

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

Letter of Recommendation for Dr. Valter Zazubovich

Dear Prof. von Steveninck,

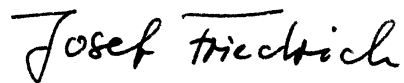
Dr. Valter Zazubovich asked me for a letter of recommendation to support his application for a position in your Department. During his graduate program at the University of Tartu, Estonia, under the supervision of Prof. Jaak Kikas, Valter Zazubovich spent several periods in my laboratory to work on hole burning investigations of optical properties of probe molecules in organic crystals undergoing transitions to incommensurate phases. A specific example in this respect is biphenyl which shows quite a rich phase behavior at low temperatures. The twist angle of the molecule introduces an incommensurate structure which was known to give rise to characteristic degrees of freedom. Valter Zazubovich investigated the temperature dependence of the homogeneous line width of a dopant molecule and found a quite unusual behavior in the millikelvin range which he associated with specific features of the biphenyl host (*Kikas et al., Europhys. Lett.* **44**, (1998) 613). According to my judgement, he did excellent work. I consider him as an outstanding young scientist with a profound experimental experience in spectroscopy, low temperature physics and high pressure techniques.

After having finished his graduate work on glasses and special disorder phenomena in molecular crystals, Valter Zazubovich decided to enter a different field, namely the spectroscopy of biological molecules. He joined the group of the late Prof. G. J. Small in 1999. Some of the topics which he investigated there, are very close to my own field. Hence, I think I can judge his scientific achievements quite well. Generally speaking, the period of Ames has turned out to be a very efficient one. He has been working on the spectroscopy and related physics and chemistry of photosynthetic proteins, antenna systems as well as reaction centers. These investigations covered a series of questions which are very interesting concerning the physics involved and which are important concerning the functioning of the photosynthetic apparatus. For instance, one of the outstanding problem in such complex biological systems concern the energy transfer physics in the antenna systems and the electron transfer processes in the reaction centers. Valter Zazubovich performed excellent experiments to answer some of the urging questions. In particular, I'd like to mention his recent work on high pressure hole burning experiments in the LH2 antenna complex in which he addressed the problem on how application of pressure influences the excitonic coupling and the energetic disorder in this system (*Zazubovich et al., J. Phys. Chem. B* **2002**, 106,6802). He found a common scaling

law for the spectral positions and the widths of the so-called B850 and B870 bands. The outstanding feature of this result is the large pressure range (10^3 MPa) over which this scaling law persists. A strong response of the width to pressure reflects structural disorder and, hence, a comparatively low structural correlation among the molecular building blocks of the antenna. That such a low correlation persists up to very high pressures is really surprising. Another feature of this investigation should be stressed, namely the solid theoretical basis on which the experiments, especially the interplay between energy disorder and excitonic coupling, were interpreted.

What I appreciated very much during the time Valter was working in my laboratory, was the way how he tackled complicated problems. He worked very independently, came up with excellent ideas to solve upcoming problems. As an experimentalist he worked very carefully and he always had the necessary criticism towards his own results. He is a modest and a very nice person. I appreciated it very much that I had him in my laboratory.

With best regards

A handwritten signature in cursive script that reads "Josef Friedrich".

Josef Friedrich

Professor of Physics,
Department of Physics and Life Science Center Weihenstephan, TUM