

Sample Academic Cover Letter #2 STEM

DO NOT PLAGIARIZE THESE EXAMPLES! USE OWN WORDS

UNIVERSITY OF CALIFORNIA, SANTA BARBARA

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SANTA BARBARA • SANTA CRUZ

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December 00, 0000

Chair Name
School Department, School
Address
Address

Dear Search Committee Chair,

I am writing to apply for the advertised Postdoctoral Fellowship position at the Initiative for the Theoretical Sciences at Columbia (Job ID: 0000). I was informed about this position by my former PhD advisor, Prof. Martin Schwartz. I will be completing my PhD in Physics in June 20XX from the University of California, Santa Barbara (UCSB), where I research morphogenesis and pattern formation in biology. With a background in statistical and biological physics, I am pursuing a research career in biological physics. In addition to interacting with resident and visiting faculty, the advertised position provides valuable teaching opportunities which are crucial to my future plans for an academic career.

For my dissertation research, I study morphogenesis which is an instance of collective behavior: regulating their molecular activities, cells collectively tune tissue-level forces and mechanical properties which in turn control the shape formation. At the macroscopic level, biological tissues are often considered as "complex fluids" with various mechanical properties (fluidity and stiffness). I collaborated with 3 other researchers to develop a novel *in vivo* technique for measuring the mechanical properties of tissues in live embryos using laser ablation and micro-drops. I modeled theoretically and computationally the dynamics of cell membrane upon disruption and drop deformations, which were used as actuators inside the tissues. Building on the results provided by that technique, I explore the collective effect of the individual cellular forces on the tissue-level mechanical properties. My research has helped to develop insights into the field of developmental biology, which I plan to evolve to help answer important questions related to diseases at early developmental stages as well as cancer.

I have submitted my dissertation research to the *Journal of XXX*, and plan to submit another article in a few months as well. My publication record of two articles and presenting at over five international conferences speaks to my involvement in the larger scientific community. My future research plans would build on my current research, and accounting for the coupling between dynamics of cell membrane to explore various aspects and dimensions of morphogenesis and pattern formation. Theoretically modeling the cellular forces and activities at the collective level could impact the field in a new way.

State the larger impact of your research. The "so what" of what you are working on

Include a statement that highlights your current research plans

Include outcomes, numbers, and/or comments to further exemplify your teaching abilities

My graduate education has also included a strong teaching load, where I have been both a graduate and undergraduate teaching assistant which has fueled my passion and interest in teaching. For three years during my PhD, I taught subjects ranging from introduction to physics to theoretical quantum physics to graduate-level non-equilibrium statistical physics courses. I have taught classes with as few as 7 and as many as 40 students, and have received minimum average ratings of 4/5. Throughout my teaching experiences, my focus has been on building and delivering concepts through clear but simple examples, then build from there. I believe more sophisticated cases can be worked out individually when the concepts are clear. This approach has been well received by students, who have remarked that my classes made them “understand physics in a new way” and “helped them have an interest in the physics” that they didn’t have. I believe my strong teaching background and success as an instructor make me effective in teaching a range of physics courses and mentoring students.

I intend to continue my research in the areas of morphogenesis and collective behavior in biological systems, and believe this research would align well with three other faculty at Columbia who have interests as well in the intersection between biological systems and physics. I foresee several opportunities for collaboration through exploring the interplay between morphogenesis and several cellular processes, including cell migration, and cell stress transmission, intersections done at the Columbia Initiative for the Theoretical Sciences program. Additionally, I know that Columbia values effective course curriculum development and I believe my teaching background would fit well with the need for theoretical physics courses in the department.

With a diverse group of visiting and resident faculty, great potential for collaborations, a considerable level of independence, and the opportunity to teach, the Initiative for the Theoretical Sciences at Columbia is a very attractive environment for me to pursue my academic career. I am confident that with my background in interdisciplinary research I can contribute positively to the Initiative for the Theoretical Sciences community, and initiate collaborations between scholars in different subfields in soft matter and biological physics.

Thank you for reviewing my application, and look forward to hearing back from you.

Sincerely,

Peter Amir, PhD candidate

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University of California, Santa Barbara
Santa Barbara, CA 93106-5070
email
phone

In order to tailor your letter, have a core letter with a paragraph at the end that shows how you fit the position