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Biocomplexity Faculty Search Committee
c/o Prof. Rob de Ruyter
Department of Physics
Swain West 117
727 East Third Street
Indiana University
Bloomington, IN 47405-7105

RE: Dr. Hyung-June Woo

Dear Prof. de Ruyter:

I am delighted to write in support of Dr. Hyung-June Woo's application for a faculty position in your department. He is the most talented theoretical chemist I have ever seen. What impresses me most is his extremely deep understanding of statistical and many-body physics. Such virtue is rarely seen even among condensed matter physicists where I belong. From my observation he is not only good at doing research, he loves doing research: He tries to get the bottom of each and every problem rather than simply publish papers.

I am a Research Physicist of SRI (used to be Stanford Research Institute), a non-profit research institution. I gained my PhD degree in theoretical condensed matter physics from Fudan University, China in 1996. Then I spent three years working in Los Alamos National Laboratory as a Director Postdoctoral Fellow. Afterwards I went to Iowa State University/Ames Laboratory as a postdoc, where I worked with Hyung-June in the same group for about one and half years. Before I joined SRI, I worked in the University of Iowa for one and half years as a postdoc. More details of my research experience can be found at <http://aristotle.sri.com/~zyu>.

During our overlap in Ames, Hyung-June showed a considerable degree of breadth and originality in his studies of liquid-solid phase transition, a difficult problem, which is very rare in a young scientist. This was clearly founded on excellent technical training at Berkeley, but also demonstrated motivation and maturity which is all his own. In studying the freezing of liquids, he extended the traditional density-functional theory and developed Monte Carlo codes to support his theory. He showed true originality in the density-functional technique he invented for this problem. His results are very important and have been used to understand protein crystallization.

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After he left Ames, Hyung-June creatively applied the mean-field theory to several complex systems including ice and fluids confined in mesoporous glasses to study the phase diagrams and phase behaviors of these systems. To study these extremely complicated systems, instead of exclusively relying on numerical simulations, as most people would do, he first extracted essential physics to construct a reliable model and then did simulations. His work involves use of both elegant theories and efficient computational algorithms. This approach enables his work to provide more insights of underlying physics in complex systems. Recently he studied nonequilibrium trajectories and pattern formation, another very challenging problem, and obtained some fundamentally important results that are generic in many systems. His ability to extract basic physics out of complex systems is truly remarkable.

The above comments were intended to emphasize my great regard for Hyung-June's strengths. He combines passion and precision not always found in the same individual! He combines very high standards of technical many body and statistical physics skills, with excellent computational competence. Equally impressively, he has shown creativity and inquisitiveness to an unusual degree sufficient for him to move with great effectiveness between complex fluids to biological systems. There can be fewer researchers at his career stage with a better training, perspective, and potential for impact in the world of complex biological systems being developed for present and future technologies. I see every reason to believe that Hyung-June will be a leader in that field. He has an excellent personality, communicating precisely, listening well, and interacting calmly and productively with all his colleagues. Since his moving to Cornell, I have only followed Hyung-June's work more peripherally, but in our conversations, he has continued to exhibit enthusiasm and great focus.

I have worked with many people in past ten years and have got acquainted with many young brilliant scientists and their research, I believe Hyung-June is clearly in the top 5% of these young scientists, and certainly the best among theoretical chemists. He has demonstrated an ability and taste to work on solid, liquid, and biological materials, in all cases entering the field quickly and crossing the focus and relevant analytical and computational tools expertly. He is exactly the kind of talent needed at the exciting frontiers of complex biological materials.

If I can provide further information, please do not hesitate to contact me.

Sincerely yours,

A handwritten signature in black ink that reads 'Zhi Gang Yu'.

Zhi Gang Yu