MESSAGE FROM THE DEPARTMENT HEAD

Dear Members of the MIT Physics Community,

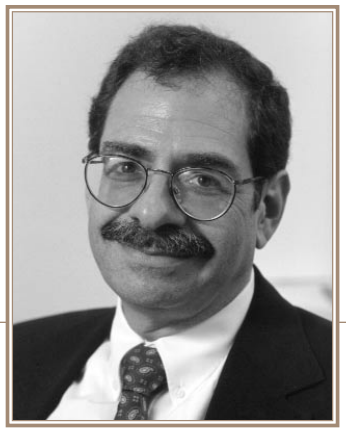
This has been another dynamic year for the Department. We have welcomed a number of outstanding new faculty members, including eminent theoretical physicist Frank Wilczek, appointed Herman Feshbach Professor of Physics in September 2000. On a sadder note, we mark the passing of two of our greatest heroes, renowned nuclear physicist and Institute Professor Emeritus, Herman Feshbach, and Nobel laureate and Professor Emeritus Clifford G. Shull. These two giants of physics will be greatly missed.

Marvelous research accomplishments continue to be achieved by MIT's physicists. A selection of recent highlights, tailored especially for *physics@mit*, includes articles by John D. Joannopoulos on molding and guiding light with photonic crystals and its impact on the fields of optoelectronics and telecommunications; Wolfgang Ketterle discussing the "magic" of matter waves, describing how the phenomenon of Bose-Einstein condensation reveals the dramatic wavelike properties of atoms; and Krishna Rajagopal's illustration of the laws of quantum chromodynamics, otherwise known as QCD, bringing fresh clarity to the theory of quarks and gluons and how they interact.

We continue the tradition of showcasing our "eminent emeriti" with an in-depth study, by science historian David Kaiser, of the life and times of Institute Professor Emeritus Francis E. Low, former Provost, theoretical high energy physicist, and avid musician .

The Department's educational initiatives have made great progress. Our flexible alternative bachelor's degree program, course VIII-B, has significantly increased the number of physics majors at MIT, and the Technology Enabled Active Learning (TEAL) project is being launched this fall, providing a new approach to teaching freshman mechanics and electricity and magnetism courses within a studio format. John W. Belcher previews the TEAL/Studio Physics Project in this issue, describing what is being done, and why.

Despite the great strides we have made in research and education, there are clouds on the horizon. Below is a graph that MIT President Chuck Vest has been showing to audiences across the United States. It summarizes a disturbing downward trend over the past 30 years in the allocation of federal research funds across three traditional disciplines: physical and life sciences and engineering. While no one thinks the U.S. Government should provide less money to the biological sciences, the entire scientific community, including those in biology

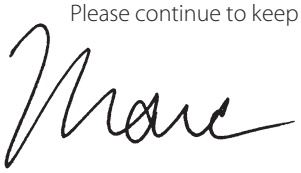


and medicine, agree that the Nation's scientific enterprise, as a whole, cannot succeed if the physical sciences are not strongly supported in kind. As members of the MIT physics community, I urge you to communicate to your Congressmen and Senators the critical necessity of providing funding increases for research in physics, through the National Science Foundation and the U.S. Departments of Energy and Defense.

One example of how the reduction in government funding of the physical sciences has affected institutions such as MIT is the fact that graduate education increasingly depends upon private contributions. Our greatest need within the Department of Physics is for graduate fellowships, so that we can continue to attract the very best students. Support of this effort is one of many reasons why we are deeply grateful to those of you who have, in the past, made contributions specifically to benefit the Department. While we also appreciate those of our alumni who have given to the Institute as a whole, we encourage all of our alumni to consider making a future gift to the Department directly, in support of such worthy goals as our Freidman Fellowship fund, which is used to provide graduate fellowships.

I hope you will enjoy the new format of our annual departmental publication, physics@mit. With the desire to strengthen our sense of community, the Department earlier emailed a "call for updates" to both our undergraduate and graduate alumni, and the large number of lively responses can be seen in the Alumni Notes section of this issue.

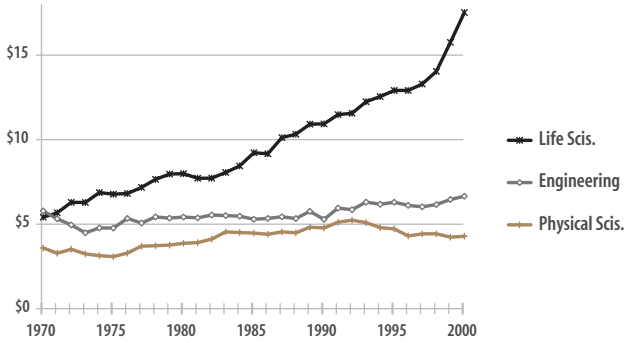
Please continue to keep in touch.



Marc A. Kastner

Trends in Federal Research by Discipline, FY 1970-2000

obligations in billions of constant FY 2000 dollars



American Association for the Advancement of Science

Source: **National Science Foundation,** ***Federal Funds for Research and Development FY 1999, 2000, and 2001***, 2001. FY 2000 data are preliminary. Constant-dollar conversions based on OMB's GDP deflators. JAN. 01 © 2001 AAAS