

PréCis

CiS Student Launch Lunches

If you know student pastors, chaplains or university science students in Birmingham, Sheffield or Belfast please contact Abigail (do@cis.org.uk) for details.

Southern Conference

**Saturday 10th
November, 2018**
09:45 to 17:00

**Redland Church
Hall, Bristol**
BS6 7HE

**More details - please see
page 6**

We are continuing the series on **Similarities AND differences** that have occurred in areas of science during “our” life time. This time we are looking at **Physics**. Listed below are answers from three CiS members from across a few generations. To keep it anonymous, we have used just their initials.

Similarities AND Differences in Physics

Approximately how long ago did you graduate in Physics?

RS - 40 to 50 years

TM - 20 to 40 years

EC - 10 to 20 years

A brief description of your personal background.

RS - I grew up in the Harrow area of NW London. I was the first of my family to go to university. Interestingly I failed the 11+ selection tests and went to the local secondary Modern then transferred to the town Grammar school for the Sixth Form. In those days one needed an O level in a foreign language to go to almost any university, so I stayed for a third year in the Sixth Form did O level French and Latin plus the Oxford entrance exam and finished up going there.

TM - I grew up in south east Greater London and went to school in Sevenoaks, Kent. I was the first in my family to

attend university apart from my maternal grandmother, who studied botany at London University in the 1920s.

EC - I was born in Italy and grew up in a large city at first and then in the countryside. Both places were situated in the north of Italy. My father was a professional physicist who worked in both academia and industry.

Why did you choose Physics?

RS - I chose physics because I enjoyed the subject, found it fascinating and was reasonably good at it. That was the way with a lot of people and five years in the secondary Modern left one rather 'unsophisticated'!

TM - I developed an interest in science from a very young age. My grandmother gave me her grandfather's old field microscope when I was about 7 or 8 years old starting a time of gazing at anything I could find to look at through it. Plant cells and insects mostly. The Apollo missions on the other hand turned my gaze upwards and after acquiring a small telescope at age 10-11 yrs. I quickly learned my way around the sky, where the planets are and began regularly observing planets, variable stars and deep sky objects. From then on, a taste for the fundamental and mathematical increasingly developed, and I realised that that science, and the approach, that I most enjoyed and valued was called 'physics'.

EC - Since my childhood I was exposed to Physics through my father's work. I developed a strong interest in the subject when following my fathers in some of his work trips. I therefore decided to study Physics and pursue a career as an academic. It was a sort of natural progression for me and I always got my parents full support and encouragement. I did my MPhys in theoretical physics in Italy and then moved to France to do my PhD in experimental biophysics.

What was it like at University?

RS - University was wonderful, but I was a little overawed. Large numbers of boys from public schools had a kind of sense of superiority. It was all male or all female in Oxford colleges in those days. In terms of students studying Physics there were around 120 per year as I recall, the vast majority being male.

We were in hall for the first year, in digs after that.

Unlike today the vast majority of funding was from the state. My parents were not well off. They made a small but very welcome contribution to top up the grant to the expected level.

After Oxford I did a PGCE in London and then got a job teaching Physics

TM - I was very lucky. No fee, a maintenance grant from my local authority and a top-up from Courtaulds who accepted me onto a 'thick sandwich' training scheme (unusual for physics). I was in my college (Emmanuel Cambridge as a scholar) all three years. All the physics students in my year at the college were male - the 10% female students at the Cavendish that year (approx.) were in other colleges.

EC - I paid university fees although not as high as in the UK, the Italian and French systems being somehow different from the UK one. When I was studying for my MPhys, the majority of my classmates were males. However, when studying for my PhD there was a sort of 50/50 split between males and females. During my MPhys I stayed at home at commuted daily. When I was studying for my PhD I had my own studio (flat).

What was a typical annual starting income after graduation?

Under £5,000

£5,000 to £10,000

£10k to £15k

During your career has there been an increase in females in your work place?

RS – Numbers broadly the same. Without facts to hand, school teaching has been more a female job than male, but with senior posts being the other way round.

Happily, that has changed a lot. My daughter is a Head Teacher.

TM - An increase

EC - Not really. I worked primarily with men and this is still the case.

At the start of your career, what was the prevailing attitude of Christian churches to science?

RS – I find this very hard to answer. It wasn't particularly discussed.

