Opening up new windows on the universe

Glasgow’s links with Caltech through the Institute for Gravitational Research

Scientists in Glasgow are working closely with colleagues in the US to develop the next generation of gravitational wave detectors.

Headed by Professor Jim Hough, the Institute for Gravitational Research at the University of Glasgow has 36 years expertise in the development of detectors and signal analysis methods to search for gravitational waves from space.

The Institute, supported by the Science and Technology Facilities Council (STFC) and Scottish Funding Council, has a particularly strong research relationship with groups in the US and Germany and are supplying crucial optical and mechanical technology for the next generation of detectors. Several groups worldwide are currently undertaking developments of these long baseline detectors. The Laser Interferometer Gravitational Wave Observatory (LIGO) project, jointly operated by the California Institute of Technology (Caltech) and the Massachusetts Institute of Technology (MIT), is one of four projects. Others are VIRGO, (a joint French/Italian collaboration), GEO 600 (Germany, UK) and TAMA 300 (Japan). Currently LIGO, VIRGO and GEO 600 are involved in a joint data taking exercise.

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A rooftop gathering

More than 60 alumni and friends gathered for a rooftop party at the Manhattan home of Dr Jim Winchester and Mrs Pat Winchester on 30 May. It was a perfect New York summer’s evening, and a wonderful chance for the growing alumni group to mingle, thanks to the warm hospitality of the Winchesters.

Lani Kaneta, our alumni coordinator in New York, has worked hard to build up the community here and looks forward to other opportunities to get together.

Joanna Storrar, Vice President for North American Development was able to use the occasion to convey the University’s congratulations to Jim (MBChB 1969), who was honoured the following evening by the Kidney & Urology Foundation for his work as an outstanding clinician and dedicated teacher.

The Winchesters have very kindly offered to host another party next summer. Please contact Lani Kaneta (kaiulani.kaneta@gmail.com) or Joanna Storrar for information about future events.

Computer simulation of gravitational waves created by the merging of two black holes.
Gravitational waves are ripples in the curvature of space-time generated by the motion of massive objects, such as two stars or two black holes orbiting each other. They were first predicted by Albert Einstein in 1916 as part of his theory of general relativity. There has been considerable progress towards the detection of these waves in recent years – not least due to the recognition given to Joseph Taylor and Russell Hulse in 1993, whose discovery and monitoring of a pair of neutron stars two decades previously provided indirect confirmation of the existence of these ripples, and led to the two being awarded the Physics Nobel Prize. As gravitational waves can penetrate regions that more familiar waves cannot, today astrophysicists are working towards measuring them in order to learn about systems they cannot observe using traditional telescopes, such as black holes.

The LIGO project will detect the ripples in space-time using a device called a laser interferometer, in which the time it takes light to travel between suspended mirrors is measured using controlled laser light. Three laser interferometers were built for LIGO - two near Richland, Washington, and the other near Baton Rouge, Louisiana. LIGO requires at least two widely separated detectors, operated in unison, to rule out false signals and confirm that a gravitational wave has passed through the earth. Advanced LIGO will replace the present detector once it has reached its goal of a year of observation, and will transform gravitational wave science into a real observational tool.

The main areas focused on by the University of Glasgow’s Institute for Gravitational Research are the development of these optical and mechanical technologies. Glasgow, Birmingham and the Rutherford Appleton Laboratory in Oxfordshire, in collaboration with Strathclyde University, are funded by the STFC to supply the mirror suspensions and part of the optics for Advanced LIGO.

Research for future detectors is under way, and the team is also involved in developments towards the space-based gravitational wave detector LISA, which is a joint European Space Agency/NASA mission scheduled for launch in 2018. This detector will have comparable sensitivity to ground-based detectors, but in a completely different frequency range, and so will be able to explore a different region of the gravitational wave spectrum where signals from highly interesting sources such as massive black holes should be detectable.

If you would like more information on the work of the Institute for Gravitational Research, contact Dr Calum Torrie, email: c.torrie@physics.gla.ac.uk.

