

STANFORD UNIVERSITY
STANFORD, CALIFORNIA 94305-5080

STEVEN G. BOXER
CAMILLE AND HENRY DREYFUS PROFESSOR OF CHEMISTRY

November 15, 2005

Dr. Jeremy Bennett
Faculty Search Coordinator
Department of Biology
Indiana University
1001 East 3rd Street
Jordan Hall 127
Bloomington, IN 47405-3700

Dear Dr. Bennett:

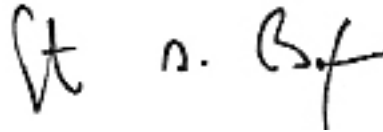
I am writing on behalf of Dr. Steven Andrews who has applied for a faculty position in your Department. Steve was graduate student in my research group. He is an extremely bright, interactive and interesting young scientist with broad interests and talents who would make a great addition to any Department.

Steve joined my lab to study the response of molecular vibrations to applied electric fields, the so-called vibrational Stark effect. My interest in this stems from a long-standing desire to develop methods to quantitatively probe electrostatic fields in complex systems, primarily proteins. These fields are widely discussed and calculated, and are essential for understanding protein folding and function, but there is little quantitative information on these fields. In a few cases, there are convenient electronic transitions whose sensitivity to a field can be calibrated by electronic Stark spectroscopy, but we reasoned that molecular vibrations are everywhere and might be a much more universal detection method. At the time Steve began this work there were fewer than 5 reports of vibrational Stark effects, all in the gas phase. He assembled a unique system and the first measurements of this sort were obtained. Steve chose to focus hard on vibrational Stark effects in simple nitriles. He has published a pair of fundamental papers on this model system, one focusing on the experimental results, the second on a theoretical framework for analyzing the results. In collaboration with another graduate student, he attempted to measure the vibrational Stark effect for CO bound to the heme iron in myoglobin and was immediately successful. In short order they were able to produce the first comprehensive look at electric fields probed by vibrations in a protein. This would never have happened without Steve's apparatus and insight into the problem. I believe that this is a really important piece of work, now being pursued in other systems by 4 people in my group.

Steve was also involved in many other projects within our lab, largely providing theoretical and conceptual insight, in several cases developing code (for example, a thermodynamic model developed to describe critical phenomena in 2D fluid lipid membranes), and always providing a grounding in fundamentals. His name appears often in the acknowledgements in diverse areas because he was, and still is, that important to the intellectual infrastructure of our group. He is the person to talk with about hard problems, where conceptual insight is essential. He is very smart, comparable with the very brightest students I have worked with. He is less politically savvy than some more pushy students, and he appears to be quite content to maintain a reserved profile.

Steve has been fascinated by complex dynamical systems for a long time and this led to his desire to work either with Dennis Bray in Cambridge or Adam Arkin in Berkeley. Both offered him positions and, after much thought, he decided that they represented the best in Europe and best in the U.S., so why not work with both. These groups have very different approaches, so his view on this emerging field is as broad as possible. He proposes to work in this new and important area of science that seeks to integrate quantitative modeling, as done by physicists and physical chemists, with information on complex biological systems. The resulting quantitative view of biology by a serious physical chemist is at the cutting edge, and Steve Andrews will, without doubt, make important contributions. I strongly urge you to consider his application. He is an exceptional young scientist.

Sincerely yours,

A handwritten signature in black ink, appearing to read "St n. Boxer". The letters are cursive and somewhat stylized.

Steven G. Boxer