

Andrea F. Young - CV

CONTACT

Department of Physics
4113 Broida Hall
University of California
Santa Barbara, CA 93106

Office: (805) 893-5465
Cell: (646) 420-6120
E-mail: andrea@physics.ucsb.edu

EDUCATION

Columbia University, New York, NY 10027

Ph.D., Physics, February 2012

Dissertation Title: Quantum transport in graphene heterostructures

Thesis advisor: Philip Kim

B.A., Physics and Mathematics, June 2006

EMPLOYMENT

University of California, Santa Barbara, Department of Physics

Professor, July 2021-Present

Associate Professor, July 2019 - July 2021

Assistant Professor, March 2015 - July 2019

Weizmann Institute of Science, Department of Condensed Matter Physics

Visiting Scientist, October 2014 - March 2015

Massachusetts Institute of Technology, Department of Physics

Pappalardo Fellow, January 2012 - December 2014

Columbia University, Department of Physics

Research Assistant, June 2007 - December 2011.

Teaching Assistant, September 2006 - May 2007.

HONORS

- Blavatnik Awards for Young Scientists Finalist, 2021.
- Young Scientist Prize, International Union of Pure and Applied Physics, 2020.
- Presidential Early Career Award for Scientists and Engineers, US DOD, 2019
- New Horizons Prize, Breakthrough Prize Foundation, 2017.
- Sloan Research Fellowship, Alfred P. Sloan Foundation, 2017.
- Packard Fellowship, David and Lucile Packard Foundation, 2016.
- William McMillan Prize, University of Illinois Department of Physics, 2016.
- Frances and Charles Townes Award, Columbia Physics Department, 2011.

SYNERGISTIC
ACTIVITIES

1. Referee for Science, Nature, Science Advances, Nature Physics, Nature Nanotechnology, Nature Communications, Scientific Reports, Physical Review Letters, Physical Review X, Physical Review B, Nanoletters, Applied Physics Letters.
2. Organizer
 - Young Research Leaders Group Workshop: Frontiers with Strongly Correlated and Topological Mesoscopic Systems, Mainz, Germany (2015)
 - Correlations in Moiré Flat Bands, Kavli Institute for Theoretical Physics, Santa Barbara, CA, January Jan. 14-21, 2019.
 - Moiré Materials: Strong Correlations in Synthetic Superlattices, Aspen Center for Physics, Aspen, CO, Jun. 16 - Jul. 7, 2019
 - Reunion workshop on Moiré Flat Bands, Kavli Institute for Theoretical Physics, Santa Barbara, CA, January Aug. 14-16, 2020.
3. DC-High B/T Users Advisory Committee Member, National High Magnetic Field Lab, 2018-2020.
4. Panelist
 - “Prospects and opportunities for parafermion and Fibonacci anyons,” Army Research Office Workshop, 19-20 August 2015.
 - “2016 Basic Research Needs for Quantum Materials for Energy Relevant Technology Workshop,” Department of Energy, 8-10 February 2016.
 - “NSF Frontiers of Condensed Matter Physics: The Quantum Revolution,” National Science Foundation, May 1-3, 2017.
 - “Exploring quantum phenomena and quantum matter in ultrahigh magnetic fields,” National Science Foundation, September 21-22, 2017.
 - “Future Directions Workshop on Topological Science,” Office of the Undersecretary of Defense, Arlington, VA, July 30-31, 2019.
5. Proposal reviewer for National High Magnetic Field Lab User Program, National Science Foundation, Department of Energy, and Army Research Office.

