

INTRODUCING
A UNIQUE NEW ENGINEERING COMPANY
IN APPLIED PHYSICS



**QUANTUM
DESIGN**
and

Superconductivity

Specialists in cryogenic design, engineering support and hardware development available to provide solutions to problems in the areas of:

- Superconducting instrumentation
- Cryogenic engineering and electronic design
- Ultra-low noise magnetic and electrical measurements
- Josephson junction physics and SQUID devices
- Experimental solid-state physics.

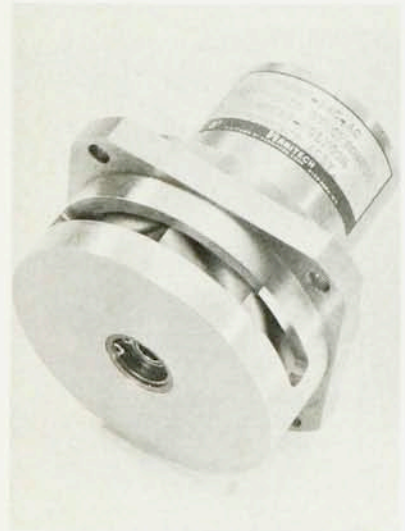
Helping to bridge the gap
between theory and ap-
plication



QUANTUM DESIGN

11404 Sorrento Valley Road, Suite 114
San Diego, CA 92121 (619)457-0248

Circle number 72 on Reader Service Card



LASER SCANNING MOTOR

Our hysteresis synchronous motors can be made to your specs for either broad or narrow band applications, with 300 to 48,000 rpm, for 15 through 1600 Hz, and with 2, 4, 6, 8, or 12 poles. We can even mount the polygon for you.



Call or write

VERNITECH
a division of Vernitron Corporation

300 Marcus Boulevard, Deer Park, N.Y. 11729
(516) 586-5100 / TWX 510-227-6079

Circle number 73 on Reader Service Card

letters

were a lecturer in chemistry, Mohammad Saleem, and Tariq Ahsan, lecturer in political science. Information from AI indicates that these scientists were only expressing themselves freely. AI further reports that since their arrests in November 1981, they have been tortured by the authorities. AI requests that letters on behalf of these individuals be written by fellow professionals and academicians to indicate their deep concern for the treatment of persons incarcerated for the simple act of self-expression. Therefore, I urge the readers of PHYSICS TODAY to write to one or both of the following individuals expressing their concern for the prisoners, and urging their release from custody: Mohamed Ali Khan, Minister of Education, Islamabad, Pakistan; Zafar-ul-Haq, Minister of Information and Broadcasting, Islamabad, Pakistan.

I may note that AI has adopted these persons as prisoners of conscience and is urging a letter-writing campaign on their behalf.

EMILE RUTNER
Dayton, Ohio

11/82

Should God save the Queen?

In regard to our letter concerning the frustration of physicists (April, page 89), the response by Robert Bell (August, page 78) is rather amazing. He readily admits his ignorance of the subject, but this very fact does not seem to prevent him from judging us. Perhaps it was the page number "89" which incensed him by induced association with the 1789 French revolution! In any case, the strong point of his letter is an aggressive verse of the British national anthem. In other words, to speak subjectively about physicists is for Bell a direct aggression against the foundations of the "Royal Order." What a nice illustration of the spectacular power produced by physics, like a "church of natural order." Who would then think to accuse its "priests" of frustration? From the opposing viewpoint we say that research is not devine. It is the result of human activity which, by definition, is subjective. The gap between objectivity and subjectivity in science is not as large as people would like to believe. If it is true that the word frustration has had historically various meanings as quoted by Bell, the Freudian one is actually the most commonly used. Moreover, from the physical situation where the word frustration is used, it is evident that the underlying meaning is the Freudian one.

To pursue our "knaveish tricks" let us talk about "chaos" in physics. The

wide interest concerning frustrated objects has now moved toward "chaos." This is indicated by the increasing number of "chaotic" publications on the subject. First introduced in mathematics, the concept and study of chaos is spreading to various fields of physics, in particular to condensed matter (localization, spin glass, phase transitions) and hydrodynamics (instability, turbulence). It is only a beginning. The actual "chaos" in the western world compels one to look for a link between the sudden interest of physicists for chaos and the confrontation of society to the uncertain future of the world. The two basic approaches to chaos in life also exist among physicists: the optimistic one of those who look for "order" in "chaos" and the pessimistic one of others who see "chaos" in "order." This whole *état de fait* leads us to perceive physicists as a reflection of society. Through the problems they study, they would in fact express collective social anxieties. This is only our hypothesis, and we would like to hear other opinions.

SERGE GALAM
City of College of New York
New York, New York

PIERRE PFEUTY
Centre d'Orsay
Orsay, France

11/82

PhD a must for teaching?

Is the PhD degree necessary for college physics teaching? If so, why? If not, what degree is necessary?

First, let's consider the nature of the PhD itself. This degree indicates two things (at a respectable institution): the recipient has successfully demonstrated an advanced knowledge of physics, and he has completed research of a quality which is publishable in refereed journals. However, it indicates nothing about his teaching ability.

Second, let's consider the nature of four college physics teaching positions: (1) directing graduate research and teaching graduate and undergraduate courses, (2) teaching a full range of undergraduate courses in a four-year institution with release-time given for research, (3) teaching a full range of undergraduate courses in a four-year institution (without release time for research) and (4) teaching general courses in a two-year institution.

Now, let's address the questions raised in the first paragraph. It is clear that a PhD is required for positions 1 and 2, since research is part of the nature of the positions. However, research is not part of the nature of positions 3 and 4, so a PhD is not required—indeed, a research-oriented PhD physicist would find himself frustrated in either of these positions.