CV: Philip B. Allen

Education / Training
Undergraduate: Amherst College, Physics, BA 1960-1964
Graduate: University of California Berkeley, PhD, 1964-1969

Appointments / positions
2016 to present: Research Professor/Professor Emeritus, Stony Brook University
1981-2016: Professor, Stony Brook University
1976-1981: Associate Professor, Stony Brook University
1971-1976: Assistant Professor, Stony Brook University
1970-1971: Member of Technical Staff, Bell Telephone Labs

Fellowships
Sloan Foundation Fellow (1964-65)
Alexander von Humboldt Senior Scientist Award, 1984
Bernd T. Matthias Visiting Scholar Los Alamos, 1990
Guggenheim Foundation Fellow (2002-2003)

Memberships
American Physical Society (Fellow)
American Association for the Advancement of Science (Fellow)

Publications: approximately 240 refereed journal publications; examples:

1. P. B. Allen and R.C. Dynes, *Transition Temperature of Strong-Coupled Superconductors Reanalyzed*, Phys. Rev. B **12**, 905-22 (1975).

2. P. B. Allen and V. Heine, *Theory of Temperature Dependence of Electronic Band Structures*, J. Phys. C. 9, 2305-12 (1976).

3. P. B. Allen, *Fermi Surface Harmonics: A General Method for Non-Spherical Problems. Application to Boltzmann and Eliashberg Equations*, Phys. Rev. B **13**, 1416-27 (1976).

4. P. B. Allen and M. Cardona, *Temperature Dependence of the Direct Gap of Si and Ge*, Phys. Rev. B **27**, 4760-69 (1983).

5. P. B. Allen, *Theory of Thermal Relaxation of Electrons in Metals*, Phys. Rev. Lett. **59**, 1460-63 (1987).

6. P. B. Allen and J. L. Feldman, *Thermal Conductivity of Glasses: Theory and Application to Amorphous Si*, Phys. Rev. Lett. **62**, 645-48 (1989).

7. P. B. Allen, J. L. Feldman, J. Fabian, and F. Wooten, *Diffusons, Locons, Propagons: Character of Atomic Vibrations in Amorphous Si*, Phil. Mag. B **79**, 1715-32 (1999).

8. B. Pamuk, J. M. Soler, R. Ramirez, C. P. Herrero, P. W. Stephens, P. B. Allen, and M. V. Fernandez-Serra, *Anomalous Nuclear Quantum Effects in Ice*, Phys. Rev. Lett. **108**, 193003:1-4 (2012).

9. P. B. Allen and Nhat Ahn Nghiem, "*Heat pulse propagation and nonlocal phonon heat transport in one-dimensional harmonic chains*", Phys. Rev. B 105, 174302:1-12 (2022).

Talks given, 2017-2022

Invited talk, 18th International Workshop on Computational Physics and Materials Science: Total Energy and Force Methods; Trieste, January 12, 2017: *Non-locality in lattice thermal conductivity*.

Invited talk at March Meeting of APS, 2017: Session V19.00002: *Electronic properties with and without electron-phonon coupling*

Invited seminar, Univ. of Illinois, Champaign-Urbana, February 14, 2017: *Lattice Thermal Conductivity - Exploiting Non-Locality seen in Simulations and Experiment*.

Invited seminar, Univ. of Missouri, Rolla, February 16, 2017: *Lattice Thermal Conductivity - History and New Developments*.

Contributed talk at March Meeting of APS, 2017: Abstract: B28.00001: *Exploiting non-local analysis of lattice thermal conductivity.*

Invited talk, 9th US-Japan Joint Seminar on Nanoscale Transport Phenomena, Tokyo, July 2-5, 2017: Ballistic/Diffusive (nonlocal) behavior: *Boltzmann treatment of the temperature distribution near a heat source*.

Invited seminar, Tokyo Institute of Technology, July 6, 2017: *Heat Transport at the Nanoscale*.

Invited seminar, Mech. Eng. Dept., CalTech, November 8, 2017: *Electrons and Phonons in Solids.*

Contributed talk at March Meeting of APS, 2018: Abstract: R29.00010: *Quasiparticles and phonon satellites in spectral functions of semiconductors and insulators: Cumulants applied to full first principles theory and Fröhlich polaron.*

Invited talk, IACS Joint Science Meeting, May 22, 2018: *Beyond Quasiparticles: computing spectral functions.*

Invited talk at the Workshop on Recent Developments in Electronic Structure Methods, U. Penn., June 14, 2018: *Beyond quasiparticles: computing features of spectral functions*

Poster presentation, DOE TCMP PI meeting, Gaithersburg, MD, August 15, 2018: *Static and Dynamic Thermal Effects in Solids*.

Invited seminar, Dept. of EE, Univ. of Buffalo, November 9, 2018: *Heat transport: Fundamentals, and theory for nanoscale*.

March meeting, Boston: Sunday Tutorial March 3, *Examples of electron-phonon interactions: The need for theory*, in session "First-Principles Techniques for Interacting Electrons and Phonons".

Invited talk, Boston March Meeting, March 7, 2019, *Spectroscopy of Electron-Phonon Interactions, and "Theory" of Spectra*, in session "P22: Electrons, Phonons, Electron-Phonon Scattering, and Phononics IV".

Invited talk, BulbulFest2019, March 9, 2019, Brandeis University, *44 Years Back: Bulbul at Stony Brook.*

Invited talk, University of Florida, Gainesville, Physics Department, March 25, 2019, *Heat transport: Quasiparticle theory at the nanoscale.*

Tutorial talk, MRS meeting, Phoenix AZ, April 22, 2019, *Heat Transport – Fundamentals and Theory for Nanoscale*, session QN04 "Outstanding Challenges in Nanoscale Heat Transport".

Invited talk, Condensed Matter Physics, Univ. of Central Florida, Orlando, January 21, 2020, *Nanoscale transport: ballistic/diffusive crossover analyzed by Boltzmann quasiparticle theory*.

Invited talk, March 2021 Meeting of APS (Virtual), *Thermal susceptibility -- the nonlocal temperature response to local heat input.*

Contributed talk, March 2022 Meeting of APS (Virtual), *Ballistic and diffusive phonon heat transport studied by pulse propagation in one dimension*.

Miscellaneous Activities

1. Supervision of PhD research. Approximately 22 PhD's have been awarded under my supervision. Some are now well-known scientists (J. K. Jain, W. E. Pickett, B. Chakraborty, J. Fabian, V. Perebeinos, for example).

2. Supervision of undergraduate research projects; most recently (2022) Nhat Ahn Nghiem, publication 9 above.

3. Supervision of summer projects by high-school students. These have resulted in three publications and 5 Westinghouse or Intel awards.

4. Supervision of masters' degree research. A written MA thesis is optional at Stony Brook, I have supervised four of these, most recently in 2020.

5. Departmental Committees: I still often serve on examination committees for graduate students, including thesis defense committees.

6. Refereeing for many journals, especially APS journals (Phys. Rev. B, etc.)

7. Host for numerous seminar speakers, Condensed Matter Seminar, Stony Brook.