1. H. Polshyn, Y. Zhang, M. A. Kumar, T. Soejima, P. Ledwith, K. Watanabe, T. Taniguchi, A. Vishwanath, M. P. Zaletel, **A. F. Young**. Topological charge density waves at half-integer filling of a moiré superlattice. arXiv:2104.01178.
2. A. Jenkins, S. Baumann, H. Zhou, S. A. Meynell, D. Yang, K. Watanabe, T. Taniguchi, A. Lucas, **A. F. Young**, and A. C. Bleszynski Jayich, “Imaging the breakdown of ohmic transport in graphene.” arXiv:2002.05065.
3. H. Zhou, T. Xie, T. Taniguchi, K. Watanabe, **A. F. Young**. “Superconductivity in rhombohedral trilayer graphene.” *Nature* (2021).
4. H. Zhou, C. Huang, N. Wei, T. Taniguchi, K. Watanabe, M. P. Zaletel, Z. Papić, A. H. MacDonald, **A. F. Young**. “Strong-Magnetic-Field Magnon Transport in Monolayer Graphene.” arXiv:2102.01061.
5. H. Zhou[†], T. Xie[†], A. Ghazaryan, T. Holder, J. Ehrets, E. M. Spanton, T. Taniguchi, K. Watanabe, E. Berg, M. Serbyn, **A. F. Young**. Half and quarter metals in rhombohedral trilayer graphene. *Nature* (2021).
6. C. L. Tschirhart[†], M. Serlin[†], H. Polshyn, A. Shragai, Z. Xia, J. Zhu, Y. Zhang, K. Watanabe, T. Taniguchi, M. E. Huber, **A. F. Young**. “Imaging orbital ferromagnetism in a moiré Chern insulator.” *Science* **372**: 1323-1327 (2021).
7. Y. Saito[†], F. Yang[†], J. Ge, X. Liu, T. Taniguchi, K. Watanabe, J. I. A. Li, E. Berg, **A. F. Young**. Isospin Pomeranchuk effect in twisted bilayer graphene. *Nature*, **592**:220-224 (2021).
8. F. Yang, A. A. Zibrov, R. Bai, T. Taniguchi, K. Watanabe, M. P. Zaletel, and **A. F. Young**. Experimental determination of the energy per particle in partially filled Landau levels. *Phys. Rev. Lett.* **126**, 156802 (2021).
9. H. Polshyn, J. Zhu, M. A. Kumar, Y. Zhang, F. Yang, C. L. Tschirhart, M. Serlin, K. Watanabe, T. Taniguchi, A. H. MacDonald, **A. F. Young**. “Electrical switching of magnetic order in an orbital Chern insulator.” *Nature* **588**: 66-70 (2020).
10. Y. Saito, J. Ge, L. Rademaker, K. Watanabe, T. Taniguchi, D. A. Abanin, and **A. F. Young**. Hofstadter subband ferromagnetism and symmetry broken Chern insulators in twisted bilayer graphene. *Nature Physics* (2020).
11. S. Pershoguba, **A. F. Young**, and L. I. Glazman. Current distribution in a slit connecting two graphene half planes *Phys. Rev. B* **102**, 125404 (2020).
12. H. Chu, C. J. Roh, J. O. Island, C. Li, S. Lee, J. Chen, Je-Geun Park, **A. F. Young**, J.S. Lee, and D. Hsieh. “Linear magnetoelectric phase in ultrathin MnPS3 probed by optical second harmonic generation.” *Physical Review Letters* **124**, 027601 (2020).

13. Y. Saito, J. Ge, K. Watanabe, T. Taniguchi, **A. F. Young**. “Independent superconductors and correlated insulators in twisted bilayer graphene.” *Nature Physics*, **16**, 926930 (2020).
14. J. O. Island, P. Kissin, J. Schalch, X. Cui, S. R. Ul Haque, A. Potts, T. Taniguchi, K. Watanabe, R. D. Averitt, and **A. F. Young**. On-chip terahertz modulation and emission with integrated graphene junctions. *Applied Physics Letters* **116**, 161104 (2020).
15. M. Serlin[†], C. L. Tschirhart[†], H. Polshyn[†], Y. Zhang, J. Zhu, K. Watanabe, T. Taniguchi, L. Balents, and **A. F. Young**. “Intrinsic quantized anomalous Hall effect in a moiré heterostructure.” *Science*, **367**, 895-900 (2020).
16. H. Zhou, H. Polshyn, T. Taniguchi, K. Watanabe, **A. F. Young**. “Solids of quantum Hall skyrmions in graphene.” *Nature Physics* **16**, 154-158 (2020).
17. H. Polshyn[†], M. Yankowitz[†], S. Chen, Y. Zhang, K. Watanabe, T. Taniguchi, C. R. Dean, and **A. F. Young**. “Large linear-in-temperature resistivity in twisted bilayer graphene.” *Nature Physics*, **15**, 1011-1016 (2019).
18. J.O. Island, X. Cui, C. Lewandowski, J. Y. Khoo, E. M. Spanton, H. Zhou, D. Rhodes, J. C. Hone, T. Taniguchi, K. Watanabe, L. S. Levitov, M. P. Zaletel, **A. F. Young**. “Spin-orbit driven band inversion in bilayer graphene by van der Waals proximity effect.” *Nature*, **571**, 8589 (2019).
19. M. Yankowitz[†], S. Chen[†], H. Polshyn[†], K. Watanabe, T. Taniguchi, D. Graf, **A. F. Young**, C. R. Dean. “Tuning superconductivity in twisted bilayer graphene.” *Science* **363**, 1059 (2019).
20. C. Knapp, E.M. Spanton, **A. F. Young**, C. Nayak, M. P. Zaletel. “Fractional Chern insulator edges and layer-resolved lattice contacts.” *Phys. Rev. B* **99**, 081114(R) (2019).
21. A.A. Zibrov, R. Peng, C. Kometter, J.I.A. Li, C. R. Dean, T. Taniguchi, K. Watanabe, M. Serbyn, and **A. F. Young**. “Emergent Dirac gullies and gully nematic quantum Hall states in ABA trilayer graphene.” *Phys. Rev. Lett.* **121**, 167601 (2018).
22. M. Barkeshli, C. Nayak, Z. Papic, **A. F. Young**, M. Zaletel. “Topological exciton Fermi surfaces in two-component fractional quantized Hall insulators.” *Phys. Rev. Lett.* **121**, 026603 (2018).
23. A. A. Zibrov[†], E. M. Spanton[†], T. Taniguchi, K. Watanabe, **A. F. Young**. “Even-denominator fractional quantum Hall states at an SU(4) isospin phase transition in monolayer graphene” *Nature Physics* **14** 930-935 (2018).
24. E. M. Spanton[†], A. A. Zibrov[†], H. Zhou, T. Taniguchi, K. Watanabe, M. P. Zaletel, **A. F. Young**. “Observation of fractional Chern insulators in a van der Waals heterostructure.” *Science*, **360**:6384, 62-66 (2018).

