

# Princeton University



March 9, 2005

Biocomplexity Faculty Search Committee,  
c / o Prof. Rob de Ruyter van Steveninck,  
Department of Physics,  
Indiana University,  
Swain Hall West 117,  
Bloomington IN, 47405-7105

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Dear Members of the Search Committee,

This letter is in support of Dr. Alexay Kozhevnikov who is under consideration for a faculty position in your department. Alex has shown remarkable growth as a systems neuroscientist over the last few years, a field he has vigorously pursued following graduate training as a physics experimentalist. I strongly recommend him to you.

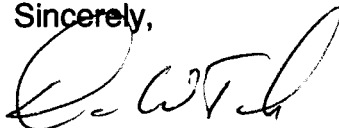
I met Alex when he came to Bell Laboratories as a postdoc with Michale Fee. Since my lab was right next door I saw Alex on a day to day basis. In addition, as department head, I performed yearly evaluations of his progress and could see how it fit into the progress of Fee's research program. Although my interactions with Alexei have largely ended following my move to Princeton, I still feel pretty up to date on his strengths and weaknesses as well as his future potential.

Alex exudes confidence, and from the day I first met him I learned one reason why. He is very good in the lab! He clearly has natural talent and a good sense of what can and cannot be accomplished. This, coupled with his extensive background with precision measurements in experimental physics meant that he could quickly get up to speed in his entirely new field of research. Already a master of electronics, computers, and optics, in a few short years he also became a master of in vivo multi-electrode recording, small animal surgical procedures, cell identification from antitoxic stimulation, and spike sorting. The particular versions of these methods that he mastered in Michael's lab (for example the ultra light micro drive) represent the forefront of techniques used in electrophysiological studies of song generation and learning in the zebra finch system.

The scientific questions Alex has addressed as a postdoc are, to me, among the most interesting in systems neuroscience. I firmly adhere to the idea that just like there are universal forms of electrochemical dynamics at the cellular level (the action potential in the squid axon is conceptually identical to that in a cortical pyramidal neuron), so too will there be universal forms of dynamics at the circuit level. The mechanisms of complex motor sequence generation and how it is learned are an excellent candidate for one such form of circuit dynamics. The beautiful set of studies on sparse coding and precise timing in RA and HVC that Alex was a central part of in the Fee lab have provided a very novel view of the general mechanisms of sequence production and learning. There is so much more to do in the future that I have no doubt Alex will have a very productive and interesting research program.

Over the last two decades, I have seen many physics trained students turn their attention to biophysics and neuroscience. When they succeed in making this transition they can become real stars (like Michale Fee, Karel Svoboda, etc.). I think Alex is on a trajectory that could place him in this category. Compared to other candidates you will evaluate, Alex will probably not have as many publications in biology. I think a department willing to look carefully at his trajectory and promise rather than count publications will see a real opportunity. I strongly recommend him to you. I think the risk is small and the potential payoff large.

Sincerely,



David W. Tank  
Henry L. Hillman Professor