



WHAT DOES OUR FUTURE HOLD IN STORE FOR US ?

This question always carries a certain amount of weight, but it feels like a much weightier question today for those living in the UK.

For students entering Years 11, 12 and 13, or equivalent, this is about imminent exams and the opportunities success in them makes available. However, these exams and opportunities carry a degree of uncertainty today which will become clearer over the course of the Academic Year ahead.

This uncertainty affects confidence and poses the following questions:

1. Am I good enough?
2. Have I made the right decisions?

As a Nation, we face the great Brexit test, and the opportunities its success makes available. However, we face much uncertainty in leaving the European Union with or without a deal.

This uncertainty ultimately affects our confidence as a Nation, and poses similar questions:

1. Is the UK good enough to find its way in the world?
2. Have we made the right decision?

The UK needs to find its confidence as a great engineering Nation once again with its ability to turn research into wealth, improve lives, and to drive economic and social progress. I am confident that our engineering sector, with its world class talent, universities, companies and facilities, will be at the heart of delivering renewed prosperity to the UK.

I also recognise that engineering success is based on people, the best and brightest at all levels, and whilst we have a world class research based and world-renowned engineers across all sectors, we face a serious engineering skills crisis.

The Smallpeice Trust's vision must therefore be a UK that is confident in its ability to once again be the world's leading engineering Nation, drawing on increasing numbers of diverse world class UK talent leaving our schools, colleges, and universities, confident in the contribution they can make through engineering.

Engineers will always need leaders in the mould of Dr Cosby Smallpeice and Sir Richard Arkwright, and hence why it is so important that we continue to identify the future engineering leadership potential in schools via our Arkwright Engineering Scholarships programme. To find out how your school can become affiliated to the programme, see page 14.

Dr Kevin P Stenson

NEW Website Launched!

Craig Carrington, Head of Marketing



It wasn't so long ago that The Smallpeice Trust announced its new website. Launched with a spring in its step, website 2.0 was fast, worked well across different platforms such as mobile phones and securely transferred data to our administration system. Now, almost 4 years later we are once again announcing our latest new website.



Why so soon after the last website?

Well, a lot has happened over the last 4 years, in terms of how the Trust operates, how everyone interacts with websites and how technology can be used to make our lives easier.

Website 3.0 features a streamlined dynamic design, improved functionality and easy access to essential information to help students, parents, teachers and funders make key decisions about their education and business needs. Housed within a secure infrastructure, the website not only looks better, but the technology behind the scenes is working harder, interacting with our new CRM system in real time.

But what does that actually mean? Well, for starters, when applying for one of our events, the website will perform a 'live' lookup against a school to ensure the details input are correct. It will automatically

prevent students from applying for an event if they are the wrong age or if an event has specific restrictions. The Trust is also trying to reduce the amount of paper it uses, so all communications about events will be conducted via email and access to our Portal. This makes it easier for parents and students to keep track of notifications and input additional information, if needed, without the hassle of printing and postage.

Following the merger with Arkwright Engineering Scholarships, the website now features information for students about the scholarship with links to find more detailed information.

I really hope you enjoy the new website and look forward to hearing your feedback.



Course review

Yr 11 & Yr 12

Space Science and Engineering

12 - 14 August • University of Leicester



This course was a new venture for The Smallpeice Trust and for the Space Research Centre (SRC), part of the Department of Physics & Astronomy at the University of Leicester. The Smallpeice Trust was keen to work with the University of Leicester on this course because it is one of the leading universities in subjects relating to space technology.

This course was for 30 Year 11 and 12 students. It was fully booked up within 2 days of its launch, so we knew this was a popular subject area.

The opening theme of **"The moon landing and where else might we go?"** was particularly relevant in view of the celebration in July of the 50th anniversary of the original moon landing.

This course started at the nearby **National Space Centre in Leicester** where the students tried out some rocketry and heat shield experiments, and learnt about inertia with the aid of a miniature hovercraft. There was also a Planetarium Show and a chance to explore the National Space Centre.

On the second day when the students were **at the university**, the students were given a space engineering overview from the academic team before testing out their own abilities with a computer aided design (CAD) exercise. The students were also given a tour of the university campus to give them a sense of what university life would be like.

The last day focused on **astrodynamics or how objects travel in space**. The students were able to use the General Mission Analysis Tool, the same software that is used to plan real space missions. They also had a tricky design challenge which brought out the creative problem-solving aspects of space science and engineering.

This course was generously supported by Royal Commission for the Exhibition 1851, the National Space Academy and the National Space Centre who helped make this new venture a huge success.



