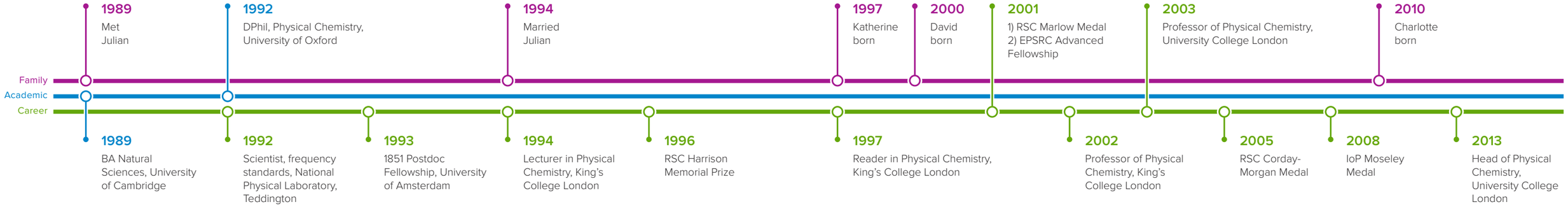


Dr Chimene Laure Daleu

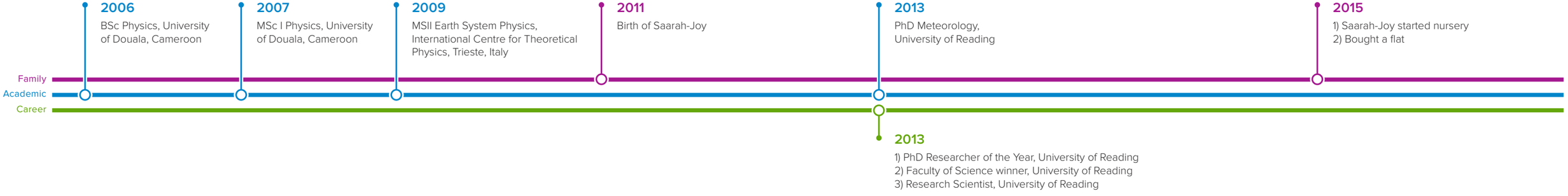
MY RESEARCH

My research is aimed at understanding tropical climate and its variability by understanding the two-way interaction between tropical moist convection and large-scale tropical circulation. My research involves numerical simulations of convection within a small domain using different representations of the large-scale environmental circulation.

MY JOURNEY

I gave birth at the end of my second year as a PhD student in meteorology. The arrival of my daughter has been professionally disruptive since I was a single mum and I didn't have parents nearby. Childcare was my full responsibility but luckily my PhD research was quite flexible and I was allowed to work part-time from home and part-time from the office. I have benefitted hugely by having supportive mentors and PhD supervisors. I was the PhD Researcher of the Year 2013, Faculty of Science winner and the second best PhD researcher of the University of Reading. My daughter has started nursery and I am now a Research Scientist at the University of Reading.

> "The arrival of my daughter has been professionally disruptive since I was a single mum and I didn't have parents nearby. I have benefitted hugely by having supportive mentors and PhD supervisors."



Professor Anita Thapar

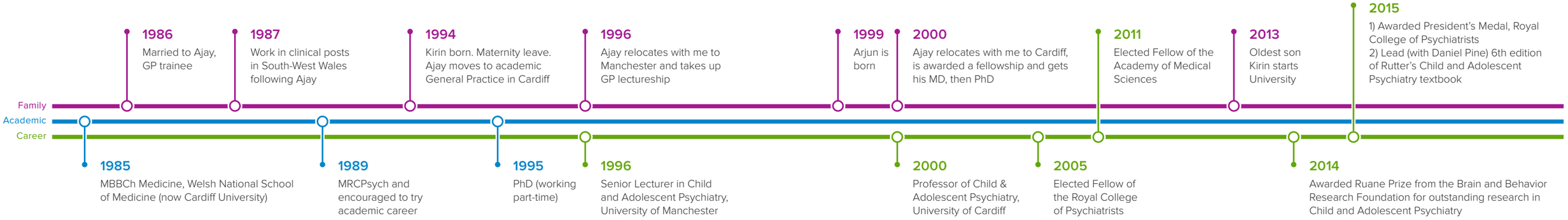
MY RESEARCH

I am a clinical child psychiatrist as well as an academic. My research focuses mainly on childhood ADHD but I have also conducted work on other childhood disorders including depression. My research work has mainly involved genetic and epidemiological studies – looking at how genes and environment contribute. My clinical work means I see children and adolescents with a range of neurodevelopmental disorders and early onset mental illness.

MY JOURNEY

In my career I have had a lot of support and encouragement from my husband. I have also been lucky in having helpful mentors and working with colleagues who value family life and understand the need for flexibility. I worked part-time when the children were younger but have still at times needed to be flexible with work as demands arise, such as making sure I am at home when there are important exams. I have not travelled as much or gone away to meetings as often as I might have done otherwise. However I feel that it has been worthwhile in supporting the children and next year, our youngest will leave school so I will have plenty of time to travel then. I have found being able to work at home when needed (for example when writing papers) a huge help.

> "I have been lucky in having helpful mentors and working with colleagues in Cardiff who value family life and understand the need for flexibility."



Professor Eleanor Highwood

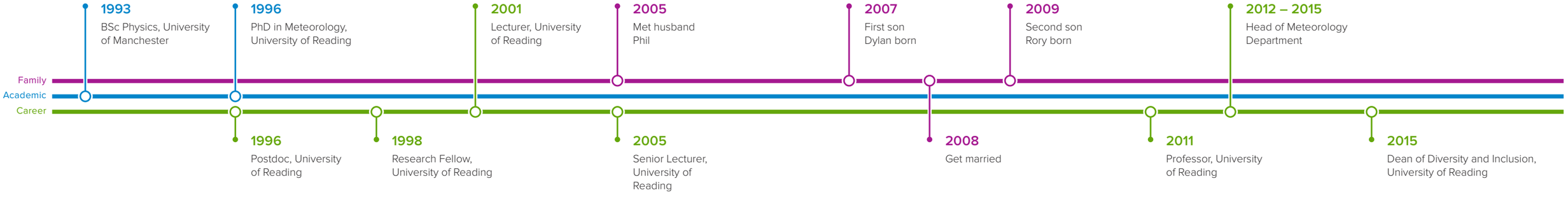
MY RESEARCH

My research focuses on atmospheric particles like smoke and dust and their effects on climate and climate change. I have led international measurement campaigns flying a research aircraft through pollution plumes, and have a large team of postdocs who use the data to improve climate models and establish the mechanisms by which aerosols change weather patterns. I am also passionate about science communication and enabling people to reach their full potential. Increasingly I am doing more research management than research, and now leadership in Diversity and Inclusion at university level.

MY JOURNEY

I took nine months leave when each of my sons were born and I have worked 0.8 FTE ever since. I do the school run in the mornings and three afternoons per week. My husband collects the boys on the other days. My Department takes flexible working and equality of opportunity very seriously and this has allowed me to take on leadership roles on my terms. My mother moved closer to us and helps out when I need to be away, but I have really cut down on international travel – there are only so many favours I can call in.

> "My Department takes flexible working and equality of opportunity very seriously and this has allowed me to take on leadership roles on my terms."



Professor Ben Sheldon

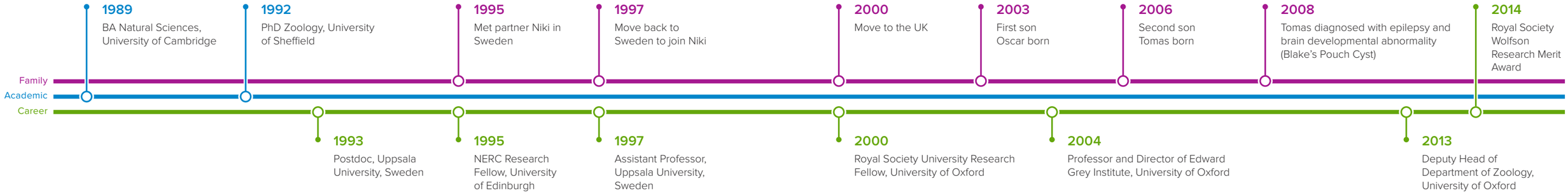
MY RESEARCH

My research seeks to understand the causes and consequences of individual variation in natural populations, and in particular how this variation impacts the operation of population-level processes. This work – usually with wild birds as a model – currently has three main foci: (i) How do animals adjust and adapt to changing environments, and in particular, how does phenotypic flexibility arise? (ii) How does social structure emerge from, and how is it affected by, individual variation? (iii) How does information flow through populations?

MY JOURNEY

I met my partner in Sweden and the flexibility of science helped in a long term relationship for the first few years. Once we settled in the same place and had children, Niki's career involved a lot of travel abroad. A supportive department coupled with the flexibility of research again made that possible. Our younger son was taken ill and diagnosed with a serious medical condition in 2008 which has emphasised even more the need for flexibility and support – from many sides of my department and university – in our lives.

"Our younger son was taken ill and diagnosed with a serious medical condition in 2008, which has emphasised even more the need for flexibility and support."



Dr Michael Morrissey

MY RESEARCH

I study how evolutionary processes play out on contemporary timescales in nature. I seek to determine whether traits in natural populations are under selection, and if there is genetic variation for these traits, such that evolution can proceed.

MY JOURNEY

During my PhD, my wife suffered serious strokes that have continuing consequences, including chronic fatigue. Due primarily to the fatigue, my Sheena has generally been unable to work in the last ten years. With Sheena's long term health considerations – and the addition to our family of our son Richard – I have to contribute substantially to home-life. My career to date, and my specific needs, have been greatly supported by the School of Biology at the University of St Andrews, as well as by specific colleagues here and elsewhere.

> "With Sheena's long term health considerations – and the addition to our family of our son Richard – I have to contribute substantially to home-life."

Professor Ottoline Leyser

MY RESEARCH

My research is aimed at understanding the complex network of long-range hormonal signals that regulate shoot branching in plants. I am particularly interested in integrating gene regulatory networks with hormone transport and whole plant level effects.

MY JOURNEY

My career has been helped greatly by my husband being a freelance writer. Because he worked flexibly from home, we were able to move easily and he was the main carer for our two children. Having the children during my post-doctoral years, when my work was more flexible, was also very helpful. Sadly my husband died of cancer last year, which was certainly the hardest of my life, trying to look after all four of us during his illness. I don't think I could have done it without my job as a point of stability, and my colleagues who covered for me many times.

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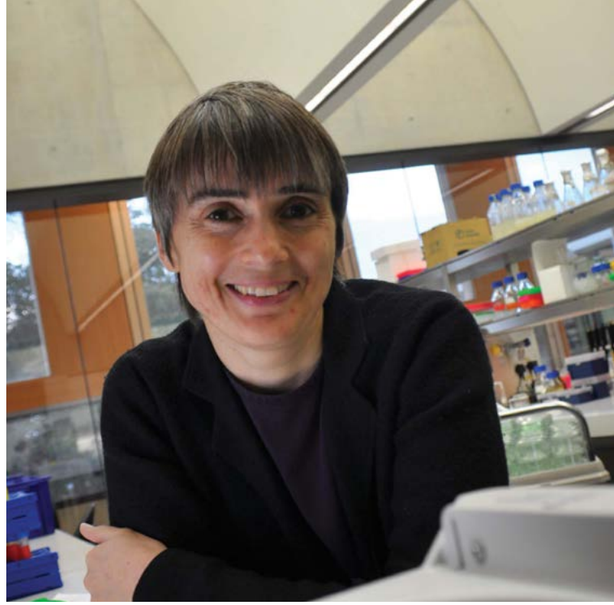

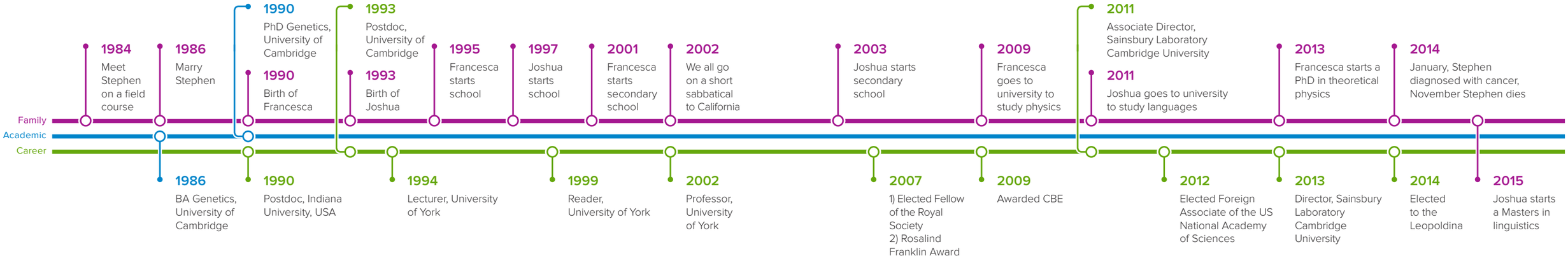

Time it right, for you

Time it right, for you

Is there an ideal time in a research career to start a family? These scientists prove that ‘the right time’ to add parenthood to the CV is different for everyone.

