Raymond Brock

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1 Biography

Raymond Brock received his Bachelor's Degree in Electrical Engineering from Iowa State University in 1972. After a year working as a sales engineer for Driv-Lok, Inc., he returned to complete his Masters Degree in Physics and the Philosophy of Science from Northern Illinois University in 1975 in a program created for him because of his interests in both fields. He subsequently received his Ph.D. degree in Physics from Carnegie-Mellon University in 1980, combining experimental high energy physics (under Arnold Engler) and phenomenological elementary particle physics (under Lincoln Wolfenstein). There he concentrated on the physics of the Weak Interaction, predominantly neutrino scattering and the production of heavy flavor. He spent two years at the Fermi National Accelerator Laboratory as a Postdoctoral Researcher under James Walker working on the neutral current neutrino experiment, E594. In 1982 he joined the faculty of the Department of Physics and Astronomy at Michigan State University as an Assistant Professor.

He was promoted to Associate Professor with tenure a year early in 1986 and to the rank of Professor in 1991. In 1994 he was selected as Chairperson of the Department of Physics and Astronomy and served until 2001. During that time, he was instrumental in the conception, design, and overseeing the construction of the $93M Biomedical and Physical Sciences Building at MSU which houses the Departments of Physics and Astronomy and the Departments of Microbiology and Molecular Genetics and Physiology. He was also instrumental in organizing the MSU commitment to the construction of the SOAR 4m infrared-optimized telescope in Chile, MSU's first telescope effort. These two endeavors were significant milestones in the history of the Department and had been decades-long goals. Brock hired a dozen faculty, including senior physicists and negotiated the endowment of the first named Cohen Chair of Experimental Physics.

While Chair, Brock revamped the way the department's $7M annual budget was calculated and how it was presented for approval. In addition, he drafted a number of written "Chair Policies" memorializing informal, long-standing, or newly required policies on many matters. He convened an annual review of each policy. Finally, he requested an anonymous annual review of his own performance in which feedback was solicited from faculty, students, and staff in the Department. This review was handled by the Department's Advisory Committee. All three of these initiatives ended with his term.

As a result of an internal hiring plan, he stepped down leaving a budget surplus of $1M earmarked for startup contributions to future hiring. In 2001, once the building and the telescope were well on their way to completion, he returned to full-time research and teaching.

Brock has taught across the undergraduate and graduate physics curriculum. At the graduate level, he concentrated on Relativistic Quantum Mechanics, Relativistic Quantum Field Theory, and Group Theory. At the undergraduate level, he has taught the large lecture classes for with- and without-calculus students. Recently, he has been teaching an intensive reading and writing course course for honors non-sciences students combining the history of physics (at a moderate technical level) with the history of art and the philosophy of science. He is currently teaching undergraduate physics majors and in addition, designing a general education course on elementary particle physics and the early universe. He has won department and university awards for teaching at both levels.

His research activities have been in electroweak physics. He was spokesperson of the Fermilab neutrino experiment E733 and has been a member of the DØ collaboration since its inception. He has been instrumental in the construction of various pieces of that apparatus (the 4π cosmic ray scintillator shield and most recently the upgraded electronics for the Level 1 trigger upgrade) and has played an important role in significant measurements: he convened the first W boson mass group (Ph.D. student Eric Flatum) and has become an expert in the resummation effects in Intermediate Vector Boson production, co-authoring papers on both the experimental and theoretical aspects of this and other "two-scale"physics reactions (Ph.D. student Freddie Landry). He current two graduate students are actively measuring properties of the top quark. For the last three years, he led a $1M upgrade to the DØ experiment's Level 1 trigger electronics, a project involving three MSU electronics engineers and a current MSU graduate student. This equipment is installed and running smoothly.