TM - I don't recall a problem – either with home church or with the Cambridge churches that I encountered. One of the first IVP books I read was Donald MacKay's 'Clockwork Image' which was very affirming and helpful. John Polkinghorne was at Trinity Hall then and giving a graduate course on Science and Theology so there were plenty of signs that this was serious.

EC - There was no dialogue between Christian Churches and science and a scientist was not supposed to mingle with religion. The two spheres had to be kept separated.

During the first 10 years of your career what were a few of the major developments in Physics?

RS – (Please see answer under next question)

TM - In my own area of statistical mechanics and soft matter there were huge strides forward in the theory of polymer fluids and melts. The dynamics of entanglements on complex structures, the statistical mechanics of gelation and networks and the microphase separation of block co-polymers I would put

high on the list. This is all part of a move to do physics in fields that would have been thought of as chemical engineering beforehand. A revolutionary example followed in the physics of granular media. Since then the application of physics to biological processes has undergone a similar transformation.

Outside my own field, the deployment of new telescopes and their discoveries: Hubble, Spitzer, the accelerating universe, exoplanets, the exploration of the solar system, have been quite wonderful to experience.

EC - The main breakthrough was the discovery of graphene.

(Graphene is a semi-metal, a form of carbon consisting of a single layer of carbon atoms arranged in a hexagonal lattice. The material was later rediscovered, isolated, and characterized in 2004 at the University of Manchester. Fascination with this material stems from its remarkable physical properties and the potential applications these properties offer for the future. (Extracts from Wikipedia and University of Manchester website)

What advancement in Physics has been the most significant during your career and research?

RS – I will confine myself to secondary school teaching and examining. The 1960s saw huge developments from the various 'Nuffield' sponsored programmes that appeared. To generalise one could say that this was driven by Rousseau's mantra 'let the child not be taught science, let him discover it' - a kind of 'stage managed' heurism. Gradually some of this found its way into

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most programmes of study and Nuffield equipment such as ticker tape trolleys, circuit boards, ray boxes etc became quite commonplace.

Over time examining physics at all levels became more imaginative giving students' better opportunities to show what they knew and understood.

TM - For my own career the emergence of the entanglement physics of polymeric fluids has been the most significant. My dual and fortuitous background in early industrial polymer science at Courtaulds, and being at Cambridge just after Sam Edwards and Masao Doi had published the first version of their theory of entangled polymer dynamics, meant that I was ideally placed to see the opportunities in this new field. I was primarily responsible for developing the application of the theory to polymers of non-trivial topology and drawing out both fundamental science and industrial value from it.

EC - Since I work in the field of microscopy and spectroscopy at the nanoscale, the main advancements which impacted on my work were in the development of atomic force microscopy for life science.

How has being a Christian influenced your career?

RS – After 25 years of teaching in mainly comprehensive schools finally as deputy head, I became head of a Church of England secondary school, essentially a re-launch of a failing borough secondary Modern school (not unlike the one I went to many years earlier) in a local authority which retailed selection. It was a fantastic privilege to be able to take a leadership style based on Christian values and Christian worship into a school and locality which absolutely needed it! Improvements were remarkable. After 2 years the school was listed as the 4th most improved school in England (by The Times)

TM - Being a Christian has profoundly affected my career. Looking back it has, I am sure, affected my choice of topics. Originally intending to do astronomy I was influenced by faith in study, practice and prayer to take a different perhaps riskier choice into something new, but which would also be of more service. I rose to a position of leadership very early in my career and being a Christian has always been challenging in how to value people and lead and encourage groups and teams.

From very early on I realised that the discussion of science in the church was theologically very thin and that far more work needed to be done. So I gave talks on a Biblical approach to science as God's gift from the early 1990s, eventually accepting regular invitations to train clergy (I became a lay reader in the Anglican Church in 1993). This all led to a book with OUP Faith and Wisdom in Science in 2014 and a 'second' career which is really part of the first in which I write and engage with theologians, the church and the wider public on building a healthy narrative of science based within a Christian worldview.

I am also sure that Christian faith has motivated my interest in interdisciplinary work, which I now perceive as part of the 'ministry of reconciliation' applied within academia.

EC - Being a Christian did not influence my career until 5 years ago when I began to develop a strong research interest in the science-religion interface.

What has your involvement with CiS been like?

