UNIVERSITY OF LOUISVILLE

COLLEGE OF ARTS & SCIENCES

Department of Chemistry

Brown and Williamson Series

Friday, October 25, 2019
@12:30 pm
Chemistry Building, LL-16

A. Jean-Luc Ayitou, PhD

Illinois Institute of Technology

Non-classical Aromatic Triplet Chromophores: Synthesis, Photophysics and Application in Light Harvesting & Energy Upconversion

ABSTRACT: Polyromantic chromophores are actively researched for their attractive light-harvesting and optoelectronic properties. These chromophores constitute the main building blocks of most organic electronics and photonics devices. Recently, our group introduced a novel quinoidization reaction that allowed to truncate the ground state intrinsic aromaticity of readily available polyromantic scaffolds to afford the corresponding quinoidal acene derivatives. Importantly, upon photo-excitation, the new organic chromophores can easily access their triplet excited state thanks to aromaticity reversal of one quinoidal ring. Using advanced spectroscopy tools, we successfully deciphered the behavior and nature of the triplet species of these compounds. Interestingly, our studies revealed that subtle changes *viz.* electron affinity, C-hybridization, and additional □-conjugation could be used to modulate the excited state dynamic and kinetic. My presentation will describe the synthesis of the new triplet chromophores; next, I will discuss their photophysical characterization, aromaticity and light-harvesting properties. Lastly, I will showcase our ongoing triplet-triplet annihilation photonic amplification research, where we employed the novel chromophores as triplet sensitizers.

BIO: Dr. Ayitou is an Assistant Professor of chemistry at Illinois Institute of Technology in Chicago, USA. After completing an Associate's Degree in physics and chemistry from the Université de Lomé in Togo, Africa, Ayitou earned his B.S. degree and Ph.D. (as a National Science Foundation Graduate Fellow and Merck Lab graduate Fellow) at North Dakota State University. He then continued his research training as a UNCF-Merck Postdoctoral Fellow and University of California President's Postdoctoral Fellow at the University of California, Los Angeles under the mentorship of Professor Miguel Garcia-Garibay (from June 2013 to July 2016). Since August 2016, Dr. Ayitou's group has been developing new synthetic methods which allow to prepare novel organic triplet chromophores, which his group utilizes for photonic amplification research. In addition, Ayitou and his research team are exploring novel organic photonic crystalline materials that can be used for energy applications. Recently, Ayitou received the prestigious NSF CAREER Award, which honors early-career faculty who have the potential to serve as academic role models in research and education.