25. B.M. Hunt, J.I.A. Li, A.A. Zibrov, L. Wang, T. Taniguchi, K. Watanabe, J. Hone, C. R. Dean, M. Zaletel, R.C. Ashoori, **A. F. Young**. “Direct measurement of discrete valley and orbital quantum numbers in bilayer graphene” *Nature Communications* **8**, 948 (2017).
26. A. A. Zibrov, C. R. Kometter, T. Taniguchi, K. Watanabe, M. P. Zaletel, **A. F. Young**. “Tunable interacting composite fermion phases in a half-filled bilayer graphene Landau level.” *Nature*, **549**, 360364 (2017).
27. Z. Bi, R. Zhang, Y.-Z. You, **A.F. Young**, L. Balents, C.-X. Liu, and C. Xu. “Bilayer Graphene as a platform for Bosonic Symmetry Protected Topological States.” *Phys. Rev. Lett.* **118**, 126801 (2017).
28. A. Uri, A. Y. Meltzer, Y. Anahory, L. Embon, E. O. Lachman, D. Halbertal, Naren HR, Y. Myasoedov, M. E. Huber, **A. F. Young**, E. Zeldov. “Electrically tunable multi-terminal SQUID-on-tip.” *Nano Letters* **16** (11), 69106915 (2016).
29. J. D. Sanchez-Yamagishi, J. Y. Luo, **A. F. Young**, B. Hunt, K. Watanabe, T. Taniguchi, R. C. Ashoori, P. Jarillo-Herrero. “Helical edge states and fractional quantum Hall effect in a graphene electronhole bilayer.” *Nature Nanotechnology*, **12**, 118-122 (2017).
30. Q. Ma, T. I. Andersen, Nityan L. Nair, N. M. Gabor, M. Massicotte, C. H. Lui, **A. F. Young**, Wenjing Fang, K. Watanabe, T. Taniguchi, Jing Kong, Nuh Gedik, Frank H. L. Koppens, Pablo Jarillo-Herrero. “Tuning ultrafast electron thermalization pathways in a van der Waals heterostructure.” *Nature Physics* **12**, 455459, (2016).
31. E. Lachman[†], **A. F. Young**[†], A. Richardella, J. Cuppens, Naren HR, Y. Anahory, A. Y. Meltzer, A. Kandala, S. Kempinger, Y. Myasoedov, M. E. Huber, N. Samarth and E. Zeldov. “Direct visualization of superparamagnetic dynamics in magnetic topological insulators.” *Science Advances* **1**, e1500740 (2015).
32. S.L. Tomarken, **A. F. Young**, S. W. Lee, R. G. Gordon, and R. C. Ashoori. “Torque magnetometry of an amorphous-alumina/strontium titanate interface.” *Physical Review B* **90**, 201113(R) (2014).
33. **A. F. Young**[†], J. D. Sanchez-Yamagishi[†], B. Hunt[†], S. H. Choi, K. Watanabe, T. Taniguchi, R. C. Ashoori, and P. Jarillo-Herrero, “Tunable symmetry breaking and helical edge transport in a graphene quantum spin Hall state.” *Nature* **505**, 528-532 (2014).
34. B. Hunt[†], J. D. Sanchez-Yamagishi[†], **A. F. Young**[†], M. Yankowitz, B. LeRoy, K. Watanabe, T. Taniguchi, P. Moon, M. Koshino, P. Jarillo-Herrero, and R. C. Ashoori, “Massive Dirac fermions and Hofstadter butterfly in a van der Waals heterostructure.” *Science* **340**, 1427-1430 (2013).
35. P. Maher, C.R. Dean, **A. F. Young**, T. Taniguchi, K. Watanabe, K. L. Shepard, J. Hone, and P. Kim, “Evidence for a spin phase transition at charge neutrality in bilayer graphene.” *Nature Physics* **9**, 154-158 (2013).

