

H. Frederick Dylla
Executive Director and CEO of the American Institute of Physics (AIP)



H. Frederick Dylla was with the U.S. Department of Energy's Thomas Jefferson National Accelerator Facility (Jefferson Lab) in Newport News, Virginia from 1990 to 2007. During this time, he concurrently held an Adjunct Professorship in Physics and Applied Science at the College of William and Mary. The author of over 190 publications, he received his B.S., M.S. and Ph.D. in physics from the Massachusetts Institute of Technology.

Holding a career-long interest in science education, Dylla helped to found the K-12 science education programs at Jefferson Lab. He founded similar programs at Princeton University's Plasma Physics Laboratory, where he held various research and management positions from 1975 to 1990. While at Princeton, he helped develop technology for nuclear fusion reactors, particle accelerators, and materials processing.

At Jefferson Lab, Dylla served as the Chief Technology Officer and Associate Director for the Free-Electron Laser (FEL) program funded by the Office of Naval Research. He was responsible for initiating, building, and operating the FEL, which generates high-power light in many different regions of the electromagnetic spectrum. In addition to providing a tool for many branches of science with applications to defense and industry, the facility's technology has inspired a new generation of light user facilities under design and construction across the world.

Dylla served on the AIP's Governing Board in the early 1990s and rejoined the Board in 2004. He has been a member of AIP's Corporate Associates Advisory Committee for many years and hosted the Corporate Associates' Industrial Physics Forum at Jefferson Lab in 2002. Currently, he serves on the AIP Board as Chair of the *Physics Today* Advisory Committee and as a member of the Committee on Public Policy.

Dylla is a Past President of the AVS: Science & Technology of Materials, Interfaces, and Processing, one of AIP's ten Member Societies, where he was elected a Fellow in 1998 and is currently a distinguished lecturer for the society. He has helped to design imaginative sessions at AVS meetings on the 100th Anniversary of Electronics and Benjamin Franklin's contributions to vacuum sciences and related fields.

He is a Fellow of the American Physical Society, AIP's largest Member Society. He is a founding member of the Forum of Industrial and Applied Physics, currently the largest unit of the APS. He is an active member in numerous local and regional technology development organizations, including appointments by the Virginia governor to two scientific commissions, and has served on many national advisory committees for the Department of Energy, Department of Defense, and the National Science Foundation.

Contact Information:

Phone: (301) 209-3131

E-mail: dylla@aip.org

James H. Stith
President, Physics Resources Center for the American Institute of Physics



James H. Stith directs a broad portfolio of programs and services that includes AIP's Magazine Division, the Media and Government Relations Division, the Education Division, the Center for the History of Physics, the Statistical Research Division and the Careers Division.

His Doctorate in physics was earned from The Pennsylvania State University, and his Masters and Bachelors in physics were received from Virginia State University. A physics education researcher, his primary interests are in Program Evaluation, and Teacher Preparation and Enhancement. Throughout his career, he has been an advocate for programs that ensure ethnic and gender diversity in the sciences.

Dr. Stith was formerly a Professor of Physics at The Ohio State University and also spent 21 years on the faculty of the United States Military Academy at West Point. He has also been a Visiting Associate Professor at the United Air Force Academy, a Visiting Scientist at the Lawrence Livermore National Laboratory, a Visiting Scientist at the University of Washington, and an Associate Engineer at the Radio Cooperation of America. He is a past president of the American Association of Physics Teachers, past president of the National Society of Black Physicists, a Fellow of the American Association for the Advancement of Science, a Fellow of the American Physical Society, a Chartered Fellow of the National Society of Black Physicists, and a member of the Ohio Academy of Science. In 2004 he was named one of "50 Most Important Blacks in Research Science" by the magazines Science Spectrum and US Black Engineer & Information Technology. Additionally, he serves on a number of national and international Advisory Boards and has been awarded a Doctor of Humane Letters by his alma mater, Virginia State University. In October 2005, he was named an Alumni Fellow, the highest honor given by the Pennsylvania State University Alumni Association.

**RECOMMENDATIONS OF THE AIP ADVISORY COMMITTEE
ON PHYSICS EDUCATION**

March 3, 2007

And the MANAGEMENT RESPONSE

April 24, 2007

Management

1. The committee commends the Education Division for its commitment to the mission of strengthening physics education. We extend our deep appreciation to Jack Hehn for establishing an environment of collegiality among team members as well as committee members.

Management appreciates the recognition and support of the mission. The Director greatly appreciates the support of the committee and this commentary. Gary White and I pledge to continue our efforts and find new ways to strengthen the communication and ties with committee members, AIP staff colleagues, and representatives of Member Societies. Our Education Division has significant and well-focused goals supported by careful review and commentary from our Advisory Committee extending over a five year period. Management will work diligently to nurture the environment of collegiality and collaboration.

