

PHYSICS and SOCIETY

The NEWSLETTER of the FORUM on PHYSICS and SOCIETY

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JANUARY, 1977

Preliminary Announcement of a Conference on

CHANGING CAREER OPPORTUNITIES FOR PHYSICISTS

August 1-3, 1977

Kern Graduate Building
The Pennsylvania State University
University Park, Pennsylvania

Sponsored by

The American Association of Physics Teachers
The American Physical Society's
Committee on Education
Committee on Professional Concerns
Forum on Physics and Society

PURPOSE

The conference on Tradition and Change in Physics Graduate Education, held in the summer of 1974 at Penn State, provided a valuable interchange between physicists in government, industries, and universities. The central question at that first conference was "Does the traditional training in physics serve the best interests of society, of the physics community, and of the individual physicist?"

This second conference will continue the interchange and take a new realistic look at physics education in the light of the actual career opportunities which are open now. What changes in the traditional training have occurred? What are the new problems ahead? How should the profession further respond?

The first conference considered Ph.D. level training mainly. The scope of the second conference will be larger; bachelor, master, and doctor level education will all be discussed.

It is expected that the output of the conference will include some concrete suggestions for educational institutions, suggestions that already have a basis of support in the profession.

CONFERENCE FORMAT

There will be five half-day sessions on specific subjects, consisting of half-hour invited talks and ten-minute contributed papers. In addition there will be a half-day of panel discussions and two evening social affairs.

ABSTRACTS

Abstracts of both contributed and invited papers will be published in the July issue of the Bulletin of the American Physical Society. The abstracts of the contributed papers should conform to the usual rules and regulations as set forth in the Bulletin. They should be mailed to R. Good at the address following and must be received before March 30, 1977.

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ACCOMODATIONS

Dormitory, hotel, and motel rooms will be available, and there are some camping possibilities within driving distance of the campus. Advance registration forms will be sent out in February.

LOCATION

The University is in the borough of State College in central Pennsylvania. There is open country with ample opportunities for outdoor activities, especially golf, swimming, hiking, and, within driving distance of the campus, sailing. Some people may wish to bring families and combine attending the conference with a few days of vacation.

TENTATIVE AGENDA

I. FACTS, MYTHS AND PROJECTIONS

The demographic data will be brought up to date and forecasts made where possible. Manpower studies that have been made in the last few years will be reviewed.

II. WHY THINGS ARE THE WAY THEY ARE

The factors governing the career choices of students will be examined. These include government funding patterns, information flow to beginning students, and the coupling of physics training to perceptions of what skills are marketable.

III. GENERAL SESSION ON NON-ACADEMIC CAREERS

Job content and career paths for physicists in industry and government will be covered in this session. What can a physicist who undertakes a non-academic career expect in the way of career satisfaction, reward system, and professional recognition?

IV. CAREERS IN HEALTH, ENERGY, ENVIRONMENT, AND GOVERNMENT

Specific information on some non-academic careers will be given. What career choices are available and how should a student choose between them?

V. PANEL DISCUSSIONS

Experience of the past few years and current opinions about physics education will be presented by panels with representation from university department chairmen, industrial department managers, postdocs, students, and faculty.

VI. IMPLEMENTING CHANGE

What are the pressures for change in the physics profession and what resistance has to be overcome? What is the role of the APS and AAPT? How important is government policy?

INFORMATION

For further information write to:

R.H. Good, Jr.
Department of Physics
The Pennsylvania State University
104 Davey Lab.
University Park, Pennsylvania 16802

(see page 3 for more on the Conference)

PLANS FOR THE CONFERENCE ON "CHANGING CAREER OPPORTUNITIES FOR PHYSICISTS"

The Forum is organizing a second conference on Tradition and Change in physics. It will be held on August 1,2,3, 1977, at Pennsylvania State University. The title of the conference is

"Changing Career Opportunities for Physicists".

This conference has evolved from the recognition that the first "Tradition and Change" conference in the summer of 1974 left many unanswered questions, especially in the area of careers other than traditional academic ones.

A steering committee has been formed to manage the organization of the conference. Its membership is given in Table 1. Roland Good of Penn State University and Martin Perl of SLAC are co-chairmen. The steering committee met on November 3, 1976, and scheduled the topics for the six sessions comprising the conference. These sessions are presented as Table 2, along with the individuals who will chair them. Those thinking of participating should be aware that Table 1 represents a fractionating into 6 broad categories of over 30 suggested sub-topics. Some of these are listed in Table 3. Individuals with further ideas should communicate with the appropriate session chairmen.

There will be several invited papers of 1/2 hour length at the start of each session. Contributed papers of 10-minute length will occupy the remainder of the time. Contributed papers will be refereed for relevance to the conference topic. Papers will be assigned to one of the six specific sessions of Table 2, but additional evening sessions may be held if there is a need for them. Contributions are particularly solicited from those who have tried things to enhance alternate career opportunities and who are willing to evaluate the success of their programs.

