Three Decades of Interacting with Arthur Kerman

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Abstract

For many years, Arthur Kerman has been a leading force in pushing for new initiatives in science. In this paper, we present a short review of our mutual interactions on many of these efforts.

1 Introduction

Let me begin by introducing myself. For those of you who do not know me, I have spent the past 40 years holding various positions, including being a Professor in the Department of Physics at the University of Massachusetts Amherst, a consultant at both Lawrence Livermore National Laboratory and Los Alamos National Laboratory, the Division Leader at Livermore for Nuclear Physics, Elementary Particle Physics and Accelerator Physics, a Science Advisor to the National Nuclear Security Administration in Washington, DC and a consulting employee of SAIC while continuing to serve as an Advisor to the NNSA. In all of these roles, I have been lucky enough to interact often with Professor Arthur Kerman, one of our guests of honor at this conference. In the short time available, I'd like to reminisce a bit on some of those interactions. For those of you who would like a short story even shorter, it might suffice to say that whenever you work on an exciting new science project, Arthur is sure to tell you that he was involved in the very early stages of that project. While it sometimes seems impossible for him to have actually done as much as he says, I know from experience that it really is true. So let's begin.

The hero of our story can be seen in Figure 1, a picture that was used with a short biography at the start of one of the many advisory committees on which Arthur has sat. To give you a flavor of the breadth of his activities in the advisory capacity, I list a few of the committees in Figure 2. As you can see, in addition to his responsibilities at M.I.T., Arthur has served on the National Academy of Sciences Committee on Inertial Confinement Fusion, on the NIF Programs Review Committee at Livermore, on the Directorate and Division Review Committees at Livermore; the RHIC Policy Committee at Brookhaven, the SLAC Scientific Policy Committee; the Secretary of Energy Fusion Policy Advisory Committee; the White House Science Council Panel on Science and Technology in the Government and many, many other important and influential bodies. Clearly the scientific community and those in positions of setting policy relevant to science highly value Arthur's contributions. There is the opinion in some circles that if you want to find Arthur, just set up an important advisory committee and he will be there at the first meeting.

2 Directorate Review Committee

My first memory of interacting with Arthur concerns one of those advisory committees: Specifically, I was asked to serve on the Director's Review Committee (DRC) for the Physics Directorate at Lawrence Livermore National Laboratory. At the time, these committees were relatively new (Arthur had strongly advocated for their formation) and were asked for their advice not only on the work that was on-going but also for their suggestions on future directions. As such they often wielded a lot of power. The meeting of the DRC was a three-day affair covering the many science areas of the Directorate. As the "new boy" on the Committee, I took careful notes on both the presentations and the lively discussions that followed each talk. I was quite impressed not only with the breadth of the science being presented -- nuclear physics, atomic physics and materials science – to name just a few – but also with the active questioning across such a wide array of topics from my colleagues on the Committee—from Arthur in particular. Arthur had a question or two for most speakers. I noticed that he never seemed to take notes even though the DRC had to produce a written summary of their observations and findings to present to the Director and the Associate Director sometime after the meeting.

After the meeting, Arthur, the chair of the DRC, asked me to write up my notes in the form of a report. I felt honored to be asked to do so and worked for quite some time to prepare my input to the report for him. Once my report was done, it is my understanding that Arthur labeled that write-up as the DRC report and went alone to see both of the senior LLNL administrators to report personally on the recommendations of the DRC. I learned an important lesson from that experience – The important aspects of a review are not what is written –rather senior administrators are much more likely to pay attention to a one-on-one report and critique of their programs. The written report becomes archival quickly while the oral comments often lead to change when change is needed.

3 The Superconducting Super Collider (SSC)

Many years ago, when the U.S, was beginning to formulate plans to build the next generation of high energy particle accelerators, there was a call for proposals for the site of this major scientific prize. To many of us in academia, Massachusetts seemed to be the perfect place to house the SSC: (1) Massachusetts is home to a very large number of Universities active in High Energy Physics – with many of the scientific leaders of the field resident there. (2) A large military base was being decommissioned providing more than ample space for the accelerator complex. Such a space avoided any complications regarding ownership of the land and interactions with home- or business-owners. And (3) the governor of a neighboring state suggested using a newly constructed nuclear power plant in his state as a source of electrical power for the SSC.

