

**SEMINAR**  
**THURSDAY JUNE 6<sup>TH</sup> 2024, h 15:00**  
**Department of Chemistry, Biology and Biotechnology**  
**Via Elce di Sotto - Aula C**

**Host-Guest Doping Systems towards Organic Room-Temperature  
Phosphorescence**

**Prof. Zhengxu Cai**  
**Beijing Institute of Technology, China**

**Abstract:** It is a great challenge to develop organic room-temperature phosphorescence (RTP) due to inhibition of the intersystem crossing and unstable triplet excitons. In order to solve these issues, our group focused on the development of high performance (long lifetimes, high quantum yields, and tunable colors) RTP materials based on the “host-guest doping method”. First, a new strategy for the development of RTP materials with high quantum yield and long lifetime was established. The phosphorescence mechanisms were investigated and multi-stimulus responsive persistent phosphorescence was realized. Second, fused ring small molecules and polymers with through-space conjugation properties were developed to tune the triplet energy levels. Near IR phosphorescence was realized for high resolution bioimaging. Finally, RTP materials with highly active triplet excitons were also attempted to be used as photosensitizers for photoreactions, such as photodynamic therapy and photopolymerization.

**Short Bio:** Prof. Zhengxu Cai received his BS degree from Wuhan University in 2009, and obtained his PhD from the Institute of Chemistry, Chinese Academy of Science in 2014. After a post-doctoral study in the US at the University of Chicago, he joined the faculty of the School of Material Science and Engineering at the Beijing Institute of Technology in 2017. His research focuses on the development of organic room temperature phosphorescence materials for application in high-resolution bioimaging. Currently, Prof. Cai has published over 150 papers, including *Acc. Chem. Res*, *Chem*, *JACS*, *Angew. Chem. Int. Ed.*, *Nat. Commun.*, *Adv. Funct. Mater.*, etc. His publications have been cited over 6500 times with an h-index of 45. In addition, he has published 4 book chapters and been granted 10 patents.

---

All the interested people are invited to attend.

Benedetta Carlotti

