Chez Pierre

Presents ...

**Monday, May 17, 2021**

**12:00pm Noon**

**Broadcast via Zoom**

# Chez Pierre Seminar

**Keshav M. Dani** – Okinawa Institute Of Science and Technology

"Using Time-Resolved XUV μ-ARPES To Probe Excitons."

About a decade ago, the discovery of monolayers of transition metal dichalcogenides (TMD) opened a new frontier in the study of optically excited states in semiconductors. These materials exhibit a plethora of robust excitonic states – bound quasiparticle pairs of electrons and holes, such as bright excitons, momentum- and spin-forbidden dark excitons, and hot excitons. While optics-based experiments can access bright excitons, directly measuring dark excitons – a decades old challenge, requires a momentum-resolving technique like ARPES.

Accessing excitons with ARPES is not just conceptually difficult – 'how does one photoemit an exciton', but also technically difficult – one needs to study micron-scale samples of atomically-thin materials, with ultrafast time-resolution, using XUV photons. In today's talk, I will discuss the efforts in my lab towards time- and space-resolved photoemission studies [1, 2], ultimately enabling us to 'see' excitons in atomically thin semiconductors [2, 3].

[1] T. Doherty*, A. Winchester*, et al. Nature 580 360 (2020)
[2] J. Madeo*, M. K. L. Man*, et al. Science 370 1199 (2020).
[3] M. K. L. Man*, J. Madeo*, et al. Science Advances 7, eabg1902 (2021).

* equal authors