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'Culling the Herd' of FSU Physicists

Having lived in the Soviet Union for more than a year, gotten married there, worked at scientific institutes in several of the republics and made an additional 14 visits there since 1977, I would like to offer some modest observations on the proposals to fund physics in the former Soviet Union.

The Soviet (now Russian) Academy of Sciences and its institutes are a model of how not to do physics. First, a truly enormous number of physicists are educated, based on quotas established with the input of the academy. The number of these scientists has no rational basis in terms of the technology of the country and greatly exceeds the number produced in the US and Japan combined. (It is akin to having a million physicists in Albania or the Cayman Islands.) To worsen the situation, most of these physicists are theoreticians, whose skills, while often considerable, have little if any immediate application to short-term economic or societal (for example, environmental) problems. Finally, to make the situation truly impossible, these physicists are isolated in research institutes where they have no direct access to universities and students or to industry and engineers. If a system were ever designed to minimize the usefulness of physicists to society, this is it!

The short-term solution to the FSU's physicist problem is to close the academy institutes (almost without exception) and to reassign the better physicists to work of more immediate use in newly created positions in universities and industry. Funding the continued existence of literally thousands of academy "think tanks" only exacerbates the situation. In the US and Japan most physicists earn their livings teaching students who are not physics majors or doing rather applied problems in industry; why should Russian physicists be more privileged than we are?

Also, there are other countries of the world, such as India, that have a fine tradition of mathematics and physics. Why are we not clamoring to support Indian physicists?

The long-term solution to the problem is that the FSU must drastically reduce the production of physicists to match the number of jobs in its new society. When wartime and postwar Russia was extremely impoverished, it produced Lev Landau, both Lifshitz brothers, Aleksandr Prokhorov and a collection of other luminaries. It is not apparent that the grotesque overproduction from 1960 to 1990 has produced Russian physicists of the same quality. Perhaps "culling the herd" would be quite healthy for Russian science.

Russian physicists for years have led a privileged existence envied by all other citizens. (There was great complaint at the Institute of Spectroscopy in Troitsk when the new office building was completed, because afterward the theoreticians were actually required to come to work five days a week; previously they came in only on the day of the weekly seminar.) Of course the life an an academician is still amazing by Western standards, with private restaurants, private resort hotels, private hospitals and so on. Those days are almost over. Russian physicists will actually have to work like other Russian citizens. It is a kind of modest revolution. And very few Russian nonscientists are shedding any tears about it.

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Reconciling COBE Data with Relativity

There is one aspect of your news story on the recent COBE data (June 1992, page 17) that I find disturbing. The article states that the dipole anisotropy in the cosmic microwave background radiation is due to "the motion of Earth relative to a 'comoving observer'—one who rides along with the general expansion of the universe." This velocity of the Earth can actually be measured, the story says, and is found to be 370 km/sec.

We were all taught in undergraduate physics that the basis of both the special theory of relativity and the general theory of relativity is the "relativity principle," the fact that all reference frames are equivalent and that there is no experiment that can determine a preferred reference frame. What your news story seems to say is that at every point in space–time there *is* a preferred reference frame, namely that of the "comoving observer," and that one's velocity with regard to this preferred reference frame can be determined by simply measuring the anisotropy in the cosmic background radiation. Thus it would seem that measurement of this dipole anisotropy is in effect a modern-day Michelson–Morley experiment, but this time with a positive result, and that the cosmic background radiation acts in effect like the stationary ether that Albert A. Michelson and Edward W. Morley failed to find. Thus it would also seem that while the special and general *theories* of relativity may be correct, the relativity *principle*, on which these theories are presumably based, is not. I would be grateful to any experts in cosmology or general relativity who could comment on this point.

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SSC: Too Much to Pay for Too Little Promise

How can the world's largest debtor nation, running a $400 billion annual deficit, with millions out of work and a collapsing industrial base, afford the Superconducting Super Collider, an $8.5 billion toy for high-energy physicists? The answer, of course, is that it can't, but an allegiance of "scientists," politicians and manufacturing companies seems to be in a position to push this project through Congress.

We have seen it before. What have recent NASA projects given us? The Hubble Space Telescope, built for the price of 50 to 100 world-class Earth-bound telescopes, needs about a billion more dollars. The space shuttle? How about the Galileo probe? Its antenna failure threatens to drain the resources of the entire deep-space network! Can big science point with pride to results from fusion research? After 30 years and Lord knows how many billions of dollars, there is no hint of commercial fusion prospects.

The products of scientific research that we use in our daily lives are the result of industrial research and small-scale university research, not big science. Our world has been immeasurably changed by the transistor, integrated circuit and laser, and now we await the fallout from high-temperature superconductivity. Is there a message here?

Are the "scientists" who mailed the letters to Congress supporting the SSC (see PHYSICS TODAY, August 1992, page 59) so out of touch with reality that they don't realize that the country is in a recession and we need to invest that money in a way that can benefit the country?

It's time that scientific research is targeted to benefit the people of the country, not to sate the intellectual curiosity of a few "scientists," the political ambitions of a few politi-