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PHYSICS AND SOCIETY, the Newsletter of the Forum on Physics and Society of the American Physical Society is published for, and distributed free to, the members of the Forum. It presents news of the Forum and of the American Physical Society; and provides a medium for Forum members to exchange ideas. PHYSICS AND SOCIETY also presents articles, letters and columns on the scientific and economic health of the physics community; on the relations of physics and the physics community to government and to society, and on the social responsibilities of

science. Space is preferentially given to those analyses and opinions which are less likely to be published in the established journals such as Physics Today and Science. Letters, short articles, suggestions for columns, and Forum news items should be sent to the Editor, Martin L. Perl, SLAC, Stanford, California 94305.

PHYSICS AND SOCIETY is also distributed free to Physics Libraries upon request. Such requests and requests for other information should be sent to M.L. Perl.

PLANS (continued from page 3)

ABSTRACTS of contributed papers must be received before 30 March 1977 by

Professor Roland H. Good, Jr.
104 Davey Laboratory
Pennsylvania State University
University Park, Pennsylvania 16802

Abstracts must conform to standard APS rules. The conference proceedings will be published, so the text of both contributed and invited papers will be required at the time of presentation.

The registration fee for the conference will probably be about \$40.00, and will include the cost of a copy of the proceedings. Students will attend free. Various other details, not yet fixed, will be announced here in further issues of Physics and Society, as well as in Physics Today.

Those wishing to help with the conference in any way should contact Roland Good or Martin Perl.

TABLE 1

STEERING COMMITTEE FOR CONFERENCE ON
CHANGING CAREER OPPORTUNITIES FOR PHYSICISTS

PHONE

Ralph Alpher	(518) 385-8620	General Electric R&D Schenectady, N.Y. 12301
B. Mike Casper	(612) 376-3235	University of Minnesota Minneapolis, Mn. 55455
W. Dale Compton	(313) 322-7105	Ford Motor Co. P.O. Box 1603 Dearborn, Michigan 48121
F.J. Darnell	(302) 772-2761	Dupont Experimental Station Wilmington, Delaware 19898
Roland H. Good, Jr.	(814) 865-7533	Pennsylvania State University University Park, Pa. 16802
Lee Grodzins	(617) 253-4244	Massachusetts Institute of Technology Cambridge, Mass. 02139
David Hafemeister	(202) 224-6919	Office of Senator John Glenn Washington, D.C. 20510
Roger M. Herman	(814) 865-6092	Pennsylvania State University University Park, Pa. 16802

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TABLE 1 (CONTINUED)

Allan R. Hoffman	(202) 224-9351	Senate Commerce Committee Washington, D.C. 20510
E. Leonard Jossem	(614) 422-5713	Ohio State University Columbus, Ohio 43201
William H. Kelly	(517) 353-8662	Michigan State University East Lansing, Michigan 48824
Thomas L. Neff	(617) 253-7032	Massachusetts Institute of Technology Cambridge, Mass. 02139
Martin Perl	(415) 854-3300 x2652	SLAC Stanford, California 94305
Brian Schwartz	(617) 253-5585	National Magnet Lab. Cambridge, Mass. 02139
Thomas P. Sheahen	(301) 921-3275	National Bureau of Standards Gaithersburg, Md. 20760
Stanley J. Shepherd	(814) 865-7533	Pennsylvania State University University Park, Pa. 16802
Mary Shoaf	(212) 685-9422 (215) 436-2736	American Physical Society 335 East 45 Street New York, N.Y. 10017
Rolf Sinclair	(202) 632-4318	National Science Foundation Washington, D.C. 20550
V.L. Tepletz	(703) 951-6544	Virginia Poly Inst. and State University Blacksburg, Virginia 24061

TABLE 2

SESSIONS FOR THE CONFERENCE

<u>DATE</u>	<u>TITLE</u>	<u>CHAIRPEOPLE</u>
Aug. 1, a.m.	Facts, Myths & Projections	L. Grodzins & R. Sinclair
Aug. 1, p.m.	Why Things Are the Way They Are	M. Casper & M. Shoaf
Aug. 2, a.m.	General Session on Non-Academic Careers	R. Alpher & J. Darnell
Aug. 2, p.m.	Careers in Health, Energy, Environment, and Government	B. Cooper & A. Hoffman
Aug. 3, a.m.	Panel Discussions	R. Good & V. Tepletz
Aug. 3, p.m.	Implementing Change	M. Perl & B. Schwartz