Dr Valentin Fischer’s daughter, Léa, was born as he and his wife, Marie, were just starting out in research. “We chose to have Léa during our PhDs. We knew it would impact our careers but we felt it was the right decision.” It wasn’t all plain sailing, but palaeontologist, Valentin, describes how they adapted their approach to suit their needs as a new family. “I worked hard to finish my PhD earlier than expected and waited for about 1.5 years before applying for postdoc grants, in order to have time with Léa and Marie and so that Marie could finish her PhD thesis with a little less pressure, and recover from a severe disease. Marie then paused her career to take care of Léa while we moved together to the UK for my postdoc.”

Professor of Nutrition at Norwich Medical School, **Aedin Cassidy**, was quite sure when the time was right: “Once I finished my PhD my goal was to be a mum!” And she has a simple explanation for how she’s managed her work amid a busy home life. “The juggle of career/parenthood began early. Efficiency has been my key to progressing.”

This philosophy is echoed by cancer scientist, **Dr Ainhoa Mielgo**. “My two children were born during my post-doctoral training. This brought an additional challenge to my life, but being a mum also made me become more efficient and organised and did not stop me from pursuing my research career.”

By contrast to the ‘early-starters’, other researchers built firm foundations in their profession before starting a family. Biophysicist **Dr Rosalind Allen** was more than a decade post-PhD before her daughter was born. “My personal circumstances meant that I had Naomi when I was already quite established in my career. While this has had its own challenges, it has meant that I have not had to deal with the stress of finding a permanent job while trying to balance the pressures of childcare.”

But of course parenthood is hard work no matter when you begin, as **Professor Andrea Brand** attests. “Jim and I did not consider having children until we had established our own research groups and my fellowship had been renewed… It has not been easy juggling two careers and family life, but with a supportive lab and very little sleep, it has been possible.”

Earthquake expert, **Dr Patience Cowie**, told us how she wanted some professional stability before taking the plunge. “I was privileged to have a research fellowship while I had my two children. Even with this advantage of flexibility, I negotiated a permanent position before I actually decided to try and get pregnant. Then my husband took a ten year career break while the children were young. I think this is a big contributing factor that explains how I managed to make it to professor.”

We’ve heard from scores of senior female researchers, like Dr Cowie, who’ve used a host of strategies to successfully combine motherhood and career progression. Some told us that they chose to focus on family for a time, before putting their foot firmly back on the career pedal once the children were grown.

Particle physicist and mother-of-two, **Professor Amanda Cooper-Sarkar**, provides an interesting retrospective on this approach. “Looking back on my career I would say that I have achieved recognition about 10 – 15 years later than men of my own generation due to my decision to prioritise my children over research, throughout their passage to adulthood. But this meant that I stayed within one discipline to cope with the demands on my time, which is ultimately what made me into a world expert in my field.”

Dr Valentin Fischer

MY RESEARCH

I analyse the fossil record of ancient marine predators: large fishes, sharks, marine reptiles, during the era of dinosaurs. Using a series of quantitative techniques, I reconstruct the fluctuations of biodiversity and seek the causes of these fluctuations, notably past climate change.

MY JOURNEY

We chose to have Léa during our PhDs. We knew it would impact our careers but we felt it was the right decision. I worked hard to finish my PhD earlier than expected and waited for about 1.5 years before applying for postdoc grants, in order to have time with Léa and Marie and so that Marie could finish her PhD thesis with a little less pressure, and recover from a severe disease. Marie then paused her career to take care of Léa while we moved together to the UK for my postdoc.

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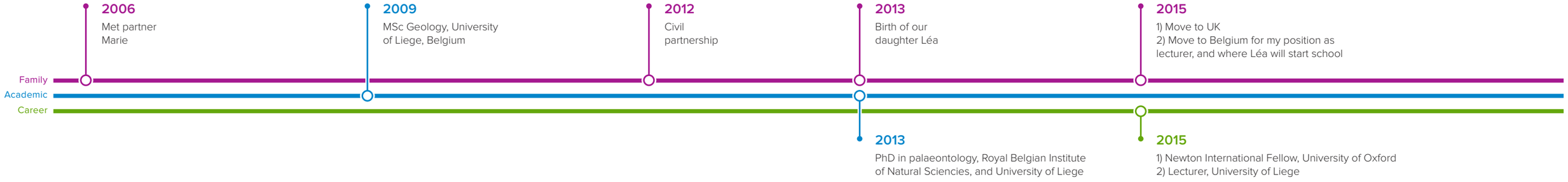

Professor Aedin Cassidy

MY RESEARCH

My research aims to develop guidelines on what specific fruits/vegetables reduce risk of chronic disease. We believe that the benefits of plant-based diets are due to bioactives called flavonoids. We apply an integrated approach to investigate their impact on human health including studying absorption/metabolism, impact on biomarkers/incident disease, and mechanisms of action. Our main focus is on one flavonoid group, anthocyanins, and our current data suggest that three portions/week of anthocyanin-rich foods can reduce risk of heart disease, type 2 diabetes and Parkinson's disease. Our ongoing clinical trial is investigating *in vivo* mechanisms and determining the impact of metabolism on cardiometabolic health.

MY JOURNEY

Once I finished my PhD my goal was to be a mum. Although the juggle of career/parenthood began early the payoff is that both kids are now at University. I worked part-time for 11 years which built flexibility into the system while my husband and I managed two science careers and two children. My career has predominantly been in academia, although I had a short spell in industry. Efficiency has been my key to progressing. In 1999 I had a major health setback – a stroke that left me with a visual impairment – but I think these setbacks make you more resilient.

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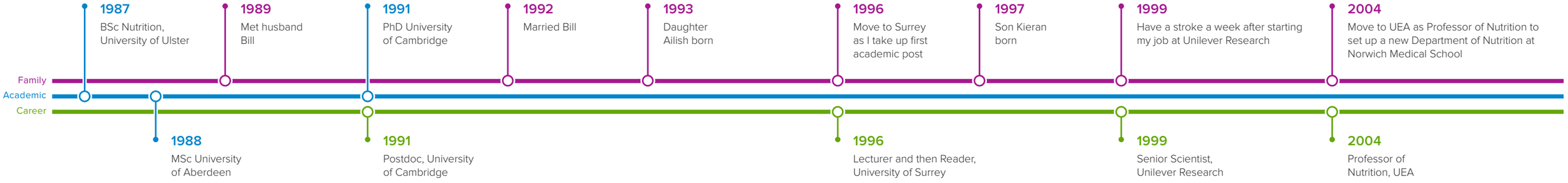


Dr Ainhoa Mielgo

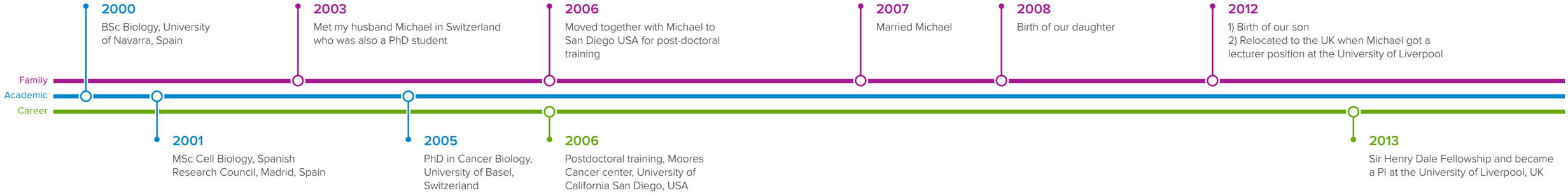
MY RESEARCH

Pancreatic cancer is a devastating disease and is predicted to become the second cause of cancer death by 2020. In pancreatic cancer, like in other solid cancers (i.e. breast, liver or lung), tumour cells are surrounded by a tumour microenvironment consisting of a large number of non-malignant cells, also known as stromal cells. Stromal cells play an important role in cancer progression and resistance to therapy but the molecular mechanisms by which stromal cells support cancer progression are not completely understood. My research focuses on understanding the complex interactions between tumour cells and stromal cells in order to identify new combination treatments targeting both the tumour cells and the tumour microenvironment.

MY JOURNEY

I always wanted to become a researcher. I met my husband while we were PhD students and thus, we always experienced the two body challenge. My two children were born during our post-doctoral training. This brought an additional challenge to my life, but being a mum also made me become more efficient and organised and did not stop me from pursuing my career in research. I always make the most out of my time, whether I am at work, or with my family, and I always pursue my dreams and persevere if they do not become true on my first attempt.

"My two children were born during my post-doctoral training. This brought an additional challenge to my life, but being a mum also made me become more efficient and organised and did not stop me from pursuing my research career."



Dr Rosalind Allen

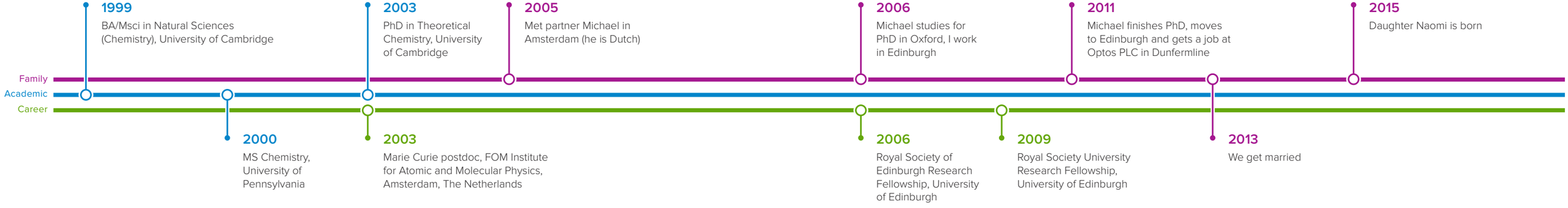
MY RESEARCH

My research focuses on microbes: microscopic, apparently primitive organisms that inhabit the Earth in huge numbers and drive much of its essential chemistry, as well as having a massive impact on human health. Recently, I've been using computer models and lab experiments to understand better how antibiotics work in killing harmful bacteria – this is important if we are to better understand how to prevent antibiotic resistance.

MY JOURNEY

I met my husband-to-be during my postdoc in Amsterdam, and we embarked on a five-year long-distance relationship while he did a PhD in Oxford and I began my independent research career in Edinburgh. Living in the same place at last, we finally got married and our daughter Naomi was born in April 2015. We have split our parental leave roughly equally, with both of us at home the first two months, then me being at home the next two months and Michael the following two months. This worked well, although the amount of work involved in looking after a baby has still been a shock! For me, I think that having Naomi when I was already quite established in my career has been helpful as I have not had to deal with the stress of finding a permanent job while trying to balance the pressures of childcare.

"My personal circumstances meant that I had Naomi when I was already quite established in my career. While this has had its own challenges, it has meant that I have not had to deal with the stress of finding a permanent job while trying to balance the pressures of childcare."



