



UNIVERSITY OF OREGON

December 13, 2004

Prof. Rob de Ruyter van Steveninck
Department of Physics
Indiana University,
Swain Hall West 117,
Bloomington IN
47405-7105

Dear Prof. de Ruyter van Steveninck:

I'm writing this letter in enthusiastic support of Dr. Andrew Hausrath, who is applying for a faculty position in Biophysics at Indiana University. To summarize, I believe that Andy is poised to make major, quite novel and possibly ground-breaking contributions over the next few years. He will bring credit to any institution with the foresight to hire him and provide him with the support required to bring this work to fruition. Andy is well prepared to take on the responsibility of a tenure-track faculty position and I urge you on the strongest possible terms to give him your most serious consideration.

As a member of Andy's Ph. D. thesis committee, I observed his progress over a period of several years and since then have remained in close contact. Andy is a truly exceptional individual with an extremely rare combination of skills. Among other qualifications, Andy's math skills are so highly honed that he could as easily have become a theoretician as an experimentalist. We are indeed fortunate that he chose the latter route as it gives him an excellent basis for application of theory. Andy is a **superb** experimentalist. However, because his understanding of the theoretical basis for techniques in microscopy, NMR and crystallography is so comprehensive, he is an invaluable resource as well. Finally, Andy is an absolutely delightful person with whom to work!

Andy was a Ph.D. student with Brian Matthews and received his degree about four years ago. He worked on various crystal structure determinations while his wife (Megan McEvoy) studied protein NMR with Rick Dahlquist. Andy and Megan are both talented experimentalists who have solved a number of protein structures. Andy, on the other hand, is most unusual in that he has an inborn gift and genuine love for higher mathematics. As a member of Andy's Ph. D. committee, I sat through some tough sessions in which we tried to help Andy reconcile his desire to do pure math with the need to do experimental studies. Unfortunately, there was no one on campus with the expertise who could serve as an advisor on theory; otherwise we would have encouraged him to develop in the more mathematical direction. As an experimentalist, Andy worked harder than any graduate student I've ever known. However, he was put on difficult projects such as structural studies of the intact F1F0 ATPase, which is a membrane protein. As a consequence (and partly because Brian was never very interested in the work) did not have great success. Andy did manage to publish one or two papers on that

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1229 University of Oregon · Eugene OR 97403-1229 · (541) 346-5151 · Fax (541) 346-5891

topic, including a low resolution map showing some previously unresolved details of the F1 particle.

Lately, Andy has embarked on a remarkable and groundbreaking research project on protein folding. The work is being conducted in relative isolation at the University of Arizona, resulting from Megan's tenure-track hire there as an NMR spectroscopist. In spite of this isolation, Andy's work has blossomed into something quite remarkable. In this new work, Andy has developed a new representation of protein folding involving parametric space curves, 19th century mathematics applied in a novel way. Andy can represent any type of protein structure with a few discrete parameters and can explore parameter space to predict new structures. The theory can be and has been applied to many types of higher-order biological structure, especially if regular symmetry is apparent (for example, superhelical DNA or chromatin). The crude space curve model can be extended to generate a complete atomic model. Furthermore, various aspects of diffraction theory can be derived directly from the model. Andy is currently working on a couple of papers that he hopes to submit in the next month or two. He has also initiated a collaboration with an applied mathematician living in France to help implement some of his ideas.

I believe that Andy's new work will be well received by a diverse groups working on macromolecular interactions, including both theoreticians and experimentalists. It is certain to bring credit to any institution with the foresight to hire its author. Andy would be an excellent colleague and resource for any department interested in macromolecular structure. He is a fine teacher who is patient with students. Finally, if you could lure Megan McEvoy away from the University of Arizona, you would be doubly rewarded! She would be a most delightful colleague as well.

Please don't hesitate to call me if you require further information.

Best regards,



S. James Remington
Professor of Physics
Member, Institute of Molecular Biology
(541) 346-5190