

gram has been oversold." But not underfunded, observed J. Bennett Johnston, the Louisiana Democrat who is chairman of the powerful Senate Committee on Energy and Natural Resources. To be sure, since the early 1950s, DOE and its predecessor agencies have spent about \$5.4 billion on fusion research. "The days of willy-nilly expenditures on fusion... are over with. We've got to demand a higher degree of success than we have in the past," said Johnston.

Hunter's plan was explosive. Among the repercussions was Hunter's abrupt departure from DOE last October (PHYSICS TODAY, January, page 49). Before he left, Hunter handed Watkins a list of fusion scientists he hoped would be named to advise DOE on the nation's entire fusion program. Watkins was uncomfortable with Hunter's choices, and on 5 March, Watkins announced a 19-member Fusion Policy Advisory Committee, only half of them from

Hunter's list.

The panel is headed by H. Guyford Stever, an all-purpose advisory committee chairman, who served as director of the National Science Foundation and, at the same time, science adviser to President Ford. It has avowed partisans of magnetic fusion and obvious proponents of inertial systems, but most of the members are nonaligned, neutral or without commitments. The full committee: Robert Conn, a UCLA nuclear engineer who has made his career designing large fusion reactors; T. Kenneth Fowler, former director of the magnetic fusion lab at Livermore; Melvin Gottlieb, onetime director of the Princeton Plasma Physics Lab; Marshall N. Rosenbluth, a plasma theorist who was at the Institute for Advanced Study and Princeton before being lured away to the University of Texas and from there to the University of California at San Diego; R. Bruce Miller of Titan Corp; Robert Sproull, president emeritus of the University

of Rochester; Barrett Ripin, head of the Naval Research Lab's space plasma branch; John Foster Jr, retired vice president for science and technology at TRW and former director of Livermore; Roger Batzel, another former director of Livermore; Ira Bernstein of Yale; E. Linn Draper Jr, chairman and president of Gulf States Utilities; Harold K. Forsen, senior vice president at the Bechtel Group; William Herrmannsfeldt of SLAC; Charles Kennel of UCLA; Arthur Kerman of MIT; Kenneth Klier, dean of Purdue University's School of Science; John Landis, senior vice president of Stone and Webster Engineering; and Richard Wilson of Harvard University.

The committee's first meeting was held at DOE headquarters on 23 March. Stever plans to deliver a preliminary report in July and a final report by September—in time for DOE's preparation of its fusion budget for fiscal 1992.

—IRWIN GOODWIN

WASHINGTON AND OREGON UNIVERSITIES TO RUN NEW NUCLEAR THEORY INSTITUTE

In recent years, nuclear physics has been described in evocative terms: The National Research Council's weighty survey "Physics Through the 1990s," more familiarly known as the Brinkman report, spoke in 1986 of major experimental advances in nuclear physics, "myriad ways in which nuclear physics has an impact on the other sciences and on society at large" and "exciting prospects for the future." When he was President Reagan's science adviser, George A. Keyworth II repeatedly told Congress, in advocating such costly new starts as the Continuous Electron Beam Accelerator Facility (now under construction at Newport News, Virginia) and the Relativistic Heavy Ion Collider (to be built at Brookhaven National Laboratory), that these machines were vital to "the renaissance now under way in nuclear physics." In May 1988, a panel of the Nuclear Science Advisory Committee observed that new experimental findings "continue to test the limits of our understanding of the nucleus" and "demand new descriptions at both the phenomenological and theoretical levels." As its principal recommendation, the NSAC panel, led by Steven Koonin of Caltech, concluded that nuclear theory needed to be strengthened and, to that end, the panel urged the creation of one or more national



Henley: Helmsman for the time being.

nuclear theory centers.

It so happens that the Department of Energy's Office of Energy Research, which funds most of the nuclear science in the US, never formally responded to NSAC's unanimous endorsement of the Koonin panel's proposal. It did something better. On 27 January, it approved the decision of NSAC to award the new Institute for Theoretical Nuclear Physics to a consortium of the University of Washington, University of Oregon and TRIUMF, the University of British

Columbia's 500-MeV cyclotron laboratory near Vancouver.

