

physics again. All these spin-ins are direct, palpable and *sine qua non* for the SSC. All claimed future spinoffs from it are ephemeral, vague and oh-so-indirect. Why?

My challenge to Kaplan is the same as that of years ago. Can he provide any plausible scenario by which specific new information on Higgs bosons or quarks, which presumably the SSC is really intended for, can be translated into a new product or service? Or indeed can he suggest, on the basis of past-citation studies, how particle physics data could be cited in any paper on condensed matter physics, solid-state chemistry or any other science? To call such esoterica as the W, Z and Higgs "basic" to science is surely the ultimate travesty. Basic human science is that which is closest to human experience and aspirations.

I remind Kaplan that from the public's point of view the payoff he brags about is hardly a great achievement of "large-scale applications" if in 70 years with very large public investments all we now have is a very modest mri industry partly dependent on superconductors.

In case Kaplan hasn't heard, the nation is in deep financial trouble. After its incredible generosity to his tribe, all the nation is asking is, Please think like an American, first, not a particle physicist, for a decade or two if you would like more American money.

RUSTUM ROY

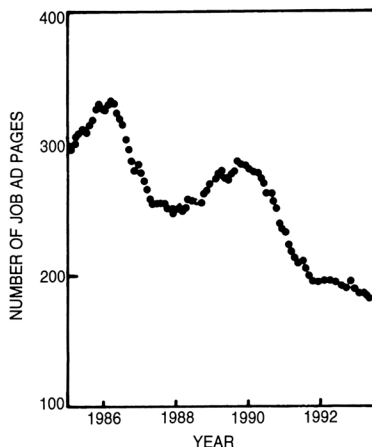
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## Rethink Physicists' Role in Light of Job Decline

Every month a number of pages with employment opportunities for physicists appear in PHYSICS TODAY. Although this number is not directly related to the actual number of open positions for physicists (some of which may not be advertised or filled), the preeminence of PHYSICS TODAY as the source for employment information for physicists validates this simple and timely measure as a gauge of the interest of prospective employers in hiring professionals from or in the field.

In the accompanying figure, I have plotted this number on a monthly basis for the last few years, adding to each point the numbers for the 11 preceding months so as to eliminate the seasonal variation. The recent steep decline in hiring interest evident from the figure is best summa-



rized by averaging: The average number for the last 18 months stands at less than 68% of the average during the five-year period from 1985 to 1990. Standard deviations for both averages are less than 10%.

In view of what appears to be a worsening employment slump, I believe our community should seriously address the issue of recruiting and training its coming generation, especially at the graduate level, in such a way as to enable them to cope with a changing world. The role of physicists may have to be consciously redefined by the community, so that a physics education is not necessarily viewed as preparation for a traditional academic or industrial research career; rather, it may have to be perceived as acquisition and development of a unique approach to problem solving that gives physicists an edge in creatively thinking about and dealing with the complex challenges of the world at large, be they technical or economic, organizational or societal. Such a conscious diversification of the available career options and of the image of physicists might serve well in attracting the best and brightest minds to spend the peak years of their intellectual power in physics. Attracting such people is the best way to guarantee the long-term advancement and healthy funding of this endeavor. In this light, I hail the recent appearance of the column "Career Choices" (April, page 39) as an important first step.

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## YBCO Magnetic Texture Credit Smoothed Out

I read with great interest Bernard Raveau's review of high- $T_c$  supercon-

ductivity in layered cuprates (October 1992, page 53). Toward the end of the article Raveau discusses texturing as a way to raise the critical-current density  $J_c$ . He talks about the success achieved using melt-textured growth and, more recently, using magnetic texturing. He mentions magnetic texturing as a well-established technique and refers in this context to work done by P. de Rango and colleagues, from Grenoble, France.<sup>1</sup> I agree that the work of the scientists from Grenoble deserves a lot of credit, especially the demonstration by M. R. Lees and colleagues<sup>2</sup> of high  $J_c$ , exceeding  $1.5 \times 10^4$  A/cm<sup>2</sup> at 77 K, in magnetically textured YBCO material in the presence of magnetic fields as high as 6.9 tesla.

My only reservation is that the work of my colleagues and myself on magnetic texturing was not recognized in the article. In fact, we did the first research on magnetic texturing (where the treatment is done in a magnetic field at temperatures approaching melting point) at least two years ahead of anybody else. In March 1989 we reported texture produced in YBCO and HoBCO during sintering (below melting point) in a small magnetic field.<sup>3</sup> In November 1991 I reported a very high degree of texture produced during sintering in a strong field.<sup>4</sup> On 7 January 1992 our patent was published.<sup>5</sup> This patent explained, among other things, the procedure of partial melting and subsequent cooling in the presence of a field (a procedure used by the group from Grenoble). It should be noted, however, that in the work of Lees and colleagues the temperature schedule was such that the samples were treated for many hours in the magnetic field at the sintering temperatures. I think that it is during this sintering stage that the size of the grains increases further and, maybe even more importantly, the coupling between grains becomes stronger. Groups from the University of Liège in Belgium<sup>6</sup> and the University of California at San Diego<sup>7</sup> have recently confirmed magnetic texturing at the sintering temperatures.

Thus we did the earliest and the most comprehensive job on magnetic texturing. And I hope that Raveau's omission is unintentional.

## References

1. P. de Rango, M. Lees, P. Lejay, A. Sulpice, R. Tournier, M. Ingold, P. Germi, M. Pernet, *Nature* **349**, 770 (1991).

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