

## Monica T. Allen

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**Research Interests:** Scanning probe microscopy in the GHz regime, topological states of matter, 2D materials and van der Waals heterostructures, quantum phenomena in mesoscopic devices.

### **Education and Training**

Ph.D. in Physics, 2016  
Harvard University, Cambridge, MA, United States

B.A. in Physics, 2009  
Harvard University, Cambridge, MA, United States

### **Academic and Professional Appointments**

Current position:  
Assistant Professor, Department of Physics  
University of California, San Diego, La Jolla, CA, United States

6/2016 – 3/2019  
Urbanek Postdoctoral Fellow, Applied Physics  
Stanford University, Stanford, CA, United States

### **Honors and Awards**

2023, National Science Foundation CAREER award  
2020, Theodore D. Foster Endowed Chair in Physics, UC San Diego  
2019, AFOSR Young Investigator Award  
2016, Karel Urbanek Postdoctoral Fellow, Stanford University  
2010, Office of Science Graduate Fellow (DOE SCGF), awarded by the U. S. Department of Energy  
2010, David J. Robbins Prize, Harvard University  
2009, Purcell Fellow, Harvard University  
2007, Princeton Center for Complex Materials Summer Research Fellow, Princeton University  
2006, Harvard Program for Research in Science and Engineering Fellow

### **Selected Publications and Preprints**

Q. Zhang, T. Senaha, R. Zhang, C. Wu, L. Lyu, L. W. Cao, J. Tresback, A. Dai, K. Watanabe, T. Taniguchi, and M. T. Allen. Dynamic twisting and imaging of moiré crystals. arXiv:2307.06997 (2023).

T. Wang, C. Wu, M. Mogi, M. Kawamura, Y. Tokura, Z.-X. Shen, Y.-Z. You, and M. T. Allen. Probing the edge states of Chern insulators using microwave impedance microscopy. arXiv:2304.09227 (2023).

L. W. Cao, C. Wu, R. Bhattacharyya, R. Zhang, and M. T. Allen. MilliKelvin microwave impedance microscopy in a dry dilution refrigerator. *Review of Scientific Instruments* **94**, 093705 (2023).

R. S. Bisht, J. Park, H. Yu, C. Wu, N. Tilak, S. Rangan, T. J. Park, Y. Yuan, S. Das, U. Goteti, H. T. Yi, H. Hijazi, A. Al-Mahboob, J. Sadawski, H. Zhou, S. Oh, E. Andrei, M. T. Allen, D. Kuzum, A. Frano, R. Dynes, S. Ramanathan. Non-local interactions in hydrogenated perovskite nickelate synaptic networks, *Nano Letters* **23**, 7166-7173 (2023).

M. T. Allen, Y.-T. Cui, E. Y. Ma, M. Mogi, M. Kawamura, I. C. Fulga, D. Goldhaber-Gordon, Y. Tokura, Z.-X. Shen. Visualization of an axion insulating state at the transition between two chiral quantum anomalous Hall states. *Proceedings of the National Academy of Sciences*, **116** (29), 14511-14515 (2019).

M. T. Allen, O. Shtanko, I. C. Fulga, J. Wang, D. Nurgaliev, K. Watanabe, T. Taniguchi, A. R. Akhmerov, P. Jarillo-Herrero, L. S. Levitov, and A. Yacoby. Observation of electron coherence and Fabry-Perot standing waves at a graphene edge. *Nano Letters*, **17**, 7380-7386 (2017).

M. T. Allen, O. Shtanko, I. C. Fulga, A. R. Akhmerov, K. Watanabe, T. Taniguchi, P. Jarillo-Herrero, L. S. Levitov, and A. Yacoby. Spatially resolved edge currents and guided-wave electronic states in graphene. *Nature Physics*, **12**, 128-133 (2016).

M. T. Allen, J. Martin, A. Yacoby. Gate-defined quantum confinement in suspended bilayer graphene. *Nature Communications* 3:934 (2012).

