2025 Caltech SURF B12202025 物理三 楊承勳

Before reflecting on my time at Caltech, I would like to first express my deepest gratitude to my mentor, Prof. Nai-Chang Yeh, and my co-mentor, Dr. Jen-Te Chang, for their invaluable guidance on my project during this summer. I am also grateful to NTU, Caltech, and Dr. Ouyang for their generous support throughout this journey. Looking back, my time at Caltech was not only an extraordinary research endeavor but also an immersion into a vibrant academic culture. Engaging with state-of-the-art research, adapting to a new lifestyle, and embracing the intellectual atmosphere have collectively crystallized my aspiration and fortified my resolve to pursue advanced studies abroad.

During this summer, our research focused on the topic *"Investigating Orbital Angular Momentum (OAM) Light-Induced Excitonic States in MoS_2 on Periodically Strained SiO_2 Nanoarrays via Scanning Tunneling Microscopy (STM)."* We developed both experimental procedures and theoretical computational methods to understand twisted light–matter interactions by manipulating excitons in transition metal dichalcogenides (TMDCs). Although it is annoying to have vibrational noise from nearby construction affecting STM measurements, we have to do the experiment at midnight. These endeavors yield some intriguing results where we observed the redistribution of the density of states under illumination with OAM light. There is still much to be explored, but our work offers a novel approach to controlling excitonic behavior and provides new insights into the potential of next-generation solid-state quantum simulators.

Beyond the laboratory, this summer at Caltech also provided me with the opportunity to explore life in Los Angeles and connect with talented students from around the world. We visited Santa Monica to witness the iconic scenes that inspired Grand Theft Auto, dined at The Cheesecake Factory in Pasadena, where Penny from The Big Bang Theory once "worked," and experienced the timeless cinematic magic of the Griffith Observatory, where La La Land filmed one of its most memorable sequences. One of the most unforgettable experiences was joining a tour of the Mt. Wilson Observatory, hosted by a local Christian community. Under the vast starlit sky, we not only admired the

grandeur of the cosmos but also engaged in deep conversations, discovering souls that shone brighter than the stars themselves.

As the summer sun sets on my time at Caltech, I feel deeply thankful for every moment I spent at Caltech. This experience not only broadened my academic perspective but also shaped my personal growth in ways I never expected. I would like to once again thank Prof. Nai-Chang Yeh, Jen-Te Chang, Dr. Ouyang, and the teams at NTU and Caltech. Most of all, I am grateful for the friendships and shared experiences that made this summer so memorable. These lessons and memories give me the confidence to keep learning and the drive to embrace whatever comes next with genuine passion and gratitude.