Chiu Fan Bowen (Leo) Lo

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Education

Columbia University, class of 2022 *New York, New York*

- Double Major in Physics and Mathematics; GPA: 3.99/4.00
- on Dean's List every semester (except Spring 2020 in which Pass/Fail is mandated)

Research Experiences

Topological Obstruction research internship, virtual *May 2021-Present*

Advisor: Yi Li

- Generalized a topologically obstructed superconducting order from a $\mathbb{Z}_2$ to a $\mathbb{Z}_4$ invariant.
- Investigated hosting Majorana bound state using magnetic skyrmion textures.

Topological Superconductivity research internship, virtual *May 2020-August 2021*

Advisor: Hoi Chun (Adrian) Po, Andriy Nevidomskyy

- Constructed Dirac superconductor model inheriting topologically protected node from the normal-state.

Basov Infrared Laboratory research internship, Columbia University *August 2018- June 2021*

Advisor: Alex McCleod, Dmitri Basov

- Investigated Cooper-pair polaritons and plasmons hybridization in cuprates/graphene heterostructures.
- Analyzed strain field of moiré domains in $WSe_2/MoSe_2$ heterostructure.
- Modeled near-field optical contrasts of few layers WTe_2 and VO_2 metallic domain.

Liu Ultrafast & Nano-spectroscopy group, Stony Brook University *June 2016-2018*

Advisor: Mengkun Liu

- Developed a simulation platform for the scattering-type scanning near-field optical microscopy.

Selected Publications

C. Lo, H. Po, A. Nevidomskyy. "Inherited topological superconductivity in two-dimensional Dirac semimetals". *Physical Review B* ***105***, 104501 (2022).

R. Jing, Y. Shao, Z. Fei, **C. Lo**, R. Vitalone, F. Ruta, J. Staunton, W. Zheng, A. Mcleod, Z. Sun, B. Jiang, X. Chen, M. Fogler, A. Millis, M. Liu, D. Cobden, X. Xu, D. Basov. "Terahertz response of monolayer and few-layer WTe_2 at the nanoscale". *Nature Communications* **12**, 5594 (2021).

G. Ni, A. McLeod, Z. Sun, J. Matson, **C. Lo**, D. Rhodes, F. Ruta, S. Moore, R. Vitalone, R. Cusco, L. Artús, L. Xiong, C. Dean, J. Hone, A. Millis, M. Fogler, J. Edgar, J. Caldwell and D. Basov. "Long-lived phonon polaritons in hyperbolic materials". Nano Letters **21**, 5767 (2021).

M. Berkowitz, B. Kim, G. Ni, A. McLeod, **C. Lo**, Z. Sun, G. Gu, K. Watanabe, T. Taniguchi, A. Millis, J. Hone, M. Fogler, R. Averitt and D. Basov. "Hyperbolic cooper-pair polaritons in planar graphene/cuprate plasmonic cavities". *Nano Letters* **21**, 308, (2020).

Y. Bai, L. Zhou, J. Wang, W. Wu, L. McGilly, D. Halbertal, **C. Lo**, F. Liu, J. Ardelean, P. Rivera, N. Finney, X. Yang, D. Basov, W. Yao, X. Xu, J. Hone, A. Pasupathy and X. Zhu. "Excitons in strain-induced one-dimensional moiré potentials at transition metal dichalcogenide heterojunctions". *Nature Materials* **19**, 1068, (2020).

X. Chen, **C. Lo**, W. Zheng, H. Hu, Q. Dai and M. Liu. "Rigorous numerical modeling of scattering-type scanning near-field optical microscopy and spectroscopy". *Applied Physics Letters* **111**, 223110, (2017).

Awards

Goldwater Scholar *2021*
Awarded for science research achievements in undergraduate

Columbia University Rabi Scholar *2018-present*
Awarded to a cohort of ~10 upon admission for science research achievements

Regeneron Science Talent Search Finalist *2018*
Top 40 nationwide among research projects across all fields of sciences

Intel International Science and Engineering Fair (ISEF) 3rd place Grand Award *2018*
In the *Physics Category; out of ~90 projects qualified for the international level*

National Merit Scholarship Winner *2018*
Winners are the top 0.1% of about 1.6 million students who entered the 2018 National Merit Program

USA Physics Olympiad Gold Medal *2017*
Top ~40 nationwide

Teaching Experience and Outreach

Electricity & Magnetism (Physics UN3007), *teaching assistant* *fall 2020 and fall 2021*
- An upper-level physics course on electromagnetic theory; ~60 students
- Graded problem sets and prepared solutions.

EM Waves & Optics (Physics UN3008)), *teaching assistant* *spring 2021 and spring 2022*
- A 2nd semester continuation of upper-level physics course on electromagnetic theory; ~60 students
- Graded problem sets, prepared solutions, and held recitations/office hours.

Proof Writing Workshop, *teaching assistant* *fall 2020 and fall 2021*
- Taught basic proof writing skills to undergraduates taking their first proof-based math course. We prepare lecture notes and hold weekly practice sessions for the first 5 weeks of the semester.

iResearch Institute, *research mentor* *summer 2020 & summer 2021*
- Mentored high school students through a 5-week intensive research program virtually

The Reading Team, *math teacher* *spring 2020*
- Taught pre-schoolers in Harlem math through games

World Science Festival, *panelist* *summer 2018*
- Appeared as a panelist for “Science Fair: Changing the World, One Foam Core Boar at a Time” Event

Skills

Software: Mathematica, MATLAB, CST Studio Suite

Programming Language: Python (libraries: NumPy, SciPy, SymPy, Bokeh), Java