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Megascience on the Prairie: The Powers and Paradoxes of Pushing Frontiers at Fermilab (The Gertrude Scharff-Goldhaber Lecture)

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In the decades following the Second World War, high-energy physics witnessed two remarkable transformations. The first, examined by many historians, led to “big science.” As researchers who participated in wartime projects continued working with costly apparatus in well-funded teams, almost all parameters of the high-energy field (time spans, size, collaboration numbers, cost, etc.) grew exponentially into the 1960s. The second transformation – the focus of this talk - unfolded during the 1970s and 80s, yielding “megascience,” a new form of big science of still larger scale. At Fermilab this second evolution proceeded shortly after the laboratory was founded in 1967. Ironically it began with a vision of small science. The first director, Robert R. Wilson, celebrated the lone researcher who conducted modest experiments and valued the small and frugal even while building a costly accelerator and doing physics at the highest energy. As progress in particle physics required much larger experiments, the dynamics of megascience took form under Fermilab’s subsequent director Leon Lederman. In time, the intensifying competition for limited resources transformed the largest experiments into long-lasting institutions for conducting effectively unending experiments.