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Distinguished self-adjoint extensions of operators with gaps

Semibounded symmetric operators have a distinguished self-adjoint extension, the Friedrichs extension. The eigenvalues of the Friedrichs extension are given by a variational principle that involves only the domain of the symmetric operator. Although Dirac operators describing relativistic particles are not semibounded, the Dirac operator with Coulomb potential is known to have a distinguished extension. In this talk I will relate this extension to a generalisation of the Friedrichs extension to the setting of operators satisfying a gap condition. In addition I will prove, in the general setting, that the eigenvalues of this extension are also given by a variational principle that involves only the domain of the symmetric operator.

This is joint work with Jan Philip Solovej and Sabiha Tokus.