



CHEMISTRY/PHYSICS SEMINAR SERIES

Dr. Kevin Stamplecoskie

Associate Professor, Department of Chemistry, Queen's University

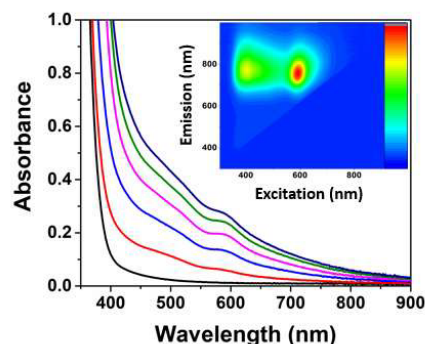
Wednesday, September 30, 2026

11:00 a.m. to 11:50 a.m. in ENW 115

Photochemistry as a General Approach to Atomically Precise Nanoclusters

ABSTRACT

Synthesis and purification of atomically precise noble metal nanoclusters is rapidly emerging. The Stamplecoskie group has carved out their niche in photochemical approach to synthesizing nanoclusters. Some Au clusters have recently shown unprecedented enhancement for radiotherapy for cancer treatment while others are unique photocatalysts. Before clinical use, it is important to isolate pure clusters of a single size and to track their fate in the body (similar factors are of high importance in many applications). The light activated synthesis of Au clusters that are stabilized by thiol, phosphine and carbene ligands, followed by light-driven size-focusing will be presented. The unique mechanism of photo-induced cluster formation and purification will be highlighted, and the use of fluorescence excitation-emission matrix (EEM) spectroscopy and PARAFAC analysis to assess optical purity.



BIOGRAPHY

Associate Professor Kevin Stamplecoskie has been a faculty member at Queen's University in the Department of Chemistry since 2016. Dr. Stamplecoskie is trained primarily as a photochemist; he received his Ph.D. with Prof. J.C. Scaiano at the University of Ottawa and performed postdoctoral research at the University of Notre Dame with Prof. Prashant Kamat. In 2025 he was awarded the Kieth Laidler award from the Chemical Institute of Canada (CIC) and in 2011, Dr. Stamplecoskie was awarded the Gerhard Closs Award in Photochemistry, which is selected semi-annually by the Inter-American Photochemical Society (IAPS). Dr. Stamplecoskie received these honours for his contribution to photochemistry, its use in synthesizing novel materials, and controlling the structure-function relationship of nanomaterials by photochemical methods. Stamplecoskie's research is very interdisciplinary, but the broad goal is the engineering of novel materials for photonics applications such as light-harvesting, cancer therapy, chemical sensing, and more. His work in photonic materials has been highly cited and lead to numerous invited talks in his short tenure at Queen's and has helped net more than \$3 million dollars to his research program specifically and contributed to ~ \$50 million dollars in funding allocated to numerous teams at Queen's. He has also received recognition for his teaching (i.e. Top 3rd year instructor in 2021) from the Department of Chemistry and is passionate about education and mentoring the next generations of chemists. Chemistry outreach and connecting with the greater local community is very important to Stamplecoskie. He has performed dozens of magic shows in the Kingston and surrounding area, including several events that hosted more than 5000 participants each at Kingston's Science Rendezvous. Over the past 6 years, Stamplecoskie has also become the chair and revived the Kingston local section of the CIC (which was previously dormant). The local section has organized numerous events to engage the local community and businesses and is a large part of the efforts of engaging the broader community in Canada.