

February 22, 2023

Rada Brooks
Leslie Van Houten
Co Vice Presidents, University Relations
ARCS Foundation, Northern California Chapter
P. O. Box 29405
San Francisco, CA 94129

Dear Ms. Brooks and Ms. Van Houten:

I am delighted to share with the ARCS Foundation leadership this endorsement of the Department of Applied Mathematics at the Baskin School of Engineering. Generous ARCS Foundation support has helped numerous talented and dedicated Baskin Engineering doctoral students advance their professional goals as engineering researchers and professionals, and I am certain that expanding program eligibility to PhD students in Applied Mathematics will contribute to the ARCS Foundation's mission to advance science and technology in the United States.

Baskin Engineering is unique in offering both free-standing departments of Applied Mathematics and Statistics, the latter of which has recently been designated as eligible for ARCS Foundation support. I am immensely proud of our Applied Mathematics faculty. In the past five years since the establishment of the department, they have designed and launched popular and growing MS and undergraduate degree programs, and their grant activity (close to \$1M in research funding per year) and PhD mentorship have remained strong. And I was pleased to see that approximately half of the Master's students in Applied Mathematics go on to PhD programs, often our own program in Baskin Engineering. Given that our MS programs tend to have a relatively higher percentage of US citizens, this trend bodes well for increasing the number of Applied Mathematics PhD students eligible for ARCS Foundation fellowships.

Extraordinary research synergies are made possible by embedding applied mathematics within a school of engineering – synergies that would be more difficult to establish in a traditional university structure in which the applied mathematicians are grouped with the pure mathematicians, typically in another school or division. A recent example of interdisciplinary research is a DARPA-funded project that pairs an applied mathematics faculty member, Prof. Marcella Gomez, and her doctoral students with two professors from Electrical and Computer Engineering to design a medical device that aims to constantly monitor complex changes in recovering patients and, by way of a machine learning algorithm, suggest or even administer treatment. The opportunity for applied mathematics PhD students to quite literally *apply* their research expertise in ways such as this presents a remarkable opportunity for them to participate in leading-edge research that will prepare them for successful careers in a broad range of academic and industry settings.

Our PhD graduates face a diversity of opportunities upon graduation. For a relatively small (but growing) department, Applied Mathematics is remarkably broad. Of the twenty-two official working groups in the Society for Industrial and Applied Mathematics (SIAM), Applied Mathematics covers nine in depth, including Computational Science and Engineering, Control and Systems theory, Dynamical Systems, Geosciences, Life Sciences, Nonlinear Waves and Coherent Structures, Optimization, Supercomputing, and Uncertainty Quantification. This breadth of coverage presents doctoral students with options to both broaden and deepen their research expertise. And with anticipated further growth (three new hires next year alone) the department sees itself providing an even richer environment for doctoral education and greater visibility for the department.

With the success and growth of our newer MS in Scientific Computing and BS in Applied Mathematics, over time it will likely be necessary to increase the size of the faculty, and thus the number of enrolled PhD students. This growth has been anticipated, and the department has successfully stepped up its strategies for recruiting top graduate students. Indeed, it now routinely receives applications from top institutions such as Caltech, Brown, UCLA, and many others.

Current PhD students and recent graduates from our applied mathematics doctoral program have a wide variety of research opportunities. As an example, faculty member Prof. Dongwook Lee recently received a \$1.1 million grant from the U.S. Department of Energy to fund his research on improving computer models for safety mechanisms within particle accelerators. Recent related work, supported by seed funding from Argonne National Lab, has been carried out in collaboration with a former PhD student. Recent placements of applied mathematics PhD graduates include engineering posts at leading companies such as Google and Qualcomm, postdoctoral research positions at Argonne National Laboratories, NASA, and Johns Hopkins Applied Lab, and academic posts at CU Boulder, UC Merced, and the Naval Postgraduate School in Monterey, CA.

In closing, I will mention our Associate Dean for Diversity, Equity, and Inclusion, Applied Mathematics professor Marcella Gomez. In addition to her work running a highly interdisciplinary research lab, she is leading school-wide efforts to create a culture of mentorship, with a strong emphasis on PhD students from historically marginalized groups. This work recognizes that to achieve excellence we must recruit, train, and graduate students with maximal potential and with the broadest of representation. The ARCS Foundation commitment to DEI mirrors an ethos that is deep-rooted in Baskin Engineering, where we strive to contribute to a highly skilled, diverse workforce reflecting the vibrant diversity of California. Through Marcella's leadership, and the expansion of ARCS Foundation support for Baskin Engineering to include doctoral students from Applied Mathematics, I see an exciting and promising opportunity for the Foundation, and for us as a school to advance some of our most important and ambitious shared goals.

Sincerely,



Alexander L. Wolf, Dean