

Greetings. I am Vinay Ambegaokar from Cornell, in part the land grant institution of New York and thus truly a sibling of UIUC---largely saved, however, from your semi-professional athletic programs by a sports association named after a climbing plant: the Ivy League.

It is of course a great pleasure and honor to chair this opening session, celebrating what was certainly the most important work in solid state physics in the second half of the 20th century, with important consequences for all of physics. In a message I received from the organizer-in-chief Philip Phillips, he referred to me as a first generation BCSer, and added that I might want to make some opening remarks about how that famous paper influenced me.

In a review of the recent biography of John Bardeen, described by its authors Hoddson and Daitch as a labor of love, I wrote that the BCS paper should be required reading for every physicist. This is absolutely true but somewhat disingenuous because although I struggled through it in the fall of 1958, and have in my hand a little brown book to prove it, my first several papers, with Leo Kadanoff, Ludwig Tewordt, and my students Alex Baratoff, Allan Griffin, and James Woo used methods developed by the Landau school, particularly Gor'kov and Abrikosov. BCS is a work of genius, and its methodology is wonderfully down to earth, but it is *difficult*: the Russian machinery had the advantage for me that it could be run without continuous intellectual effort. I only really understood how to work in the BCS way a very few years ago when I had to follow in the footsteps of Overhauser to find the mistake in his "proof" that something I had done the other way was wrong. Anyway, better late than never, I have now done my required reading.

It is a particular pleasure to give the floor to Charlie Slichter who, in addition to doing important experiments, early learnt how to do calculations the hard way. In the BCS paper there is a magical note added in proof about a subtle consequence of the theory due to the constructive or destructive interference of two quantum mechanical amplitudes. Slichter and Hebel are explicitly thanked for discussions on these matters. His talk is titled "NMR and the BCS theory of superconductivity."

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The next speaker, Mike Tinkham, is another distinguished experimenter who also is a master of the BCS theory, as readers of his books will know. His seminal work on the infrared properties of superconducting films early and explicitly demonstrated the presence of an energy gap in the electronic spectrum.

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In my little brown book in 1958 I struggled with a canonical transformation invented by Bardeen and David Pines, our next speaker, which produced a velocity-dependent phonon-induced interaction between electrons. Although the details were superseded by the work of Eliashberg, it contains the resonance which, if its attractive part overpowers the screened Coulomb repulsion, is the foundation on which the pairing theory is built. He will talk about his personal recollections of the heroic early days.

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The final speaker of this session is Leon Cooper, the C of BCS, who has achieved immortality in his own right through the "Cooper pair" and the "Cooperon." He also was the first user of the two-parameter approximation to the Bardeen-Pines interaction, which captures its essence and allows the wonderful analytical calculations and the "laws of corresponding states" found in BCS.