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predictable, either. Adding small amounts of wind power (perhaps up to 10%) to a larger system adds little to the system's overall unpredictability and, as a practical matter, may hardly be noticed by operators.

Some strong preliminary evidence indicates that a customized mesoscale weather model does a good job of predicting the output of the wind farm on relevant time scales. On the whole, the future for wind power appears very bright.

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The articles in the April 2002 special Energy Challenge issue of PHYSICS TODAY seemed generally thoughtful and well-written. However, I was puzzled that nowhere in that issue, not even in Samuel Baldwin's renewable energy article (page 62) covering solar power, was there a mention of solar power satellites, lunar solar power, or the other space-based alternatives that, in the long run, can provide us with an astronomically large, completely renewable energy resource—for example tens of terawatts from (admittedly large) satellites in geosynchronous orbit. Considering that these options have, in the past, been advocated primarily by physicists, including Gerard O'Neill, Freeman Dyson, and others associated with the Space Studies Institute,[1] it seems derelict of PHYSICS TODAY to ignore the current status and future prospects of this energy option.

Fortunately, David Criswell provides an introduction to the lunar solar power option in a recent issue of *The Industrial Physicist*.[2] Space-based power has apparently suffered from NASA neglect at least since the 1970s, although an installed base of at least several hundred kilowatts is already in operation, powering satellites and the space station. Of course, there is always a battle for research funding, but the long-term potential usefulness of space-based solar power seems so immense that a more focused effort to develop this technology is long overdue.

References

1. For more information on the Space Studies Institute, see http://www.ssi.org.
2. D. Criswell, *The Industrial Physicist* **8**(2), 12 (2002).

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NSF Graduate Research Fellowships: A Missed Opportunity

Each year, the National Science Foundation awards its Graduate Research Fellowships (GRFs) to the nation's "best and brightest" students in mathematics, science, and engineering, to help support the early stages of their graduate study. As the chair (Boye) and members of the panel judging recent physics and astronomy (P/A) applications, we are concerned that the current selection criteria are not well understood. Some excellent candidates may not apply, thinking that grades and Graduate Record Examination (GRE) scores are of overriding importance. These students miss a career-defining opportunity. Fewer qualified P/A applicants also means that the proportion of awards in our field declines. Between 1996 and 2002, as the number of program awards rose from 765 to 900, the number in P/A actually fell—from 53 to 46.

The GRF provides three years of financial support to be used within a five-year period. The current stipend is \$21 500. US citizens, US nationals, and permanent resident aliens who have completed no more than one year of graduate study are eligible to apply. For the 2002 competition, there were more than 6600 applicants overall, but just 376 of these were in P/A. We estimate that in P/A, only about 15% of those entering graduate school who meet the eligibility requirements actually apply, while the numbers of applications in other fields have grown tremendously due to proactive strategies that encourage qualified students.

We are also concerned by the underrepresentation of women and minorities among P/A applicants. The proportion of women in physics still decreases with each step up the academic ladder. Just 22% of P/A applicants in 2001–02 were women, and only 1% of P/A applicants came from historically black colleges and universities or institutions primarily serving Hispanic students.

We feel that faculty in P/A should seek out, encourage, and mentor strong candidates. The application