AIP Matters

November 11, 2013

Director's Matters

By H. Frederick Dylla, Executive Director & CEO

It's elementary

The enjoyment of science has always been part of my life. Throughout my career, I have always found it useful to promote the value of science by drawing on science's far-reaching connections, such as the connections between science and our general welfare, science and history, and science and art. These linkages enable the message to reach a wider audience, making science more accessible or interesting. Twice a year at the American Center for Physics, the staff and colleagues of AIP, APS, AAPT, and AAPM get the opportunity to explore new connections in science and art with the opening of a new art exhibit. Two or three artists are invited to display their work in ACP's public space and introduce the exhibit personally during an opening night reception. On the evening of October 21, Langley Spurlock and John Martin Tarrat introduced their decade-long endeavor to present the elements to the public—in image and in verse. Langley brings appropriate training to this task, as a retired chemist with profound interest in all forms of artistic expression. His collaborator, Tarrat, is a retired advertising copywriter who has dedicated his post-career efforts to the art of poetry.

Their joint project, on display at ACP through April 11, 2014, shows a unique piece of art for a number of the individual chemical elements. They are more than 10 years into the project and have thus far depicted about 40 of the 118 elements, with a grand plan to create a unique piece for each of the 118 elements on the standard periodic table. Their first chosen element to enshrine was promethium, because its namesake, Prometheus, appealed to Tarrat's poetic roots. From the start they recognized that some elements would be easy to represent because of their name, familiarity, and/or pedigree. However, they would face artistic challenges with about 50 obscure elements. The least attractive—the so-called "dogs" in the Spurlock-Tarrat classification scheme—are so rare and fleeting in existence that they serve little purpose except to fill up their anointed spot in Mendeleev's table (at least, given our current knowledge of chemistry). To tap and hold the interest of their viewers, the artists prepare for exhibits by creating art for a balanced mix of elements, depicting the celebrities (i.e., gold, silver, etc.) with the familiar (i.e., oxygen, helium, etc.) with the "dogs."

Each element-inspired piece involves a considerable collaboration between the two artists as they research its history, use, and connections to humanity. The end result is a dedicated haiku poem that is integrated with the imagery. The artists take great care in conceptually integrating the poems within the works; they are by no means simple captions.

Listening to Spurlock and Tarrat talk, it was clear to me that their project is clearly a labor of love and a learning experience for them and their audiences. From my point of view, it works as a connection

between one of the first things that all students are exposed to in science—the elements that make up our world—and their history, technology, and utility, captured in image and verse. And there's more to come. The artists forecast another decade before they have worked through all 118 elements . . . What a wonderful prospect.

To provide one form of closure, the artists asked 118 people to draw their impression of each element, and this montage is presently on display as homage to Mendeleev's original layout of the elements. Please stop by ACP before April 11 and enjoy Spurlock and Tarrat's exhibit, "Intersections: Secrets of the Elements."

Physics Resources Matters

Federal science agencies return to full operations, with uncertain future

Many federal scientists were furloughed during the government shutdown that lasted through the first half of October. While these scientists are back at work, the closing acts on Capitol Hill for the Fiscal Year 2014 budget cycle remain a work in progress.

Funding for the federal government was restored—at largely current levels—through the middle of January. It is hoped that a severely divided Congress will find a legislative solution to avoid another shutdown before then. A committee of key senators and representatives is meeting behind closed doors, and it is generally expected that there will be no "grand bargain" to put the government's financing on a better footing. The focus appears to be on finding a way to replace the automatic budget cuts ("sequestration") for FY 2014 and providing enough money to fund the federal government through the end of next September.

House and Senate committees are working on a separate track, on legislation setting policy and maximum funding levels (but not the actual funding) for the Department of Energy's Office of Science, the National Science Foundation, and the laboratory programs of the National Institute of Standards and Technology. The original version of this legislation—The America COMPETES Act—was enacted in 2007 with much bipartisan support in the House and Senate. When that law expired in 2010, the House went through some highly contentious deliberations before it was passed. Judging from what happened with a NASA bill in the House this year, passing new COMPETES legislation is not going to be easy. AIP's Government Relations staff has been participating in meetings and briefings on this new legislation, and is reporting on public hearings and other developments in *FYI: The AIP Bulletin of Science Policy News*.

Full house for public lecture on Rutherford

This fall Professor Emeritus John Campbell of the University of Canterbury in New Zealand spoke to over 60 guests about his lifelong fascination with Ernest Rutherford. "Rutherford's Path to the Nuclear Atom" began with an eight-minute trailer of his three-hour video documentary of Rutherford's life. Campbell spent his career as a condensed-matter physicist in the same department from which Rutherford attained a BSc in 1894. Campbell has also been one of New Zealand's most active proponents of physicists doing outreach to schools and teachers. This event was cosponsored by AIP Student Programs, AIP History Programs, AAPT, and APS.

The purpose of the talk, as indicated by the title, was to take a close look at the work done by

Rutherford and his researchers between the first gold-foil scattering experiments in 1908 and the announcement of the nuclear atom in 1911. Campbell described the efforts of Hans Geiger and Rutherford to develop reliable methods for detecting alpha particles, as well as Rutherford's work with Thomas Royds to demonstrate experimentally the identity of alpha particles and doubly ionized helium. Campbell noted the care with which Rutherford elaborated the steps in this research. The experimental culmination came in May 1909, when Geiger and third-year physics student Ernest Marsden published "On a Diffuse Reflection of the a-Particles" in *Proceedings of the Royal Society.* This set Rutherford and his team to studying the statistics of scattering, alpha emission by various elements, and most importantly, it set Rutherford to thinking how backscattering could be accounted for. That an alpha particle could deflect back from an atom was, as Rutherford said, "incredible, as if you fired a 15-inch shell at a piece of tissue paper and it came back." Rutherford first suggested in March 1911 that a "charged center" concentrating most of the mass of the atom could explain such deflections. By 1913, this charged center was called the nucleus and the Bohr atom was released upon the world.

Campbell's biography, *Rutherford: Scientist Supreme* (1999), is the most reliable popular book on him. For more information visit AIP's newest history web exhibit, "Rutherford's Nuclear World," or Campbell's site, Rutherford.org. Those interested in obtaining a DVD with the three-episode biography of Rutherford should contact rutherforddvd@ask-a-scientist.net.

Coming Up

November 11

- AIP Executive Committee meeting (College Park)

November 12

- AIP Governing Board meeting (College Park)

November 13

- Birthday breakfasts (Melville and College Park)

November 15

- Open Enrollment deadline for health and flexible spending benefit programs (Melville and College Park)

November 18-19

- AIP Publishing Board of Managers meeting (New York, NY)

November 20

- Brown bag lunch, 12 pm, given by Charlie McMillan, Director of Los Alamos National Laboratory (College Park)

November 28-29

- AIP and AIP Publishing closed for Thanksgiving holiday

December 4-5

- STM Innovations and e-Productions Seminars (London, UK)

December 1-6

- RSNA Annual Meeting (Chicago, IL)

December 2-6

- ASA 166th Meeting (San Francisco, CA)

December 11

- Birthday breakfasts (Melville and College Park)
- All-hands Meeting and Milestone Presentations (College Park)

December 12

- Holiday party for AIP Publishing staff (Melville)