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TABLE 3

Subtopics Within the Conference on
Changing Career Opportunities for Physicists

Updating employment and manpower figures
Projection of needs for physicists
Job Security and tenure
Early retirement options
Applied physics - viewpoint of those in optics, etc.
How to implement a change once it's agreed upon
Alternative careers in health, government, energy
Physics as part of a double major
Opportunities for people with BS or MS degrees in physics
How to channel students into careers in physics?
Cooperative programs between industry and universities
Lowering barriers between various careers
What changes are likely in the near future?
How to make undergraduate physics flexible?
Mixing career flexibility with a physics background
What are the goals of the physics profession?
How does physics interact with government?
What are the views of undergraduate physics majors?
Changing the attitudes of professors towards industrial careers
Recruiting patterns by industry
Can research be decoupled from graduate teaching?
Where did the people go who left physics?
What courses must be taught to produce physicists who are useful to industry?
Response of "the system" - what will physics departments do?
How can students become more marketable?
What impact will government science policy have?
How can physics couple strongly to the national energy problem?
Freedom, security and recognition in industry
Management of industry as an exit from physics
Review of POPA activities.

TWO FORUM SESSIONS AT THE APS MARCH
MEETING, SAN DIEGO, MARCH 21-24, 1977

CONTINUING EDUCATION FOR PROFESSIONALS: Blanpied, Griesner, Decker,
Fetter, Munushian; Monday Afternoon, March 21.

ENERGY CONSERVATION: Snyder, Berg, Schipper, Williams, Comly; Wednesday
Afternoon, March 23.

LETTER ON INDUSTRIAL CAREERS

From A.V. Ferris-Prabhu (The writer is a PhD in solid state physics, a Fellow of the AAAS and a Senior Member of the IEEE.)

Earl Callen says (1) that were conditions better in industry, physicists would be more inclined to follow industrial careers. His thoughts may be shared by J. Goldman (Vice President and Chief Scientist of Xerox) and by L. Branscomb (Vice President and Chief Scientist of IBM), in recent articles (2,3) which appear to be directed primarily toward industrial research facilities. But these views should be applicable equally, if not more so, to industrial development and manufacturing facilities which are seeking to increase their employment of PhD level physicists.

However, the management of such facilities are judged, by their bosses, primarily on their ability to "get the product out": they are required to achieve a specified mission, in a specified time, at a specified cost. It is hardly surprising, therefore, if they are reluctant to foster the atmosphere or to provide the time, in which to nurture ideas, the fruition of which may require time, and which may not always be readily quantifiable by them in terms of dollars saved or earned. And yet, as Branscomb points out, many absolutely essential manufacturing processes are as exciting as they are not well understood. Would it not make economic sense to encourage the sustained investigation, control and better use of these processes by physicists currently employed directly in manufacturing and development. Not only would this encourage more physicists to seek careers in industry but it would also reduce the amount and frequency of empiricism. The apparent belief that gestation can be shortened by increasing the numbers of those in labour is pervasive but hardly convincing.

Industry's acute need for self analysis (2) may be met if the notion that physicists can both enjoy and contribute significantly to the solution of eminently practical problems (3) is made relevant. A method of achieving this relevance would be to make the identification, recognition, and proper utilisation of physicists deemed to be capable by their peers (as defined by Goldman), a line item in the performance plan by which development and manufacturing managers at all levels are appraised.

Perceptions being realities to the perceivers, the visible and sustained implementation of such an item may encourage more physicists to seek employment willingly in all segments of industry, with results at once beneficial to themselves, to industry and to society as a whole.

References

1. E. Callen, Physics and Society, August 1976, p.3.
2. J.E. Goldman, Physics Today, December 1975, p.23.
3. L.M. Branscomb, Physics Today, January 1976, p.55.

APS CONGRESSIONAL SCIENTIST FELLOWSHIPS

(From Mary Shoaf)

Dear Member of the Forum:

Have you thought of spending a year in Washington? Each year the Congressional Scientist Fellowship selection committee has had the pleasure of awarding Fellowships to superbly qualified candidates and, in 1977, we again want to send candidates of this caliber to Washington.

Would you please consider your colleagues? A well-trained, confident scientist who is a literate, concise speaker and writer, and who, having become aware of a social or public policy problem has done something about it, belongs in the pool of candidates. Did the attack fail? The committee considers the quality and value of failure as well as the measures of success.

A letter of intent, a resume, and three of recommendation from people who can assess the candidate's scientific training as well as the experience or training which might qualify the candidate for a year's service in Washington should be sent to the APS New York office by 15 March 1977.

Fellows have ranged in age from their late twenties to their late forties, have had academic and industrial affiliations, and have been trained in a number of sub-fields of physics. Each year, additional Society members have been chosen as Congressional Fellows by the other societies participating in the program.

For further information, please read the articles in the November issues of the BULLETIN OF THE AMERICAN PHYSICAL SOCIETY and of PHYSICS TODAY.

Mary L. Shoaf, Administrator
Congressional Scientist Fellowship
Program

THERE WILL BE FORUM SESSIONS AT
THE APS SAN DIEGO MEETING!! (SEE PAGE 6)

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