Professor Andrea Brand

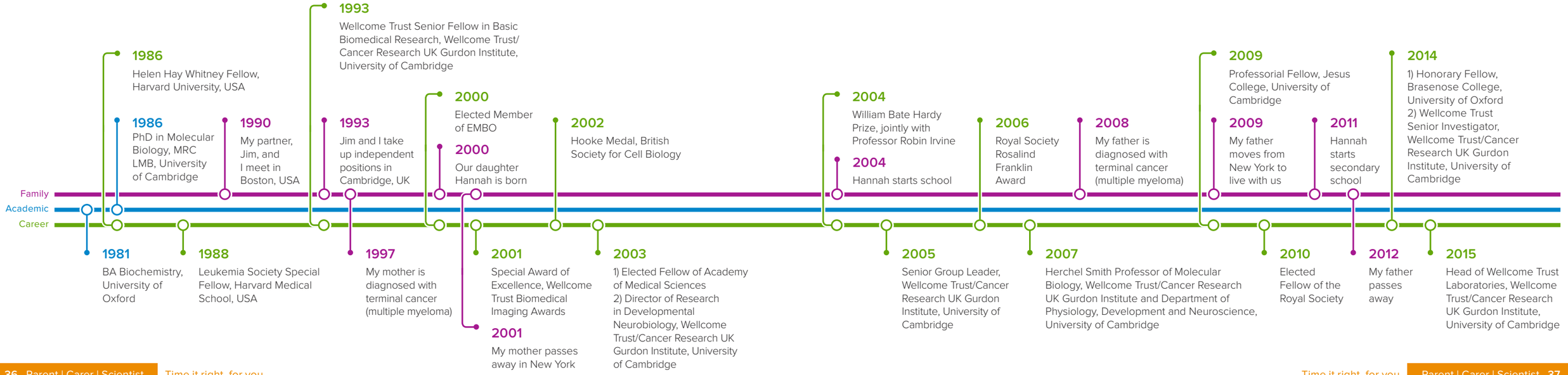
MY RESEARCH

One of the goals of research in neurobiology is to repair or regenerate neurons after damage to the brain or spinal cord. Neurons are produced by multipotent neural stem cells that can both self-renew and simultaneously generate different types of neurons. My research aims to identify the genes that specify the characteristic behaviours of these neural cells. It may then become possible to induce stem cells to become neurons at will, or induce neurons to regenerate.

MY JOURNEY

Jim and I did not consider having children until we had established our own research groups and my fellowship had been renewed. We have no childcare help at home and our families live in the US and Australia. It has not been easy juggling two careers and family life, but with a supportive lab and very little sleep, it has been possible.

"Jim and I did not consider having children until we had established our own research groups and my fellowship had been renewed... It has not been easy juggling two careers and family life, but with a supportive lab and very little sleep, it has been possible."



Dr Patience Cowie

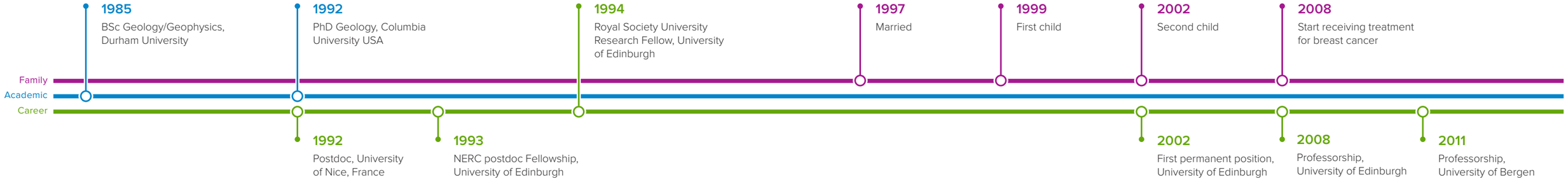
MY RESEARCH

My research is aimed at understanding geodynamic processes in the earth, in particular the link between earthquakes and the development of topography. This includes studying processes of erosion and sedimentation in tectonically active settings. My main field area is the Apennines of central Italy and I use a combination of methods that includes numerical modelling of these processes and cosmogenic isotope analysis to quantify process rates.

MY JOURNEY

I was privileged to have a research fellowship while I had my two children. Even with this advantage of flexibility, I negotiated a permanent position before I actually decided to try and get pregnant. Then my husband took a ten-year career break – and did an Open University degree – while the children were young. I think this is a big contributing factor that explains how I managed to make it to professor. Since being diagnosed with breast cancer things have gone a bit 'pear-shaped', but I manage to still do some research and some teaching. I'm not quite sure how much longer that will be possible.

"I was privileged to have a research fellowship while I had my two children. Even with this advantage of flexibility, I negotiated a permanent position before I actually decided to try and get pregnant."



Professor Amanda Cooper-Sarkar

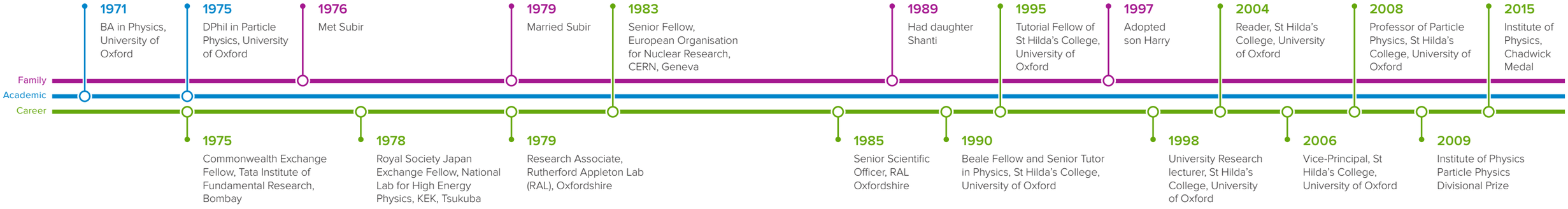
MY RESEARCH

I am a particle physicist in the field of Deep Inelastic Scattering, which uses high energy leptons – such as electrons and neutrinos – as probes to study the structure and dynamics of quarks inside nucleons and nuclei. The momentum distributions of quarks and gluons which are thus determined have aided our understanding of the fundamental building blocks of the universe, but also of the nature of the strong force quantum-chromodynamics which holds these constituents together. This knowledge is now a vital input to the interpretation of discovery physics at the Large Hadron Collider at CERN, where protons are collided.

MY JOURNEY

Looking back on my career I would say that I have achieved recognition about 10 – 15 years later than men of my own generation largely due to my decision to prioritise my children over research, throughout their passage to adulthood. But this has meant that I stayed within one area of my research discipline in order that I could cope with the demands on my time, which was ultimately what made me into a world expert in my field.

"I stayed within one discipline to cope with the demands on my time, which is ultimately what made me into a world expert in my field."



Learn to work smarter

Learn to work smarter

When your circumstances change, your work habits may have to. This might feel awkward at first, but can have wide-ranging benefits. Here, researchers share how they altered their working day, or whole career, to suit new priorities.

After six years in industry **Professor David Haddleton** opted to move to academia. And he says he has "never regretted" the career-changing decision he made after the birth of his triplets. "Our choice of house was dictated by being able to get home in five minutes, with a garden for our children. I worked every day from 8.30am to 5.30pm, being home well before 6pm each day. My ex-students still tell me how they chased me down the corridor telling me about their breakthroughs as I was intent on getting home for bath time."

Leaving work on time might sound like a small matter, but it's a discipline that many contributors told us is crucial to their families. Cancer scientist, **Dr Luke Boulter**, and his partner, Ed, adopted two children in 2015. Luke finds that, "whereas previously I would just stay that extra hour or two at the end of the day, I can no longer do this. In fact, I like not being able to as I would rather be home for supper and story time! This has meant a great deal more time management in the day and more sitting up at night getting something finished at home."

Dr Al Lambourne makes more time for the family by managing his hours at his job as a materials scientist at Rolls Royce. "I am fortunate to be able to maintain a good work-life balance, starting work early and home for tea with the children every day. I work full-time, but I make use of the government 'parental leave' scheme which provides much needed additional time off."

Professor Adele Marston and **Professor Paul Palmer** were one of several couples in which both worked in academia. They married in 2002 and had their first child while working in the US, before returning home. "Finding two suitable group leader positions in the same city back in the UK was not easy and for a short while we were working in separate cities, which was challenging with a young child." Now settled in Edinburgh, they have two children and two careers to tend to. "Our families live too far away to provide day to day help so we alternate working extended hours to share the responsibility of childcare."

While some scientists use international conferences as a chance to show their children the world, many admitted they have limited their travel since becoming a parent or carer. **Professor Saiful Islam** says, "Being away at overseas conferences can be hard, so I try to cut that down. I sometimes show my wife Gita a list of exotic conferences I have declined, although she replies 'can I go instead?'"

Changing the way you work, by choice or by necessity, can pay-off in ways you can't predict. Stem cell scientist, **Dr Sally Lowell**, reveals how being a mum of twins has made her a better lab leader. "Having young twins at home does limit my time in the lab, but this has brought the benefit of forcing me to give up on my unfortunate tendency to micromanage my group's projects. Having to give my students and postdocs the freedom to make their own mistakes is one of the things that has allowed them to flourish into the wonderful innovative and self-driven scientists that they all are!"

Professor David Haddleton

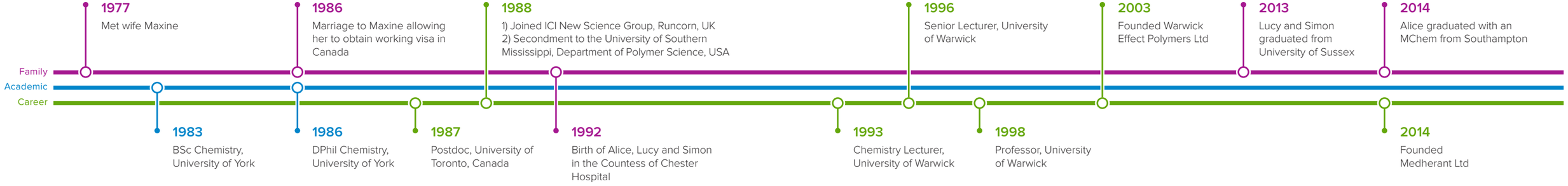
MY RESEARCH

My work involves the design and synthesis of polymers with specific properties for targeted applications. I'm heavily involved with partners from industry and other disciplines providing the problems. Current applications range from viscosity modifiers for automotive, to personal care products and improving pharmaceuticals. For example, we work closely with Monash University on improving the stability of oxytocin for use in childbirth, to improve access in the developing world.

MY JOURNEY

I'd worked in UK industry for 6 years when my three children were born in 1992. At the time company policy was for up to three days paternity leave. My manager granted me two days. With three children in intensive care and Maxine in hospital I wondered what you would have to do to be eligible for three days. In addition in order to progress I had to be totally flexible, and my next job could have been a plant manager in Siberia. I opted to move to Warwick University as a Lecturer, which I have never regretted. Our choice of house was dictated by being able to get home in five minutes with a garden for our children. I worked every day from 8.30am to 5.30pm being home well before 6pm each day. My ex-students still tell me how they chased me down the corridor telling me about their breakthroughs as I was intent on getting home for bath time. Working at Warwick gave us the flexibility to put the family first without seemingly to have to compromise at work.

> "Our choice of house was dictated by being able to get home in five minutes, with a garden for our children. I worked every day from 8.30am to 5.30pm being home well before 6pm each day."



Dr Luke Boulter

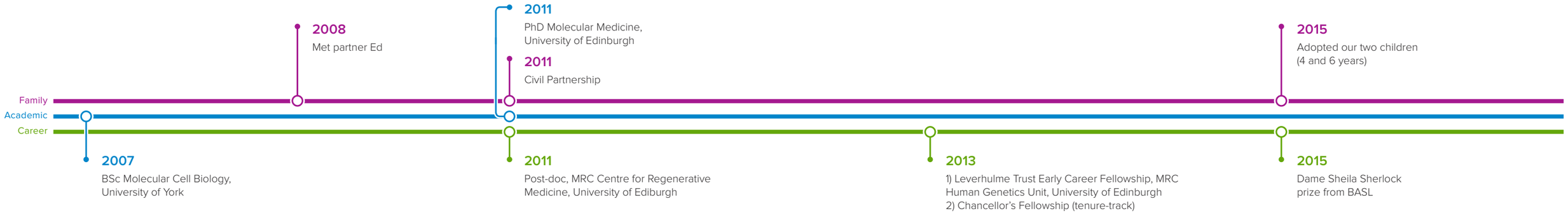
MY RESEARCH

My group seeks to understand the processes that happen as an adult tissue undergoes regeneration to repair itself and then asks whether these processes are hijacked or coopted to drive carcinogenesis with the aim of finding small molecules which can target these molecular switches as a therapy for cancer or to enhance regeneration and repair. We use a combination of *in vivo* and *in vitro* models as well as pathological human tissue to do this and primarily focus on the liver and colon in health and disease to better understand these processes.

