

**STEM
AMBASSADORS**
ILLUMINATING
FUTURES



Leading Lights

Meet 19 leading lights who are using their Science, Technology, Engineering and Maths (STEM) skills to push the boundaries, and to make the world a better and more exciting place in which to live.

From astrophysics to pharmacy, web design to sustainability, these young men and women are all working on ground-breaking projects and cutting edge research. Their work takes them all over the world; from the dusty deserts of South Africa to the snow-covered French Alps.

Their dedication is preventing diseases like cancer. Their expertise is helping the UK to break the world land-speed record. Their vision is protecting our precious energy resources, and their creativity is finding new ways for us to communicate with each other.

These men and women want to make sure there is a new generation of leading lights to take over the baton and continue their work. They are part of a network of thousands of people all over the UK who volunteer as STEM Ambassadors, working with young people in schools and colleges to explain what they do and why they love it.

So are you one of the leading lights of the future?

If you are, and want to help illuminate futures in STEM for young people in your local area, you can find out more about the benefits of becoming a STEM Ambassador for you and your employer by visiting www.stemnet.org.uk

If you are a STEM teacher and would like a local STEM Ambassador to help you inspire your young people, find out more at www.stemnet.org.uk



Clare Wood & Ben Evans

Clare Wood and Ben Evans are both research officers at the Civil and Computational Engineering Research Centre at Swansea University. They are working on BLOODHOUND SSC, a supersonic car which is being designed to break the world land speed record.

Clare says: "By volunteering as a STEM Ambassador I get to work with young people who are really excited by real-life challenges such as BLOODHOUND SSC. I'd like to see lots more women becoming engineers in the future."

Ben became fascinated with airplanes as a teenager and went on to study aerospace engineering at Cambridge. Ben says: "I'm working on one of the most exciting engineering challenges in the world. It doesn't get better than that!"

Clare and Ben are pictured in an industrial wind tunnel at Southampton University – the computational fluid dynamics supercomputing that they carry out is the modern-day equivalent of months of wind tunnel testing.



Shanom Ali

Shanom Ali is about to finish a groundbreaking thesis on microbiology, investigating the possible risks to human beings of processing recyclable waste. Shanom's work is vital in making sure we can continue as a country to recycle safely and has attracted international interest.

Shanom works at UCL Hospital for Tropical Diseases where he is running a screening project for the deadly MRSA bacteria, and developing better ways to detect its presence and so save lives. He has been a scientific consultant on Channel 4's 'How Clean is Your House?' series.

Shanom says: "I am interested in microbiology because identifying bacteria is a highly technical process and a real mental challenge – I like the nitty gritty. As a STEM Ambassador I enjoy inspiring students about the work I do."

Shanom is pictured at a materials reclamation facility in Northamptonshire, where paper, card, plastic and cans are sorted for recycling. The facility is capable of processing around 20,000 tonnes (the equivalent of 1,374 double decker buses).

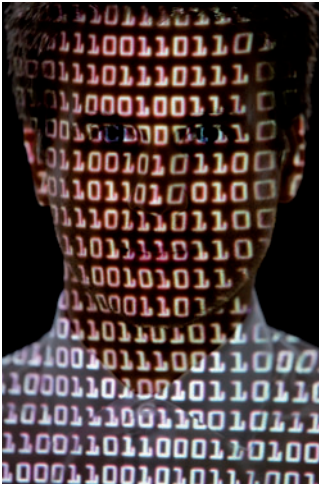


Liza Brooks

Liza Brooks is a mechanical engineer in the third year of her engineering doctorate at Cranfield University. She is also co-founder and technical director of True Snowboards in Wiltshire. Liza uses her engineering skills to analyse the performance characteristics of different snowboards, and develops new materials for them – she then has the fun of testing them out on the slopes at Morzine in the French Alps.

True Snowboards sponsored a team at the British Snowboarding Championships in 2008 which had a 74% medal win rate. "I love my job", says Liza, "because of the variety. One day I can be in the laboratory testing materials for a new board, and the next day I'll be out testing it on the slopes to see if all my work has paid off."

