

266th WPI-IIIS Seminar

How the Central Clock and Hypothalamic Nuclei Compute Light Signals for Circadian Photoentrainment and Avoidance

To survive in nature, animals evaluate ambient light intensity and the specific time of day of light exposure to occupy appropriate temporal niches. For example, the endogenous circadian clock entrains the sleep-wake cycle to environmental cycles, while light intensity regulates transitions between exploration and avoidance. Although visual afferents are traditionally viewed as parallel labeled-line pathways, we found that hypothalamic structures—including the suprachiasmatic nucleus (SCN) and supraoptic nucleus (SON)—utilize probabilistic population coding to control physiological functions. Thus, deep brain nuclei perform sensory computations through dynamic, flexible population circuitry rather than simple on-off switches.



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Date: **Thursday, October 1, 2026**

Time: **10:30 – 11:30**

Venue: **1F Auditorium, IIIS Building**

*** On-site participation only**



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