MY JOURNEY

Balancing work and family is a skill that I have only recently had to develop, since my husband and I adopted two children, four and six years old. What I have found is that whereas previously I would just stay that extra hour or two at the end of the day, I can no longer do this. In fact I rather like not being able to as I would rather be home for supper and story time! This has meant a great deal more time management in the day and more sitting up at night getting something finished at home. I work at home on Monday afternoons, whilst my children do jigsaws, arts and crafts and Ed is secreted away studying for his MLitt. By taking these afternoons I get some rare one-on-one time with them, which is excellent fun.

"Whereas previously I would just stay that extra hour or two at the end of the day, I can no longer do this. In fact, I like not being able to as I would rather be home for supper and story time! This has meant a great deal more time management in the day and more sitting up at night getting something finished at home."



Dr Al Lambourne

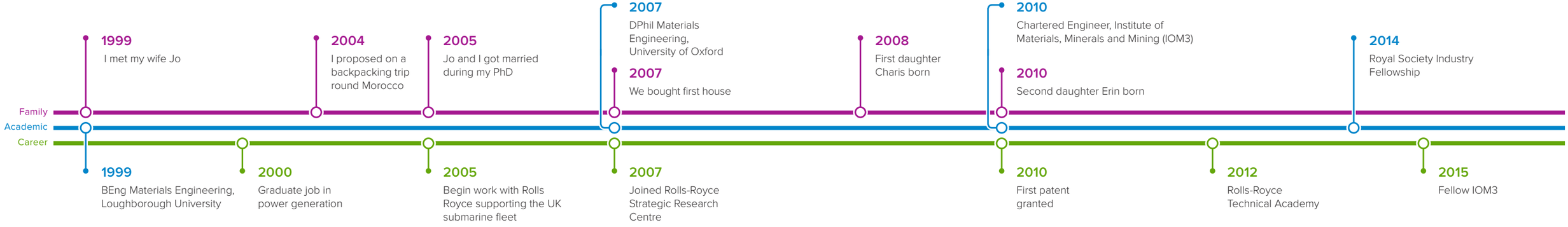
MY RESEARCH

I'm a materials engineer with a broad range of interests and experience. The common theme is 'solving problems' with the application of materials engineering, this has included work on nuclear reactors, marine propellers, gas turbine blades and coatings for coinage. My current work is investigating the materials and manufacturing technologies for the next generation of efficient electric motors and generators, which has applications for hybrid electric propulsion for future aircraft.

MY JOURNEY

I have been fortunate to find a career that I find interesting, I am even more fortunate to be able to maintain a good work-life balance, starting work early and home for tea with the children every day. I work full-time, but I make use of the government 'parental leave' scheme which provides much needed additional time off. My work-life balance is largely possible through the efforts and sacrifices of my wife, Jo, who decided not to go back to work when we had children. It means I'm able to focus on work and adapt to new challenges without worries about juggling childcare. I'm hugely proud of my family and delighted when my children point to an aeroplane in the sky and ask 'did you make that one daddy?' It is great to be in a career where I am contributing to cleaner technology for the world my children will inherit.

"I am fortunate to be able to maintain a good work-life balance, starting work early and home for tea with the children every day. I work full-time, but I make use of the government 'parental leave' scheme which provides much needed additional time off."



Professor Saiful Islam

MY RESEARCH

My research is in the area of clean energy materials, exploring new classes of compounds for rechargeable lithium batteries and next-generation solar cells. As a Royal Society of Chemistry poster says: 'Not all chemists wear white lab coats.' My research uses advanced computer modelling techniques to help understand fundamental structure-property relationships of new energy materials on the atomic- and nano-scale. For example, my research group are studying lithium-ion diffusion in iron-silicate battery materials for electric vehicles, which offer the tantalising prospect of cheap and sustainable electrodes from rust and sand!

MY JOURNEY

I am very fortunate working at a university carrying out exciting research and having the flexibility to share family things such as dropping-off at the nursery and primary school, preparing meals and reading bedtime stories. As a GP, Gita is a working mother and has been very supportive of my academic career. We had children relatively late (38+). Local nurseries and a child-minder were very important. Sadly, austerity cuts mean affordable childcare is not available to all. Being away at overseas conferences can be hard, so I try to cut that down. I sometimes show Gita a list of exotic conferences I have declined, although she replies "Can I go instead?"

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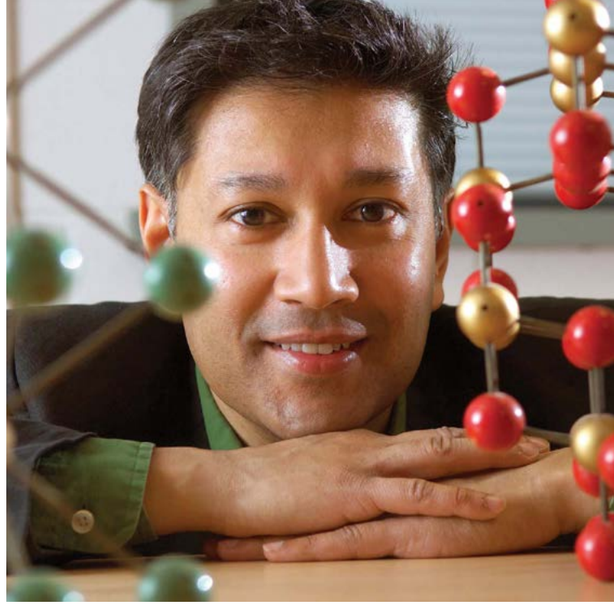
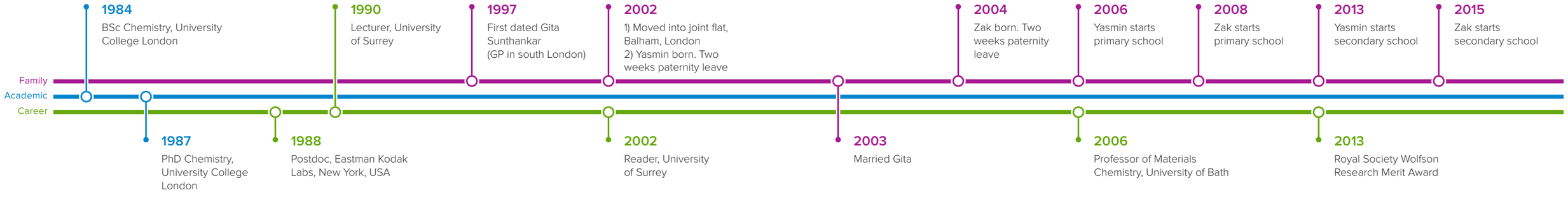




Dr Sally Lowell

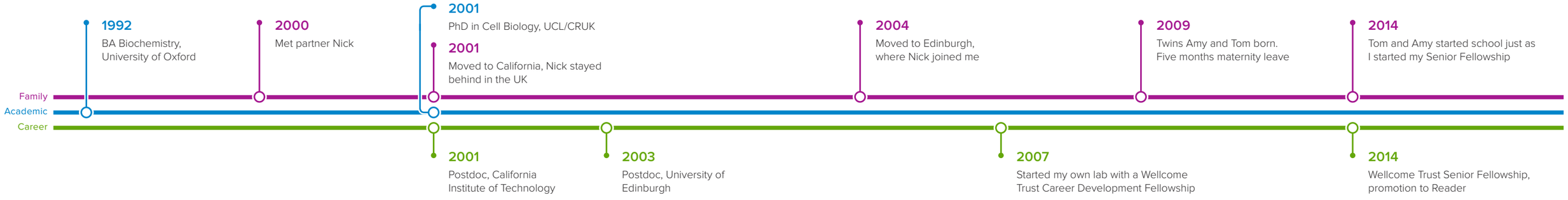
MY RESEARCH

I am interested in understanding how stem cells differentiate into functional cell types in the body and how we can use this information to generate useful cell types in a culture dish. We know that there is a great deal of variability between individual cells in the way they respond to differentiation cues, but we don't understand why this is. I am exploring the idea that changes in cell adhesion influence the way that cells integrate information from their environment. The hope is that understanding this level of regulation will help to resolve the apparent unpredictability of the differentiation response.

MY JOURNEY

Twin mums have to learn very quickly how to keep going no matter how tough things get – a very handy skill in a research career! Having two small children at home does limit my time in the lab, but this has brought the benefit of forcing me to give up on my unfortunate tendency to micromanage my group's projects. Having to give my students and postdocs the freedom to make their own mistakes is one of the things that has allowed them to flourish into the wonderful innovative and self-driven scientists that they all are!

"Having young twins at home does limit my time in the lab, but this has brought the benefit of forcing me to give up on my unfortunate tendency to micromanage my group's projects. Having to give my students and postdocs the freedom to make their own mistakes is one of the things that has allowed them to flourish into the wonderful innovative and self-driven scientists that they all are!"



Professor Adele Marston and Professor Paul Palmer

ADELE'S RESEARCH

The overall goal of research in my group is to understand how the genome is accurately transmitted from one generation to the next. We study the process of chromosome segregation during meiosis, the cell division that generates eggs and sperm.

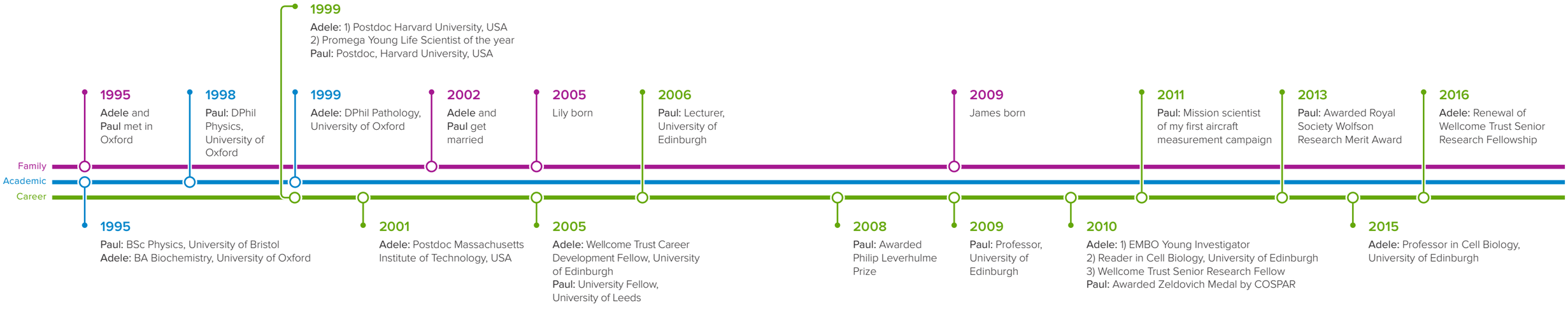
PAUL'S RESEARCH

My research aims to understand what drives observed variations of atmospheric trace gases and aerosol particles relevant to climate. We achieve this using data, models, and theory.

OUR JOURNEY

After meeting in Oxford we both found postdoc positions in Cambridge, Massachusetts. Our daughter was born in the last year we were there. Finding two suitable group leader positions in the same city back in the UK was not easy and for a short while we were working in separate cities, which was challenging with a young child. Our families live too far away to provide day-to-day help so we alternate working extended hours to share the responsibility of childcare.

"Finding two suitable group leader positions in the same city back in the UK was not easy and for a short while we were working in separate cities, which was challenging with a young child."



“Our families live too far away to provide day-to-day help so we alternate working extended hours to share the responsibility of childcare.”

Professor Adele Marston and
Professor Paul Palmer

Be adaptable

Be adaptable

Ambitious researchers may change their scientific focus, or relocate between institutions or countries, more than once in a career. When the challenges and opportunities of life present themselves, these scientists and engineers reveal how they've had to adapt.

In the 1960s, **Professor Ruth Lynden-Bell** succeeded in combining her career as an NMR spectroscopist, with her new life as a mother. But she wasn't afraid to change to a specialism that suited her better: "I made the transition to a theorist and then a computational chemist partly as my interests changed and partly because it was easier to combine theory and computational work with family timetables."

Ecologists, **Dr Nick Isaac** and **Dr Seirian Sumner**, contributed one of many examples of how – as couples adapt to career opportunities – traditional gender roles of parenthood blur to best fit the family. "After our second child was born, Nick decided to join me in working part-time, to spend more time with the children. This worked well, as I was commuting three hours a day. Soon after I took up my position in Bristol I decided to return to full-time working, and Nick stayed part-time. He does 90% of the after school care (including dancing classes, music classes etc.) and at least 60% of other domestic duties."