The institute is to be established at the University of Washington in Seattle, where it will be housed temporarily in the Applied Physics Lab. It will be managed for the time being by Ernest M. Henley until a permanent director is appointed, possibly before the end of the year.

The new institute has two main objectives: to provide scientific leadership and intellectual stimulation for the increasingly interdisciplinary nuclear theory community through visitor programs, seminars, workshops and summer studies; and to contribute to the training and nurturing of graduate students and postdoctoral fellows in the field.

The idea for an institute of nuclear theory has been marking time for some 20 years. But the countdown didn't really begin until the National Science Foundation launched the Institute for Theoretical Physics in September 1979 at the University of California, Santa Barbara. When that institute was first bruited, there were doubts about the wisdom of a centralized theory center with a large proportion of US and foreign visitors, staying typically from a few months to a year. Some predicted that the center would siphon funds from individual investigators. What's more,

the proposed emphasis on interdisciplinary studies raised fears among theorists who held a different view of how theory should be developed. Santa Barbara's record has largely dispelled such angst. Both NSF and the physics community now recognize that the Santa Barbara institute has attained worldwide renown for its programs and research "at the forefront of theoretical physics" (see *PHYSICS TODAY*, August 1983, page 48) and that grants for individual nuclear theorists have not suffered any worse fate than has funding for other theorists in NSF programs.

Even so, the Santa Barbara institute had few programs for nuclear theorists, and to be fair it had difficulty attracting theorists to programs dealing exclusively with nuclear physics. In fact, the field had relatively few practitioners, due in part to such meager funding by DOE and NSF that there seemed to be few prospects for theorists, let alone for graduate students and postdocs. At the same time, the blurred borderlines between nuclear physics and particle physics appeared to have left nuclear theory adrift. Nuclear theorists flocked to the more glamorous and better funded field of particle theory. D. Allan Bromley, a nuclear physicist turned science adviser to President Bush, has despaired that one reason high- T_c superconductivity moves so fitfully is the lack of a theory to understand it.

In this gloomy setting, NSAC appointed a ten-member subcommittee on nuclear theory under Koonin's chairmanship. Its report, issued in May 1988, documented the crisis. It noted, for instance, that many NSF grants for nuclear theorists "are too small to pay telephone and network connection charges" for the long periods required to access supercomputers or to reimburse universities for the cost of setting up network links to the offices of theorists. The Koonin study also found that 35% of the grad students in nuclear theory came from West Germany and Japan, most of them funded from abroad.

Despite the foreign influx, the report lamented, not enough theorists of any nationality were working in US nuclear science. "Interesting ideas are not pursued, important calculations are not being done and all of us have heard more than occasionally the complaints of our experimental colleagues about the lack of theoretical support for their activities. The primary reason for all of this is lack of people in the field," the report stated. "This shortfall is likely to be exacerbated when the major new experi-



Koonin: Champion of a modest center.

mental initiatives of CEBAF and RHIC are realized."

Widening the intellectual base

After examining the situation in university departments and national laboratories, the Koonin subcommittee declared that the availability of money for theoretical physics today is just about the same as it has been for decades, taking inflation rates into account and ignoring any new funding for computing. Yet even in years of tight Federal budgets, money is found for expensive new projects, such as NSF's science and technology centers or the Superconducting Super Collider. So, it seemed natural for the Koonin group to recommend a modest center for nuclear physics theory that would serve the community; broaden the intellectual base of the field; stimulate interactions with other fields, such as high-energy, condensed matter, atomic and molecular physics and astrophysics; and, perhaps most important, attract young scientists.

When the Koonin report appeared, a consortium of the State University of New York at Stony Brook, Brookhaven National Lab and MIT was ready. Within weeks it delivered its proposal for just such a center to DOE. The group's swift reaction surprised DOE officials, who were still considering what to do. The entry sent them scrambling to find other universities and groupings to compete for the new institute. In five months there were five rivals, all having responded without so much as DOE's customary request for proposals.

