

state & society

Galt panel urges DOD to support basic research

The Department of Defense must support "an extensive, vigorous, imaginative and high-quality basic research effort" as part of its overall mission to ensure national security. So stated the Science Adviser's Panel on Basic Research in the Department of Defense, headed by John K. Galt (Sandia Labs). The panel urged the continuation of substantial increases in basic research funding by the department over the next few years, and the opening of new channels of communication both internally and between DOD and the basic-research community. The panel also discussed how the criterion of "relevance" should be applied, and the proper roles of the various performers—universities, in-house laboratories, industry and non-profit organizations—of DOD-supported basic research.

The Galt committee, and a companion one that examined basic research in the Department of Energy (PHYSICS TODAY, September 1978, page 85), were set up by the Office of Science and Technology Policy. Composed of government officials and university and industrial individuals having long experience with DOD, the Galt committee concerned itself primarily with broad matters of policy. Unlike the DOE panel, it did not examine the basic-research program by field. The panel acknowledged the influence of the



GALT

1976 Defense Science Board study "Fundamental Research in Universities" (PHYSICS TODAY, February, page 77).

Necessity of DOD-supported basic research. The panel cited several reasons why DOD should play an active role in the support of basic research. Because the security of the country depends to a great extent upon a rapidly changing and ever more complex technology, DOD must ensure, through its basic-research program, that

fields of importance are not neglected in research, education or training. Such a program also enables DOD technical personnel to have direct access to research institutions and scientists, and, in the other direction, acquaints research personnel with pressing technical problems of defense.

Noting that DOD funding of basic research in constant dollars is about half that of FY 1966, the panel endorsed Secretary of Defense Harold Brown's announced goal of seeking 10% real growth each year in 6.1 (basic) research for the next several years. By comparison, the department's overall Research, Development, Testing and Evaluation program is expected to have significantly less real growth in the same period.

The panel observed that these planned increases in funding would enable DOD to support research with longer-term payoff and with greater potential value (but higher risk) as well as previously unsupported areas of basic research. George Gamota, until recently the Staff Specialist for Research in the Office of the Assistant Director for Electronics and Physical Sciences at the Pentagon, told PHYSICS TODAY that the increased funding would enable DOD to support long-term and high-risk basic research in

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Scientists and engineers run for Congressional seats

Among the candidates running for Congress this year are at least 16 who have scientific or technical backgrounds. They include five incumbents and 10 challengers.

Known to be seeking re-election to the House are the following: Mike McCormack (D-Wash.), George E. Brown (D-Cal.), James G. Martin (R-N.C.), David F. Emery (R-Me.) and Newton I. Steers (R-Md.). The other House candidates with experience in science are John R. Berg (R) of Minnesota's fourth Congressional District, A. Donald Goedeke (R), of California's 38th Congressional District, Saul J. Harris (R) from Maryland's fifth district, Emmett Hudspeth (R) of Texas's tenth district and Robert Hutchings (D)

of the seventh, and Steven Stalos (D), who is running in Washington's fourth district.

The following engineers are also known to be seeking House seats: Ross Cook (R) in the seventh district of Tennessee, John Getz (R), running in Michigan's 14th district, Don Grimshaw (R) of California's 31st, Robert P. Hudock (R), running in Pennsylvania's 11th district and Anthony Panuccio (R), from the third district of South Carolina. This list of contenders is not necessarily complete; some candidates may have been missed, especially in late-filing states.

The incumbents. Martin is seeking a fourth term in Congress. His first term he served on the Science and Astronautics

and Interior Committees. For his last two terms he has been a member of the Ways and Means Committee and the Ad Hoc Select Committee on Energy. Martin has traditionally been one of the strongest supporters of science on Capitol Hill, a distinction no doubt related to his being the only PhD in a physical science in the House of Representatives. He received his doctorate in 1960 in organic chemistry from Princeton University and taught at Davidson College, where he became an associate professor on the chemistry faculty in 1964. His background in chemistry has earned him recognition as something of an expert on food additives and carcinogens.