Sometimes, for couples in academia, family roles fall into place through a scarcity of funding, as **Professor Dame Athene Donald** tells of her situation in the late 1980s: "After our second child was born [husband] Matthew's funding dried up and it became logical for him to become the primary carer. There was no flexible or part-time working available then, but I worked very flexibly – academia is good for that – and restricted my travel to only three nights away a year."

With a cross continental journey (Manila, New York) through his early scientific career, immunologist, **Dr Julius Clemence Hafalla**, says he and his wife "succeeded in having two complementary careers, not always by precise preparation, but by working as a team and seizing opportunities as they came – including moving to the UK." After settling in London, daughter Mariella was born. "With our families far away (Philippines and USA) it's been challenging sometimes, but the same supportive environment and values (persistence, collaboration, creativity) that shaped my scientific career have been key ingredients in building a rewarding family life."

Dr Jo Shien Ng agrees that the skills she employs in her research as an electronic engineer overlap into parenthood, saying "It was only after our first child was born that we realised the size of the challenge in having two fulfilling careers and an enjoyable family life simultaneously... I find an open mind set, good organisation skills, and willingness to adapt – which I have also relied on as an academic – help me enormously in achieving the family life that we desire."

Psychologist, **Professor Stephan Lewandowsky**, and his family are experts at adaptability. His two children were born in Canada and the US, before the family moved to Western Australia where Professor Lewandowsky ultimately separated from his wife. "Finding a balance between career and family life was harder than anything else I have ever done. The children spent half their time with me while I was living in Perth. When I spent a sabbatical in Germany in 2005, they were able to attend school there for a semester. I hope that they have learned to appreciate different cultures around the globe." In 2005 he met his second wife, who had three children of her own. "Juggling two jobs and five children turned life into a tumultuous circus for a few years. Now that the kids are adults and scattered across three continents life is no longer a circus but a never-ending series of airline tickets."

Professor Ruth Lynden-Bell

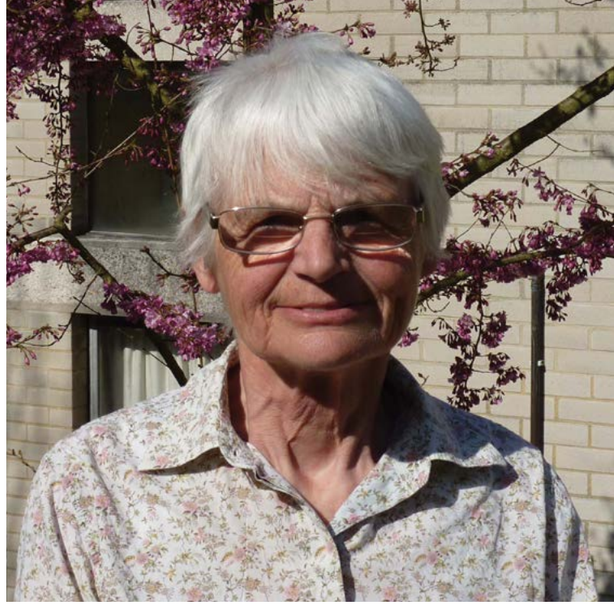
MY RESEARCH

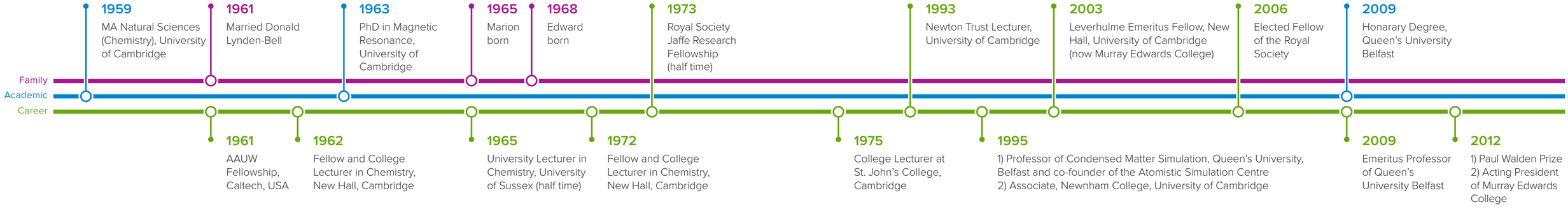
My current research uses computational modelling to try to understand liquids. At present I am modelling the behaviour of ionic liquids near electrodes in collaboration with scientists in Spain, Estonia and the UK.

MY JOURNEY

Originally I was an NMR spectroscopist measuring chemical shifts and coupling constants of simple molecules, but I made the transition to a theorist and then a computational chemist partly as my interests changed and partly because it was easier to combine theory and computational work with family timetables. My most important asset has been a supportive husband who respects my abilities.

> "I made the transition to a theorist and then a computational chemist partly as my interests changed and partly because it was easier to combine theory and computational work with family timetables."





Dame Athene Donald

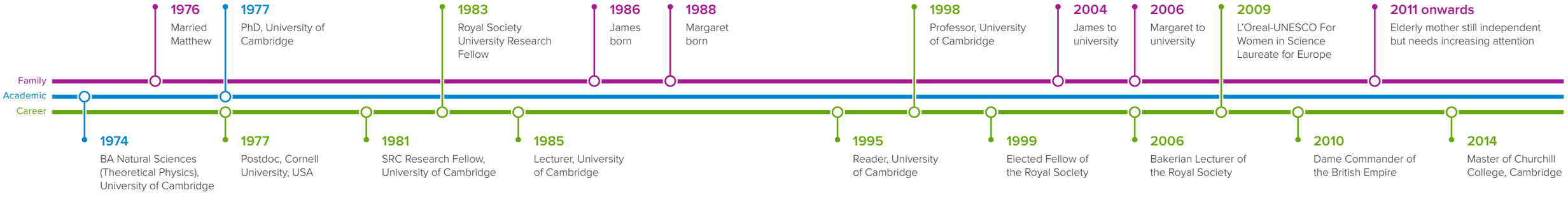
MY RESEARCH

I work in soft matter physics, particularly at the interface with biology. This has included polymer and colloid research, development of Environmental Scanning Electron Microscopy, starch and currently protein aggregation and cellular biophysics.

"After our second child was born Matthew's funding dried up and it became logical for him to become the primary carer."

MY JOURNEY

I met my husband, a mathematician, during my PhD. At that point I had no intention of staying in academia. We got married at the end of my second year and decided to go to the USA (Cornell) where I got a two year postdoc position and Matthew started a PhD. At the end of my first postdoc I swapped from working on metals to polymers for a second postdoc so that I could stay in the USA whilst Matthew finished his PhD and it was during this period that I finally got hooked on an academic career. We returned to Cambridge where Matthew had a college fellowship and I also got a fellowship in the Materials department. After our second child was born Matthew's funding dried up and it became logical for him to become the primary carer. There was no flexible or part-time working available then, but I worked very flexibly – academia is good for that – and restricted my travel to only three nights away a year. Over the years I rose through the hierarchy, becoming a professor in 1998 and an FRS in 1999. I never really got back in the swing of doing much travelling, but my work in soft matter physics thrived and at the Cavendish we slowly built up a large group. In time I became deputy head of department and, from 2010 both the Royal Society's Education Committee chair and the University's Gender Equality Champion. These two roles reduced my time on research. I have always done significant committee work, which I believe is an important part of being a senior scientist. My second child left home and went to university in 2006. Now my caring responsibilities are for my elderly mother, who lives in London. Since 2014 I have been Master of Churchill College. I also write a significant amount on my own personal blog and in the print media.



Dr Julius Clemence Hafalla

MY RESEARCH

My research investigates factors that govern the magnitude, efficiency and long-term maintenance of protective T cell responses to the initial stages of malaria infection. By combining tools in bioinformatics and immunology, we have identified novel fragments of malaria proteins that are targeted by immune T cells. In addition, using tools in experimental genetics, we are defining whether the 'best' targets of T cells are expressed in distinct stages and/or in specific compartments during parasite development. The goal of my research is to contribute to our knowledge of the basic immunity to the malaria parasite as a bridge to the rational development of malaria vaccines.

MY JOURNEY

My scientific journey has taken me from Manila to New York and then to London. Having met in post-graduate school, my wife and I understood early on both the demands and rewards of our vocation. We worked long hours, and we made sacrifices, but we also enjoyed the fruits of our labour. Through the years, my wife and I have by some means succeeded in having two complementary careers, not always by precise preparation, but by working as a team and seizing opportunities as they came – including moving to the UK. When our daughter was born, she became our priority. With our families far away (Philippines and USA), it's been challenging sometimes, but the same supportive environment and values (persistence, collaboration, creativity) that shaped my scientific career have been key ingredients in building a rewarding family life.

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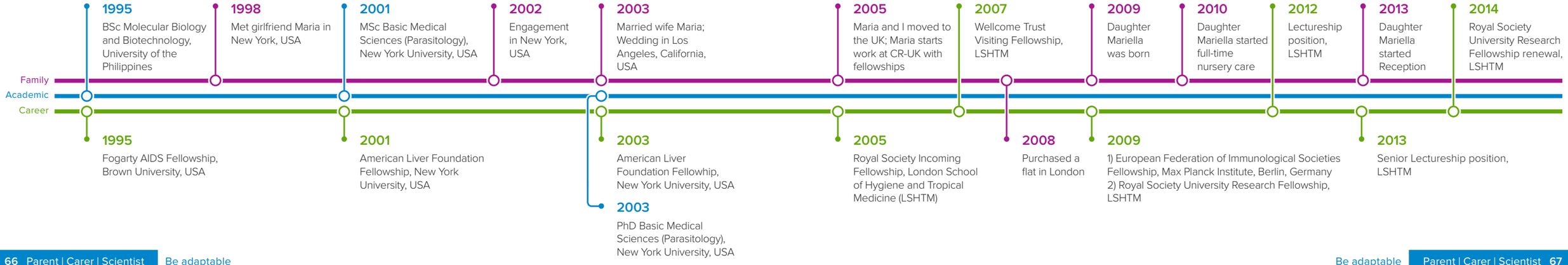


Dr Jo Shien Ng

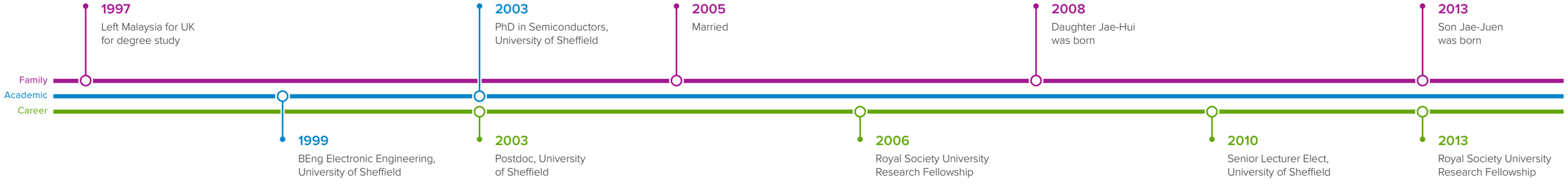
MY RESEARCH

I develop electronic devices that detect light and produce electrical current with high sensitivities. The types of activities are wide-ranging, including producing new design ideas, developing raw materials for the devices, producing and assessing test samples to rule out or confirm new ideas. If development for a particular device goes well, the devices could end up in scientific/industrial sensing instruments whose principle of operation depends on sensitive detection of light. Progress in my research relies heavily on collaborative working with people with different expertise, which makes work more satisfying for me than working alone.

MY JOURNEY

My husband and I are both full-time academics, working in the same department. It was only after our first child was born, we realised the size of challenge in having two fulfilling careers and an enjoyable family life simultaneously. With mental and practical supports from each other, we have so far largely succeeded. In addition, I find an open mind set, good organisation skills, and willingness to adapt – which I have also relied on as an academic – help me enormously in achieving a family life that we desire.

"It was only after our first child was born that we realised the size of the challenge in having two fulfilling careers and an enjoyable family life simultaneously. I find an open mindset, good organisation skills and willingness to adapt – which I have also relied on as an academic – help me enormously in achieving the family life that we desire."



