ERIC VAN CLEPPER
RATIONAL FOR CARNEGIE INSTITUTION
PROPOSED MENTOR: CONEL ALEXANDER

I aim to work primarily with Dr. Conel M. O'D. Alexander in the Earth & Planets Laboratory at the Carnegie Institution. Conel is an expert in meteorite compositions and the constraints they set for the evolution of the Solar Nebula. Throughout my research, I have gained an expertise in modelling mixing across substructures in protoplanetary disks, including mixing between meteorite NC and CC reservoirs across the gap opened by Jupiter. Dr. Conel Alexander's work in understanding and interpreting the compositions of different chondritic components is a necessary counterpart to placing my theoretical work in a Solar System context. A current open question in cosmochemical and astrochemical is the degree of mixing that should be expected across giant planet induced gaps, and the two-pronged approach of meteoritic and theoretical constraints possible by a collaboration between Dr. Alexander and my work will address this question.

In addition to my work with Dr. Alexander, the Earth & Planets Laboratory is home to many researchers with expertise in both solar system and exoplanet science, which will lead to many fruitful collaborations. Among the many researchers studying the Solar System, George Cody, Dionysis Foustoukos, and Robert Hazen will provide valuable expertise in connecting my PPD models with constraints from the interiors and mineralogy of Solar System bodies. Additionally, exoplanet scientists including Peter Gao, Johanna Teske, and Alycia Weinberger will be important resources for connecting my disk evolution models with the exoplanet population demographics.

The main resource required for my research is access to computational resources necessary for my simulations. As a fellow at Carnegie Science I will have access to computing resources through the Caltech HPC cluster. Using this resource, I will have access to both CPU and GPU resources in addition to ample storage space necessary for my proposed research.

Finally, working as a 51 Pegasi b fellow at the Earth & Planets Laboratory in Washington, D.C. will provide many opportunities to further my work in STEM education. The Carnegie Academy for Science Education (CASE), for example, not only will allow me to work directly with students around the D.C. area, but also the opportunity to work with educators to improve STEM education long-term. Washington, D.C. is home to many currently underrepresented groups in astronomy and STEM in general and I look forward to working with members of these communities to help make planetary science a more welcoming and diverse field.

Carnegie Science is an ideal fit for me, both scientifically and professionally. I look forward to the opportunity to not only connecting my theoretical work with meteoritic data, but to also expand my knowledge in planetary interiors and atmospheres in addition to origins of life sciences. I have no doubt that I will be able to excel in my career as a 51 Pegasi b fellow here.