36. L. C. Campos, **A. F. Young**, K. Surakitbovorn, K. Watanabe, T. Taniguchi, and P. Jarillo-Herrero, “Quantum and classical confinement of resonant states in a trilayer graphene Fabry-Pérot interferometer” *Nature Comm.* **3**, 1239 (2012).
37. J. Chae, S. Jung, **A. F. Young**, C. R. Dean, L. Wang, Y. Gao, K. Watanabe, T. Taniguchi, J. Hone, K. L. Shepard, P. Kim, N. B. Zhitenev, and J. A. Stroscio, “Renormalization of the graphene dispersion velocity determined from scanning tunneling spectroscopy.” *Physical Review Letters*, **109**, 116802 (2012).
38. **A. F. Young**[†], C. R. Dean[†], L. Wang, H. Ren, P. Cadden-Zimansky, K. Watanabe, T. Taniguchi, J. Hone, K.L. Shepard, and P. Kim, “Spin and valley quantum Hall ferromagnetism in graphene.” *Nature Physics* **8**, 550–556 (2012).
39. **A. F. Young**, C. R. Dean, I. Meric, S. Sorgenfrei, H. Ren, K. Watanabe, T. Taniguchi, J. Hone, K.L. Shepard, and P. Kim, “Electronic compressibility of gapped bilayer graphene.” *Physical Review B* **85**, 235458 (2012).
40. C. R. Dean[†], **A. F. Young**[†], P. Cadden-Zimansky, L. Wang, H. Ren, K. Watanabe, T. Taniguchi, P. Kim, J. Hone, K.L. Shepard, “Multicomponent fractional quantum Hall effect in graphene.” *Nature Physics* **7**, 693-696 (2011).
41. **A. F. Young** & L. S. Levitov, “Capacitance of graphene bilayer as a probe of layer-specific properties.” *Physical Review B* **84**, 085441 (2011).
42. N. Gu, M. Rudner, **A. F. Young**, P. Kim & L. S. Levitov. “Collapse of Landau levels in gated graphene structures.” *Physical Review Letters* **106**, 066601 (2011).
43. I. Meric, C. R. Dean, **A. F. Young**, N. Baklitskaya, N. J. Tremblay, C. Nuckolls, P. Kim, and K. L. Shepard, “Channel length scaling in graphene field-effect transistors studied with pulsed current-voltage measurements.” *Nano Letters* **11**, 1093 (2011).
44. C. R. Dean, **A. F. Young**, I. Meric, C. Lee, L. Wang, S. Sorgenfrei, K. Watanabe, T. Taniguchi, P. Kim, K.L. Shepard, and J. Hone, “Boron nitride substrates for high-quality graphene electronics.” *Nature Nanotechnology* **5**, 722 (2010).
45. T. J. Zega, C. M. O’D. Alexander, H. Busemann, L. R. Nittler, P. Hoppe, R. M. Stroud, **A. F. Young**. “Mineral associations and character of isotopically anomalous organic material in the Tagish Lake carbonaceous chondrite” *Geochimica et Cosmochimica Acta* **74** 20 (2010).
46. P. Jiang, **A. F. Young**, W. Chang, P. Kim, L. W. Engel, & D. C. Tsui. “Quantum oscillations observed in graphene at microwave frequencies.” *Applied Physics Letters* **97**, 062113 (2010).
47. P. Kim, M. Y. Han, **A. F. Young**, I. Meric & K. L. Shepard. “Graphene nanoribbon devices and quantum heterojunction devices.” Electron Devices Meeting (IEDM), Baltimore, MD, 2009, pp. 1-4.
48. **A. F. Young** & Philip Kim, “Quantum interference and Klein tunnelling in graphene heterojunctions.” *Nature Physics* **5**, 222 (1 February 2009).

49. I. Meric, M. Y. Han, **A. F. Young**, P. Kim, & K. L. Sheppard, “Current saturation in zero-bandgap, top-gated graphene field-effect transistors.” *Nature Nanotechnology* **3**, 654-659 (2008).
50. **A. F. Young**, C. Sanloup, E. Gregoryanz, S. Scandolo, R. J. Hemley, and H.-K. Mao, “Synthesis of novel transition metal nitrides IrN₂ and OsN₂.” *Physical Review Letters* **96**, 155501 (2006).
51. **A. F. Young**, J. A. Montoya, C. Sanloup, M. Lazzeri, E. Gregoryanz, and S. Scandolo, “Interstitial dinitrogen makes PtN₂ an insulating hard solid”, *Physical Review B* **73**, 153102 (2006).
52. H. Busemann, **A. F. Young**, C. M. O’D. Alexander, P. Hoppe, S. Mukhopadhyay, and L. R. Nittler, “Interstellar Chemistry Recorded in Organic Matter from Primitive Meteorites.” *Science* **312**, 727 (2006).

