

NORTHWESTERN UNIVERSITY MEDICAL SCHOOL



303 East Chicago Avenue
Chicago, Illinois 60611-3008

Tuesday 30 of December 2002

Chairperson
Dept. of Physics
Indiana University

Dear Sir:

It is a pleasure to write this letter of support for Dr. Mindlin who is applying for a position in your department. I have known him for a decade already and witness how his impressive productivity opened new and exciting roads in our discipline. Dr Mindlin is an extremely original, creative, and constructive scientist, and I recommend him to you in the strongest possible terms.

I will deal with the part of Gabriel's multi-faceted research activities that I am most familiar with. After significant contributions in symbolic dynamics of nonlinear systems, well documented in one of his books, Dr. Mindlin undertook, with tremendous success, two challenges: going into biology and building from zero a new group in this field at the University of Buenos Aires. I have to say that just one of these aspects is more than enough to maintain busy any bright physicist, but the energy and creativity of Dr. Mindlin is exceptional. In record time, his team and colleagues became the best reference in biological physics in Argentina. As a result, a handful of his trainees are now either working or pursuing further degrees in very good physics programs around the world, international funding agencies granted competitive support to the lab, and the group research is published *always and only* in top impact physics journals. Of course, recognition to the significance of Dr. Mindlin efforts abound; to mention just one a well known institution in complex systems recently honored him as an International Fellow together with another colleague of the Buenos Aires program.

It is clear to me that Gabriel is a unique scientist who has a vast knowledge of issues in biology, physics, and computer science, which gives him a unique background for doing front-line research in complex systems. I became fascinated with the most recent work of Gabriel on birdsongs that is an example of how breathtaking work he does. He first introduced a model of the bird vocal organ based on two simple variables; the driving bronchial pressure and the tension of the syrinx labia. This model is considered in the field a perfect example of good fundamental physics put to work to solve a complex biological question. His vocal organ' model already represented an important breakthrough; nevertheless, Gabriel pursued an even more ambitious task, which is how to produce a whole birdsong by giving the vocal organ model a relatively simple instruction. In this work he showed under which conditions an even simplified

neural nonlinear circuitry can produce very robust attractors that can be triggered on and off by moving a single parameter. This is a clear example of complexity arising from simplicity thanks to the nonlinearity in the dynamics. Gabriel discovered the link between these abstract concepts from the physics of nonlinear dynamical systems and apply it to solve this fascinating biological problem. This elegant connection is an example of the class of unique contributions that Gabriel is able to make to biology nowadays. No doubt this work will be classic for years to come.

Besides his exceptional professional achievements, Gabriel is an extremely charming and easygoing colleague to have around. His unending energy powers him with a contagious smile even under stressful boundary conditions. Gabriel is a gentle, warmth and caring person, with a special ability to listen patiently colleagues and students as well, a personal facet that have made him very popular among his colleagues. His lectures and conferences are outstanding and always source of discussions and inspiration to everybody. It is always a pleasure to argue with him, -it seems like people perceives somehow having in front a sharp, fun, and creative gentleman-.

In sum, I believe that Gabriel, because of his extremely creative thinking, and his never-ending energy belongs to a very select group of scientists who has the capacity of producing the truly spectacular!

With best regards

A handwritten signature in black ink, appearing to be 'D. Chialvo', written in a cursive style with a horizontal line crossing through the middle of the letters.

Prof. Dante R. Chialvo