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Courant Institute of Mathematical Sciences
New York University
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Academic Search Committee:

It is with great enthusiasm that I am applying for appointment as Courant Instructor in the Courant Institute of Mathematical Sciences at New York University. I am currently jointly appointed as an Adjunct Associate Professor in the Department of Mathematics and Computer Science at St.John's University and the Department of Physics and Astronomy at Hunter College. I am writing a book entitled *Treatise on Political Stability and Inflexibility*, which applies the apparati of vector calculus and statistical mechanics to the field of politics. Towards this end, I am presently writing a conference paper entitled "Dependence Structure of Hyperball Distribution," which will be published at the 2020 International Conference of Applied and Engineering Mathematics. I am applying for this particular position, because of New York University's superb academics (#29 in National Universities[1]). I want to make the switch to a highly ranked school because I have found that the more motivated my students are the more I am inspired to be the absolute best professor that I can be.

My book, *Treatise on Political Stability and Inflexibility*, examines several terms in the philosophy of political thought using the apparati of statistical mechanics and vector calculus. I have specifically examined the overarching terms of *stability* and *inflexibility*, as well as other terms such as *coherence*, *interference*, and *moment*. Whereas the great philosophers of political thought including Plato, Aristotle, Aquinas, Locke, Hobbes, and Montesquieu use an inductive empirical approach; in my papers *Dependence Structure of Hyperball Distribution* and *Dependence Structure of Dirac-Hyperball Distribution* I expound the mathematical foundation for a deductive, first-principle approach. I prove that political stability depends on both the number of participating electors and the number of co-equal, independent political domains of governance. I prove that political inflexibility depends, most grossly, on the number of parties in each of the political domains and, more finely, on the proportional representation of each of these parties in each branch. I apply the theories of stability and inflexibility to a particular political system.

[1]U.S. News and World Report

I am also mentoring four students at the Brooklyn Technical High School who are working on a project entitled *Application of Density Matrices to Political Systems*, which is an empirical study that will rely heavily on undergraduate research. Currently, I am mentoring two students as a result of their participation in this research project, and I look forward to mentoring students at New York University.

I employ evidence-based and skill-building practices with the aim of improving student learning. Some examples include using female role models, creating student portfolios, and utilizing a *practica*. I chose to attend a National Science Foundation workshop offered by the Minority Science and Engineering Improvement Program that focused on implicit bias in science, engineering, technology, and mathematics education. I learned that studies show that both (i) seeing images of female scientists and (ii) learning about them, safeguard women's math test performance to a large extent; as well as safeguard men's math test performance – though to a lesser degree. Based on this knowledge, every exam that I give includes an image and a biography of a successful female mathematician). I use portfolios as both an instructional strategy and an assessment tool. Throughout the semester they are actively maintained and meaningfully integrated into my courses. They are used to inform and adjust my instructional techniques. They also provide opportunities for conversations with students so as to provide in-depth and immediate feedback, all of which helps students take ownership of their education. In the last part of my class sessions, once they grasped the primary idea, the students participate in a *practica*, where the students work on a number of varied problems in class. I have used these three techniques in my Precalculus, Calculus, and Mechanics classes over the last two semesters.

Service is an important component of being a good academic citizen. Towards this end, I will continue to act as a judge at the New York City Science Fair, which I have done for two years. I also look forward to contribute to the important work done by the department's committees. Finally, I'd like to emphasize how essential I believe academic advisement to be and that I will provide this to your students.

I can serve the students of New York University because their enthusiasm for learning inspires my enthusiasm for teaching. I am an ideal candidate and I look forward to hearing from the committee reviewing my application.

Sincerely,

Michael Y. Levy, Ph.D.

encl: curriculum vitae, teaching statement