Liza is pictured testing one of her True Deviant snowboards in Sevenoaks in Kent.



Graham Gannon

Graham Gannon is certainly not your average scientist - he did a degree in Business Management at the University of East Anglia in Norwich, but had been fascinated with computers since he was a child. While at university he teamed up with a computer science student to start Lime Websites – a web design business which provides companies with content management and e-commerce systems, so that their products can be sold on the internet.

Graham loves the problem-solving aspects of his job – he also enjoys working in local schools in Norfolk as an Ambassador. “The young people I visit in schools have some fantastic ideas – we run brainstorming sessions with them on some of the real-life technical problems we face as web designers. I like to show them that science, creativity and enterprise can, and should, go together.”

Graham is pictured with a section of binary code. Binary code is the underlying mathematical structure that represents everything in computing.



Jo Carris

Jo Carris developed a passion for sustainable technology during her undergraduate degree in Technology at the University of Birmingham. Her university studies, and internships at Arup and Scott Wilson, cemented her interest in the area. Jo started working for Laing O’Rourke as a Sustainability Advisor in 2006, and became qualified in assessing the environmental impact of building and civil engineering projects.

Jo now works within the Sustainability Team for London 2012, specialising in energy and waste. She is helping ensure that the next Olympic and Paralympic Games are the greenest games in history, and is working on the installation of one of the first-ever large scale wind turbines in an urban environment.

Talking about her work, Jo says: “Being able to implement green initiatives on a project of this scale is hugely satisfying.”

Jo is pictured in front of a wind turbine at Coldham Wind Farm in Cambridgeshire.



Laurie Winkless

Laurie Winkless is a higher research scientist at the National Physical Laboratory (NPL). She gained a BSc in Physics and Astrophysics, and went on to study a Masters in Space Science.

Laurie’s main project is for the European Space Agency, looking into the use of nanomaterials in the space industry. Nanomaterials are used in everyday products to make them lightweight and strong. However, their use in the space industry is limited, and Laurie’s work is breaking new ground.

Laurie is passionate about communicating science to young people. She says, “I knew that I wanted to work in science when, at aged five, I used my first telescope to see the moon. Every scientist can pinpoint the moment or person who made them realise that science was what they wanted to do. Too many young people think science is a difficult and scary subject, and I’m committed to helping them see how fun and interesting it really is”.

Laurie is pictured outside the University of London observatory.



Rachel Gerrard

Rachel Gerrard is a civil engineer working in Flood Risk Management.

Working for the Environment Agency in Cumbria, Rachel is involved in the development of new flood alleviation schemes within the area. In addition, Rachel is part of a round-the-clock team that monitors, warns of and responds to potential flood risks.

Flooding has become a greater threat to people and property across the UK in recent years and, with rainfall patterns changing and rain intensity increasing, flood protection measures play a vital part in the safeguarding of homes and lives.

Rachel was investigating a flood alleviation scheme prior to Carlisle being flooded in 2005. This is now nearing completion, and will greatly reduce the future risk of flooding to the city. Her innovative work ensures that, despite increased rainfall, Cumbria's flood defences can cope.

Rachel is pictured in the River Eden in Cumbria.



Heather Williams

Heather Williams is a senior medical physicist at the Manchester Royal Infirmary. She works primarily in nuclear medicine imaging, a non-invasive and painless way of diagnosing a variety of diseases, including many types of cancer, heart disease and other disorders within the body.

Nuclear medicine imaging typically involves giving a slightly radioactive injection to the patient, and then using a gamma camera to pick up the radiation it gives off as it is taken up in the body. The images show whether tissues and structures, such as the heart, kidneys, liver and brain, are working as they should.

Talking about her work in schools Heather says: "When I talk to groups of young people, there are always some that have a 'light bulb' moment, and realise that science is exciting and rewarding, and something that they can and want to do for a living".

Heather is pictured in a gamma camera at the Manchester Royal Infirmary, holding an image of a nuclear medicine bone scan.



