

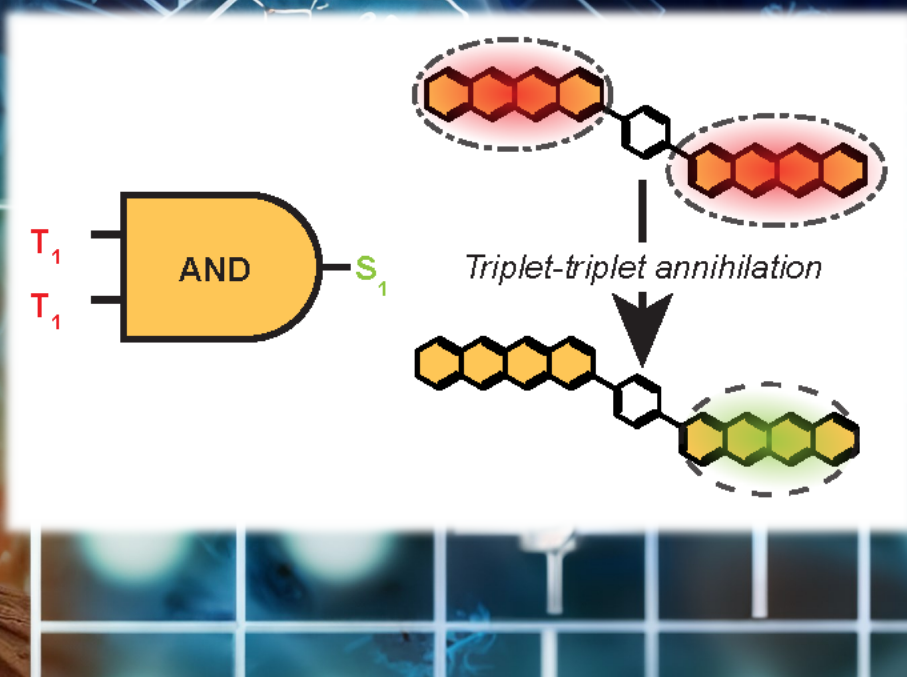
## *invited speaker series*

### **Multiexcitonic Logic: Pathways and Progress**

Using excitons and multiexcitonic processes such as singlet fission (SF) and triplet-triplet annihilation (TTA) to perform logical operations presents opportunities for developing sub-nanometre, ultrafast and biocompatible computational devices. In the first half of my talk, I will outline a proposed framework for constructing logical devices using an excitonic information basis, encompassing aspects of multiexciton control, exciton transport and circuit assembly.

One method of exerting control over multiexcitonic processes is to manipulate multichromophoric systems using multiple optical pulse sequences to access higher electronic excited states. Several recent studies have suggested that SF occurs from higher electronic excited states of perylene, but the nature of these states and their relaxation dynamics are currently unclear. In the second part of my talk I will present a femtosecond spectroscopic study of perylene's high-lying electronic excited states, to characterise the states accessible by one- or two-pulse excitation and hence assess the viability of gating SF through these higher excited states for logical operations

**Date: Friday, 11th August 2023 | Time: 9:00 am | Room: H12, NW I**



**Dr. Rohan Hudson**

Research Fellow in Materials Spectroscopy  
ARC Center for Excellence in Exciton Science  
The University of Melbourne, Victoria