

## **Inverse Problems Network Meeting 4**

Thursday, 17<sup>th</sup> January 2019 - Friday, 18<sup>th</sup> January 2019

Mall Room, Level 8 of the School of Mathematics, University of Leeds

### **Abstract of Talk**

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## **SPECTRUM AND A TRACE FORMULA FOR STATIONARY SPACETIMES**

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University of Leeds

We consider a natural spectral problem appearing in the analysis of wave equations on stationary spacetimes. It turns out that the spectrum in such a relativistic context is not the spectrum of a self-adjoint operator, but rather the spectrum of an operator pencil, or, somewhat equivalently, the spectrum of a Krein-self-adjoint operator on a Pontryagin space. We prove a trace formula and a singularity expansion for the spectrum. The underlying geometry is the symplectic geometry of the space of lightlike geodesics. This has applications to the inverse problems of detecting properties of the spacetime from the spectrum. (joint work with S. Zelditch)