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

Subject: Recommendation letter for Dr. habil. Alexei Boulbitch related to his application for the tenure-track faculty position at the Biocomplexity Institute of the Indiana University.

15.01.2004

Dear Search Committee Members,

I know Dr. Alexei Boulbitch since 1990 when we met for the first time at a conference. Since that time we were in a permanent professional contact, I am aware of his publications, attended at his talks at several conferences and seminars. Few years ago we met several times in Germany where Dr. Boulbitch was working first as a Humboldt Fellow and later as a researcher. I therefore, can give you my professional as well as my personal opinion about him.

When we met for the first time A. Boulbitch was working at the Institute of Physics of Rostov University (Rostov-on-Don, Russia). During that time he was working in an interdisciplinary field at the boundary between solid mechanics and physics of phase transitions. He developed a theoretical description of phase transitions in solids containing cracks, dislocations, twin boundaries and so on. In this area he obtained several outstanding results.

For example he has found exact solutions in two problems describing a phase transition at the crack tip (J. Mater. Sci. **27**, 1070, 1991 and Phys. Rev. Lett. **81**, 838, 1998), he has found an exact solution describing nucleation of a new phase at a moving defect (Sov. Phys. Crystallogr. **35**, 156, 1990 and Phys. Rev. Lett. **81**, 838, 1998), he expanded mathematical methods of the plane theory of elasticity to solids with phase transitions and applied these methods to describe spontaneous fracture of solids during phase transitions (J. Mater. Sci. **27**, 6401, 1992), he explained the embrittlement of hydrogenized metals (J. Alloys Comp. **196**, 29, 1993) and made several other interesting works in this area. All these results are of a very high importance for the theory of phase transitions in solids containing defects.

Since about 10 years A. Boulbitch switched to mechanics of biological objects, and now he actively works in this area at the Technical University Munich. Though I am less familiar with this area, I am aware of his pioneering work describing deformation of bacterial wall by the tip of atomic force microscope (Phys. Rev. E **62**, 1034, 2000), of his highly cited paper on magnetic tweezers (Biophys. J. **75**, 2038, 1998) and of his recent outstanding results in the area mechanics of bioadhesion (Eur. Biophys. J. Lett. **31**, 637, 2003; Europhys. Lett. **59**, 910, 2002; Biophys. J. **81**, 2743, 2001 and Europhys. Lett. **54**, 826, 2001). All these works concern recent experimental findings and are made in collaboration with experimentalists.

In Russia Dr. Boulbitch funded himself from research grants received from an industrial institution. His work in Munich became possible after he has received the Alexander von Humboldt award. His further work in Germany was funded by the DFG (German Research Society). This ensures the ability of Dr. Boulbitch to fund his research.

The conference and seminar talks of Dr. Boulbitch were always excellently given: very clear, well structured and easy to understand. Though I am not aware of his teaching activities, this ensures me that he can give excellent lectures for students. Several years ago Dr. Boulbitch obtained his Habilitation degree from the Technical University Munich. This degree (which may be received only by a person already possessing the PhD) is a prerequisite for the professorship in the German system. It ensures a high level of research and teaching as well as the ability to supervise students research.

I would like to add that Alexei Boulbitch has a nice personality, always having a good mood and a strong sense of humor.

As much as I can see, the area of scientific interests of Dr. Boulbitch corresponds to Biomedical Engineering. He is able to conduct a strong and independently funded research program. I strongly support the application of Dr. Boulbitch for the faculty position in the Department of Biomedical Engineering of the University of Rochester. I am convinced that he will demonstrate his high creativity as a researcher and his excellent ability in teaching.

Do not hesitate to contact me if you have any additional questions.

Sincerely,



Valery Levitas