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NMR and the BCS Theory

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The talk will review the status of superconductivity research in the early 1950s, Bardeen's thoughts about the role of an energy gap in producing superconductivity, our ideas that NMR experiments might test his ideas, and about the experimental challenge my student Chuck Hebel and I had to overcome: how can one do NMR in a perfect diamagnet (which therefore excludes magnetic fields!), the surprising results we found, then the arrival of the theory of Bardeen, Cooper, and Schrieffer, and how applying their theory to relate NMR to ultrasonic absorption verifies the essential idea of the theory (their wave function of electron pairs).