Sir Harold W. Kroto & Steve Acquah GEOSET Award by Steve Acquah

The Sir Harold W. Kroto & Steve F. A. Acquah GEOSET Award is presented to a chemistry major at UMass Amherst who has demonstrated excellence in science communication through digital media.

After Sir Harold Kroto received the 1996 Nobel Prize in Chemistry with Richard Smalley and Robert Curl for the discovery of Fullerenes, he continued to focus on research and expand his efforts into science outreach and communication. Directing the Kroto Research Group allowed me to get involved in many outreach activities culminating in the creation of the Global Educational Outreach for Science Engineering and Technology (GEOSET) initiative. After Kroto's passing, I wanted to keep his legacy and passion for research and science outreach alive by establishing this award at UMass Amherst. Central to the work of Kroto and I were our efforts to encourage the next generation of students to pursue science as a career, through local community engagement. Talking with international research students at the 'Lindau Nobel Laureates Meetings' and sharing ideas about how they engaged with their local communities in outreach projects provided added incentive to establish this award.

The 2019 GEOST Award presented to Dominique Carey by Richard Vachet and Steve Acquah

If Harold Kroto were still with us, he would have undoubtedly been impressed with how students are embracing the maker movement and science communication in response to some of the challenges we currently face in society.

I completed my doctorate at the University of Sussex (United Kingdom) under the supervision of the Nobel Laureate Sir Harold Kroto, Prof. David Walton, and Prof. Dek Woolfson, working on fullerenes and a collaboration based on self-assembling alpha-helical coiled coils for tissue engineering. In my final year, I moved to Florida State University as a Research Scholar to direct the new Kroto Research Group. My research activities there focused on carbon nanotube-based technologies involving hydrogen sensors, piezoelectric devices, and fullerene-based photovoltaic devices.

Directing Sir Harold Kroto's Research Group

Sir Harold Kroto was an English Chemist and a professor of Chemistry at Florida State University, where he focused on nanoscale research while developing new approaches to STEM educational outreach. In 1996 he received a Knighthood for his contributions to chemistry and was selected as one of the recipients of the Nobel Prize for Chemistry for the discovery of fullerenes. He was a Fellow of the Royal Society of London and held an emeritus professorship at the University of Sussex.

I directed all the undergraduate research projects and some of the graduate research for the group and received funding from the Undergraduate Research Opportunity Program (UROP). My research collaborations enabled me to work at the Bio-Nano Electronics Research Centre, part of Toyo University in Japan, where I currently hold a position as a Visiting Researcher.

One of the first Global Doodles celebrating 25 years of the discovery of the Buckyball (https://www.google.com/logos/buckyball.html)

For the 25th Anniversary of the discovery of fullerenes, Google reached out to Harry Kroto about the creation of a doodle for one of their first global interactive doodles.

Science Communication - Global Educational Outreach for Science Engineering and Technology (GEOSET)

Kroto founded The Vega Science Trust to create broadcast quality science films for British television networks, including the BBC. Production for television was expensive, and Harry wanted to explore online videos as a way of delivering on-demand content. The Global Educational Outreach for Science Engineering and Technology (GEOSET) initiative was created to exploit the creative dynamics of the Internet to improve the general level of scientific understanding and awareness around the world.

Prior to my arrival at UMass Amherst in 2018, I was director of the Global Educational Outreach for Science Engineering and Technology Studios (GEOSET Studios) at Florida State University (FSU), and I continue to direct international GEOSET collaborative efforts. GEOSET provides a free resource of educational materials and videos produced by students and educators. I designed and supervised the construction of an educational recording studio at FSU. The $70,000 facility in the Science Library provided a central location for students and faculty to showcase their passion for science communication. I invited Bill Nye 'The Science Guy', a connection I made at a Google science event, to formally open the facility.

During my time at FSU, I received several international awards for e-learning activities, including the Rich Media Award for Global Reach, and The Enterprise Video Award

— Video Scholarship, which enabled me to present a student at FSU with a scholarship to support their studies. I also received the Enterprise Video Award — Video Maverick, and an Honorable Mention for Scholastic Achievement. GEOSET Studios also provided a support service for funding proposals and outreach activities. Similar support services have been established at the UMass Amherst Digital Media Lab.