Steers has just completed his first term



HUDSPETH



HARRIS



HUTCHINGS



BERG



GOEDEKE



STALOS

in Congress, during which he served on the Committee on Banking, Finance and Urban Affairs, the Committee on the District of Columbia and the Ad Hoc Committee on Energy. He introduced one bill and co-sponsored another promoting the commercial development of solar energy. He also cosponsored a bill with Brown for five years of intensive research and development of advanced automobile propulsion systems. Steers studied economics at Yale College, from which he graduated in 1939. He then attended the school of meteorology at MIT and subsequently pursued an Air Force career in meteorology. He worked for the Atomic Energy Commission in 1951-53 and later started a mutual fund for scientists.

Brown holds a BS in physics and worked as an engineer before he won election to the House in 1962. He serves on several subcommittees of the Committee on Science and Technology and is chairman of the Subcommittee on the Environment and the Atmosphere. He is also a member of the Committee on Agriculture and the Technology Assessment Board.

McCormack seeks a fifth term in the House. He has served as chairman of a task force on energy, chairman of the subcommittee on energy of the Science and Technology Committee, and ranking Democrat on the Subcommittee on Fossil and Nuclear Energy. He has been the author of various acts promoting solar, geothermal and fusion energy research. He is currently chairman of the Subcommittee on Advanced Energy Technologies and Energy Conservation Research, Development and Demonstration. He sponsored the Solar Photovoltaic Energy Research, Development and Demonstration Act of 1978 and introduced in June a bill to establish two away-from-reactor storage facilities for spent nuclear fuel elements from commercial nuclear power plants. McCormack received his BS and MS degrees in chemistry from Washington State University in 1948 and 1949, respectively. He was employed as a research scientist at the Atomic Energy Commission's Hanford Project from 1950 to 1970.

Emery won his first House seat in 1974. He served on the House Science and Technology Committee his first term and on the Armed Services and Merchant Marine and Fisheries Committees this

past term. He graduated from Worcester Polytechnic Institute in 1970 with a bachelor's degree in electrical engineering, and has served two years in Maine's state legislature prior to his election to Congress. Emery has developed a number of bills that promote the use of alcohol-based fuels for use in automobiles and electrical generation and was successful in having test programs in alcohol fuels written into the 1979 fiscal year Department of Energy authorization bill.

The challengers. Berg received his BS in 1954 from the College of St. Thomas and his PhD in physical chemistry from Iowa State University in 1961. He has worked at the 3M Company in St. Paul, Minnesota since 1961 and was co-inventor of four patents in imaging technology. Currently, he is technical manager of the energy control products project at 3M. He opposes Bruce Vento (D-Minn.) for the House seat bid.

Goedeke graduated from Rockhurst College in 1956 with a BS in physics. From 1956 to 1959 he was a research assistant to James Van Allen at the University of Iowa, where he participated in developing the first US space satellite and conducted research in space radiation and solar-terrestrial interactions. From 1959 through 1972 he was chief scientist at McDonnell Douglas. For two years (1976-77) he was an administrator with NASA responsible for remote-sensing technology and technology transfer. Goedeke faces Jerry Patterson (D-Cal.) in November.

Harris, who is bidding to unseat incumbent Gladys Spellman (D-Md.), comes from a background in health physics. He received his BS in physics from Queens College in 1943 and an MS in industrial and management engineering from Columbia University in 1959. In 1947 he joined the then newly established Brookhaven National Laboratory as a research associate and health physicist. Then the New York State Department of Labor hired him as a radiation physicist, where he developed the first state radiation-level program. Other employers have been Western Electric, the Atomic Industrial Forum, Baird-Atomic, US Public Health Service and the New York City Department of Health. Since 1975 he has been a registered lobbyist (supporting the nuclear option) for the Edison Electric Institute.

