

# MSc Thesis Presentation

**Bradley Creelman,  
Memorial University**

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## **Using Spacetime Surgeries to Model Null Fluids and Null Fluid Radiation**

**ABSTRACT:**

In 1991, Ori proposed a construction to remedy energy condition violations in the ingoing Vaidya-Reissner-Nordstrom (VRN) spacetime. The model replaces the violation regions of VRN with an outgoing VRN spacetime. The two spacetimes are attached along a spacelike hypersurface and the hybrid spacetime models the ingoing matter bouncing at this surface. Such a spacetime surgery was claimed to produce no thin shell at the junction surface. In 2015 Booth showed that in the special case of extremal Reissner-Nordstrom a thin shell will exist under the same construction.

In this talk the Ori construction is generalized to Husain null fluids, a one parameter generalization of the VRN solution. Along the way, the tension between the extremal case and the VRN case will be resolved: there are several ways to match coordinates along the junction surface and the two cases chose different matchings. Further, the case of a timelike junction surface will be analyzed as a classical model of null radiation from a black hole.