Professor Stephan Lewandowsky

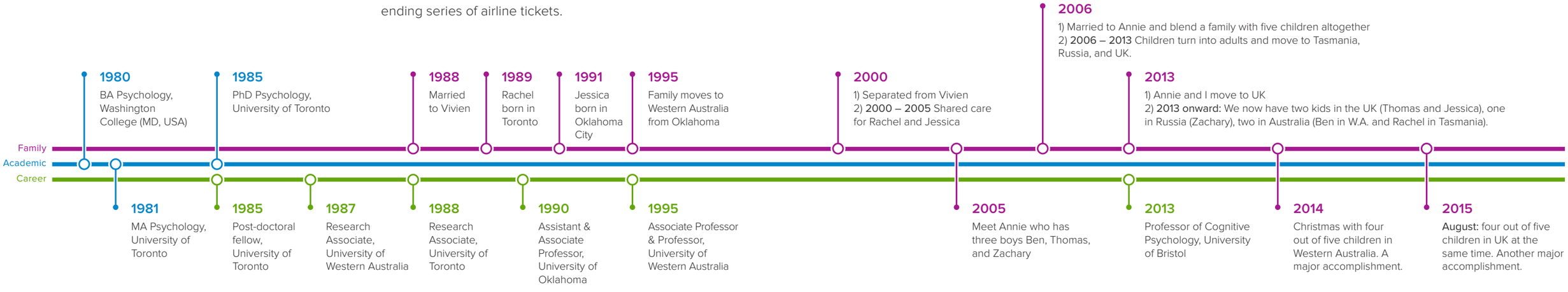
MY RESEARCH

My research examines people's memory, decision making, and knowledge structures, with a particular emphasis on how people update information in memory. I currently focus on the potential conflict between human cognition and the physics of the global climate, which has led me into doing research in climate science and climate modeling as well as in cognition. In addition to publishing in the peer-reviewed literature, I have contributed numerous opinion pieces to the global media on issues such as climate change 'skepticism' and misinformation.

MY JOURNEY

Finding a balance between career and family life was harder than anything else I have ever done. I am not sure how successful it was, but I am proud that I contributed a major share of the care of my daughters during their formative years. They spent half their time with me while I was living in Perth, and we travelled to Europe together pretty much every year. When I spent a sabbatical in Germany in 2005, they were able to attend school there for a semester. I hope that they have learned to appreciate different cultures around the globe. After Annie and I got married, juggling two jobs and five children turned life into a tumultuous circus for a few years. Now that the kids are adults and scattered across three continents life is no longer a circus but a never-ending series of airline tickets.

"Finding a balance between career and family life was harder than anything else I have ever done."



Dr Nick Isaac and Dr Seirian Sumner

NICK'S RESEARCH

I study how biodiversity is distributed in space, how we measure it, and how it is changing over time. My research combines statistical analysis with the development of statistical tools to draw robust inferences from noisy data. I am interested in revealing the mechanisms linking large-scale patterns with fundamental ecological processes (such as birth, death and extinction), and how these patterns and processes are being affected by land-use and climate change.

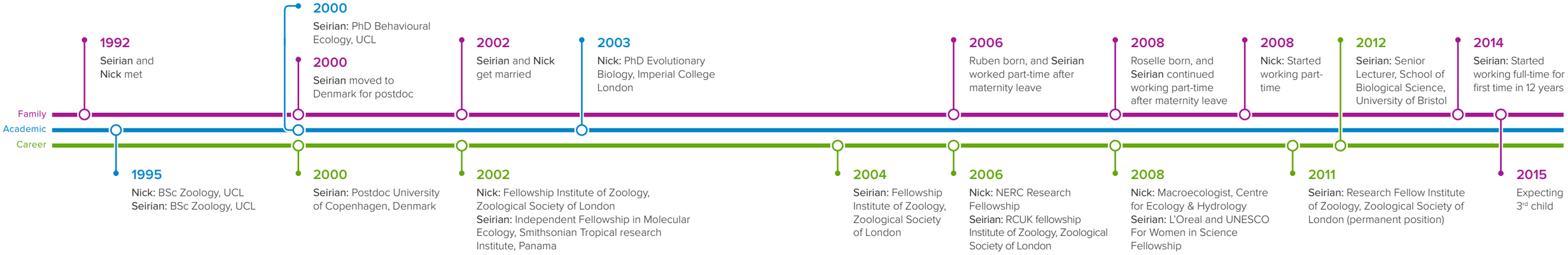
SEIRIAN'S RESEARCH

I am interested in the evolution of behaviour, and the role of plasticity in behaviour. Social behaviour is especially intriguing, where some individuals give up the chance to reproduce in order to help others reproduce. I study the mechanisms and evolution of social behaviour, from genes to phenotypes, in social insects (bees, wasps and ants). I use a combination of classical field ecology with the latest molecular sequencing methods to better understand the origins of sociality, caste evolution and how genomes are used differently (e.g. via gene expression and protein synthesis) to generate variation in social behaviour and phenotypic plasticity.

OUR JOURNEY

I (Seirian) was lucky enough to have a permanent position before our first child was born. We shared childcare responsibilities from the outset, although I worked part-time whilst Nick remained a full-time research fellow. After our second child was born, Nick decided to join me in working part-time, to spend more time with the children. This worked well, as I was commuting three hours a day. Soon after I took up my position in Bristol I decided to return to full-time working, and Nick stayed part-time. He does 90% of the after school care (including dancing classes, music classes etc.) and at least 60% of other domestic duties. The children often accompany us on fieldwork and conferences. We've yet to work out how a 3rd child will fit into our lives, but we hope our teamwork ethos will get us through.

> "After our second child was born, Nick decided to join me in working part-time, to spend more time with the children. Soon after I took up my position in Bristol I decided to return to full-time working, and Nick stayed part-time."



Don’t be afraid to ask for help

Don’t be afraid to ask for help

Juggling work and parenthood or caring responsibilities is tough, and sometimes impossible, without help. Whether it’s finding support from family, friends or paid help, these researchers share the solutions that worked for them.

Biomolecular engineer, **Professor Aline Miller**, emphasised the value of a true partnership approach. “The key, I believe, to combining a career with family life is having a fully supportive partner. Everything, from school pick-ups, to homework help and laundry is shared equally between me and my husband.” But sometimes a safety net is needed too; “having a strong network of local friends to call upon in an hour of need has been important, and I am always happy to return the favour when I can.”

Finding trusted professional help can be invaluable, as **Professor Claire Grierson** found when her husband’s health worsened. “Once Mark [husband] was too ill to work we advertised for someone to help with housework and children, who could help Mark enjoy family life when I couldn’t be there. We rejected quite a few applicants before we found Carol, who our children see as an extra aunt.”

Meeting the needs of childcare during early mornings, after school, term-time and holidays adds up to a complex mix-and-match of help, as **Dr Judith Hillier** suggests: “Since returning to full-time work, I have been fortunate to have an excellent nursery, a school with wrap-around care, a supportive husband and extended family. Retired grandparents have been really useful, and I also have enough close friends to call for help when I do drop one of the balls I am juggling.”

Grandparents play a crucial childcare role in many families. But the globe-trotting nature of research careers means that, for many, this option isn’t available. “I’m originally from the Czech Republic and my wife, Biying, is originally from China” says computer scientist **Dr Stanislav Zivny**. “We don’t have the support of our families that live in other countries. Thus it’s rather challenging to combine our professional lives and raising a child. However, by various sacrifices and working hard, we have managed so far!”

For some, working overseas can mean spending time away from family, which can be tough. After moving to the USA with her daughter, Jessie, particle physicist **Dr Lily Asquith** had to uproot again. “Two years into my postdoc I was relocated from Chicago to CERN and Jessie returned to the UK and stayed with my sister and then my mother. I was commuting between Brighton and Geneva for two years, sometimes spending two weeks at a time away from my daughter, which was as horrible as it sounds. However, in August 2014, I got funding with the ATLAS group at the University of Sussex, meaning that Jessie and I could move to Brighton together, permanently.”

Professor Aline Miller

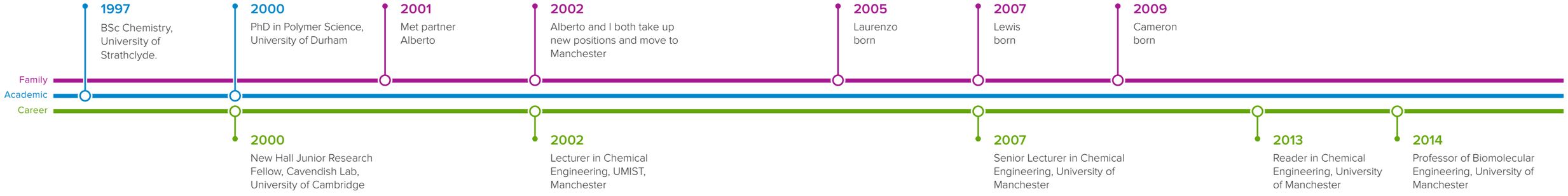
MY RESEARCH

My research focuses on the characterisation of polymer, biopolymer and peptide materials across the length scales, both in the bulk and at fluid surfaces. In particular the understanding of the chemical architecture – thermodynamic – structure – physical property correlations in complex systems to achieve process and product control using state of the art techniques. These include neutron and X-ray small angle scattering in large scale facilities. The group has recently extended its activities into the creation of 3D hydrogel scaffolds from the self-assembly of proteins and *de novo* designed short peptides. These scaffolds have been further functionalised by conjugating the peptides to pH and temperature responsive polymers.

MY JOURNEY

The key, I believe, to combining a career with family life is having a fully supportive partner. Everything from school pick-ups to homework help and laundry are shared equally between me and my husband. It does help that we are both academics and benefit from the flexibility that university life has to offer and I have also been very fortunate in having a Head of School who creates an environment that fully adopts family friendly practices. I have also found that having a strong network of local friends to call upon in an hour of need when meetings overrun or trains are delayed has been important and I am always happy to return the favour when I can.

"The key, I believe, to combining a career with family life is having a fully supportive partner."



Professor Claire Grierson

MY RESEARCH

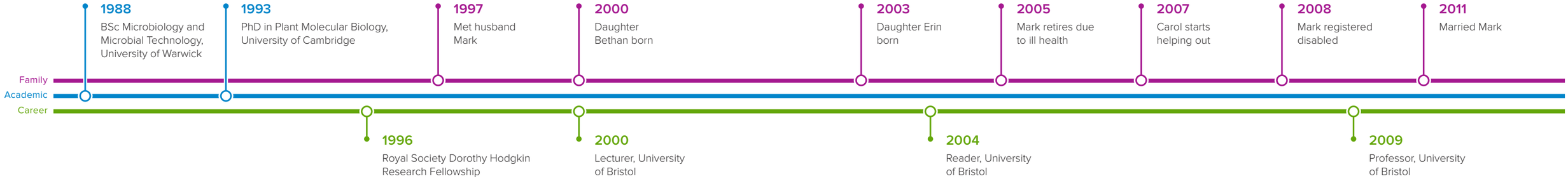
I really enjoy being the plant or cell biologist in an interdisciplinary team. Current projects tackle:

1. How plants contribute to soil cohesion, for example to prevent soil erosion. This is a collaboration with environmental scientists and biophysicists.
2. New ways to control gene activity in bacterial populations. This work is done with engineers and biochemists.
3. How patterns of molecules and cells arise – a collaboration with mathematicians.

MY JOURNEY

My life has required stubbornness, hard work and luck. Once Mark was too ill to work we advertised for someone to help with housework and children, who could help Mark enjoy family life when I couldn't be there. We rejected quite a few applicants before we found Carol, who our children see as an extra aunt. The flexibility of academic work means I can fit in hospital visits at short notice, look after sick children/husband, and get to some school events. I have sometimes had to dig deep and work very hard when I'd rather be sleeping, bathing, or watching the tennis, but I am never bored!

> "Once Mark was too ill to work we advertised for someone to help with housework and children, who could help Mark enjoy family life when I couldn't be there."



Dr Judith Hillier

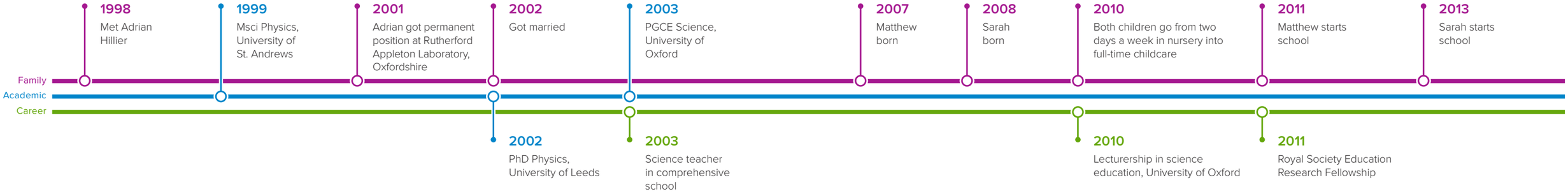
MY RESEARCH

As a physicist turned physics education researcher and physics teacher educator, my research interests lie in the process of becoming a physics teacher. I aim to develop a better understanding of what motivates physics graduates to enter the teaching profession. I examine the experiences of beginning physics teachers, what they need in terms of informal and formal continuing professional development (CPD) and what factors influence their subsequent career decisions. And I study how beginning physics teachers learn to explain physics – essential for effective teaching – and what processes and resources best aid the development of the subject knowledge and pedagogical knowledge needed to do this.

