

Tuesday, October 29<sup>th</sup> @ 2pm  
Schwinger Lounge

## “Electrical Circuits meet Feynman Diagrams”

**Miguel Correia (McGil)**

**Abstract:** Feynman integrals and scattering amplitudes have a very intricate analytic structure. While the computation of Feynman integrals is a hard task, one can determine their analytic structure independently due to the seminal work of Landau in 1960. The Landau equations are a set of algebraic equations whose solution yields the locations in kinematic space where Feynman integrals are singular. However, the full system of equations quickly becomes intractable beyond one loop. In this talk, I will describe how the Landau equations have a direct analogy to Kirchoff's laws for electrical circuits, and how (surprisingly simple) circuit reduction ideas can be used to solve the Landau equations recursively. This approach allows to go beyond the current state-of-the-art on a laptop without the use of heavy numerical methods. We find new predictions relevant for two- and higher-loop processes in the Standard Model and other theories. Based on [2406.05241] with S. Caron-Huot and M. Giroux, and ongoing work with S. Mizera.