Subspace-based approaches via eigenvalue decomposition of spatial covariance matrices are common in multichannel signal processing. In this talk, polynomial covariance matrices will be exploited as a way to capture space-time information about the signals received at a sensor (microphone) array. Polynomial eigenvalue decomposition (PEVD) diagonalizes jointly across the dimensions of space and time and leads to a family of space-time subspace-based signal processing algorithms that are particularly suited to broadband signals. An example application of PEVD applied to speech enhancement will be discussed.