

## **Yubo Su Personal Statement**

As an aspiring theoretical astrophysics professor, my goals consist of developing both a strong grasp of pertinent numerical and analytical techniques and a broad understanding of all science that can be observed in astrophysical systems. Having this extra understanding will allow me to contribute to various fields using the natural laboratories that astronomical objects supply, probing physics inaccessible to traditional experiment. To this end, the NDSEG fellowship along with its associated benefits are a great fit for my goals, and I would look forward to contributing to the NDSEG community and the scientific community at large.

My immediate priority in becoming a professor is to seek highly versatile, interdisciplinary research to best prepare myself for future work. Such research will build up a core skillset that can be applied to various fields. My proposed research, numerical studies of nonlinear wave breaking in white dwarfs, is an example of such research that combines high energy physics, fluid dynamics and numerics. A second core component of building a transferrable skillset is collaborating with scientists with diverse areas of expertise. The NDSEG practicum will be a great opportunity both to meet research leaders in relevant but different fields and to work alongside fellow growing scientists.

Ultimately, I seek to become a research professor developing simple, tractable models of behaviors in astrophysical systems as probes of conditions beyond man-made laboratories. I believe such models are invaluable for turning astronomical observations into constraints useful for other fields of study. My proposed work accomplishes this by turning observed white dwarf luminosity and orbital parameters into constraints on the behavior of matter under extreme conditions. My preference for simpler models is rooted in my excitement to teach; intuitive models are more pedagogically suitable. Many of my best-taught classes were transformative experiences for me, and I hope as part of my job to instill the same clarity as did my professors.

My academic career to date has revolved around my goal of becoming an interdisciplinary research and teaching faculty member developing simplified models of intractable behavior. At Caltech, I pursued a double major and a broad courseload that prepared me to apply many skills flexibly in my research. I then worked for a year at a software startup, where I brought in many of my problem solving skills from my physics background, and am now bringing industry best practice to my research efforts at Cornell. I will therefore be well prepared to bilaterally share knowledge between a DoD practicum and Cornell research groups. Now, I have begun research with the versatile Professor Dong Lai whose research centers on the same principle of distilling intractable problems into intuitive, simplified models. My present track lines up well with my desired goals, and I am primed to both contribute to and learn from an NDSEG fellowship.