† Equal contributions

PATENTS

1. P. Bonderson, C. Nayak, D. Reilly, A. F. Young, M. Zaletel. “Scalable designs for topological quantum computation in all van der Waals systems.” Provisional Patent application to US Patent Office. MS 408862-US-PSP / KS 8864-104928-01
2. P. Bonderson, C. Nayak, D. Reilly, A. F. Young, M. Zaletel. “Individually tunable quantum dots in all van der Waals heterostructures.” Provisional Patent application to US Patent Office. MS 408863-US-PSP / KS 8864-104938-01

REVIEWS/CHAPTERS

1. E. Y. Andrei, D. K. Efetov, P. Jarillo-Herrero, A. H. MacDonald, K. F. Mak, T. Senthil, E. Tutuc, A. Yazdani & **A. F. Young**. “The marvels of moiré materials.” *Nature Reviews Materials* (2021).
2. L. Balents, C. R. Dean, D. K. Efetov, and **A. F. Young**. Superconductivity and strong correlations in moiré flat bands *Nature Physics* **16**, 725733 (2020).
3. C. R. Dean, P. Kim, J. Li and **A. F. Young**, “Fractional Quantum Hall Effects in Graphene” in *New Developments in Fractional Quantum Hall Effect*, eds. B. Halperin & J. Jain, Singapore: World Scientific (2020).
4. **A. F. Young**, Y. Zhang, and P. Kim. “Experimental Manifestation of Berry Phase in Graphene.” In H. Aoki and M. Dresselhaus (eds.), *Physics of Graphene*, Switzerland: Springer (2014).
5. C.R. Dean, **A. F. Young** et al. “Graphene based heterostructures.” *Solid State Comm.* **152**, 1275-1282, (2012).
6. **A. F. Young** & Philip Kim, “Electronic transport in graphene heterostructures.” *Annual Reviews of Condensed Matter Physics* **2**, 101 (2011).

INVITED
RESEARCH
TALKS

1. "Towards topological qubits in graphene heterostructures." Microsoft Research, Goleta, CA. August 16, 2021.
2. "Ferromagnetism and superconductivity in rhombohedral trilayer graphene." Condensed Matter Seminar, Case Western Reserve University, August 5th, 2021.
3. "Ferromagnetism and superconductivity in rhombohedral trilayer graphene." Condensed Matter Physics in the City: Quantum Materials to Quantum Information. July 9th, 2021.
4. "Orbital magnetism in moire materials." Condensed Matter Physics in the City: Quantum Materials to Quantum Information. July 7th 2021
5. "Easy as ABC." Janet Das Sarma Memorial Conference, University of Maryland, College Park MD, June 14th, 2021.
6. "Orbital magnetism in graphene heterostructures." EPQHS, April 21st, 2021.
7. "Orbital magnetism in graphene heterostructures." Condensed Matter Seminar, Princeton University, Princeton, NJ, May 19th, 2021.
8. "Orbital magnetism in graphene heterostructures." MRS Spring meeting, April 19th, 2021.
9. "Orbital magnetism in graphene heterostructures." Physics Colloquium, Northwestern, April 2nd, 2021.
10. "Orbital magnetism in graphene heterostructures." CAMP seminar, Penn State Univeristy, March 22nd, 2021.
11. "IUPAP Young Scientist Prize talk: Orbital magnetism in graphene heterostructures." APS March Meeting, March 17th, 2021.
12. "Orbital magnetism in graphene heterostructures." CIQM seminar, Harvard Univeristy, February 17th, 2021.
13. "Orbital magnetism in graphene heterostructures." Long Range Colloquium, hosted by Virtual Science Forum, February 3rd, 2021.
14. "Orbital magnetism in graphene heterostructures." Physics Colloquium, Ohio State University, Columbus, OH, January 12th 2021.
15. "Orbital magnetism with and without moires." Correlated Systems with Multicomponent Local Hilbert Spaces. KITP, Santa Barbara, CA, December 10th, 2020.
16. "Orbital ferromagnetism in graphene heterostructures." 2020 MRS Virtual Spring/Fall Meeting, November 30th, 2020.

