



Sheikh Rubaiat Ul Haque

Postdoctoral Scholar, Photon Science, SLAC

Bio

BIO

Rubaiat received his undergraduate degree in Applied Physics from the University of Tokyo in 2017. He then moved to the University of California San Diego where he finished his PhD in Physics under Professor Richard Averitt in 2023. During his PhD, he performed time-resolved broadband terahertz spectroscopy on excitonic insulator candidate Ta₂NiSe₅ where he demonstrated light-induced terahertz parametric amplification and photonic time crystal state mediated by phonon squeezing. He has also worked on the optical control of plasmonic modes in semiconducting metamaterials. Currently, Rubaiat is a postdoctoral scholar at Stanford University working with Professors Tony Heinz and Aaron Lindenberg on the strong-field lightwave-driven dynamics and nonlinear magnonics in low-dimensional materials. His research interests also include cavity QED and Floquet engineering of quantum materials.

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, American Physical Society (2017 - present)
- Member, Optica (2020 - present)

PROFESSIONAL EDUCATION

- PhD, University of California San Diego, Physics (2023)
- B.S., The University of Tokyo, Applied Physics (2017)

STANFORD ADVISORS

- Tony Heinz, Postdoctoral Faculty Sponsor
- Aaron Lindenberg, Postdoctoral Research Mentor

Publications

PUBLICATIONS

- **Terahertz parametric amplification as a reporter of exciton condensate dynamics.** *Nature materials*
Haque, S. R., Michael, M. H., Zhu, J., Zhang, Y., Windgätter, L., Latini, S., Wakefield, J. P., Zhang, G. F., Zhang, J., Rubio, A., Checkelsky, J. G., Demler, E., Averitt, et al
2024
- **Photonic time-crystalline behaviour mediated by phonon squeezing in Ta₂NiSe₅** *Nature Communications*
Michael, M. H., Haque, S., et al
2024; 15
- **Generalized Fresnel-Floquet equations for driven quantum materials** *PHYSICAL REVIEW B*
Michael, M. H., Foerst, M., Nicoletti, D., Ul Haque, S., Zhang, Y., Cavalleri, A., Averitt, R. D., Podolsky, D., Demler, E.
2022; 105 (17)

- **Broadband Terahertz Silicon Membrane Metasurface Absorber** *ACS PHOTONICS*
Huang, Y., Kaj, K., Chen, C., Yang, Z., UI Haque, S., Zhang, Y., Zhao, X., Averitt, R. D., Zhang, X.
2022; 9 (4): 1150-1156
- **Structural tuning of nonlinear terahertz metamaterials using broadside coupled split ring resonators** *AIP ADVANCES*
Keiser, G. R., Karl, N., UI Haque, S., Brener, I., Mittleman, D. M., Averitt, R. D.
2021; 11 (9)
- **On-chip terahertz modulation and emission with integrated graphene junctions** *APPLIED PHYSICS LETTERS*
Island, J. O., Kissin, P., Schalch, J., Cui, X., UI Haque, S., Potts, A., Taniguchi, T., Watanabe, K., Averitt, R. D., Young, A. F.
2020; 116 (16)