All of the stars seemed to be aligned. Arthur took the lead role in gathering together leaders in HEP from the Massachusetts academic community. There were about 7 private universities (including Harvard, MIT, Boston College, Boston University, Brandeis, Tufts, etc.) and one public University (University of Massachusetts Amherst). We met many times at MIT to plan our proposal – our group included Roy Schwitters of Harvard who eventually became the Director of the ill-fated SSC project. During a few hectic months, we became experts in geology - was the land suitable for tunneling - and a variety of other engineering aspects. We submitted a beautiful proposal that would have won—in my opinion—except for one minor problem. A project of this size – several billion US dollars – had to have the support of the Governor of the home state. Unfortunately, Governor Mike Dukakis decided this project wasn't high on his list of priorities and chose not to support it. (For those of you who remember, Dukakis was not known for his political acumen as evidenced by his overwhelming loss in presidential politics.)

4 The French Program

At the NNSA, I manage an international agreement between the CEA/DAM in France and the NNSA/DP in the United States entitled " Cooperation in Fundamental Science Supporting Stockpile Stewardship". Under this agreement, scientists at Livermore, Los Alamos and Sandia National Laboratories in the US are encouraged to collaborate with their counterparts at CEA (Bruyeres-le-Chatel) on unclassified basic science projects, leading to publications in the open literature. This effort began in 1998 when Daniel Gogny was assigned to spend time at Livermore investigating possible collaborations. Various meetings then occurred between scientific leaders of both sides over the next few years, with a formal agreement document signed in 2002.

Arthur was present at all of the formative meetings, strongly urging that the agreement go forward. To be sure, there was always a very strong nuclear physics component in the interactions between the two countries – collaborations that preceded the international agreement. Under the agreement, there continue to be fruitful collaborations in nuclear physics.

In addition to his pushing for this agreement, Arthur has always attended the General Meetings at which each of the active projects reports on the progress of their collaborative research. Held every two years, these meetings alternate to sites in the two countries. In Figure 3, we have a picture that was taken at the official banquet held at the Chateau D'Artigny near Tours in France. Obviously it was a great scientific meeting and the banquet was extremely well received. See Figure 4 for another picture from that affair.

5 N Division Advisory Committee

I served as the leader of the Livermore division that was concerned with Nuclear Physics, Elementary Particle Physics and Accelerator Physics. Some of the major projects during the time I was leader included: Building the SLAC-LBNL-LLNL B Factory; Accelerator Production of Tritium; Accelerator Transmutation of Waste; PEREGRINE – a program to improve the treatment of cancer; the Rare Isotope Accelerator; proton radiography; improved nuclear data; measurements of important nuclear cross sections such as Pu(n,2n); and a host of other efforts.

During the 8 or 9 years that I served as leader, Arthur was always there to provide advice. For example, he was a charter member of the N Division Advisory Committee that met annually to review all our programs. A picture from one of those meetings is shown in Figure 5. (Arthur was never shy about offering his advice and served on every committee that met during my tenure there.)

6 "Arthur-isms"

Having had the pleasure of working with him for many years, I have also had the chance to observe him up close and personal. You might find some of these observations interesting.

1. Despite the ubiquity of laptops, IPAD's and Smart Phones, Arthur does not use the computer. He gets emails but only when he has someone print the message for him. Perhaps not being tied to the Internet allows him to get so much done.

2. He seems semi-indestructible. He and I took an overnight "red-eye" flight from California to Boston for an all-day presentation to the MIT Nuclear Engineering Department regarding either the Accelerator Production of Tritium or Accelerator Transmutation of Waste Project. We both had heavy loads consisting of briefcases and suitcases. We arrived at location of the briefing early in the morning. I struggled up the two flights of stairs hoping that some young graduate student would take pity on me and help (to no avail). When I reached the landing, I turned around and to my surprise, I saw Arthur trotting up the same set of stairs with his luggage as though he were completely fresh and ten years younger than me.