2. The committee applauds the Physics Resource Center (PRC) strategic planning efforts and appreciates the valuable contributions made by Education Division staff. We are encouraged that the Education Division goals are well aligned with the PRC strategic priorities as stated in the draft strategic plan and encourage continued strong participation by the Education Division in the ongoing PRC strategic planning efforts.

Management appreciates the support. The division has benefited from both the planning and goal-setting efforts and the staff has expressed very positive attitudes toward the process. The involvement and commentary from the committee has been supportive and effective. We will continue to implement the process with attention of the role of the Division in the overall PRC effort. Budget planning and staff activities will be carefully compared to the goals statements to determine priorities.

3. The committee recommends to the Education Division that its policies, programs, and written materials be constructed to succinctly define and specify which “communities” these policies and programs will impact. As an example, in the draft strategic plan, the word “community” is used as a reference to the broader scientific community while also being used as a reference to the general public. To this end, a greater definition might be appropriate.

Management will focus attention on this issue and make concerted efforts to specify the target audience for programs and procedures and align those with efforts with the PRC. Language must be specific but careful, allowing and supporting collaboration and efforts toward diversity, and including as wide an audience as is practicable.

Goal 1 (Students) and Goal 2 (Member Society Interactions)

4. The committee applauds the efforts of the Education Division to promote the discussion of diversity and inclusion among students. The idea of a year long discussion of diversity issues is a notable one, and though initial attempts to fund the “Future Faces of Physics” conference have not been fruitful, this type of innovative programming for and by students is exceptional. The committee strongly endorses the efforts of the Education Division and encourages continued efforts in this direction. We endorse PRC funding of the Education Division’s efforts in this area.

Management is appreciative of this commendation, and will continue efforts to increase the number and diversity of those studying physics. Efforts currently include expanding partnerships (MentorNet, MUSPIN-NASA, NSBP, NSHP, etc.), recruiting new student chapters among under-represented groups and generally, supporting and hosting conferences, disseminating career trajectory information, serving on policy and advisory bodies, and enhancing on-line resources. We are committed to the idea of a Future Faces of Physics conference and dialogue, and will continue to promote it.

5. The committee commends the Education Division for enhancing communication with students. We specifically commend the redesigned SPS and ΣΠΣ websites and the student components of ComPADRE.

Management appreciates this recognition and is committed to continual evaluation and improvement of its web resources for students. We will continue to look for opportunities to enhance our three primary websites, and to leverage other science websites for physics students’ use, as appropriate.

6. The committee encourages the Education Division to investigate ways to effectively promote physics at the pre-college level. One avenue may include developing stronger relationships between high schools and SPS chapters. A second plan of action might include identifying and assessing member society programs and activities that target pre-college students. Information gained from this effort could be tailored into recommendations to member societies.

Management is also encouraged by the increasing numbers of high-school students taking physics, and the Education Division will investigate effective ways to promote physics to this audience. The idea of partnering with member societies in this effort seems especially promising, and our first efforts will be focused there. We believe, however, that an extensive effort in pre-college physics clubs is beyond the resources of the AIP Education Division, and to divert attention substantially in this direction would be unwise; our primary focus will continue to be undergraduate students.

7. The committee commends continuing efforts of the Education Division through SPS for their efforts to reach two year educational institutions. We encourage broader measures to increase the participation of these institutions, by increasing student membership, institutional involvement, and participation in undergraduate research opportunities.

Management appreciates this commendation and will continue its efforts at recruiting two year educational institutions into the SPS fold. We will look for ways to leverage SPS programs, especially our undergraduate research programs (awards, clearinghouse, travel stipends), so that they become better known in these institutions.

8. We recommend the continued inclusion of an ex-officio student representative on the AIP Advisory Committee on Education. The contributions of the student representative over the past two years have proven both valuable and unique.

Management is in complete agreement with this recommendation and will continue the practice.

9. The committee recognizes the value of aggregating multiple measures or metrics to assess the effectiveness and impact of its programs. We recommend that the Education Division strive to consider and clarify what constitutes “success” in each of its initiatives and programs. What are the metrics being used? What is their significance? We believe this activity would be helpful across the PRC divisions.

Program evaluation is a complex undertaking which is recognized in this recommendation. Management will continue efforts to provide both qualitative and quantitative measures of success and explore, as recommended, broadening the base upon which those measures are made. The Education Division will continue to provide narratives, particularly those written by students, as evidence of program progress and success. Management will continue to foster expert review of those narratives as ethnographic tools of investigation and evaluation. The committees of SPS Council serve not only to help plan programs but also as both peer and expert reviewers of publications, programs, and communication efforts. The opinions of the SPS Council are represented in the deliberations of this advisory committee.

