Elizabeth Winstanley (University of Sheffield, UK): *Quantum properties of black holes*

The renormalized expectation value of the stress energy tensor (RSET) is an object of central importance in quantum field theory in curved space-time, but calculating this on black hole space-times is far from trivial. The original methodology was developed in the 1980s and 1990s and successfully applied to a range of quantum fields on four-dimensional Schwarzschild black holes. The subject has enjoyed a renaissance in recent years with the development of novel approaches to computing the RSET and renormalized vacuum polarization (VP). These advances have enabled calculations on a wider range of black hole space-times to be performed and new physics questions to be addressed. In this talk we will review both the original and latest methodologies. We also discuss some recent results for the RSET and VP on asymptotically flat, de Sitter and anti-de Sitter black holes to give a flavour of the insights to be gained into the quantum properties of black holes both outside and inside the event horizon.