temperature cuprate superconductors, the "$d_{x^2-y^2}$-wave" momentum dependence of the gap, $\Delta_0(\cos k_x - \cos k_y)$, is consistent with an effective pairing interaction that has a positive peak for momentum transfers near (π, π). This is what one would expect if the pairing mechanism is associated with the exchange of antiferromagnetic spin fluctuations (*1*). Indeed, this type of structure in the effective interaction has been found in Monte Carlo studies of the Hubbard model (*2*).

Clearly, further measurements of both the momentum and frequency dependence of the gap, along with additional theoretical work relating this structure to the pairing interaction, are needed. Nevertheless, the symmetry of the gap, reflected in its momentum dependence, provides an important clue to the mechanism responsible for pairing in the cuprates.

Douglas J. Scalapino
Department of Physics,
University of California,
Santa Barbara, CA 93106–9530, USA

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Chernobyl Thesis

The ScienceScope item "MIT student's Chernobyl analysis flawed" (12 Aug., p. 859) states that my thesis (*1*) concluded that more than 185 million curies of radioactivity were released in the 1986 Chernobyl accident in Ukraine. The "185 million" refers only to seven isotopes of three biologically hazardous and volatile elements—tellurium, iodine, and cesium. The total release (which includes the many more radioactive isotopes produced in the core of a nuclear power reactor but does not include the noble-gas isotopes) was estimated to be on the order of 200 to 250 million curies, or four to five times more than the initial Soviet total release figure of 50 million curies (excepting noble gases). The Nuclear Regulatory Commission (NRC) correctly pointed out that I overestimated the amount of Cs-136 calculated to be in the core at the time of the accident. However, they do not mention that this miscalculation was traced to an error in a British computer code used for the initial core inventory calculations. Moreover, NRC nuclear engineer George Sege concluded that "Sich's results are [thus] reduced by about a factor of two" (*2*). Even if this is correct (although it is still disputed because subtle arguments in the thesis support the fact that this estimate was deliberately skewed toward a lower value), the 185 million curies (for only those *three* volatile elements) is reduced to 93 million curies (already almost twice the Soviet *total* estimate), and thus the *total* can be roughly estimated to be in the range of 120 to 150 million curies, or 2.5 to 3 times the Soviet *total* release figure.

My estimate of the radioactivity released is not central to the main arguments posed in my thesis. It merely confirms earlier Western concerns (and published reports) that more was released (*2*). The main conclusions of my thesis are (i) the accident management actions taken in the early days after the explosions destroyed the core were not as effective as the Soviets said they were in Vienna in August 1986—the Soviets did not succeed in smothering the "burning" core with more than 5000 metric tons of materials dropped from helicopters; and (ii) given this fact, along with new release data and results of radiochemical analyses of the core presented in my thesis, a scenario is hypothesized as to what may have happened to the core during the first 10 days after the accident. These aspects of my thesis have not been challenged.

It seems that few are paying attention to the positive aspects of the thesis. The Chernobyl accident may have, once and for all, shattered the myth of a "China syndrome" ever occurring: an amount of nuclear fuel equivalent to that found in the largest Western reactors (approximately 135 metric tons) melted down at Chernobyl, yet did little if any damage to the lower regions of the reactor building. Additionally, it is not clear why more cesium was retained in the matrix of the Chernobyl core (exposed to a highly oxidizing environment for 10 days) than was retained, on average, in the melted portion of the Three Mile Island fuel. Answers to these questions may yield significant safety-related design improvements for future reactors. The thesis clearly recommends the *consequences* of the accident should be revisited, just as the *causes* were revisited by INSAG-7 (3).

Alexander R. Sich
43 Solent Road,
London NW6 1TY,
United Kingdom

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EPA Dioxin Reassessment

On 13 September 1994, after more than 3 years of effort, the U.S. Environmental Protection Agency (EPA) officially released draft documents describing its reassessment of the potential human health risks arising from exposure to dioxin and related compounds that bind to the aryl hydrocarbon receptor. During the early stages, EPA made extensive use of outside experts in the preparation and peer review of eight "State of the Science" chapters of its new Health Assessment Document (HAD) which, together with a three-volume exposure assessment, lays out the factual basis for EPA concerns. Most of us participated actively in this information-gathering process.

The new HAD's ninth chapter is a risk characterization that presents the conclusions EPA has drawn from the scientific