3. That is not to say he hasn't been ill. A few years ago, Arthur was hospitalized and for that reason was forced to cancel some of his schedule. In particular, he had been planning on joining the group that was going to France for a meeting regarding the International Agreement on Fundamental Science that was mentioned earlier. That episode was quite serious – not for the medical reasons about which I am not expert—but for another factor that many thought was life threatening. Arthur was hospitalized just a few weeks before the French meeting. We assumed that he had bought an inexpensive non-refundable airline ticket. We were sure that if he had to cancel his trip and as a result LOST the money on the ticket, that fact would kill him! As it turns out, Arthur had been smart – as usual – and had not bought such a ticket and all ended well.

4. As a long-time consultant to Livermore, Arthur has – as you might expect—become an expert on how to enjoy his time in the Livermore valley. On one of his visits, I offered to drive him from the lab to his residence near the lab. I remind you that the laboratory treats its consultants very well – providing more than adequate per diem allowances so that one can stay in any of the many hotels within a 20-mile radius of the lab. Eager to see what arrangements a senior consultant had made, I was unprepared to see that Arthur lived in a trailer park in a fairly old Airstream trailer (Figure 6). Somehow, it did not fit with my preconceptions.

As it turns out, this trailer had some history and involved a battle between Arthur and the lab. I believe Arthur wanted to park the trailer at the lab when he wasn't visiting- moving it during those periods when it was occupied. The lab management (the budget folks) did not want that to happen. You'll have to ask Arthur for all the details.

5. When I retired from Livermore and when I went to Washington on assignment, I often was given a two-person office to use. Almost invariably, my office partner turned out to be Arthur. Since we each tend to have busy schedules, this never posed a problem – in fact I admit to enjoying the many discussions such close proximity encourages.

6. I was fortunate enough to attend Arthur's 80th birthday celebration at MIT, along with many of the country's luminaries in science who took time to attend. It was an impressive gathering.

7. Arthur either knows everyone of importance or had them as students. I continue to be amazed at his ability to get appointments with everyone in DOE or at the laboratories – Steve Chu, Steve Koonin as well as the laboratory directors. If you want something done, convince Arthur and he'll be an influential advocate.

8. Finally, I leave you with one of Arthur's many wise observations that I treasure. We have often argued about which of the many scientific facility investments should be made by the U.S. government – through either the Department of Energy or the National Science Foundation. In this era of tight budgets, one spends a great deal of effort making choices that are extremely difficult. Arthur's constant argument – with which I completely agree – is that the United States now spends a smaller percentage of the Gross National Product on science than it did years ago. If we want a robust economy in the future led by inventive bright young scientific minds, we should not be choosing which scientific endeavor to pursue from a menu – WE SHOULD BE DOING THEM ALL!!

So, thank you Arthur and I look forward to many more years of interacting with you.

Arthur Kerman

Fig.1: Arthur Kerman

- National Academy of Sciences –Committee on Inertial Confinement Fusion
- NIF Program Review Committee
- Livermore Directorate Review Committee
- Livermore/Los Alamos Division(s) Review Committee(s)
- RHIC Policy Committee- Brookhaven
- SLAC Scientific Policy Committee
- Secretary of Energy Fusion Policy Advisory Committee
- White House Science council Panel on Science and Technology in the Government
- LANSCE Advisory Board

Fig. 2: A few of the Advisory Committees on which he has served (away from MIT)

Fig.3: General Meeting under the DOE/NNSA CEA/DAM Agreement Held in France.

Fig. 4: Dinner at one of the General Meetings

Fig. 5: Arthur (see arrow) served on every advisory panel for the LLNL Division on Nuclear Physics, Elementary Particle Physics and Accelerator Physics.

Fig.6: Arthur's Luxury Hotel near Livermore