The Official Opening of GEOSET Studios with Bill Nye, and the recording studio setup.

In the early years of GEOSET, the focus was on making impactful connections to academic institutions and organizations to support our goals. Tim O'Reilly (O'Reilly Media), Chris DiBona (Google) and Timo Hannay (Nature) invited me to join them at Science Foo Camp, also known as "Sci Foo". It is an event organized by Google, Nature, O'Reilly, and Digital Science, where the invitees come from many different areas of science, as well as technologists and policymakers, deciding on the agenda of the conference on arrival.

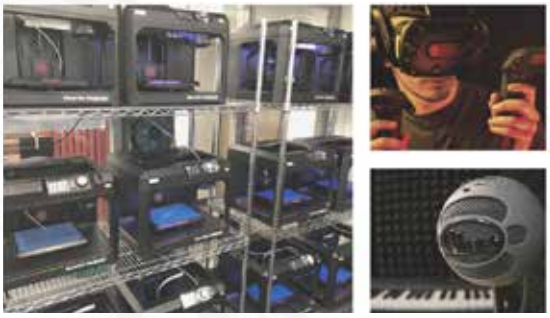
Science Foo Camp has taken place annually at the Googleplex campus in Mountain View, California, and I gave a presentation about GEOSET and the importance of science communication and outreach. In attendance to the event were Bill Nye, BBC News correspondents, and the author Robert Sawyer.

Directing the UMass Amherst Digital Media Lab

At UMass Amherst, I lead the Digital Media Lab and foster collaborations with departments and organizations outside the university in the development of media projects, 3D printing research, and Virtual Reality technology. I host the Research Art Science Exhibition (RASE) each year at the DML and create Virtual Reality based exhibitions to archive the work of the students.

2019 virtual exhibition https://simmer.io/@GEOSET/rase-2019

The Digital Media Lab (DML) in the W.E.B. Du Bois Library is a key location for creativity and innovation supporting the university community through engagement on professional audio/video productions, virtual and augmented reality, 3D printing, and artificial intelligence. This centralized facility provides equipment for students and staff to borrow and use in their projects, classroom activities, and to support funding proposals. The virtual reality facility keeps the DML at the cutting edge of technology with a service that delivers a new way to reach out to the university community. We are working on virtual reality applications that cover many issues, including a simulator to help students practice public speaking in a virtual lecture hall.



At UMass Amherst, I was a 2018 Innovation Fellow and a 2019-2020 Sustainability Curriculum Fellow. I co-instruct the Makerspace Leadership and Outreach course, helping students with hands-on projects that support the United Nations Sustainable Development Goals. My research connects my position in the chemistry department and the coordinator of the Digital Media Lab by investigating new materials for 3D printing.

The Digital Media Lab worked as part of the UMass Amherst COVID-19 Response Teams, leading efforts to produce 3D printed personal protective equipment (PPE). Innovation Hubs, Makerspaces, and Libraries were all activating their large clusters of 3D printers to produce PPE, making an impact in supporting their communities. Our 3D print farm (fifty 3D printers) was used to produce components for over 2000 face shields. We worked with community volunteers to assemble the 3D printed headbands from the DML with the clear plastic visors and delivered the completed face shields to hospitals and care facilities, including the Soldiers' Home In Holyoke.

The Digital Media Lab featured in the 'Be Revolutionary' campaign video highlighting our Virtual Reality equipment. Our new facility under construction in the Library will have two Extended Reality rooms where students and faculty can engage in and receive support with Virtual Reality, Augmented Reality, and Artificial Intelligence.

I was awarded the status of Chartered Chemist (CChem) and Chartered Scientist (CSci) by the Royal Society of Chemistry and The Science Council. The Chartered status is only awarded by Institutions that operate under the Royal Charter by a British Monarch. As a Fellow of the Royal Society of Chemistry (FRSC) and the Royal Microscopical Society (FRMS), I work towards creating opportunities for students to get involved with science communication.