MY JOURNEY

I worked part-time for three and a half years, which I really enjoyed as I was able to spend time with the children. Since returning to full-time work, I have been fortunate to have an excellent nursery, a school with wrap-around care, a supportive husband and extended family. I also have a flexible job, and have brought the children in occasionally! We have to be really organised, and I am quite firm about not working past 5pm regularly, and about limiting the amount of foreign travel I do. Retired grandparents have been really useful, and I also have enough close friends to call for help when I do drop one of the balls I am juggling. It is possible to have a career and children, but it is hard work.

"Retired grandparents have been really useful, and I also have enough close friends to call for help when I do drop one of the balls I am juggling."



Dr Stanislav Zivny

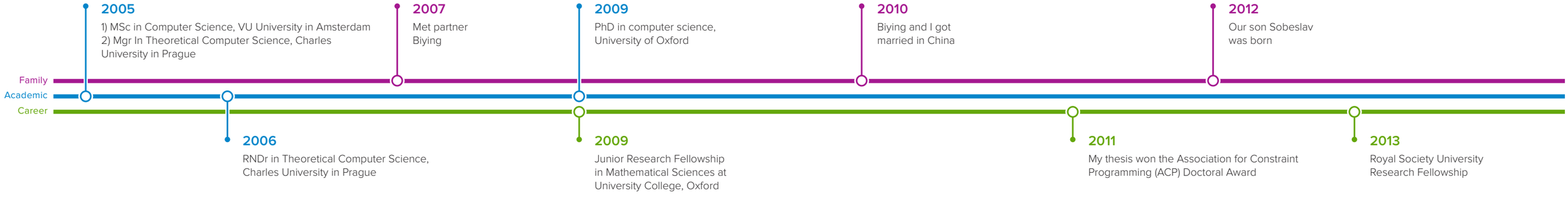
MY RESEARCH

I am a theoretical computer scientist. My research centres around the application of mathematics to the design and analysis of algorithms, with a long-standing interest in optimisation of discrete functions. Most of my work deals with developing efficient algorithms for optimisation problems that can be modelled by separable discrete functions, and proving under which conditions efficient algorithms for such problems can exist. Such problems are studied under many different names in various contexts of computer science: constraint satisfaction problems, pseudo-Boolean optimisation, inference in graphical models, Gibbs energy minimisation, or Markov Random Fields.

MY JOURNEY

I'm originally from the Czech republic and my wife Biying is originally from China. As two immigrants in the UK, we don't have the support of our families that live in other countries. Thus it's rather challenging to combine our professional lives and raising a child. However, by various sacrifices and working hard, we have managed so far.

"We don't have the support of our families that live in other countries. Thus it's rather challenging to combine our professional lives and raising a child."



Dr Lily Asquith

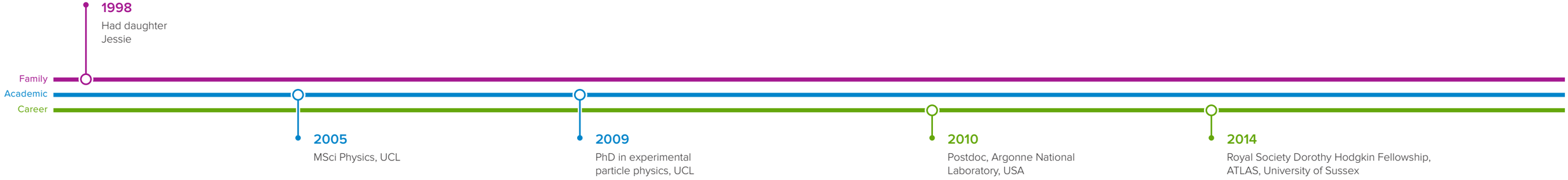
MY RESEARCH

I work on analysing data from the ATLAS experiment at the Large Hadron Collider, CERN. I am currently developing novel methods for reconstructing energy deposits and particle tracks to uncover signatures of new physics, and am also working on measurements of the interaction between the newly discovered Higgs boson and the top quark. This interaction is very interesting because it is the Higgs boson that gives the top quark its freakishly large mass.

MY JOURNEY

I didn't have any qualifications when I had my daughter. When she was a baby I started going to Birkbeck College one night a week to do physics and then maths. I did that for two years, and then UCL agreed to take me onto the Physics MSci course. Jessie started nursery on her third birthday, a few days after I started at UCL. I stayed at UCL for eight years, then we moved to Chicago for my postdoc when Jessie was 11. Two years into my postdoc I was relocated from Chicago to CERN and Jessie returned to the UK and stayed with my sister and then my mother. I was commuting between Brighton and Geneva for two years, sometimes spending two weeks at a time away from my daughter, which was as horrible as it sounds. However, in August 2014 I got funding with the ATLAS group at the University of Sussex, meaning that Jessie and I could move to Brighton together, permanently.

"I was commuting between Brighton and Geneva for two years, sometimes spending two weeks at a time away from my daughter, which was as horrible as it sounds."



“It wasn’t easy being a mother and managing a demanding international career.”

Dr Angela Strank

Be determined

Be determined

Whether you're breaking new ground or battling personal hardship, you'll need determination and resilience. These scientists describe how they've weathered tough times, juggled family life and continued to succeed in the career they love.

Dr Lily Asquith's story epitomises the drive that many researchers have to draw on to succeed in their careers. However, Dr Asquith had to find this drive at the very start of her journey: "I didn't have any qualifications when I had my daughter Jessie. When she was a baby I started going to Birkbeck College one night a week to do physics and then maths. I did that for two years, and then UCL agreed to take me onto the Physics MSci course. Jessie started nursery on her third birthday, a few days after I started at UCL." Some years later, after a PhD in particle physics, Dr Asquith would work at the Large Hadron Collider at CERN (see page 86).

After more than a decade as a secondary school science teacher – and with two children – **Professor Jane Clarke** set her mind to becoming a researcher. "I didn't accept when told it was impossible to do a PhD with young children. I've learned to manage time, to decide for myself what success looks like – judge me by what I achieve, not by time spent in the lab."

Chief Scientist and Head of Downstream Technology at BP, **Dr Angela Strank** had similar resolve in her 'mission' to combine parenthood with a successful career in a tough industry. "It was hard being a mother and managing a demanding international career, particularly in the early years, but I was determined to be a successful geologist and business leader in the oil and gas industry. I was on a mission in some respects. I wanted to show that women could be successful in the world of frontier exploration industry, as well as having a family and being a good mother."

The normal juggles of life and work are challenging for most, so how do you cope if you have the added complication of poor health?

"I think setbacks make you more resilient" says **Professor Aedin Cassidy** simply. In 1999 – a week after starting as Senior Scientist at Unilever – Professor Cassidy had a stroke. It left her with a visual impairment, but she's since gone on to set up the Department of Nutrition at University of East Anglia (see page 30).

Similarly, the ambition of Cardiff neuroscientist **Dr Seralynne Vann** outweighed the challenges she faced. "I always knew I wanted a career in science and to be a mother. However, I am physically disabled with chronic health problems and I always feared that this might be a barrier to having children. Despite that, with the help of IVF we were able to have our beautiful son. I took 11 months maternity leave and then returned to work part-time. Combining everything – and doing it well – is a huge challenge, but I have a brilliant team and a very supportive partner and family, which is a great help."

"My life has required stubbornness, hard work and luck" says **Professor Claire Grierson**, whose husband Mark had to retire due to chronic ill health in 2005. Mum of two, Professor Grierson says that "the flexibility of academic work means I can fit in hospital visits at short notice, look after sick children/husband, and get to some school events." But she admits it's been tough "I have sometimes had to dig deep and work very hard when I'd rather be sleeping, bathing or watching the tennis, but I am never bored!" (see page 80).

Dr Janet Deane and her husband **Stephen** have had to dig deep too. After starting their own labs in Cambridge in 2011 and 2012, they were hit with a series of serious health issues. Stephen was diagnosed and treated for cancer, which recurred in 2014, when Janet suffered a disabling back injury. It's perhaps an understatement when she says "These experiences were extremely challenging, both psychologically and physically. Running a new lab, let alone two, is hard enough at the best of times and these were not the best of times."

During a tough time as a lone parent, **Professor Angela Karp** – biomass crop scientist at Rothamsted Research – matched her professional ambitions with the determination to be the best mum she could. "I adopted the practice that when I am working, I am 100% working efficiently and when I am at home with my children, I am 100% with them. I viewed the after school time and weekend time as their time with me and I pledged never to come home from work saying I was too busy or tired to do something important to them – even though this often meant working late after they had gone to bed. I was on my own with two children and a demanding job, but this kept a strong bond between us."

Professor Jane Clarke

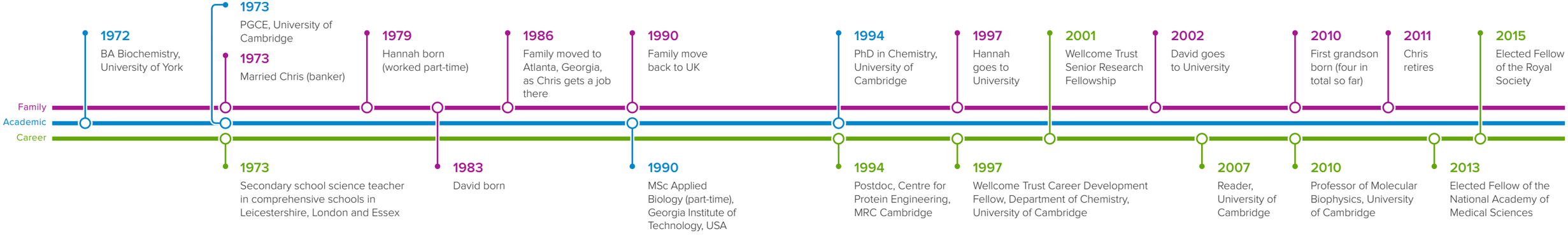
MY RESEARCH

I am interested in protein folding – in the fundamental relationship between protein sequence, structure and function. My research is multidisciplinary, combining single molecule and ensemble biophysical techniques with protein engineering and simulations. My group addresses many of the fundamental questions on how proteins fold and the evolution of folding landscapes by studying families of homologous proteins. We are interested in more complex problems, including investigating the folding and misfolding of multidomain proteins and, recently, folding upon binding of intrinsically disordered proteins.

MY JOURNEY

I love being a research scientist. I relish the freedom, the excitement of discovery, spending days working with clever young scientists. But, I haven't sacrificed family or friendships for my career – their support is invaluable. I didn't accept when told it was impossible to do a PhD with young children. I've learned to manage time, to decide for myself what success looks like – judge me by what I achieve, not by time spent in the lab. But let's try to make it as easy for my granddaughter as my grandsons to be a scientist when she grows up.

"I didn't accept when told it was impossible to do a PhD with young children. I've learned to manage time, to decide for myself what success looks like – judge me by what I achieve, not by time spent in the lab."