Neil Noble
Business Development
The Smallpeice Trust

Course review

Year 9 Girls into Engineering

15 - 18 July 2019 • University of Warwick

The University of Warwick hosted the four-day residential course attended by 100 girls, aged 13 - 14 from around the UK, who learnt about engineering and engineering careers through presentations and hands-on projects. The course was organised by The Smallpeice Trust, with hands-on projects from Jaguar Land Rover, Leonardo, Transport for London and The Rail Delivery Group, and was supported by the ERA Foundation, GE, Leonardo and The RAF Charitable Trust.

The students were introduced to basic engineering principles through a weighted bridge ice-breaker challenge. After this, in their respective teams and for the remainder of the course, the girls were tasked with creating two of the following four course projects:-

Creating an off-road vehicle to travel a pre-determined course

Beach clean-up with Arduino powered buggy

Building a cable car

Designing a working train and accompanying railway station

The girls were guided through all stages of the project development, with the support of engineers from the companies running each of the four projects, from the initial concept to final testing. They were also faced with real-world challenges such as the need to work within a budget and make the project commercially viable.

As well as the practical side of the course, students enjoyed an evening social programme that included a film night, sports night, and a formal dinner and disco with after-dinner speakers from Leonardo and The RAF Charitable Trust.

"Before the course I had a different career path in mind but now this course has inspired me to take an interest in engineering and hopefully pursue a career in it."

Kathryn,
Year 9 student



To book for 2020, please go to:

Alumni David Greenwood

Professor of Advanced Propulsion Systems

Warwick Manufacturing Group | The University of Warwick



“ In 1987, as a 16 year old boy, I arrived at Liverpool University for a week's engineering summer school run by The Smallpeice Trust. My memory of the activities is a bit hazy now, but I do remember motorising an easter egg to swim across a swimming pool and climb out the other side. Most importantly, I remember working with teams of like-minded people to solve difficult problems with some planning, some trial, and a lot of error.

That was better preparation than I could have imagined for the two decades which followed. After A levels in Maths, Physics and Design & Technology, I studied Engineering at Cambridge University, then worked my way up through the ranks at Ricardo (an engineering consultancy headquartered in Sussex) which gave me fantastic opportunities to work on automotive, marine, motorsport, aerospace and military projects - like The Smallpeice Trust projects, but on a much grander scale, and with industrial grade resources.

Today I run the Energy and Advanced Propulsion research activities at Warwick Manufacturing Group (WMG). We're a team of about 250 people researching the technologies which will make transport and energy provision cleaner, cheaper and smarter in the future. We work closely with companies to ensure our research remains relevant and makes its way into the market as quickly as possible.

Engineering offers vibrant and exciting career opportunities to people from all backgrounds. There is an increasing demand for skilled technicians and manufacturing engineers, as well as a need for chemical, mechanical, electrical, electronic and software engineers. The workplace has also changed significantly over the last decades - requiring people to develop a mix of these skills during their career, and to work together in global teams.

The UK in particular has a skills shortage which we can only address by ensuring that we encourage children to study STEM subjects, and that we attract candidates from every background, gender and ethnicity. I'm delighted to have the opportunity to help The Smallpeice Trust in doing this.



And so it was last summer, just over 30 years after I attended my own Smallpeice Trust residential course, I found myself taking 100 students (who were attending The Smallpeice Trust Year 9 Girls into Engineering residential course at the University of Warwick) on tours of the engineering laboratories at WMG. **Among them was my daughter Jessica, who reflects on her personal experience:-**

“ The course was a great opportunity to make friends and broaden my knowledge about career options and the many different types of engineering. We did two projects over a week, each organised by an engineering company. One included building a robotic arm and sensors, then coding them to detect light, sound, water and metals. The other, in the form of a game, allowed us to run a railway network, including management, budgeting and adapting to changing situations.”

Earlier this year, my other daughter, Zoe, attended the CyberFirst Girls Defenders Wrexham residential course which was available to anyone who had participated in the CyberFirst Girls Competition 2019 in March. **Zoe comments on her experience:-**

“ I had recently participated in an online cybersecurity challenge set by GCHQ for girls between the ages of 12 and 13, in a team with two of my friends. Having just missed out on the finals, we were determined to learn more about cybersecurity - so we booked places on one of the CyberFirst Girls Defenders residential courses. We learned how to tackle challenges such as password tapping, detecting and preventing viruses, and even how to hack a device. It was an incredible experience, and after over six months I am still in touch with the friends I made”

So thank you The Smallpeice Trust from myself and my two daughters, Jessica and Zoe, for the formative experiences and the fun you've delivered to us and thousands like us.

My advice to young people entering engineering -
grab every interesting opportunity that presents itself, however scary it may seem at the beginning. You'll learn from your failures and be proud of your successes - but every day will be different.