RS – I have only just become a member. After retirement from my teaching career I became a reader at my local church and last year got involved in 'Take your vicar to the lab'. A great idea. It took me to Rutherford-Appleton near Oxford and earlier this year

to LHC near Geneva. Very motivating. Next month, thanks to help from the Faraday Institute, I am leading a science-faith festival where 3 leading scientists who are active Christians will share this with those who come. My hope and prayer is that this may help people to understand that science and faith can support and even enhance each other.

TM - Regular (if not always) attendance at meetings, including speaking, and reading publications.

EC - I have not been actively involved so far and hope to be able to participate more in the life of CiS.

Would you recommend a career in Physics?

RS - Certainly. Always great when able, energised scientists who are Christians work at the cutting edge in their field.

TM - Yes, always. Physics is a great key to many doors. I have found that learning biology after physics was possible, though the other way around is very difficult, for example. I love the way that physics helps you answer questions that arise in many walks of life.

EC - Without hesitation.

What is/was life in the lab like?

RS - n/a

TM - I am a theoretician so don't have a 'lab'. I do have a 'group' and have had very large ones but have always led them, so you would have to ask others what it was 'like' to be in it. But from the earliest days I have tried to communicate that everyone can 'lead' - all ideas count and that a physics group is a place to think big, and that together we can make things happen. I have also always thought that external connectivity and community is essential in science - so we welcomed industrial scientists into collaborations always.

EC - I enjoyed working in the lab when I was a PhD student and then a postdoc. It is an aspect of my career that I miss.

What have been the biggest pressures on balancing work/family/church life?

RS - The work of a head teacher is very demanding indeed. Hours are long and the work can be stressful. Somehow one is always needed by students, colleagues, parents, the wider community etc. One has to be prepared for last minute changes to one's schedules. To preserve balance, good organisation is essential and systems that direct folk who need help to the best source of that help which often is not the Head Teacher. But it doesn't always work! But if you allow too many distractions then performance in essential leadership tasks will be compromised.

Once I became Head Teacher it was very hard indeed to be actively involved in church. Church was supportive but one's ministry, be it organising and leading worship or giving pastoral help was much more in the workplace.

TM - One of the biggest pressures was the invitations to speak away from home. Conferences etc especially when children were growing up. The worst time was when I was a pro-vice-chancellor for years during our older children's teenage years when I think that they and my wife did not get the support from me that she needed and deserved. That was very hard, as I was expected to carry on an 'international profile in research' at the same time as an administrative job that was already much more than full time. It was almost intolerable at times.

EC - Time for certain. There are not enough hours in a day to take care of everything with the same level of precision and accuracy.

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10th November, 2018

9:45 to 17:00

Being Human in an Age of Machines

Speakers

**** Prof John Wyatt - *What it means to be human***

**** Prof Peter Robinson - *AI/Robotics***

**** Rev Dr Justin Tomkins - *Human enhancement***

**** Rt Rev Dr Steven Croft - *Closing reflection***

**** Dr Nick Higgs - *Oliver Barclay lecture 2018***

**Including 2 work shops:-
The evolution of technology - "*Can we be optimistic about the future of technology?*"
and "*Faith in the Lab*"**

**Redland Church Hall, Redland Green
Road, Bristol, BS6 7HE**

**Further details are available at
<http://www.cis.org.uk/2018-southern-conference/>**

Short Bios for the Speakers 2018 CiS Southern Conference

Professor John Wyatt

Professor of Ethics and Perinatology at UCL, co-Principal investigator at The Faraday Institute, investigating implications for human self-understanding of recent advances in AI and robotics.

Reverend Dr Justin Tomkins

Associate vicar at St Mary's, Longfleet and co-director of "Faith, technology and Tomorrow" project, Poole, and author of "Better People or Enhanced Humans?"

Professor Peter Robinson

Professor of Computer Technology in the Computer Laboratory, Cambridge, working on the interface of computers and their users. He is co-PI with John Wyatt of the project, "The science of human flourishing".

Right Reverend Dr Steven Croft, Bishop of Oxford

Bishop of Oxford and a member of the House of Lords Select Committee on Artificial Intelligence.

LOCAL GROUP NEWS

*Details of all events are also available
on the CiS App and on our website
www.cis.org.uk/events.*

BRISTOL

Friday 2nd Nov, 7:30 pm: *Discussion Group*.

Friday 16th Nov, 7pm for 7.30pm "Caring for the Earth 1" Speaker: Prof Simon Stuart
Species conservation: a summary of progress and challenges for the future. Location: Redland Church Hall, Redland Green Rd, Bristol BS6 7HE
No need to book – just turn up. Refreshments provided including homemade cake and tea.
No entrance charge, but opportunity to give donation, suggested £5, to cover costs.