Dr Angela Strank

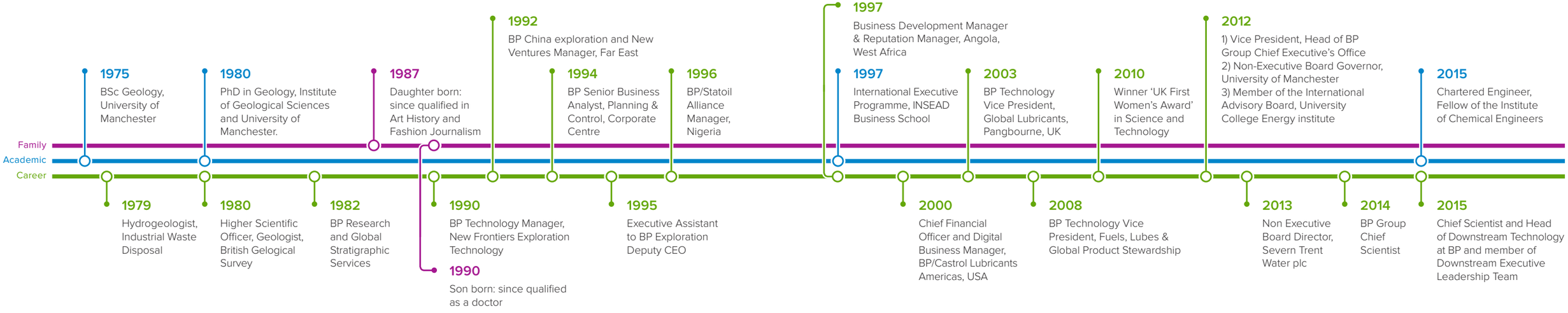
MY RESEARCH

I'm a geologist by background and did a PhD in micropalaeontology. It is a very specialised field and it proved to be my entry ticket into the oil and gas industry. I have worked all over the world exploring for oil and gas, held diverse technical, commercial and leadership roles in exploration, and later in my career led large global teams of scientists and engineers developing new lubricant and fuel products for the marketplace. I am now a member of BP's Downstream Executive Leadership Team responsible for technology across all the Refining, Petrochemicals, Lubricants and Fuels businesses. I have published over 30 papers in international and national journals, and often speak at international conferences on all aspects of science and technology in the industry.

MY JOURNEY

Along with being a mother of two, I've had a rewarding and challenging international career as a technology and business leader with BP. It wasn't easy being a mother and managing a demanding international career, particularly in the early years, but I was determined to be a successful geologist and business leader in the oil and gas industry. I was on a mission in some respects. I wanted to show that women could be successful in the world of frontier exploration, as well as having a family and being a good mother. I hope that by sharing my experience, I might inspire other young women to see that it is possible to combine an exciting international career in science, industry and business with family life.

"It wasn't easy being a mother and managing a demanding international career, particularly in the early years, but I was determined to be a successful geologist and business leader in the oil and gas industry.



Dr Seralynne Vann

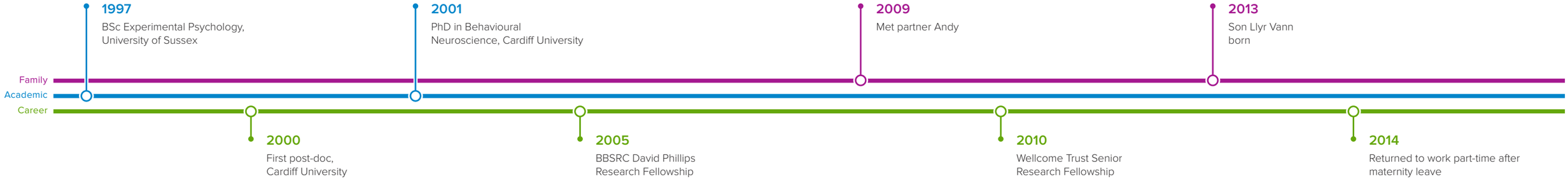
MY RESEARCH

My research goals are to reveal and understand the importance of non-hippocampal brain regions, such as the mammillary bodies and retrosplenial cortex, for event and spatial memory. I use a number of convergent approaches including behavioural neuroscience, comparative neuroanatomy and cognitive neuropsychology, which involves working with patients with circumscribed neuropathology. As part of my research I have developed new models into how midbrain regions support hippocampal function. The overall aim is to uncover why damage to certain limbic brain regions has such profound effects on memory with a long-term goal of being able to reduce these impairments.

MY JOURNEY

I always knew I wanted a career in science and to be a mother. However, I am physically disabled with chronic health problems and I always feared that this might be a barrier to having children. Despite that, with the help of IVF we were able to have our beautiful son. I took 11 months maternity leave and then returned to work part-time. Combining everything – and doing it well – is a huge challenge, but I have a brilliant team and a very supportive partner and family, which is a great help.

"I always knew I wanted a career in science and to be a mother. However, I am physically disabled with chronic health problems and I always feared that this might be a barrier to having children. Despite that, with the help of IVF we were able to have our beautiful son."



Dr Janet Deane

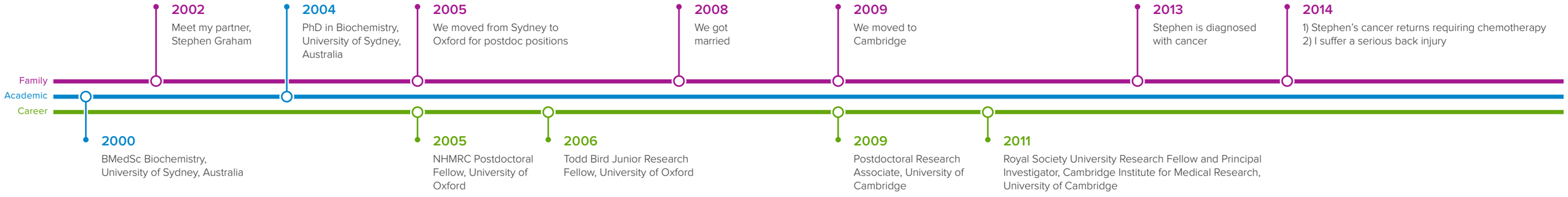
MY RESEARCH

My research is aimed at understanding the molecular mechanisms underlying human disease. We use techniques from structural biology and cell biology to visualise what goes wrong when specific genes are mutated and the resulting proteins become defective. I work together with chemists and clinicians to develop our molecular insights into new avenues for therapeutic development. The diseases I've studied throughout my career have changed as I have moved location and have included breast cancer, neurodegeneration and infectious disease.

OUR JOURNEY

I started my lab in 2011 and in 2012 so did my husband. In 2013 Stephen was diagnosed with cancer and rapidly underwent surgery. The cancer returned in 2014 with the treatment this time being intensive chemotherapy. During this period I suffered a back injury that became disabling. Although Stephen was recovering I now required support until surgery corrected the injury. During this period both my husband and I were trying to supervise the multiple PhD students who had joined our growing labs. These experiences were extremely challenging both psychologically and physically. Running a new lab, let alone two, is hard enough at the best of times and these were not the best of times!

"These experiences were extremely challenging, both psychologically and physically. Running a new lab, let alone two, is hard enough at the best of times and these were not the best of times!"



Professor Angela Karp

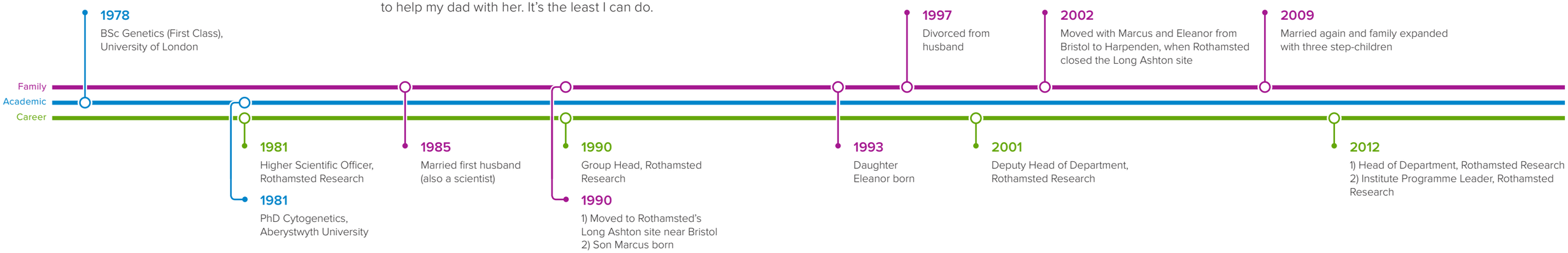
MY RESEARCH

My current research focuses on optimising the sustainable yield and composition of perennial biomass crops (especially willows) for bioenergy, biofuels and other industrial products, under the constraints of low-input arable systems. I am particularly interested in understanding the basis of perennial traits and improving the value of willow biomass through development of high value products.

MY JOURNEY

I have always adopted the practice that when I am working – I am 100% working efficiently and when I am at home with my children, I am 100% with them. When they were small this meant working late into the night once they had gone to bed, to make up for the fact I had to finish promptly to be home before 6pm with them. I viewed the after school time and weekend time as their time with me and I pledged never to come home from work saying I was too busy or tired to do something important to them – even though this often meant working late after they had gone to bed. I was on my own with two children and a demanding job but this kept a strong bond between us all. My parents helped out if I was at meetings or conferences. Even, so, I cut down the number I attended, which did affect my profile. Looking back my parents' support was immensely helpful. Now my mother has dementia and I am willingly giving up my time to help my dad with her. It's the least I can do.

"I adopted the practice that when I am working, I am 100% working efficiently and when I am at home with my children, I am 100% with them.



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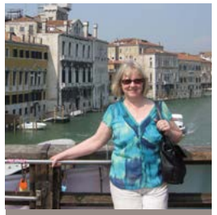

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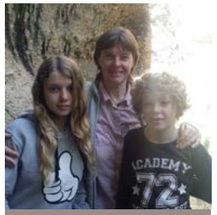

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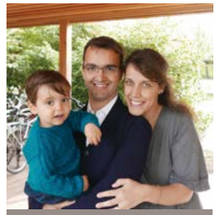

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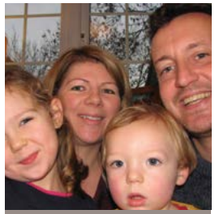

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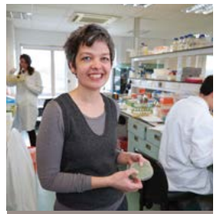

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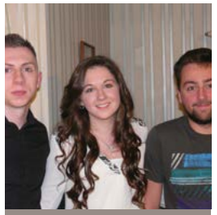

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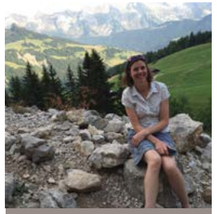
Dr Janet Lovett
Chemistry



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Physics

Dr Sarah Malik
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Dr Elin McCormack
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Professor Pat Monaghan
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Dr Emily Nurse
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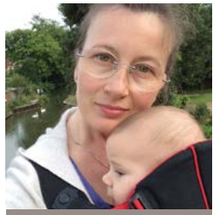

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Professor Eann Patterson
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Dr Brian Patton
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Conservation Biology

Professor Marysia Placzek
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Professor Frances Platt
Pharmacology

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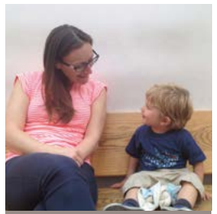
Computer Science



Dr Nichola Raihani
Human Evolutionary Biology

Dr David Robinson
Integrated Catchment Management and Soil Systems

Professor Alison Rodger
Chemistry

Dr Marco Sacchi
Chemistry

Dr Patricia Sanchez-Baracaldo
Evolutionary Biology

Professor Daniela Schmidt
Earth Sciences

Dr Amanda Sferruzzi-Perri
Developmental Physiology

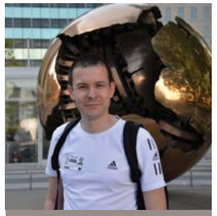
Professor Ian Smail
Physics

Dr Jennifer Smillie
Physics

Professor Kate Storey
Cell & Developmental Biology

Dame Janet Thornton
Biology

Professor Ulrike Tillmann
Mathematics



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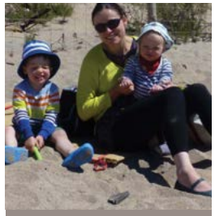
Physics

Professor Veronica van Heyningen
Human Genetics

Professor Essi Viding
Psychology

Dr Thomas Walker
Medical entomology

Professor Nina Wedell
Biosciences



Dr Natalie Wheeler
Photonics

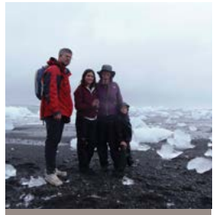
Dr Bryony Williams
Biosciences

Dr Sarah Woolner
Cell Biology

Professor Parveen Yaqoob
Nutritional Physiology

Professor Lesley Yellowlees
Chemistry

Professor Julia Yeomans
Physics



Dr Tzviya Zeev-Ben-Mordehai
Life Sciences

Dr Li Zhang
Electronics

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“My partner is the hero behind my ability to combine family life with a career.”

Professor Faith Osier

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“I’m very lucky to be well-supported at home, especially by my husband.”

Professor Rebecca Kilner

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