Hudspeth is perhaps the best-qualified

physicist among all of the candidates. He received an AB (1937), and MA (1938) and a PhD (1940) from Rice Institute. He was a staff member at the Radiation Lab at MIT from 1941 to 1945 and became a professor of physics at the University of Texas at Austin in 1950, where he is currently employed. Some of his research interests have been disintegration of light elements and energy levels of nuclei. He is a former member of the board of directors of Texas Nuclear Corporation, Medical Monitor Systems, the Nuclear-Chicago Corporation and Amsco Medical Electronics. He is opposing J. J. Pickle (D-Tex.) in the upcoming election.

Hutchings, who received his degree in chemical engineering from the University of Tennessee in 1974, is currently employed by Crown Central Petroleum Refineries as a process engineer. He will face incumbent William Archer (R-Tex.) in the elections.

Stalos ran against McCormack (D-Wash.) in the September Washington State primary. At this writing, the outcome of that race was unknown. Stalos has a BA in physics from Hastings College and one year of graduate physics from Montana State University. He is employed by Rockwell Hanford Operations, a subsidiary of Rockwell International.

Power generation. PHYSICS TODAY recently spoke with the candidates or their staffs. We discussed several issues and found a degree of homogeneity among their answers. On the question of nuclear energy, for example, all but one agreed that nuclear reactors offer the best and most immediately available solution to our energy needs. The exception was Stalos, McCormack's opponent in the primary, who put forth three major criticisms of the nuclear power industry. "It is unnecessary," he explained, "because we have other energy sources—although they have drawbacks, too—which can be used in place of nuclear power." Secondly, Stalos feels that the industry is underinsured, and for this he blames the 1957 Price-Anderson Act, which provides for, among other things, a limit of liability of \$560 million. Finally, Stalos said the industry is undercontrolled because, traditionally, those "people who were supposed to be regulating the industry... have been the same people responsible for promoting the acquisition and construction of nuclear power plants."

Goedeke argued that we must develop the breeder reactor in order not to lose our technological supremacy to countries such as West Germany, France and Great Britain. Stalos, on the other hand, described the breeder reactor as "a multi-billion dollar boondoggle."

Another area of general agreement among this group of candidates is the role solar and other alternative energy sources should play in our future. Goedeke commented that "solar power will not be able to replace nuclear power as a base power load source, but could be an efficient source of secondary power." Likewise, Harris called the use of solar energy to supplement nuclear energy, "a very logical blend."

R&D. The problem of funding basic research was another issue raised. All of the candidates queried were concerned about the movement in government toward being increasingly cautious with money for research and development. Hutchings observed that one "can almost mark the beginning of the recession with the cutoff of R&D money by the Nixon administration in 1969." Harris is concerned that what he calls the "Proxmire syndrome" (named for Wisconsin Democratic senator William Proxmire, who popularized criticism of basic research with his "Golden Fleece Awards") may be spreading through the Congress. "... Congress wants to put money into payoffs that will result in a dramatic result within the lifetime of the member of Congress. Congressmen want results which they can point to with pride; they want to have their picture taken in front of some gadget or symbol of construction and say, 'Look what I did!' I think that psychology is very negative." Martin criticized this attitude during last spring's NSF authorization debate (on the House floor), when he urged the members to be careful not to abolish fundamental studies in favor of practical applied research, saying that it was not the place of Congress to oversee research, only to exercise fiscal restraint. Goedeke proposed maintaining a fixed percentage of our national budget for basic research with additional appropriations for major programs which stand on their own merits. But he cautions, "... a fixed percentage of the national budget for basic research would only make sense if Federal agencies responsible for spending that money have the public's interest in mind ... The one thing we cannot afford [to do] is turn our scientific community into a 'welfare state.'" Berg believes that "we would be far better off directing funds through universities and private institutions ... rather than building more governmental labs." Emery feels that "we don't do a very good job of coordinating research efforts. There is not enough cross-talk between universities and industry. We have to encourage cross-pollination." But, he adds, "This is something we can-

not do with legislation."