17. “Orbital magnets, Pomeranchuk Effect, and isospin entropy in twisted bilayer graphene,” CEMS Topical Meeting Online on Correlated Topological Semimetals and Insulators, RIKEN, Japan.
18. “Pomeranchuk effect and the isospin entropy in twisted bilayer graphene Condensed Matter Seminar,” Condensed Matter Seminar, University of Minnesota, Minneapolis MN, October 2020.
19. “Pomeranchuk effect and the isospin entropy in twisted bilayer graphene Condensed Matter Seminar,” Condensed Matter Theory Seminar, University of Maryland, College Park MD, September 2020.
20. “Pomeranchuk effect and the isospin entropy in twisted bilayer graphene.” Reunion workshop on moire materials, KITP, Santa Barbara CA, August 2020.
21. “Orbital magnetism in moiré heterostructures.” Molecular Foundry User Meeting, Berkeley CA, August 2020.
22. “Universe in a van der Waals heterostructure.” EPIQS Zoomposium, Gordon and Betty Moore Foundation, Palo Alto CA, August 2020.
23. “A twisted perspective on moire heterostructures,” Physics Department Colloquium, University of California, Davis CA, Feb. 24th, 2020.
24. “Superconductivity and magnetism in clean twisted bilayer graphene,” Condensed Matter Seminar, California Institute of Technology, Pasadena, CA, Feb. 20th, 2020.
25. “Superconductivity and magnetism in clean twisted bilayer graphene,” Condensed Matter Seminar, University of California, San Diego CA, Jan 29th, 2020.
26. “Superconductivity and magnetism in clean twisted bilayer graphene,” Workshop on Theory and Computation for 2D Materials, University of California, Los Angeles, CA, Jan 16th, 2020.
27. “A twisted perspective on moiré heterostructures,” Condensed Matter Seminar, Stanford University, Palo Alto, CA, Nov. 21, 2019.
28. “Superconductivity and magnetism in moiré materials,” EPiQS-TMS alliance workshop on Topological Phenomena in Quantum Materials, KITP, Santa Barbara, CA October 25, 2019.
29. “Superconductivity and magnetism in moiré materials,” Spintronics Meets Topology in Quantum Materials, KITP, Santa Barbara, CA September 18, 2019.
30. “Twisted bilayer graphene: junction-less superconductivity, pressure tuning, and quantum anomalous Hall effect,” moiré Materials: Strong Correlations in Synthetic Superlattices, Aspen Center for Physics, Aspen, CO June 25, 2019.
31. “Engineering topological phases in van der Waals bilayers,” Gordon Research Conference on Topological and Strongly Correlated Materials, HKUST, Hong Kong, June 19, 2019.

32. “Electronic transport in clean twisted bilayer graphene,” Gordon Research Conference on Superconductivity, Les Diablerets, Switzerland, May 13th, 2019.
33. “Skyrmion solids in graphene quantum Hall ferromagnets,” Strongly Correlated Systems & Interactions in Quantum Matter, Princeton, NJ, April 26th, 2019.
34. “Correlations in moiré flat bands: topological order and symmetry breaking,” Physics Colloquium, University of Arizona, Tucson, AZ, March 15th, 2019.
35. “Engineering topological phases of matter in van der Waals heterostructures,” Physics Colloquium, MIT, Cambridge, MA, February 28th, 2019.
36. “Even denominator fractional quantum Hall states and Skyrme solids in monolayer graphene,” Condensed Matter Seminar, National High Magnetic Field Lab, Tallahassee, FL, February 26th, 2019.
37. “Correlations in moiré flat bands: topological order, symmetry breaking, and superconductivity,” Physics Colloquium, California Institute of Technology, Pasadena, CA, February 21st, 2019.
38. “Correlations in moiré flat bands: topological order, symmetry breaking, and superconductivity,” CU Boulder Physics Colloquium, Boulder, CO, February 6th, 2019.
39. “Correlations in moiré flat bands: topological order, symmetry breaking, and superconductivity,” Physics Colloquium, University of California, Santa Barbara, CA
40. “Towards synthetic topological insulators in graphene.” Conference on Materials for Quantum Computing. Pittsburgh, PA October 31st, 2018.
41. “Controlling Correlations in moiré flat bands.” Workshop on Advances in Non-Fermi Liquids, Lawrence Berkeley National Lab, Berkeley, CA, August 16th, 2018.
42. “Correlations in moiré flat bands: superconductivity and topological order.” Seminar, ICFO, Barcelona, Spain, July 27th, 2018.
43. “New topologically ordered states in graphene heterostructures.” 23rd International Conference on High Magnetic Fields in Semiconductor Physics Toulouse, France, July 22nd, 2018.
44. “Correlations in moiré flat bands: superconductivity and topological order.” Entanglement and Coherence in Quantum Materials, Gordon Research Conference, Mount Holyoke College, June 24th, 2018.
45. “nanoSQUID magnetometry of magnetically doped topological insulator thin films.” New York University, New York, NY, April 2nd, 2018.
46. “Ground states of interacting electrons in the Hofstadter butterfly.” Joint Quantum Institute Seminar, University of Maryland, College Park, MD, March 26th, 2018.