Recently, he assembled an externally funded 150 processor Linux farm for use in the DØ experiment Data Grid. It is running full time and is producing more than 1.5M monte carlo events per week for use around the world. Recently, he and a colleague at the University of Michigan successfully led a proposal to become for a joint "Tier 2" data center for the mammoth Atlas experiment at CERN. This is a project which will provide analysis computing for U.S. physicists for the next decade and will be the first full-time use of the recently installed state of Michigan 10 Gbps fiber network called the Michigan Lambda Rail, "MiLR". When installed, thousands of processors and Petabytes of storage will be installed at MSU and programmed to operate within the Atlas Grid.

During the years, he has held a number of administrative positions within the DØ collaboration, most recently as the co-head of the Database, Datahandling, Datagrid group and a member of the Computing Policy Board, CPB. He has recently rejoined the CPB as chairperson. He is a member of the ATLAS experiment at CERN, convening the first Electroweak Top Quark physics group as preparation for the Physics Technical Design Report. Brock is the author or co-author on over 200 publications in experimental and phenomenological high energy physics. He has been continuously funded by the National Science Foundation since his arrival at MSU and is currently the co-PI of NSF Award PHY 0457035, $2.45M from 2004-2007.

2 Service to the Scientific Community

Brock has held a number of advisory positions within the American Physical Society (APS) and Department of Energy laboratories and advisory groups:

2.1 elected positions

- 1988–1990; member, Fermilab Users Exectutive Committee
- 1989–1990; Chairman, Fermilab Users Exectutive Committee
- 1998–2000; member, Fermilab Users Executive Committee

2.2 appointed positions

- 1980–1981; Co–leader (with Leon Lederman) of Arms Control and Disarmament Seminar Series
- 1983; member, Fermilab Computer Coordinating Committee
- 1988–1989; Physicist on an independent panel appointed by the Governor of Michigan to study the radiological and toxilogical effects of the SSC in Michigan.
- 1991; member, Search Committee for the Director of Fermilab (following the retirement of Leon Lederman)
- 1991–1995; member, Fermilab Program Advisory Committee
- 1991; member, 1^{st} Fermilab Neutrino Oscillation Panel (*ad hoc* advisory panel to FNAL Director)
- 1994; Chairman, 2^{nd} Fermilab Neutrino Oscillation Panel (*ad hoc* advisory panel to FNAL Director)
- 1991–1994; member, Los Alamos Meson Physics Facility Physics Advisory Committee
- 1992–1995; Special Assistant to the Fermilab Director
- 1994–1995; Committee on Long Term Planning, Division of Particles and Fields, APS.
- 1997; Member of the DOE Site visit team to the Stanford Linear Accelerator Laboratory.
- 1997–1998; Nominating Committee for the APS Division of Particles and Fields Panofsky Prize.
- 1998; Committee for Review of Academic Tenure, APS.
- 2001-current; Co-chair, US-European Working Group to organize LHC upgrades and VLHC activities.

- 2002-2005; University Representative to the DOE High Energy Advisory Panel (HEPAP).
- 2003; Led the University Team in the first-ever "Committee of Visitors" review of the DOE Office of High Energy Physics.
- 2004-5; Co-chaired a task force to evaluate the physicist resources in the U.S. for the remainder of the decade. This involved a survey of every NSF and DOE grant and every experiment HEP experiment in the world.
- 2005; Vice-chair, APS DPF Nominating Committee.
- 2006; Chair, APS DPF Nominating Committee.
- 2006-7; Member, DOE/NSF High Energy Physics Advisory Panel University Grants Program Subpanel, a review of both the DOE and NSF funding agencies.
- 2006-7; Member of the HEPAP "Envoy Program" steering committee.

Brock is a Fellow of the American Physical Society. He is a recipient of the two MSU all-university awards for research and teaching: the MSU Teacher-Scholar Award, for untenured faculty in 1985 and the MSU Distinguished Faculty Award, 2004. He has also been recognized within the Department of Physics and Astronomy for teaching: voted by the graduate students as the "Best Graduate Instructor" in 1993 and the Osgood Award for Undergraduate Teaching in 2005.

He is an avid baseball fan and coached baseball many years at the high school level in Michigan. With his new knee, he hopes to resume his regular racquetball program soon.