

LABORATOIRE DE DYNAMIQUE
DES FLUIDES COMPLEXES

April 22, 2003

Faculty Search Committee
c/o Prof. James Glazier
Dept. of Physics, Indiana University
Swain Hall West 117
Bloomington IN, 47405-7105
U.S.A.

Dear Prof. James Glazier:

I am writing to you about a tenure-track Assistant Professorship in the Department of Physics and the Biocomplexity Institute, and hoping you will consider my application. For a little more than 1 year, I have worked as a postdoctoral researcher at the Laboratoire des Dynamiques de Fluides Complexes with Dr. Didier Chatenay. I am looking for a faculty position within a physics department to start a new experimental biophysics lab, teach physics classes and advise graduate students.

My research interests involve applying the quantitative approaches of an experimental physicist to problems in biology. More specifically, I am interested in how DNA is packaged within chromosomes, population dynamics and diversity of bacteria, and using GFP technology and microchannels to study these problems. I worked with eukaryotic cells during my thesis research and am currently working with the bacterium *Escherichia Coli* (*E. coli*). Both my Ph.D. thesis research and my current postdoctoral research involve setting up and conducting quantitative measurements on biological systems with a combination of physical and biological techniques.

My thesis project studied the elastic properties of mitotic chromosomes and how various biomolecules affect these properties to provide insight into the unsolved problem of how eukaryotic DNA is packaged into a mitotic chromosome. These studies led to the conclusion that a mechanically contiguous scaffold does not exist within mitotic chromosomes and instead there is likely to be a network of chromatin cross linked on average every 15 kb by chromatin folding proteins (Belmont, A.S. Proc. Natl. Acad. Sci. USA 99, 15855-7, 2002).

My current research involves studying phenotypic variations within clonal populations of bacteria and how these variations contribute to the evolution and adaptation of microbe populations. I am studying *E. coli* with a multidisciplinary approach that combines molecular biology, microfluidics and fluorescent microscopy. Currently, I am developing *E. coli* strains with phenotypes measurable on the single cell level and building an experimental setup that measures and sorts the population based on phenotype.

As a faculty member, my research plan would be to build an experimental lab focusing on single cell measurements that combine micromanipulation experiments, microfluidics and fluorescence microscopy. My initial single cell experiments would focus on the population dynamics of *E. coli* with the colicine plasmid addition system to help understand colicine's role in microbe evolution and dynamics. This would require setting up a microscopy system, pipette fabrication system and soft lithography facilities. In addition, I would build up a lab where simple cell biology and molecular biology can be done with a focus on developing eukaryotic and bacteria stains, which express the Green Fluorescent Protein (GFP). I am also interested in developing collaborations in the Physics, Chemistry and Biology departments where both ideas and resources could be shared.

In addition to conducting research, I am excited about the teaching responsibilities of an Assistant Professor. Clearly, teaching is the main goal of any university and, for an Assistant Professor, is a major component of the

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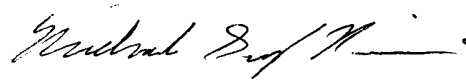
position. I enjoyed my teaching duties when I worked as a teaching assistant during graduate school and am excited about teaching again at the university level.

I feel the faculty position within the Department of Physics at the University of Indiana is an excellent place to develop a biophysics lab focusing on cell biology and microbiology because of its new Biocomplexity Institute. Also, I anticipate the University overall to be a great place for interdepartmental collaboration, which will be vital to my research.

I have included my CV, some recent publications and a PNAS commentary concerning my graduate research, and have arranged for three letters of reference to be sent to you.

Thank you for your time.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Guy Poirier". The signature is fluid and cursive, with a long horizontal stroke at the end.

Michael Guy Poirier, Ph.D.

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June 16, 2003

Prof. James A. Glazier
Indiana University
Department of Physics
Swain Hall West 177
Bloomington, Indiana 47405-4202
U.S.A.

Dear Prof. Glazier:

Thank you for your response to my application for a tenure track faculty position with the Department of Physics at Indiana University at Bloomington. I most definitely would like to be considered for your next faculty search during the 2003-2004 academic year.

Also, thank you for the invitation to visit Indiana University and give a seminar. Unfortunately, I have no plans to be back in the U.S. this summer.

I have arranged for the three letters of reference to be sent to you. They should have arrived by now. If they have not, please let me know.

Thank you for your time.

Sincerely,



Michael Guy Poirier, Ph.D.