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High Temperature Superconductivity 20 Years Later: Achievements, Promises and Challenges

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The discovery of high temperature superconductivity (HTS) 20 years ago has been hailed as one of the major advancements in modern science with great promises. In this presentation, I shall first briefly recall the seminal observation of superconductivity at 35 K in early 1986 and several episodes leading to the discovery of superconductivity at 93 K in early 1987. I shall then summarize the progress that has been made in the ensuing 20 years in the areas of HTS science, materials, and applications. Finally, challenges to realize the full promises of HTS technology will be discussed and steps to meet the challenges proposed.