Oliver King

Oliver King is a senior consultant at Faber Maunsell|AECOM, an energy efficiency consultancy. He works in the Sustainable Development Group, and helps organisations become greener and save money.

Oliver studied Earth Sciences at University, and went on to do a Masters in Advanced Environmental & Energy Studies within Buildings.

Oliver now works to improve the energy efficiency of all types of buildings, from modern office blocks to ancient cathedrals. He and his team look at how energy is used through lighting, heating and computers, and develop strategies to reduce this.

Oliver is passionate about his role as a STEM Ambassador: "I think I can make a difference and help young people begin to think about what sort of thing they want to do."

Oliver is pictured with an energy saving lightbulb at Southwark Cathedral, where he has been working to reduce the building's carbon footprint.



Kandarp Thakkar

Kandarp Thakkar is Lead Pharmacist for Admissions and Discharge at the Hammersmith Hospital.

“When people think of pharmacy”, says Kandarp, “they picture someone behind the counter but there is a lot more to it than that and my job never involves being stuck in a dispensary.”

His average day starts with a round of the emergency admissions ward of the hospital, advising doctors on what kind of medication to prescribe. “It is very hectic and adrenalin driven and I get to work with a range of healthcare professionals including consultants, junior doctors, nurses and physiotherapists.” Kandarp’s job requires a detailed knowledge of thousands of different medications, their chemical structure and possible side-effects. The best part of the job for Kandarp is the interaction with patients.

He is pictured in an automated dispensary at Hammersmith Hospital – medications are selected quickly by a robotic device which means Kandarp can spend more time with his patients.



Luke Fowler

Luke Fowler is a mechanical engineer whose career was kick-started aged 16 by a four-year apprenticeship at a niche engineering firm called Allen Gears in Pershore, Worcestershire, which makes giant industrial gear boxes for everything from oil, gas and power generation to marine propulsion in ships.

Allen Gears allowed Luke to go on to study for a four-year Masters in Mechanical Engineering at The University of Birmingham.

Luke now works in research and development, designing and testing gearboxes that typically measure two metres high and cost anything up to half a million pounds. Luke’s latest project has been designing a tidal turbine gearbox – a highly challenging and technical brief which has tested his knowledge to the full.

Luke is a STEM Ambassador at a local school, where he mentors students working on technology projects.

Luke is pictured inside a two-metre diameter epicyclic gearbox casing, destined for a hydro power station in Retiro, Brazil.



Jonathan Taylor

As a materials technologist at Rolls Royce, Jonathan Taylor takes new product ideas from jet engine designers for civil and defence aircraft, and identifies the materials needed to turn each idea into a viable jet engine component.

Materials science is a largely hidden industry that bridges the gap between design and production.

Talking about his job, Jonathan says: “Materials science is such a fascinating field in which to work; what we do has a rapid, lasting and tangible effect on the world around us”.

Jonathan believes that engaging young people in science, technology, engineering and maths is vital: “These young people are the innovators of the future and we need to ensure that they’re excited about technology at a young age”.

In his portrait, Jonathan is attached to the Zwick mechanical test machines that he uses at Rolls-Royce to test how and when materials break.



John Gray

John Gray is a specialist engineer for the BBC where he plays a crucial role in making sure that the programme production system used by local radio stations across England is working properly.

John was at university studying for a degree in Computational Physics when he first worked for the BBC during the summer vacation.

Problem solving is one of the reasons John loves his job. He relishes the challenge of identifying faults and working out how to tackle them. His job is fast-paced, time critical and never the same from one day to the next.

John's next challenge is to implement new systems that will help to combine television, radio and online production as part of the Digital switchover.

John says: "One of the best parts of my job is being able to improve the quality of service to the public, so I'm thrilled to be able to help the BBC do this."

John is pictured at a transmission site in the Midlands.