Besides the Stony Brook proposal there were four others: These came from the University of Illinois and Argonne; the University of Arizona and Los Alamos; the universities of Washington and Oregon, along with

TRIUMF; and the Lawrence Berkeley National Laboratory, proposing to set up a nuclear theory task center, which was characterized as something less than a year-round institute and something more than a summer session. The proposers represent most of the research universities and national laboratories where the nation's nuclear theorists work.

Once NSAC had endorsed the Koonin report, it appointed a six-man committee under Harvey B. Willard, who recently retired as director of NSF's nuclear science program, to evaluate the proposals. DOE received the last entries in September 1988, and the Willard panel spent the next nine months reviewing the proposals and visiting the various sites. On 16 June 1989, the panel delivered its unanimous "preferred choice" to NSAC. A decisive factor in picking the Washington consortium, the panel stated in its report, was "the perception that the Seattle proposal and the principal investigators were clearly the most sensitive and responsive to the needs and wishes of the national nuclear science community." The University of Washington is experienced in running summer studies and workshops on nuclear theory, the panel noted, and Henley, the university's leading nuclear theorist, is recognized for his contributions to the summer institutes. Indeed, because Henley is so widely respected, the panel observed, his early direction of the new institute "will be crucial to its ultimate success. Its style and reputation will be established very rapidly."

The panel also commented on the university's plan to construct a new physics building. The blueprint calls for 21 offices to be set aside for the theory institute, as well as conference rooms and a library that would be shared with the physics department. The idea of an institute embedded in the department appealed to the Willard panel. In addition, the university proposed hiring three tenured nuclear theorists, including the new director. The university was committed. Its proposal stated that the Murdoch Charitable Trust had been approached for start-up funds. Another advantage was the proposed siting of KAON, an accelerator that would generate intense beams of protons to produce K mesons in profusion, at TRIUMF (*PHYSICS TODAY*, June, page 44). The Canadian government is leaning toward a decision to start building KAON this year. University backing and the KAON collaboration made the Washington entry "superior or equal to any of the other proposals"

in cost-effectiveness, the Willard panel claimed.

Guaranteeing the funding base

It turns out that the Murdoch Trust has now approved giving \$276 000 to the institute. DOE has guaranteed to support two of the three new professors. The department also has allotted \$600 000 in its current budget to the institute. Moreover, it plans to

assign \$900 000 for the institute in fiscal 1991, \$1.2 million in 1992 and \$1.5 million in 1993.

According to Henley, the institute will conduct two or three workshops and a summer school this year. Meanwhile, the search for the institute's director goes on under the leadership of Alvin Kwirim, senior vice provost at the University of Washington.

—IRWIN GOODWIN

WASHINGTON INS & OUTS: BROMLEY FILLS TOP JOBS AT OSTP; LYONS BECOMES NIST DIRECTOR

After months of frustration, waiting for the FBI to complete the national security and financial conflict clearances of his designated top aides, D. Allan Bromley finally filled all four posts of associate directors at the White House Office of Science and Technology Policy. He now has 34 full-time staffers—one more than his predecessor, William R. Graham, but 11 fewer than OSTP's peak staff under George A. Keyworth II, at the start of President Reagan's second term. But even as he filled his most important slots, Bromley was informed of an impending vacancy among his key people.

The departing aide is **James B. Wyngaarden**, a physician who was plucked from the Duke Medical School by Reagan's talent scouts in 1982 to be director of the National Institutes of Health and then was bumped by the Bush Administration over the issue of abortion rights. Then, to the amazement (and amusement) of Administration watchers, Wyngaarden was named by President Bush last June to be the OSTP associate director for life sciences. It seemed likely that at OSTP Wyngaarden's views would bear more political weight than at NIH. The Senate, however, defused any ideological bombshells by withholding its confirmation of Wyngaarden until last November. By then he had decided to run for the position of foreign secretary at the National Academy of Sciences. Not many were surprised when Wyngaarden won the election in a landslide against Rudi Schmid, another physician at the University of California at San Francisco. Wyngaarden will assume his academy post on 1 July.

