Yale University *New Haven, Connecticut 06520*

PHYSICS DEPARTMENT
217 Prospect Street

November 29, 1972.

My dear Feza:

The job hunting season is upon us (tatatatatatatata -----), and I must ask you to ~~write~~ write letters for me to the places on the enclosed list.

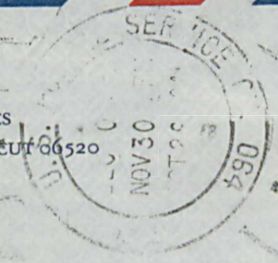
I have very little time for research now since I am devoting most of my time to my courses and Tanya. Nevertheless I have found your model of a classically spinning particle enormously useful; in fact if one quantizes it à la dual models, it seems that I obtain what Sciuto and you did i.e. just one oscillator. More on this later.

The hot stuff lately is Coleman's work on the spontaneous breaking due to radiative corrections; his idea: if all masses are zero to start with, will radiative corrections change the potential in such a way as to give a) a real ~~true~~ mass or b) an imaginary mass to the scalar? His conclusion: after summing all one loop contributions in the limit of zero momentum on the external legs, (i.e. 0→0 transition), you get a spontaneously broken solution !!!!

My best regards to Sarka, and to you too.

Peter.

P. Ramond
YALE UNIVERSITY
SLOANE LABORATORY
DEPARTMENT OF PHYSICS
NEW HAVEN, CONNECTICUT 06520



Prof. F. Gürsey
Physics Dpt.
Middle Eastern Technical Institute
Ankara,

TURKEY

Foldy - PR. 107, 568 (1957)

Pions + Lithium

Yale University *New Haven, Connecticut 06520*

PHYSICS DEPARTMENT
217 Prospect Street

New Haven, October 30, 1972

Dear Feza and Suha:

I must apologize for not writing earlier but since Tanya's arrival, we have not had much time to do anything. Although she is quite cute (and to prove it I am enclosing a picture), her demands are to be met without delay, which is very tiring. Anyway, we are waiting eagerly for her to become responsive to us [from a linear to a non-linear system]. Life in New Haven is not the same without you. I saw Yusuf a few days ago. He is in good spirits and swears he has written you a long letter. The poor man is getting harassed. Whoever he meets asks him to write to you and then proceed to introduce himself! Lillian is even more tired than I am since she has to breast-feed. I feel bad since there is nothing I can do to alleviate the situation. My graduate course is going quite well; in it are two students from the History of Science Department, which enables me to learn of the history of the subject. M. Klein comes in every Wednesday, but I have not talked to him. Teaching is very nice, but between Tanya and students, I have not had any time to do anything. The big thing is now the string formalism of Fred and L.N. Chang. It has enabled people at CERN to prove that the dual model is not invariant ~~unless you~~ under the Lorentz group unless you have 26 dimensions for the old model [10 for the Neveu-Schwarz model: this can be obtained from considering 11 anticommuting matrices: if you want to keep them 4×4, you have to introduce octonions γ_p and $e_i \gamma_5$, leading to another generalization of Dirac's equation: $[\gamma \cdot p - e_i \gamma_5 \pi_i - m]\psi = 0$. I do not know how to interpret the π_i's, but for 10 dimension I do not need e_7. Hence it seems to be a natural way to introduce SU(3) - (?) Please your comments. By the way Namba is very much interested in octonions!

Last week there was the Eastern Theoretical Physics Conference at Storrs which I attended. Fubini was there and he offered me a job at CERN with him for a year, without even my asking him! I pointed out to him my preference for staying here and he said it did not make any difference: anytime. I am flattered, needless to say, but still I'd rather stay here if I can. A depressing note: Fubini spoke of the string but did not mention Fred or anybody else for that matter except himself and his collaborators! Fred was furious and I don't blame him. Murat is doing quite well and is finally learning some physics: gauge theories - all for the better. I was told this Turkish fellow's wife went to the hospital with labor pains two days ago - I assume they now have a baby. In conclusion, there is really nothing new in Physics (as you might expect). What about Ankara? Please let us know how you are doing. We were told Feza's stomach was not quite happy about the Cafeteria. Give us details.

With our best regards, your friends,

Piero
Lilliana
Tanya

P.S. our regards to the Swanks.

Yale University *New Haven, Connecticut 06520*

PHYSICS DEPARTMENT
217 Prospect Street

New Haven, November 7, 1972.

Dear Feza:

Just this quick Physics note. Once you said that the metric for the interior Schwarzschild solution was conformally invariant. Could you tell me in what way? The reason for my interest is as follows: Press (Caltech) gave a talk two weeks ago on black holes and it occured to me that since radiation cannot leave a black hole, there may be a connection with some group property shared by metrics describing black holes. This belief was strengthened by finding out that equations separate out nicely (see Teukolski, P.R.L. June 72 I think) as if by "magic". This sort of magic smells like group theory and I tend to think there might be ways of classifying black hole metric in terms of groups - and maybe find new metric beyond Schwarzschild and Kerr..... Grandiose thoughts spurred by your remark! Please enlighten me on this invariance for it is not at all obvious. What do you think of this crazy talk?

More news: 1) Tanya is beginning to smile!!! (no. 1 news)

2) Coleman gave a beautiful talk (here) on radiation corrections as possible sources of spontaneous breakdown.

One question: when will you write your Poincaré group + octonions paper - the world awaits with impatience.

Lastly, my regards to you and Suha.

Pierre.

Pierre