# Scdt] SCDT-FlexE Centre Weekly Tuesday Seminar - 05.04.202


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**Priority** Normal

Zoom Meeting for joining the webinar:
https://zoom.us/j/99863678964?pwd=ZVJvdFN5T1UyQjdZbmxwS0htRUJOUT09

Meeting ID: 998 6367 8964
Passcode: 064022
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Dear Colleagues,

I welcome you to join the SCDT-FlexE Centre Weekly Tuesday Seminar the coming Tuesday evening by Dr. Rituraj who has recently joined the Electrical Engineering Department. In the seminar, Dr. Rituraj will share details of some of the work he had done on "Semiconductor based few-photon sources & scaling limits of nanophotonic devices" at Stanford, just prior to his current appointment. The specific details of the seminar and a brief bio of the speaker appear below.

With regards
S.K.I.

~~~~~~~~~~~~~~~~~~~~~ Details of the Seminar ~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Weekly Seminar Title:
Title: "Semiconductor based few-photon sources & scaling limits of nanophotonic devices"

Date: 5th April, 2022
Time: 7:30 PM to 8:30 PM
Zoom link for the event is given above at the start of this email.

Abstract
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Nanophotonic systems in general are comprised of three primary components – light sources, structures to manipulate the electromagnetic waves, and photodetectors to perform measurement. In this talk, I will present some of my work related to the first two components – semiconductor-based few photon sources, and light manipulation using a small number of quantum two-level systems (quantum dots, atoms etc.). In the first part of my talk, I will discuss a tunable single photon source and a semiconductor-based entangled photon pair source. The focus will be on the design of the photonic environment to realize an efficient and tunable photon source. In the second part of the talk, I will discuss the scaling limit of various photonic devices such as mirrors, prisms, waveguides, resonant cavities, and electromagnetic cloaks. I will show that all these photonic devices in the single photon limit could be realized using just hundreds of atoms/quantum dots. Finally, I will talk about two-dimensional periodic lattice of quantum dots interacting with a single photon. I will focus on two particular applications – slowing light to extremely small velocities and design of non-reciprocal devices based on photonic Chern insulators.
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