Friday 7th Dec, 7:30 pm: *Discussion Group*.

For more information or discussion group locations, please contact Christina Biggs cmbbiggs@gmail.com

CAMBRIDGE

For details of events in Cambridge please go to <http://www.faraday.st-edmunds.cam.ac.uk/>

DUNDEE

Monday 12th Nov, 5:15pm: *Learning The Lessons of Quantum Mechanics* (part of the James Gregory Lectures on Science, Religion and Human Flourishing)

If you wish to start a
Local Group in your
area, please get in
touch with Abigail,
our Development
Officer, at
do@cis.org.uk



Speaker: Revd Canon Joanna Penberthy.
Location: Main Physics Lecture Theatre, University of St Andrews

For more details on Dundee events please contact christiansinsciencedundee@gmail.com

HARROW

For details of future events in Harrow please contact Revd Lyndon North (revlnorth@aol.com)

HUDDERSFIELD

For details please contact Omololu Fagunwa on fagunwaomololu@yahoo.com.

IPSWICH

For more information about future events please contact Dr John Ling (jjling@btopenworld.com).

IRELAND

Details about the upcoming events in Ireland can be found at www.cis.org.uk/ireland or contact Dr Peter van der Burgt (peter.vandenburgt@nuim.ie)

LEEDS

Further details of meetings please contact John Lockwood at jglockwood1@me.com

LONDON

For more details about the London group please email cins.london@gmail.com

MANCHESTER

For more information on upcoming events please contact the Secretary on sec.cismanchester@yahoo.co.uk

NORWICH

Monday 19th Nov, 7:30pm: “*Memory, dementia and the spiritual self.*” Speaker: Dr Sarah Housden. Location: Trinity Meeting Place, Essex St., Norwich NR2 2BJ. Please contact snforfolk1@gmail.com for more details.

OXFORD

For more information, please contact Diana Briggs at diana.briggs@wolfson.oxon.org

OXFORD - Students

15th October. For location and details please contact Abigail - do@cis.org.uk

READING

For more information please contact Simon Peatman at cisreading@yahoo.com

SHEFFIELD

There is a monthly meeting for staff at Sheffield University, on the 1st Wednesday of every month, in Coffee Revolution in the Students' Union. If you are interested in joining, feel free to turn up, or contact Dr Rhoda Hawkins on rhoda.hawkins@sheffield.ac.uk

SOUTHAMPTON

For information on meetings please contact Peter May on petergeorgemay@gmail.com

SOUTH WEST

Friday 2nd Nov, 7.30pm: ‘*Does Science Need God?*’. Speaker: Professor Roger Trigg from the

Faculty of Theology, Oxford University. Location: Sherwell Centre, Plymouth University
For more information on events please check www.cissouthwest.co.uk or email cissouthwest@gmail.com

ST ANDREWS

Monday 12th Nov, 5:15pm: *Learning The Lessons of Quantum Mechanics*. Speaker: Revd Canon Joanna Penberthy. Location: Main Physics Lecture Theatre, University of St Andrews
For details on the Undergraduate group please contact Dr A Torrance (abt3@st-andrews.ac.uk), Joshua Sharp (jas29@st-andrews.ac.uk) or Laura McCullagh (lsm4@st-andrews.ac.uk).
Postgraduate group, please contact Dr Rebecca Goss (rjmg@st-andrews.ac.uk).

SURREY

For more details please contact Joy Perkins at joyeperkins@googlemail.com

SURREY HEATH

Tuesday 16th Oct, 7 for 7.30pm: ‘*Bioethics and Genetic Modification*’. Speaker: Professor John Bryant. Location: High Cross Church, Knoll Rd, Camberley GU15 3SY

For more details please contact John Russell at chynoweth.jw@gmail.com

TYNESIDE & NORTHUMBERLAND

For information on Newcastle events, please contact Bill Clegg at bill.clegg@ncl.ac.uk

UCL

If you are interested in joining the group, contact Marta Berbel Gallego on cisucsoc@gmail.com

WEST MIDLANDS

For more information please contact Godfrey Armitage on g.n.armitage@warwick.ac.uk

WORCESTER

For more information please contact Jim Smith on jgsmith29@aol.com

YORK

For more information please email christiansinscienceryork788@gmail.com