

## ROYAL INSTITUTION CHRISTMAS LECTURE SERIES

Michael Faraday is a well-known name in the field of science, known for his discoveries in electromagnetic induction, electro-magnetic rotations, the magneto-optical effect, diamagnetism and field theory,<sup>(6)</sup> he remains a name discussed in many Chemistry and Physics lectures to this day. However, one of his lesser known prized accomplishments is a series of lectures given to audiences of all ages, which to this day remains relevant.

Started by the famous Faraday was a series of Christmas Lectures each with a particular subject in mind. The Christmas Lecture series began at The Royal Institution of Great Britain as a way to convey scientific concepts to a general audience in an informative and entertaining manner when science education was scarce. The lectures varied greatly, but as a whole focused on teaching youth during their holiday breaks. Initially, a lecture series was given in the afternoons from the Royal Institution as early as 1800 for adults to attend, but it quickly became evident that in a time when education for youth was scarce, the series could inspire in children an interest in science.<sup>(7)</sup> As director of the Royal Institution of Great Britain between 1825 and 1867, Faraday enhanced the reputation of the institution as not only a research center, but also as a center of education for everyone of all ages. He gave his last Christmas Lecture in 1860 on “The Chemical History of the Candle” and later published the lecture as a book which has never been out of print.<sup>(8)</sup>

To this day, the Christmas Lecture Series, also known as, “The Faraday Lecture Series” goes on. The series has been a long standing tradition for almost two hundred years, it has continued on an annual basis every year except during the years of World War II.<sup>(9)</sup> When television became an icon of the modern world, the series began to be recorded and shown on

television for those who could not attend. The latest series hosted in 2016 by the Royal Institution was, “Supercharged: Fueling the Future.”<sup>(10)</sup> It was available online and as such continues the custom of teaching during holiday break for audiences of all ages.

Stemming from the Christmas Lecture series, other institutions have taken up the torch and began their own series during holiday breaks all geared towards being an engaging and fun forum for children to learn about science. Harvard’s Jon A. Paulson School of Engineering and Applied Sciences started their series in 2002,<sup>(11)</sup> the University of Wisconsin’s Dr. Bassam Shakhashiri has been doing a holiday series since 1970.<sup>(12)</sup> Other institutions such as the University of Warwick<sup>(13)</sup>, and Rockefeller University<sup>(14)</sup> also participate annually with their own spectacle.

#### THE FARADAY LECTURE SERIES AT THE UNIVERSITY OF UTAH

Since 1980, the University of Utah has been presenting its own “Faraday Lectures” during the holiday season in homage to the tradition started at the Royal Institution one hundred and fifty-five years prior. Professor Ron Ragsdale and Jerry Driscoll began “perhaps the most anticipated and well attended lecture series on campus.” After 24 years, both professors “retired” themselves from the exhausting nature of the demonstrations and passed along the torch to Dr. Peter B. Armentrout and Dr. Chuck Wight as the “New Faraday Lectures”. Today the lectures are presented by Dr. Janis Louie and Dr. Thomas Richmond,<sup>(15)</sup> continuing to ignite the enthusiasm of science for audiences of all ages in person, online, and on local channels when show annually on the Utah Education Network.

With sold out lectures attended every holiday season, scout groups, student groups, and families are all present to watch the exciting lecture series. During the demonstrations there are many happy and awed faces taking in how outstanding science can be. Due to the high attendance and the identity of the audience, the Faraday Lecture series presents an opportunity to push science past the doors of learning institutions into the homes of future scientists, engineers, and mathematicians.

### FARADAY@HOME

With the help of the Faraday Lecture Series, the University of Utah Chemistry Department has shown children and families just how exciting science, more specifically, chemistry can be. When walking with a young boy and his father to one of these series, I overheard the young boy say, “I hope I don’t get bored. If this is boring it’s your fault Dad.” When I saw this same boy after the lecture series he was enthralled in the night’s event and was excited as he peppered me with questions as to how certain experiments were able to take place. Many children go home from these lecture series hoping to learn more about science from their teachers, but there is a distinct idea that science only occurs at school. Outside the doors of an educational setting, where even the Faraday Lecture Series take place, there is world of science supported by stay-at-home mothers and do-it-yourself science blogs. However, aside from the annual science fair, science and STEM as important as they are, do not find themselves in the home often. Continuing Faraday from the “U” to the youth would take science past the front doors of educational facilities and towards the homes of young students.

The initial collection to be used for “Faraday@ Home” consists of ten experiments, with topics ranging from Agricultural and Food Chemistry to Inorganic Chemistry to Geochemistry.

Primarily these experiments were chosen because of their ability to outline important topics in chemistry that can often be misconstrued from an early age as determined by professionals in the educational field, both collegiate and secondary. These exercises could be altered or changed in multiple ways so that students can test what would affect their experimentation and address aspects of the scientific method. Additionally the experiments were chosen based on their supplies and whether or not they could be readily found in a home as well as be done safely in a home setting. Only a few experiments would require going to find supplies when not available in a local grocery store or would require additional parental guidance. Once these two objectives were met, it was important for the experiments to demonstrate the diversity of Chemistry by classifying each as a particular field or fields in chemistry so that if students grew exceedingly interested in one type of experiment they could learn more about the field that the science they did applies to.

However, having the experiments chosen would not make the experiments accessible or worthwhile without the connection to a system of higher education that is renowned for its sciences. With multiple examples of “at home” experimentation for children, the differentiation of these experiments from science websites or science blogs is their reliance on a noteworthy research institution as their access point. The University of Utah has established itself in the Salt Lake City, Salt Lake Valley, and Utah communities as an institution of higher learning, however it also plays the role of an R1 research institution as a part of the PAC-12 where it competes academically with other critical research institutions. Through the Faraday Lecture Series, the university is able to captivate audiences in a setting that is more distinguished. Using this as a stepping stone, the Faraday@ Home experiments can be based on a website fundamentally established by the Chemistry Department at the University of Utah. This would be a public site

accessible to multiple communities that could be viewed as a viable source due to the university's credibility. The Faraday Lecture Series could prove an excellent time to unveil this option for parents and children alike to take science home and make their kitchen a laboratory.