letters

We will continue our struggle for all the Soviet Jews we left behind. We urge our American colleagues to join us.

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Refuseniks' plight

We would like to inform PHYSICS TODAY readers about the situation of Marks S. Kovner, a magnetospheric physicist who applied to emigrate from the Soviet Union in 1978. This letter may be of special interest to members of the American Geophysical Union, who only recently began to receive PHYSICS TODAY and therefore may not be aware of the frequent discussions in these pages concerning the situations of scientists who have applied to emigrate from the Soviet Union, and the many ways that their colleagues in the West can help them.

Kovner was a professor in the radiophysics department of Gorky State University and a project director on the staff of the Gorky Radiophysical Research Institute. He had published over 50 papers, most recently on magnetohydrodynamic plasma waves in the Earth's magnetosphere and at the bow shock and on VLF waves. When he first applied to emigrate, he was refused permission "until 1985 for security reasons," although later he was officially told that none of his work was considered secret. He was immediately dismissed from his teaching and research positions, and since then he has been employed in a series of temporary positions, doing such tasks as writing solutions to physics problems for high school students. For the past several years he has not been allowed to travel to Moscow, an unusual restriction even for those who have applied to emigrate. Because Gorky is closed to foreign visitors and his mail from abroad is usually not delivered, Kovner has been completely isolated from other physicists, making it impossible for him to do any serious research. His situation has been made even more difficult because his wife and children were given permission to emigrate to Israel, and did so in 1977 in the hope that he would soon be able to join them.

We urge any readers with similar research interests to send preprints and reprints to Kovner (preferably by registered mail) at the Department of Radiophysics, Gorky State University, Prospekt Gagarina 23, Gorky, RSFSR, USSR. (Letters can also be sent, but should not discuss politics.) Even more important, those who have contact with Soviet magnetospheric physicists, especially (but not limited to) Soviet physicists who are prominent or who come from Gorky, should express their concern about Kovner and ask why he is still not allowed to emigrate. If the Soviet government sees that there is widespread concern about Kovner, and that its treatment of him harms the reputation of the Soviet Union among those scientists who would normally favor increased international scientific cooperation, then there is hope that he will be allowed to emigrate to Israel, where he can make use of his considerable scientific talents and be reunited with his family.

We wish to remind readers that the well-known Soviet magnetospheric physicist Jacob L. Alpert has also been refused permission to emigrate from the Soviet Union since he first applied in 1975 and was demoted from his position as deputy director of the Institute of Terrestrial Magnetism, Radio Research and Ionosphere. Alpert would also appreciate receiving preprints and correspondence on magnetospheric physics, and would benefit if physicists from outside the Soviet Union would discuss his situation in meetings with Soviet physicists. His address is 2-Oi Mosfilmovsky Pereulok 21-198, Moscow 119285, RSFSR, USSR.

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Interpreting quasar redshifts

The June 1985 issue of PHYSICS TODAY contained a letter from John Kierein (page 15) advocating the Compton effect interpretation of the quasar redshift. This suggestion, originally made by Arthur H. Compton for solar spectral lines,[1] appears to be untenable for several reasons.

Paul A. M. Dirac showed that for the case of single Compton scattering, thermal motion of the scattering electrons broadens the spectral lines and obscures the line shift, which is comparable to the Compton shift (0.024 Å).[2] The line shift may even be toward the blue if the electron thermal energy exceeds the photon energy. These results were confirmed by F. N. Edmonds, who extended the calculations by including the Klein–Nishina formula for electron scattering.[3] For multiple Compton scattering Subrahmanyan Chandrasekhar found that the spectral lines would be severely weakened, whereas the line shift would remain small.[4] Jay Pasachoff and Joseph Silk[5] and I[6] have written about other difficulties with the Compton effect interpretation for the solar case, where the observed redshift ordinarily is interpreted as the Einstein gravitational redshift.

The Compton effect interpretation of the quasar redshift encounters even larger difficulties than the solar case because the observed redshifts are very large. The observed widths of the spectral lines place stringent limits on the possible number of scatterings. If large redshifts were produced through Compton scattering the relative shift $\Delta\lambda/\lambda$ would be wavelength dependent, in contrast to the observed shift. Thus it appears that the quasar redshift debate may continue without the Compton effect interpretation.

References

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It was disingenuous of John Kierein to write about the Compton effect interpretation of the redshift, citing his earlier article,[1] without mentioning that Joseph Silk and I[2] responded devastatingly to the suggestion shortly after its publication. Silk and I thought of a long list of reasons why the Compton effect wouldn't work, but just as we were about to send our article off discovered that Evry Schatzman[3] and Fritz Zwicky[4] before him had already pointed out many of the objections, and that Paul A. M. Dirac[5] and Subrahmanyan Chandrasekhar[6] had also ruled out the effect. So we shortened our paper, adding references to the previous work.

So it seems that not only is there "a long history associated with these ideas," as Kierein cites, but there is also a long history of rebuttal. I refer interested readers to our article and to the papers cited in it; I believe refereed journals are better places for scientific discussions than letters columns. I am