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To the Intensity Frontier Fellowship Committee:

I am writing to apply for renewal of my Intensity Frontier Fellowship for one additional year. I have served as Physics co-Coordinator of DUNE since September 2021. In this role I am responsible for coordinating the physics analysis efforts of the collaboration, including development of simulation and reconstruction tools and analysis of prototype data. Another important responsibility is crafting and coordinating the physics messaging of DUNE in the broader particle physics community. I am also part of the DUNE senior management team, which plans the activities of the collaboration, and serve ex-officio on the Executive Board, Publications Board, and Speakers Committee.

The past year featured two huge milestones for DUNE in the DOE CD1-RR review and the Snowmass process. A critical component of CD1-RR was demonstrating the physics capability of DUNE Phase I, and in particular the Phase I ND and its threshold scope. I led a dedicated effort to produce a note describing this physics, which was shared with the review committee prior to the review. I also gave an hourlong seminar-style talk on the DUNE oscillation measurement strategy to the physicists on the review committee a week before the review, which was specifically noted as being very helpful in the final report. I was also significantly involved in ensuring a strong endorsement of DUNE at Snowmass. I was the main author of the DUNE collaboration whitepaper, and gave the main DUNE presentations at both the Neutrino Frontier workshop and the Community Summer Study meeting in Seattle. Both CD1-RR and Snowmass were very successful for DUNE, and put us in a strong position leading into this year's P5 process.

In addition to the important reviews, DUNE has published six journal articles that were prepared within the Physics organization. Analysis of ProtoDUNE-SP data is in full swing, with ten additional analyses nearing completion and likely to produce papers in the coming year. The simulation and reconstruction of the Vertical Drift FD module has been developed in the past year, and I was involved in writing the Physics chapter of the corresponding TDR. Significant progress has been made on simulations in the Near Detector, with plans in place for a major update to the flagship DUNE oscillation sensitivity analysis. This has also been a year of transition for the collaboration, which just completed its second spokesperson election in 10 months. I have played an important role in organizing collaboration meetings and workshops during this period.

In the next year, my main focus will be to oversee the publication of ProtoDUNE-SP results, and prepare to take additional physics data with ProtoDUNE-HD, VD, and the 2x2 Near Detector prototype. We are in the process of restructuring the physics organization to facilitate all of this work. We will also be reviewing and publishing the Vertical Drift TDR, and preparing the physics analysis for long-baseline oscillations, low-energy physics, and BSM searches for the CD-2 reviews starting in 2024. We will also be supporting the ongoing P5 process. I am applying for support of 50% of my academic salary and fringe benefits, corresponding to 4.5 months of effort over the period from January 1 to December 31, 2023. This support would buy out my teaching responsibility for the Spring 2023 semester, allowing me to spend at least 75% of my effort on DUNE and fulfill my important role as DUNE Physics Coordinator in this important period as we prepare for critical reviews.

Sincerely,



Chris Marshall