47. “Interacting ground states in the Hofstadter butterfly.” Microsoft Station Q Meeting of theorists and Experimentalists, Santa Barbara, CA, March 3rd, 2018.
48. “Ground states of interacting electrons in the Hofstadter butterfly.” MRSEC Seminar, Columbia University, New York, NY, Feb 6th, 2018.
49. “Ground states of interacting electrons in the Hofstadter butterfly.” Ultra Quantum Matter, Simons Foundation, New York, NY, Feb 5th, 2018.
50. “Fractional Chern insulators in graphene heterostructures.” TMS-EPiQS 2nd Alliance Workshop, Kyoto University, Kyoto, Japan, January 12th, 2018.
51. “New even denominator fractional quantum Hall phases in graphene heterostructures.” Condensed Matter Physics Seminar, University of California, Riverside, CA, November 18th, 2017.
52. “Topological order and symmetry breaking in van der Waals heterostructures.” Physics Colloquium, University of California, Riverside, CA, November 17th, 2017.
53. “Observation of Fractional Chern insulators in a van der Waals heterostructure.” Ultrahigh magnetic field workshop, National Science Foundation, Washington, DC, September 21st, 2017.
54. “New even denominator fractional quantum Hall phases in graphene heterostructures.” Electronic Properties of 2 Dimensional Systems, Pennsylvania State University, State College, PA, August 2nd, 2017.
55. “New Fractional quantum Hall phases in graphene heterostructures.” Special Condensed Matter seminar, Harvard University, Cambridge, MA, June 27th, 2017.
56. “Layered 2D materials: opportunities and challenges.” MEET conference, University of Texas, El Paso, TX, May 17th, 2017.
57. “New Fractional quantum Hall phases in bilayer graphene.” Condensed Matter Seminar, University of California, San Diego, CA, February 7th, 2017.
58. “New Fractional quantum Hall phases in bilayer graphene.” Quantum materials seminar, University of California, Berkeley, CA, January 11th, 2017.
59. “New Fractional quantum Hall phases in bilayer graphene.” Strongly correlated matter: present and future. Weizmann Institute, Rehovot, Israel, December 20th, 2016.
60. “Robust Pfaffian ground states in bilayer graphene.” Conference on Topological Quantum Matter, KITP, Santa Barbara, CA, October 15th, 2016.
61. “Engineering Symmetry and Topology in van der Waals heterostructures.” McMillan Award Colloquium, University of Illinois, Urbana-Champaign., IL, September 14th, 2016.

62. "Topology and symmetry in van der Waals heterostructures." Materials Colloquium, University of California, Santa Barbara, CA, December 4, 2015.
63. "'Direct Capacitive Probe of Isospin Order in Graphene Bilayers.'" Condensed Matter Seminar, University of California, Riverside, CA, November 6th, 2015.
64. "Direct capacitive probe of layer order bilayer graphene." Condensed Matter Seminar, University of Texas, Austin, TX, April 30, 2015.
65. "Direct capacitive probe of valley order in a bilayer graphene quantum Hall ferromagnet." APS March meeting, San Antonio, TX, March 3rd, 2015.
66. "Direct measurement of isospin order in bilayer graphene." Condensed Matter Seminar, Technion, Haifa, Israel, February 10th, 2015.
67. "Direct measurement of isospin order in bilayer graphene." Condensed Matter Resnick seminar, Bar Ilan University, Ramat Gan, Israel, December 4, 2014.
68. "Direct measurement of isospin order in bilayer graphene." Condensed Matter seminar, Weizmann Institute of Science, Rehovot, Israel, December 3, 2014.
69. "Tuning and probing symmetry breaking in graphene heterostructures." International Workshop on Correlations, Criticality, and Coherence in Quantum Systems, Evora Portugal, October 2014.
70. "Tuning and probing symmetry breaking in graphene heterostructures." Condensed matter seminar, U. Maryland, College Park, MD, September 2, 2014.
71. "Tuning and probing symmetry breaking in graphene heterostructures." Penn State CM Seminar, State College, PA, September 2, 2014.
72. "Tunable symmetry breaking in graphene quantum Hall ferromagnets" Topology and Entanglement in Correlated Quantum Systems, Dresden, Germany, July 22, 2014.
73. "Topology, symmetry, and edge states in graphene" Condensed Matter Seminar, University of Chicago, Chicago, IL, May 2014.
74. "Tunable symmetry breaking in graphene quantum Hall ferromagnets" ICSM2014, Antalya, Turkey, April 29th, 2014.
75. "Quantum spin Hall effect in graphene at high magnetic fields" Condensed Matter Seminar, Columbia University, NY, Friday, March 14th, 2014.
76. "Topology, symmetry, and edge states in graphene" Physics department colloquium, UC Santa Barbara, Santa Barbara, CA, March 11, 2014.
77. "Topology, symmetry, and edge states in graphene" Physics department colloquium, University of Washington, Seattle, WA, February 24, 2014.
78. "Topology, symmetry, and edge states in graphene" Physics Department, Caltech, CA, January 29, 2014.