With thanks to the LIGO Scientific Collaboration (LSC) for the use of the photographs.
People in profile

Rose Cameron (MA 1991) was born in Elsworth Airforce Base, South Dakota in 1969. From an airforce background, she has lived all over the world and started her education at boarding school in Britain, she returned to the States at 12 but decided when she left school that she needed to return to Scotland.

Rose chose Glasgow for its history of ‘embracing characters’ and graduated with an MA in Sociology and Theatre Studies in 1991. It’s the fond memories of people that she remembers most about her time at Glasgow. The amazing conversations with Alastair Cameron, Ephraim Borowski and Jan McDonald, the 3am poached eggs with hollandaise, the drinking championships at the QMU (which she won four years running), and delivering her dissertation in the nick of time.

‘Going to Glasgow was like having a passport to immerse myself in my passions for four years,’ says Rose. Her studies took her to the Northwest Pacific coast to study the Kwaikiutl Native Americans and to New York City to interview Larry Kramer for her dissertation on Theatre and AIDS.

‘Glasgow wasn’t just an education to me. It was a way of life.’

Since leaving university, Rose has spent the past 16+ years focused on the creation, care and feeding of great brands. Her clients have included McDonald’s, IBM, Coca-Cola, Microsoft, and even Scottish Enterprise. She has worked in London, Canada and all over the United States at some of the world’s top agencies.

Some of her most interesting and challenging projects include; extensive research on the after-effects of 9/11 on the US consumer and US brand consumption, and a global study on how modern men are evolving the definition of masculinity. Her studies have been quoted by the global press including USA Today, Reuters, Crain’s, CBC, and The New Yorker.

Money and adventure, are what took Rose back to America, but it is home life and a fulfilling career that are keeping her there today. ‘I’ve the most amazing little girl named Ariana. She’s six and one of the smartest, funniest, and hardest working people I know. She has autism and verbal apraxia and this year she started to talk, read and spell all at the same time. She’s my miracle.’

Although Rose and Ariana live in Arlington Heights just outside Chicago, Rose still maintains her links with Glasgow. Her dear friend Nancy McFarlane and her godchildren Leotie and Elias Whitelaw live in Glasgow although she doesn’t get back nearly enough to tell them how much she loves them.

Rose is still very close to her 72 year-old mum, Marie, who attended our first Chicago Burns Supper in 2007 at the University Club of Chicago. “She is a wonderful woman and I have the pleasure of being her personal fan club.”

Looking back, Rose says that Glasgow gave her some of the happiest years of her life. ‘I was exposed to so many different cultures and ideas - Ghanians, Moroccans, Kurds, Goans, Norwegians, Chinese, even Jordies at 66 Hillhead Street. It opened my eyes to this amazing world where I now spend all of my time.’

When asked about the achievement of which she is most proud, Rose laughs. ‘How can anyone just have one? I have two!’ She circumnavigated the globe three times before she was 30, making good friends in every country that she landed. The other, and possibly proudest achievement, is raising a kid as great as Ariana.

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Scott Mazuzan is a welcome new addition to our international team, having recently taken the post of US Representative. Based in Maine, he will travel throughout the eastern seaboard representing the University at US High Schools, Colleges, and Universities and developing current recruitment activities. The bulk of these efforts will take place during the academic year, with several weeks of travel in the fall and again in the spring. Scott will be recruiting study abroad, undergraduate, and postgraduate students.

Originally from Maine, Scott studied undergraduate Psychology and Italian at the University of New Hampshire. He developed a taste for recruitment through his involvement with the office of undergraduate admissions there. He spent a semester as a study abroad student in Florence, Italy, which helped him develop an appreciation for intercultural learning.

After graduating, Scott began work in the field of international education as a programs associate for a study abroad provider, serving as a liaison for outgoing US study abroad and degree seeking students. Over the course of the years his travels have found him in Italy, France, Switzerland, Ireland, Scotland, Australia, and all over the USA. Besides travel, Scott spends his time listening to or playing music, reading, eating delicious foods, or spending time with friends by the ocean.

Scott looks forward to meeting many of our US based alumni over the next few months. To find out if he will be in your area during his travels, contact alumni@gla.ac.uk.