20 Course 20 Timetable

Ignition Courses

for years 8 & 9

Introduction to Cyber Security			
Royal Holloway, University of London 30 March - 1 April 2020	£220	9	
Off Road Vehicle Engineering			
Harper Adams University 30 March - 1 April 2020	£285	9	
Engineering Experience			
University of Nottingham 6 - 8 April 2020	£260	8 9	
Girls into Engineering			
University of Warwick 20 - 23 July 2020	£220	8 9	
Engineering Experience (Northern Ireland)			
Queen's University, Belfast 3 - 5 August 2020	£220	9	
Engineering Experience (North East)			
Durham University 3 - 5 August 2020	£220	9	
Engineering Experience (North West)			
University of Liverpool 10 - 12 August 2020	£220	9	
Engineering Experience (Yorkshire)			
University of Hull 17 - 19 August 2020	£220	9	

Momentum Courses

for years 10, 11 & 12

Mobile Robotic Engineering			
Harper Adams University 30 March - 1 April 2020	£385	11 12	
Physics in Engineering			
University of Warwick 15 - 17 April 2020	£285	10	
Astrophysics			
Royal Holloway, University of London 15 - 17 April 2020	£385	12	
Aerospace Engineering Experience			
Kingston University London 26 - 28 May 2020	£195	10	
Aviation Technology			
University of Leeds 24 - 26 June 2020	£410	12	

Biomedical Engineering			
Birmingham City University 7 - 9 July 2020	£285	12	
Future Cities			
University of Southampton 8 - 10 July 2020	£410	12	
Girls into Electronics			
Royal Holloway, University of London 27 - 29 July 2020	£285	12	
Girls into Physics			
Royal Holloway, University of London 27 - 29 July 2020	£285	10	
Biomedical Engineering			
University of Southampton 3 - 6 August 2020	£395	11	

To find out about additional courses and current availability of all courses, please visit: www.smallpeicetrust.org.uk/timetable

Student's Point of View



Year 10 Physics in Engineering

3 day residential course

15 – 17 April 2019 • University of Warwick

Avyay Jamadagni

As a curious individual, I always look for ways to incorporate what I learn in school into the real world. I find it fascinating when I see theory in practice. This course gave me that same experience. Set in the stunning campus of the University of Warwick, the course began in the Students' Union Building, which was buzzing with the excitement of a hundred eager students like me who were about to embark on a memorable three day experience.

The eye-opening lectures that we had gave us a great insight as to not only what to expect when we reach university, but also what we could expect after. The topics ranged from engineering in astrophysics to different career paths in engineering. One truly memorable lecture for me was that on subatomic particles by two Particle Physicists from ATLAS. Their presentation was very informative and their experiments were very engaging. They were using a Van de Graaff generator to show how charges moved along and transferred between different mediums.

All the activities were hands-on, and we always learnt something from it. We learnt about amplitude modulation by building an AM radio. We learnt about air resistance by building a rocket propelled derby car. We learnt about Microscopy by operating a £2.5 million Transmission Electron Microscope! The only activities where we sat on a chair behind a table happened of an evening when we watched a movie and had a fun quiz.

During the course, we visited many different buildings on campus where we either had lectures, educational activities, or fun social evening activities. Of great interest to me was the science building which had a few massive lecture rooms with the rest of the building dedicated to labs where the actual research took place. This gave me a valuable insight into future university life as I wish to delve into a science-related path.

The course also showed us how our future careers would look like if we pursued engineering in any of its fields. It provided us opportunities to ask questions and gave us a chance to network with professionals working in fields that may become ours in the future. This course opened my mind to the wonders of engineering, and I cannot wait to apply for another.

Summer STEM event in Jersey

Around 300 Year 9 students from secondary schools in Jersey learnt about ethics in the digital world and careers in cyber security.

The Year 9 students took part in The Smallpeice Trust brand new Cyber Forensics STEM Days which took place over one week in July, and which were all held at Beaulieu School in St Helier, Jersey. The STEM Days were sponsored by Defence Logic, working with Skills Jersey, and The Smallpeice Trust delivered them.

The students worked in small teams to solve crimes using many digital techniques and exploiting flaws in the criminals' cyber security. Each activity reinforced the appropriate and safest ways to act in an increasingly digital world.

Dave Roworth, from Skills Jersey and who oversaw the planning for the events, was pleased that every secondary school was involved:

"It was clear from feedback that schools loved this workshop. By engaging in a life-like cyber investigation scenario, students now have a good understanding of cyber security as a career option but, more importantly, the kinds of skills and attitudes required to be successful in this field."

"It was a great experience for them all. Thank you to The Smallpeice Trust team who put together such a detailed and well-thought out workshop."