R. T. Weitz, M. T. Allen, B. E. Feldman, J. Martin, and A. Yacoby. Broken-symmetry states in double gated suspended bilayer graphene. *Science* **330**, 812-816 (2010).

J. Martin, B. E. Feldman, R. T. Weitz, M. T. Allen, and A. Yacoby. Local Compressibility Measurements of Correlated States in Suspended Bilayer Graphene. *Physical Review Letters* **105**, 256806 (2010).

### Selected Invited Talks

- Invited talk at the **Simons Ultra Quantum Matter Meeting, Harvard University** (9/2023)
- **Laboratory of Physical Sciences: Seminar** (8/2023)
- Invited talk at the **ARO/LPS Quantum Computing Program Review** (8/2023)
- **Lancaster University, UK: Special Condensed Matter Seminar** (7/2023)
- **Oxford University, UK: Special Condensed Matter Seminar** (6/2023)
- Invited talk at the **IR/THz/Microwave Nanoscopy for Quantum Information Science Meeting** (6/2023)
- **UC Santa Barbara: Quantum Foundry Seminar** (6/2023)
- **UC Davis: Condensed Matter Seminar** (11/2022)
- Invited talk the **Materials Research Society (MRS) 2022 Spring Meeting** (5/2022)
- **Clemson University: Physics Department Colloquium** (4/2022)
- Invited talk the **Materials Research Society (MRS) 2021 Spring Meeting** (4/2021)
- **UC Berkeley: Materials Science and Engineering Seminar** (9/2020)
- Invited talk, **IEEE Research and Applications of Photonics in Defense Conference** (8/2020)
- Invited talk, **Los Alamos National Laboratory Working Group on Quantum Materials** (8/2020)
- Talk at **Enabling Quantum Leap: Braiding and Fusing Majoranas (NSF Workshop)** (7/2019)
- **University of Chicago: Invited talk at the James Franck Institute** (3/2019)
- **University of Maryland: Center for Nanophysics and Advanced Materials Seminar** (12/2018)
- **UCLA: Condensed Matter Seminar** (10/2018)
- Invited talk at the **Collective Phenomena in Driven Quantum Systems Workshop** (7/2018)
- **University of Pennsylvania: Materials Science and Engineering Seminar** (3/2018)
- **ETH Zurich: Condensed Matter Seminar** (3/2018)
- **UC Berkeley: Solid State Technology and Devices Seminar - EECS Department** (2/2018)
- **Caltech: Condensed Matter Seminar** (2/2018)
- **Cornell University: LASSP and A&EP Seminar** (2/2018)

- **Brown University:** Condensed Matter Seminar (2/2018)
- **University of Waterloo:** Invited talk at the Institute of Quantum Computing (10/2017)
- Invited talk, **Moore Foundation EPIQS Postdoctoral Symposium.** Aspen, CO (2/2017)
- **Yale University:** Condensed Matter Seminar (12/2015)
- **Princeton University:** Special Condensed Matter Seminar, Department of Physics (12/2015)
- **Cornell University:** Special KIC/LASSP Seminar at the Kavli Institute (12/2015)
- **UC Berkeley:** Invited Seminar, Department of Physics (11/2015)
- **Stanford University:** Invited Seminar, Department of Applied Physics (11/2015)

### **Professional Service**

- Manuscript Referee for *Science*, *Nature Physics*, *Nature Communications*, *Nano Letters*
- Co-organizer for 2D Materials Symposia at the Spring 2020 and Fall 2022 Materials Research Society (MRS) Meetings
- Faculty Mentor, Summer Training Academy for Research Success at UCSD (2019 – present)
- Faculty Mentor, Regents Scholars Research Initiative Program at UCSD (2019 – 2020)
- Committee Member, Faculty Search in Quantum Computing: Departments of Mathematics and Computer Science & Engineering (2019 and 2021)