



**Department of Materials Science and Engineering,**

**Master' Defense**

**June 4<sup>th</sup>, 2020**

**1:00 to 2:30 PM**

**Zoom link:**

**<https://drexel.zoom.us/j/7947195785>**

## **Dual Layer-Encapsulated Halide perovskite with Enhanced Stability for Bioimaging**

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### **Abstract**

Organic lead halide perovskite (OLHP) nanocrystals are an emerging class of high performing materials with application as the molecular probe for bioimaging. OLHP exhibits many desirable traits of fluorophores such as high quantum yield, excellent photoluminescence, large stokes-shift, high photostability, and infrared emission wavelengths. Despite its excellent properties, OLHP experiences poor stability when exposed to moisture, heat, or high energy wavelengths. Utilizing a dual layer-encapsulation comprising of silicon dioxide (SiO<sub>2</sub>) and nonionic amphiphilic triblock copolymer (Pluronic F-127), the surface chemistries can be altered. This allows transfer of OLHP nanocrystals synthesized in organic solvent to an aqueous media while retaining their optical properties for up to an hour. As a result, the modified OLHPs exhibit improved stability, higher photoluminescence, and increased quantum yield (23%) compared to untreated OLHPs.