79. "Topology, symmetry, and edge states in graphene" Physics Department, Stanford University, Palo Alto, CA, January 23, 2014.
80. "Topology, symmetry, and edge states in graphene" LASSP seminar, Cornell University, Ithaca, NY, January 21, 2014.
81. "Band structure engineering in van der Waals heterostructures." Materials science and engineering department, University of Pennsylvania, Philadelphia, PA, January 16, 2014.
82. "Tunable symmetry breaking and helical edge transport in a graphene quantum spin Hall state" International Workshop on Interface Science for Novel Physical Properties and Electronics, Okayama, Japan, December 9, 2013.
83. "Spin-symmetry protected quantum spin Hall effect in graphene." Techion-IIT, Haifa, Israel, June 23, 2013.
84. "Topology and symmetry in the graphene quantum Hall effect." Colloquium, Ben Gurion University, Beer Sheva, Israel, June 20, 2013.
85. "Engineering new low dimensional systems in graphene-based heterostructures." Weizmann Institute, Rehovot, Israel, June 19, 2013.
86. "Quantum Spin Hall effect without time reversal symmetry in monolayer graphene." Graphene2013, Bilbao, Spain, April 23, 2013.
87. "Quantum Spin Hall effect without time reversal symmetry in monolayer graphene." Tata Institute for Fundamental Research, Mumbai, India, April 11, 2013.
88. "Spin and valley quantum Hall ferromagnetism in monolayer graphene.", Meso-12, Chernogolovka, Russia, June 23, 2012.
89. "Interacting quantum Hall effects in graphene." New Paradigms for Low-Dimensional Electronic Materials, Aspen, CO, February 9, 2012.
90. "Quantum transport in graphene heterostructures." California Institute of Technology, Pasadena, CA, January 3rd, 2012.
91. "Multicomponent Quantum Hall ferromagnetism and fractional quantum Hall effect in graphene." Brookhaven National Laboratory, NY, October 2011.
92. "Quantum Hall ferromagnetism and fractional quantum Hall effect in graphene on hexagonal Boron Nitride." Fudan University, Shanghai, China, August 19, 2011.
93. "Integer and fractional quantum Hall effects in graphene" 19th international conference on Electronic Properties of Two-Dimensional Electron Systems, Tallahassee, Florida, July 25th, 2011.
94. "Quantum transport in graphene heterostructures" Columbia NSEC Closing Symposium. New York, NY, June 11, 2011.

95. “Quantum Hall ferromagnetism in monolayer graphene”. National Institute of Standards and Technology, Gaithersburg, MD. June 9th, 2011.
96. “Quantum transport in graphene heterostructures” Condensed Matter Seminar, University of Pennsylvania, Philadelphia, PA. March 30th, 2011.
97. “Compressibility and layer polarization in bilayer graphene.” APS March meeting, Dallas, Texas, March 2011.
98. “Quantum transport in graphene heterostructures.” Condensed Matter Colloquium, Tohoku University, Sendai, Japan. January 20th, 2011.
99. “Electronic transport in Graphene/hBN heterostructures.” Graphene Workshop in Tsukuba, Tsukuba, Japan. January 17th, 2011.
100. “Quantum transport in graphene heterostructures.” Cornell University, January 5th, 2011.
101. “Quantum transport in graphene heterostructures.” Harvard University, November 21st, 2010.
102. “Quartet quantum Hall effects in graphene on BN” University of Texas, Austin, November 8th, 2010.
103. “Multi-component quantum Hall effect in graphene.” Department of Physics, Massachusetts Institute of Technology. October 27th, 2010.
104. “Graphene/hBN heterostructures.” Boston Area CarbOnNanoscience Bacon Day, Boston University, Boston. June 25th, 2010.
105. “Quantum interference and Klein tunneling in graphene heterojunctions” 2nd Metro-Gotham Meeting, New York Academy of Sciences, New York,. November 21st, 2009.
106. “Quantum interference and Klein tunneling in graphene heterojunctions.” Center for nanoStructures and bioSystems at Surfaces, Università di Modena, Italy. February 27th, 2009.
107. “Quantum oscillations and carrier collimation in graphene heterojunctions.” Department of Physics, Massachusetts Institute of Technology. September 26th, 2008.
108. “Quantum oscillations in graphene heterojunctions.” Condensed Matter Physics Seminar, Columbia University, New York NY, July 1st, 2008.

SERVICE AND
TEACHING
TALKS

1. “Topological and correlated physics in graphene heterostructures” Tutorial on 2D Materials, American Physical Society March Meeting, Boston, MA, March 3rd, 2019.

2. “Topology and symmetry protected edge states in graphene,” Daejon, Republic of Korea, November 24th, 2016.
3. “Isospin probes and fractional quantum Hall states in bilayer graphene,” Daejon, Republic of Korea, November 24th, 2016.
4. “Moiré patterns in the world’s thinnest cloth” USA Science and Engineering Festival, Washington, DC, April 25, 2014.
5. “Fractal butterflies in moiré superlattices” MIT Pappalardo Fellows in Physics Symposium, May 10, 2013.
6. “Quasiparticles and semiconductor devices” Indo-American Frontiers of Science Symposium. Agra, India, April 9, 2013.