Einstein statue commemorates centennial

The National Academy of Sciences will place a monumental statue of Albert Einstein, three times life size, in the southwest quadrant of its grounds in Washington, D.C. NAS plans to unveil the statue on 22 April 1979 at its 116th annual meeting. The ceremony will honor the centennial this year of Einstein's birth.

After sculptor Robert Berks completes the statue in clay, it will receive a bronze casting. A portrait head of Einstein that Berks sculpted from life in 1953 is the basis for the new statue. The Einstein memorial will rest on a circular white granite base 30 feet in diameter on which is a slightly smaller circular map of the heavens done in black granite. To delineate the stars of the constellations, Berks will use 3000 stainless-steel studs of varying thicknesses; US Naval Observatory astronomers will plot their exact locations.

The seated figure of Einstein will rest on the middle of a three-step semicircular white granite bench as he contemplates the universe at his feet. The statue is to be twelve feet high; it would be 21 feet were Einstein standing.

A pad of paper in the left hand will bear three of Einstein's most important scientific contributions: a tensor for the theory of relativity, the equation for the equivalence of energy and matter, and the equation for the photoelectric effect. On the back wall Berks will inscribe Einstein's credo: "The right to search for truth implies also a duty; one must not conceal any part of what one has recognized to be true."

The cost of the statue, base and ground preparation is expected to be more than $1.5 million. In addition to seeking large donations from a small number of potential donors, the Academy has organized a fund-raising campaign among the US technical community; letters from Academy president Philip Handler have already been sent to over 130 000 scientists and engineers. Contributions should be sent to the Einstein Memorial Fund, National Academy of Sciences, 2101 Constitution Avenue, N.W., Washington, D.C. 20418.

NAS: RICHARD MEEK

---

participation of the membership of the OSTP group.

The DOD basic research budget. The $470-million DOD-supported research program can be tabulated, Gamota noted, according to five broad technology areas; the two with the strongest physics impact—electronics and materials—receive more than 50% of the funding.

Gamota considers the basic research supported by DOD to fall into three overlapping categories. He defines the first as "technology-pull" research. This applies to work on applied problems that still require basic research or understanding; examples would include smokes and aerosols ("making ourselves unseen"), tribology (the design, friction, wear and lubrication of interacting surfaces in relative motion), ballistics, explosives and microwave tubes.

The second category, "technology-push" research, would be identified with longer-term needs. Gamota gave as examples blue-green (this wavelength range is transparent in water) and high-energy lasers, near-millimeter waves, microelectronics, composite materials, computer-software research and new calculational methods in aerodynamics and hydrodynamics.

The third category, "which we are weakest in and need to strengthen", Gamota calls "potential-breakthrough" research—work at the "frontiers" of science and technology that may either revolutionize or make obsolete some current technology. He named neutrino communication, spin-aligned hydrogen, x-ray lasers, ultra-sub-micron (20 to 500 Å) structures, and neutral or charged-particle beams as examples.

The DOD basic-research budget cycle consists of several steps. After the Secretary of Defense provides guidance on the growth or decline in the overall budget (a 7% real growth for basic research is slated for FY 1979, and an aim for 10% growth in FY 1980), the individual military services submit for review to Gamota's office proposed budgets for their own research programs. After all points of dispute are resolved, the basic-research budget is inserted in the overall DOD budget. The latter is in turn successively submitted to the Office of Management and Budget, to the President and to Congress. After Congress authorizes and appropriates funding for DOD, Gamota's office reviews the overall DOD basic-research program again at what is known as the "apportionment review."

Gamota views the apportionment review "as an opportunity to be able to scope the overall program; to look at the direction it's heading; and to see who the key players are, what their intentions are for funding and what are the new thrusts. It is extremely important that the DOD program manager have a definite investment strategy." The program manager must establish priorities and levels of funding for his or her areas of research. With a finite research budget one must be careful not to be either spread too thin or "to over-subscribe by jumping on a bandwagon." The final job of the program manager is to support the best researcher.

How to obtain support. Gamota noted that each military service has an office of scientific research and issues periodically a pamphlet that summarizes the current research program in broad categorical terms and lists the names and phone numbers of the various division directors. From this pamphlet the individual investigator can determine the "thrust areas" as well as the overall program. Gamota was quick to point out that "all proposals are unsolicited and that 70% of the research is not actually in thrust areas. If we could predict all important areas, there would be no need for a basic-research program."

With respect to relevance, Gamota complained that "too often we find good researchers doing good work make the decision in their minds that DOD is not interested in supporting their work and don't even bother coming in and asking us." The question of potential usefulness, he pointed out, should be determined not by the researcher but by the program manager at the office of scientific research.

Each military service handles proposals in a different way. The Army has a peer-review system, the Navy does mostly internal reviewing, and the Air Force uses a combination of peer, committee and internal review. Gamota believes this is "good and healthy," as it gives the researcher three chances of getting support instead of one.

Gamota encourages researchers to contact also the Defense Advanced Research Project Agency. Although this agency largely supports the development of high-risk technology (roughly $290