

## **The symmetric nonnegative inverse eigenvalue problem**

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The nonnegative inverse eigenvalue problem (NIEP) asks when a list  $S$  consisting of  $n$  complex numbers is the spectrum of an  $n \times n$  nonnegative matrix. When the list consists of real numbers, the symmetric nonnegative inverse eigenvalue problem (SNIEP) asks when  $S$  is the spectrum of an  $n \times n$  symmetric nonnegative matrix.

Both problems are not completely solved unless  $n$  is at most 4. When  $n$  is at least 5 and  $S$  consists of real numbers it is known that NIEP and SNIEP are different. In this talk we consider SNIEP for  $n=5$  and try to further our understanding of it using the concept of extreme spectrum. We also find lists of 5 real numbers which satisfy SNIEP for  $n=5$  and have not been known previously.

This talk is based on a joint work with J.J. McDonald.