We also brought up the problem of declining industrial innovation. Here, again, there was general agreement. Hudspeth said, "I think this is largely a matter of government policy toward taxation of capital gains and limitations on writeoff of losses on speculative new ventures." Others felt that it wasn't so much a question of money as one of excessive regulation. Goedeke made this point in saying that "It is government that curtails the incentive for business to be more innovative. Unless we begin to remove government regulations and restrictions from industry, our inflationary problem will continue to worsen and our advances in technology will diminish ... When elected, I will draft legislation which will make it a requirement of every Federal agency to determine the economic impact of every new Federal regulation on business and industry, and to determine the benefit-to-cost ratio." Berg has had personal experience with this problem: "I work for 3M. We have actually had to hire more people to provide paperwork to meet government regulations than we are actually adding on to our research staff. In other words, part of our budget is being burned up on staff functions which are not producing new science, technology or products."

Most of the candidates agreed that the scientific community is underrepresented in the Congress. How well this group of candidates fares in the November elections may well determine whether or not this situation will improve. —MEJ

Field heads NAS study of astronomy, astrophysics

The National Academy of Sciences has asked George Field, director of the Harvard-Smithsonian Center for Astrophysics, to head a two-year survey of astronomy and astrophysics for the 1980's. This appointment was made in anticipation that the National Science Foundation and the National Aeronautics and Space Administration would shortly make a formal request to the Academy to carry out such a study.

The new survey would be the first discipline-wide study of astronomy and astrophysics since the NAS-NRC Astronomy Survey Committee, headed by Jesse L. Greenstein (Caltech), made its report in 1972.

Field has written to 200 astronomers outlining his preliminary plans and asking for suggestions. This fall a group of astronomers will meet to discuss how the survey will be carried out, specify the kinds of questions to be addressed, set up and schedule the necessary panels, and nominate members.

Field told PHYSICS TODAY that the survey committee would, among other tasks,

- ▶ review the effect of the Greenstein report on the development of astronomy and astrophysics in the 1970's;
- ▶ examine the implications of post-1972 scientific, technological and management advances on the development of astronomy and astrophysics in the 1980's;
- ▶ assess to what degree current facilities and resources are able to address the scientific problems of the 1980's and determine what new facilities will be needed, and
- ▶ assign relative priorities for the various programs and facilities recommended by the survey committee.

Field told us that he estimates that the two-year study will cost approximately \$400 000, with equal support from NSF and NASA. He expects that these agencies will make their official funding decisions sometime this fall. —CBW

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fields such as man-made high-energy neutrinos, spin-aligned hydrogen and the physics of ultra sub-micron devices (20 to 1000 Å).

Increased funding would also enable DOD to revitalize more easily its ties with universities and bring in new performers. Galt told PHYSICS TODAY that "We recognize the difficulties involved in funding a new performer at the expense of a tried and tested individual who has done excellent work and is still doing so, and who is older. When your funds are limited enough, that bind becomes terribly difficult to deal with. As you get more funding, that new money must be used to a significant extent to bring in new performers. You must look at your age and experience distributions and be sure that you're not coming to a time when all of your first-class people are going to disappear on you at once."

Clarification of policy. The panel observed that both within and without DOD there are many differing perceptions of the department's current policy toward basic research. The variation has resulted from such things as differing responses to the tight budgets of the past decade in a large, complex department and differing interpretations of the Mansfield amendment. The Secretary of Defense should dispel the confusion, the panel urged, by declaring "his own interest in basic research, his desire for a new surge of technological innovation in DOD, and his policy on the interpretation and application of such topics as relevance." The panel is certain that Brown's scientific credentials—he is a PhD physicist—"would bring to the policy unprecedented weight in both the technical and operational communities of the Department and to the scientific and engineering communities throughout the country."

No such direct statement has as yet