Ranna Patel

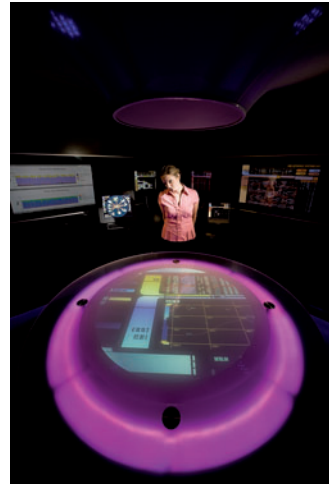
Ranna Patel did a doctorate in Biochemical Engineering at UCL which broke new ground in the development of processes to make antibiotics, vaccines and monoclonal antibodies.

Monoclonal antibodies are similar to the antibodies created by our own body's immune system, and are providing the latest breakthroughs in the treatment of cancer and other debilitating diseases.

Ranna's research contributed to making these life-saving treatments faster, safer and cheaper.

Ranna says of her job: "It's challenging and I get to use my knowledge of science and technology to make a direct difference to society. Meeting an engineer at my school was enough to make me realise it was the career I wanted to pursue - I want to do that for the next generation."

Ranna is pictured here inside a giant bubble - her career as a process engineer has included making washing-up liquid and glycerine, both of which are ingredients of bubble solutions.



Niamh Hyslop

Niamh Hyslop is a business analyst for British Telecom where she works on internal business improvement and transformation. Although her first degree was in Law, Niamh was attracted to the fast-paced nature of the technology industry and decided to do a Masters in Computing.

Niamh works in business improvement, where she identifies how the company can do things better, simpler and faster in order to improve BT's service to its customers.

Talking about her work as a STEM Ambassador, Niamh says: "I want to inspire young people to think about working in technology. It is a fantastic area to work in as I never do the same thing from one day to another."

Niamh is pictured at the BT Showcase, where the company demonstrates its Information and Communications Technology solutions to potential customers.



Samme Brough

Samme Brough works in the energy industry as a geoscientist for Ikon Science, world-leaders in the field of 'rock physics.' Never before has the sourcing of energy supplies been so important.

Samme's degree in Environmental Earth Sciences led to her current job as an exploration geologist. She builds accurate computer-generated models of the earth's many sub-surfaces, and this gives energy companies the information they need to find oil and gas supplies effectively, both in terms of time, money and the environment.

Samme says of working as a STEM Ambassador: "It's fantastic! You literally see the young people switch on when they understand that what they are learning is the real thing".

Samme is pictured at a disused quarry in Hertfordshire – understanding how to drill effectively through rock is vital to the future of the energy industry.



Kola Liadi Mudashiru

Kola Liadi Mudashiru is a research associate in the clean use of fossil fuels at Newcastle University. He is breaking new ground in the development of revolutionary techniques to produce energy from coal in a way that is 'carbon neutral'. This includes developing innovative ways to store waste carbon dioxide produced in underground cavities.

There is global interest in his work, and Kola predicts that these new techniques have the potential to create around 5,000 new jobs in the UK alone.

Kola is passionate about communicating science to young people, "I want to help raise the ambitions, hopes and aspirations of the next generation of scientists."

Kola is pictured at a landfill drilling site for Coal Bed Methane at Rochdale near Manchester – this state-of-the-art equipment can drill to a depth of 500 metres.



Sean Tapodi

Sean Tapodi studied Chemistry with Management Studies before doing a Masters degree in Analytic Sciences. Sean is in charge of ensuring that all the samples taken, and analysis done on materials produced and discarded by the Sellafield site, conform to the strict regulations involved with nuclear reprocessing and decommissioning.

"You can imagine how serious the consequences would be if we didn't do our job properly", says Sean. "Everything that Sellafield produces, from the fuel we sell to the waste we dispose of, has to meet very strict specifications."

Sean has been a STEM Ambassador for five years. He says: "I want young people to be as interested in science as I was at their age. It's great to see the students' faces light up when they see something go bang or start fizzing as if from nothing! Science is fascinating and we need them to realise that at a young age."

Sean is pictured on the Sellafield site with an Accelerated Gas-Cooled Reactor.