WHITTIER
1887
COLLEGE

26 June 2023
National Science Foundation CAREER Program
2415 Eisenhower Ave
Alexandria, VA 22314

Dear Program Representative:

I write this Department Letter as part of Dr. Jordan Hanson's application for the National Science Foundation CAREER Award on behalf of the Department of Physics and Astronomy at Whittier College. Whittier College is a Hispanic Serving Institution that prides itself on its diverse body of student population. Indeed, diversity is a foundational core value of Whittier College and the Department of Physics and Astronomy, and as such, we are committed to inclusivity in all fields of study, including the STEM fields. We are aware of the traditional barriers that the minority students face in entering the STEM fields and always work towards eliminating those barriers.

Dr. Hanson is proposing a well-thought-out and innovative CAREER plan that will not only provide a boost to the field of phased-array antenna technologies but also offer research and educational opportunities to our diverse undergraduate students. As of the date of this letter, Dr. Hanson is a tenure-track faculty member in our department and hence eligible for the NSF CAREER program.

Dr. Hanson's research area is ultra-high energy neutrino physics which he pursues in part as a member of the IceCube (Gen2) Collaboration. IceCube-Gen2 is a 10-cubic-kilometer natural ice-based neutrino detector located at the South Pole. Through Dr. Hanson's affiliation and work with this observatory, Whittier College has become a member institution. Recently, he has co-authored two articles in this area: one in the prestigious journal *Physical Review D* (with a Whittier College student as co-author) and the other in the *Journal of Glaciology.* In addition, Dr. Hanson is also involved in an engineering collaboration with the US Navy through the Office of Naval Research (ONR) on radar and RF component design. He has published a single-author article in this area recently in the journal *Electronics,* which, impressively, won Top 10 Most Notable Journal Articles in that journal for six months and secured an invited talk in a conference at MIT. His collaboration with the US Navy is poised to be very beneficial to our students and the College. To that end, Dr. Hanson facilitated a long-term partnership agreement (Educational Partnership Agreement) between Whittier College and a US Navy laboratory called the NSWC Corona Division in Corona, CA.

In his NSF CAREER plan, Dr. Hanson is proposing to create the first open-source computational electromagnetics (CEM) software and additive manufacturing integrated system that will be capable of 3D-printing phased arrays with conductive filament. His recent work has

demonstrated that open-source CEM tools can be successfully used in the RF phased-array design process. As he has done in his previous research efforts, Dr. Hanson will involve our undergraduate students in every stage of this project and integrate it into our curriculum in the form of offering lectures on the subject matter. Furthermore, Dr. Hanson is also proposing to create a bilingual (Spanish and English) mobile application that will introduce STEM concepts to students and a series of bilingual lectures to be delivered to the broader community.

These proposed research and educational plans and activities by Dr. Hanson align well with our institutional and departmental mission, and we believe that they will advance our inclusive research and educational goals. Therefore, we fully support this proposal of his professional development.

All faculty members, including the tenure-track faculty, at Whittier College are expected to be committed to teaching excellence and top-quality research and scholarship. Therefore, being a tenure-track faculty member at Whittier, Dr. Hanson is not just recommended, but rather, expected to enact a successful research project that will involve undergraduate students and be eventually integrated into our curriculum to benefit our larger student body. I verify that his CAREER proposal resonates well with these responsibilities and his own career goal of being a professor at a diverse liberal arts institution like Whittier College.

Our department is fully committed to mentoring of Dr. Hanson throughout and beyond this project. We, as a department, will make sure that he integrates his educational responsibilities with his research efforts. The way in which we will do that is as follows (which are already integrated into our departmental responsibilities towards our probationary faculty members by our College): we will routinely

(a) Work with him to resolve any resource issues.
(b) Communicate with him about his progress.
(c) Monitor undergraduate involvement in his research and research output.
(d) Supervise him on potential courses that he can develop based on or informed by his research.

Dr. Hanson is a highly motivated and skilled young faculty member with a demonstrated track record of excellence in teaching and research. He is well prepared to lead a rigorous and inclusive research program that will immensely benefit our students and the society at large.

Sincerely,

Serkan Zorba

Serkan Zorba, Ph.D.
Chair, Department of Physics and Astronomy
Whittier College
szorba@whittier.edu