10. The committee advocates that the Education Division continue to explore ways to leverage the SPS internship program. The further expansion of the program would provide additional opportunities for undergraduate research. Promoting the program should increase visibility of undergraduate research at many levels.

Management concurs that the intern program is effective for the participants, and is studying a recently completed formal qualitative evaluation of the program that documents its strongest features. This study will help the division explore ways to expand the program to engage more students, while taking care to maintain its perceived quality.

11. The committee is impressed by the speed, seriousness, and comprehensive nature of the approach that the Education Division has taken to investigate the impact and role of undergraduate research on students. The meeting with CUR and the upcoming NCUR meeting are impressive first steps. Though funding for a more substantial investigation has not yet materialized, the Education Division should continue to find ways to make an appropriate assessment of the undergraduate research experience in order to identify best practices in the UR experience. The evaluation of student journals is a valuable beginning. In addition, the Education Division should begin thinking how to best distribute assessment strategies and best practices to promote effective and engaging UR experiences for all students.

Management will continue its efforts to investigate the role of undergraduate research in the education of physics students, and disseminate the results to appropriate audiences. We are appreciative of this acknowledgement of the importance of this work by the committee. While we will continue to engage with representatives of other disciplines to learn about the impact of undergraduate research more broadly, our efforts will be focused on the physics community primarily.

12. The Committee continues to encourage the Division's efforts to build connections and communication with and between the Member Societies. Including the Chair of the Liaison Committee as a member of this Advisory Committee is a positive step.

Management has implemented the efforts specified to provide cross-communication between the Advisory and Liaison committees and will document the interactions that are fostered. Management pledges to continue to build connections and to keep the communication ties with Member Societies as open and productive as possible and to encourage synergistic activities among Member Societies and with other professional organizations. Management recognizes this as a major initiative for which AIP as an umbrella society is uniquely positioned and has a unique responsibility.

Goal 3 (Policy)

13. The committee lauds the Division's work at the national level as an effective and discerning voice spanning the continuum of education through public outreach and awareness to political advocacy. Prudent and carefully considered efforts emphasizing the importance of science like those with the Coalition on the Public Understanding of Science and a possible future involvement with the "Year of Science 2009" are noteworthy examples of the kinds of activities we encourage.

Management will continue, and increase where possible, its attention to Member Society and AIP efforts that bring the "big picture" of science and science education to the attention of the public and to policy makers and agency staff who implement those policies. The Division will continue to participate in efforts of the Coalition for the Public Understanding of Science (COPUS) such as the Year of Science 2009 (YOS 09). Efforts to reach beyond the traditional physical science community will be continued with some emphases on the establishing ties to the life sciences community. A coordinated response across the units of PRC will be undertaken recognizing that the next few years promise to provide major challenges with respect to public policy and support regarding science and education.

Education Division Mission and Goals

Updated: January, 2005

Mission

Support the highest quality science education for all students.

To provide student services and support programs within the broad physics community that will identify, promote, and enhance high-quality, student-centered, and societal-relevant educational practices and initiatives that positively impact students and their learning of physics, astronomy, and allied sciences and technology.

Goals

Goal 1: Enhance the value of the Society of Physics Students (SPS) and Sigma Pi Sigma in physics education nationwide, with an emphasis on undergraduates.

Utilize SPS and Sigma Pi Sigma to enhance and expand programs and services to the physics community in order to promote system-wide improvements in undergraduate physics education, to increase the number and diversity of students who study physics, and to encourage and support a strong sense of community.

Goal 2: Develop, support, and implement programs, often partnering with AIP Member Societies, that enhance physics education, improve the science preparation of future teachers, increase the effectiveness of Physics and Science Departments in colleges and universities, and promote pre-college science education.

Undertake specific efforts to work with Physics and Science Departments and their leaders to provide information about exemplary programs and encourage constructive strategies for continuous improvement in two-year colleges, primarily undergraduate institutions, and research universities.

Work with the Member Societies to expose more students to physics instruction and improve the quality of physics education at all levels. Implement programs with the intent of attracting more students, especially from under-represented groups, into studying physics and selecting physics or physics related majors.

Work with the AIP Corporate Associates program focusing on integrating and synthesizing student, academic department, and industry interests and concerns.

Goal 3: Shape and influence national science education policy including public advocacy of dedicated funding for improving science education.

Increase the visibility and level of interest in and importance of physics and science education among the Member Societies, the physics community, federal agencies, policymakers, and the general public. Work with AIP units to provide improved science education information and resources, and to act as a catalyst for the exchange of information on education programs among the Member Societies.

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