The other three associate directors have far less controversial backgrounds. **J. Thomas Ratchford**, who served as associate executive director of the American Association for the Advancement of Science under

the last three directors, was confirmed by the Senate in November as OSTP's associate director for policy and international affairs at the same time as was Wyngaarden. Ratchford earned a PhD in solid-state physics from the University of Virginia in 1961, taught at Washington & Lee University and worked at Sandia Labs, the Naval Ordnance Lab and the Air Force Office of Scientific Research. In 1970 he joined the staff of the House Committee on Science and Technology, working on science policy and funding issues dealing mainly with energy R&D. In 1976 he was a research scholar on global energy problems at the International Institute for Applied Systems Analysis in Laxenburg, Austria. The following year he went to the AAAS.

The Senate confirmed the other two OSTP associate directors at the end of March. **Eugene Wong**, chairman of electrical engineering and computer sciences at the University of California at Berkeley, is associate director for physical and engineering sciences. Born in Nanking, China, Wong received both his BS and PhD degrees in electrical engineering, the latter in 1959, from Princeton University. He took time away from his graduate studies in the mid-1950s to work at the IBM Research Laboratory in Poughkeepsie, New York, and re-joined IBM in the early 1960s to work at the corporation's research center in Yorktown, New York. He has been a fellow at Harvard University, Imperial College and Cambridge University. Wong joined the Berkeley faculty in 1962. He was a founder of INGRES Corporation, a major computer software company.

The other most recently confirmed aide is **William D. Phillips**, a veteran industrial researcher who was science adviser to Republican Governor John D. Ashcroft of Missouri since 1987. At OSTP Phillips is associate director for industrial technology. Until he

joined OSTP, he had been president of the Missouri Advanced Technology Institute and professor of chemistry at Washington University in St. Louis. Phillips got a PhD in physical chemistry from MIT in 1951 and worked at DuPont from 1951 to 1978, where he wound up as assistant director for R&D. In the early 1980s, he was senior vice president for science and technology at Mallinckrodt Inc., an international chemical and biomedical products company.

Bromley's staff also has three physicists in prominent positions. His special assistant is **Judith L. Bostock**, who had been on leave from MIT to the White House Office of Management and Budget as a science policy analyst. As an associate professor on the MIT faculty since 1972, she taught condensed matter physics and engaged in research in low-transition-temperature superconductors. Before that she was special assistant to the head of the Institute for Theoretical Condensed Matter Physics at the University of Saarlandes in West Germany. She has been a consultant to the Naval Research Laboratory, BDM Corporation and the science textbook division of Addison-Wesley Publishing Co. At OMB, Bostock was chiefly responsible for the Department of Energy's research budget. She received her PhD in solid-state physics in 1971 from Georgetown University.

Karl A. Erb, a nuclear physicist who once worked with Bromley at Yale's A. W. Wright Nuclear Structure Laboratory, is assistant director for physical sciences and engineering. As such he has special responsibility for university-based research and for such physics-related megaprojects as the Superconducting Super Collider, the Relativistic Heavy Ion Collider, to be built at Brookhaven, and the synchrotron light sources at Lawrence Berkeley and Argonne. Erb, who earned a PhD in physics from the University of Michigan in 1970, taught at the University of Pittsburgh for two years before joining Yale's faculty in 1972. In 1980 he moved to the Oak Ridge National Laboratory as a staff scientist. He joined the National Science Foundation in 1986 as program director for nuclear physics and served as the principal staffer of the Nuclear Science Advisory Committee, which reports to both NSF and the Department of Energy.

Robert L. Post Jr went on special detail to OSTP from OMB in May 1988, while William Graham was director and science adviser to President Reagan. He stayed on at OSTP