"It was fantastic to see all the students enthusiastically participate in these events. In particular, to see the excitement as the students unravelled and solved each individual piece of evidence to eventually solve the crime."

Emma

**STEM Events
Programme Manager
The Smallpeice Trust**



My Engineering Journey



by Lauren Duggan

Smallpeice Trust Alumni

Arkwright Alumni

Smallpeice Trust Course Supervisor

I was actively encouraged and supported, from an extremely young age, to enter the world of science and engineering by my parents who both had careers in STEM.

When I reached Year 9, my parents enrolled me on The Smallpeice Trust residential course for ECITB Construction Engineering. My brother had already been on several Smallpeice courses and had highly recommended that I go on one as well. During the course, I discovered my love and passion for designing, building and testing a possible solution to the initial real-world issue that we had been given. From that course onwards, I knew that engineering was my dream career – problem solving to make the world around us a better place. Despite having loved the course, I wasn't certain if that particular field of engineering was for me. Therefore, I attended more Smallpeice courses to help me decide – 7 more courses to be exact. These included Marine Technology, Physics in Engineering, National Grid Engineering, Offshore Wind Energy, Biochemical Engineering, Structural Engineering and Aerospace Engineering. I had an incredible time on each of these courses even if, afterwards, I realised that I didn't want to go into that particular field of engineering. It was just as important to rule out sectors within engineering as it was to find the one I wanted to go into. I could then concentrate upon discovering more about the sectors which were of interest to me.



In addition to The Smallpeice Trust courses, I was able to secure work experience at different organisations which gave me invaluable experience in different STEM subjects. All work experience and Smallpeice courses attended were fantastic opportunities to gain hands-on experience with top quality companies and facilities.

During Year 11, my parents discovered Arkwright Engineering Scholarships. I decided to sit the exam for it and, to my surprise, I advanced to the interview stage. During the interview, I was able to demonstrate my design, build and presentation skills showcasing my engineering project. I was then successful in receiving an Arkwright Engineering Scholarship.

I had decided to go to university to study engineering. However, for all my experiences, I was still unsure upon which specific aspect of engineering to focus on. I was extremely lucky to secure a place on the BAE Systems work experience Taster Week at Warton. This course cemented my decision to study Aerospace Engineering.

I aspire to achieve a career within aerospace and gain Chartered Engineer status

I am now in my final (4th) year of an Aerospace Engineering Master's Degree from the University of Liverpool. I aspire to achieve a career within aerospace and gain Chartered Engineer status.

There are a few other organisations which encourage young people to consider an engineering career but The Smallpeice Trust courses are an absolute core experience. During the summer breaks, I volunteer as a supervisor for The Smallpeice Trust residential courses. This allows me to share my experiences with the younger generations and hopefully inspire them to achieve their aspirations.

Being dyslexic means I have had to work a little harder than some of my peers, but it has never stopped me from aiming high and achieving what I set my sights on. It is possible to do anything if you have the drive and motivation to do it.

Engineering's fun GO FOR IT!



Arkwright Engineering Scholarships Nominations are Open

Arkwright Engineering Scholarships are open for pupil applications for Scholarships to be awarded in Autumn 2020!



The Arkwright Engineering Scholarship Programme inspires the best and brightest young leaders to pursue their dreams of changing the world through engineering. Awarded at the beginning of Year 12, Year 13 in Northern Ireland and S6 in Scotland, this prestigious Scholarship is recognised for nurturing talent across the engineering sector.

An Arkwright Engineering Scholarship is perfect for highlighting individual achievement when applying to university and degree apprenticeship programmes, giving students a range of benefits from financial help, to mentoring and enrichment opportunities.

To be selected for an Arkwright Engineering Scholarships, students must excel during the selection process which includes a 2-hour exam and a formal interview at one of the UK's most prestigious engineering universities. Students apply during the year in which they will take their GCSEs or Scottish National 5s, and must aspire to study STEM subjects at A level or Scottish Advanced Highers, and to pursue a career in engineering.

If you know of any eligible, engineering minded students, please encourage them to apply through their affiliated school for this prestigious award! It's completely free for schools to become affiliated and only takes a few minutes for a teacher to complete.

**Affiliation
is quick,
simple and
FREE**

For more information on the Arkwright Engineering Scholarships or to download the affiliation form, please visit

THANK YOU

to all our supporters who make the work of The Smallpeice Trust possible

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National Grid	The Ellis Campbell Foundation	
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Universities & Education

Birmingham City University	Loughborough University	University of Leeds
Cardiff University	Royal Holloway	University of Leicester
Coventry University	University of London	University of Southampton
Harper Adams University	University of Birmingham	University of Strathclyde
Kingston University	University of Exeter	University of Warwick
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