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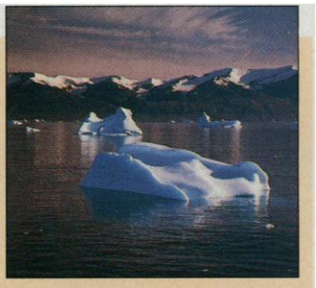
LETTERS

Fire and Ice

Letters this week discuss how global warming might be affecting Arctic ice (at right), the maturation of theory and experiment in plasma physics, how collaborating researchers could share hot data, the missions of laser fusion and particle accelerators, and creatures that hotfoot (and plants that passage) along wildlife corridors.



Global Warming and the Arctic

In the News article "Polar regions give cold shoulder to theories" by Dennis Normile (8 Dec., p. 1566), John Walsh of the University of Illinois is said to note the absence of retreating sea ice, and H. Jay Zwally of Goddard Space Flight Center says his search for long-term trends in ice cover, based on a review of satellite-based remote sensing of polar ice, "has given ambiguous results." These comments are contrary to the enhanced warming in the Arctic region predicted by the global climate model developed by the Hadley Centre for Climate Prediction and Research in Bracknell, United Kingdom (*1*). These statements are also contrary to what we find.

We have shown that there is a significant decrease of sea ice extent (area within the ice-ocean margin limited by the 15% ice concentration contour) and area (area of ice-covered ocean) over the last 16 years by analyzing separately treated, passive microwave satellite data from the SMMR and SSM/I sensors (*2*). Recently we have been able to use the July and August 1987 overlap period between the two sensors to merge the time series (*3*).

We obtained a 16-year record (1978–1994) of Arctic and Antarctic ice extent and ice area: The greatest decreasing trends (within the 99% confidence level) were found in Arctic ice extent, −4.6%, and ice area, −5.8%. These trends are at least one order of magnitude higher than the overlap period differences between the two sensors and also between the trends found earlier (*2*) with the use of separately treated SMMR and SSM/I data. This conformance supports our contention that the merging of SMMR-SSM/I data was successful.

Our study (*3*) establishes a decrease of Arctic ice extent and ice area from 1978 to 1994, which may well be a signal of global greenhouse gas warming. This study has taken place in a critical period with respect to fingerprint detection of global warming (*4*).

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1. J. Mitchell, T. Johns, J. Gregory, S. Tett, *Nature* **376**, 501 (1995).
2. O. M. Johannessen, M. W. Miles, E. Bjørgo, *ibid.*, p. 126; SMMR, scanning multichannel microwave radiometer; SMM/I, special sensor microwave/imager.
3. O. M. Johannessen, M. W. Miles, E. Bjørgo, in *Proceedings from the International Geoscience and Remote Sensing Symposium 1995*, Florence, Italy (Institute of Electrical and Electronics Engineers, New York,1995).
4. K. Hasselmann *et al.*, *Technical Report 168* (Max-Planck-Institut für Meteorologie, Hamburg, Germany, 1995).

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Collaboration and Data Sharing: Continued

While I agree in general with Barbara Mishkin ("Urgently needed: Policies on access to data by erstwhile collaborators," Policy Forum, 10 Nov., p. 927) that clear guidelines would be useful to determine data ownership in scientific collaborations, there are two points on which I depart.

First, one of the cases Mishkin describes, the Maryland Whistleblower case, was not a data ownership or access dispute. I served as trial counsel for the plantiffs in the case. Mishkin is now appellate counsel for the University of Alabama, seeking to reverse the trial court's judgment. The evidence demonstrated that the dispute arose out of the alleged misuse of the whistleblower's intellectual property, not the University of Alabama's data, in seeking National Insti-