Course: **Atomically Precise Metal Nanoclusters: Properties, Electrocatalysis, and Photocatalysis**

Duration: **24 hours**

Teacher(s): **Flavio Maran, Sabrina Antonello, Sara Bonacchi, Alfonso Zoleo**

Curriculum: **Chemical Sciences**

Description: Atomically precise thiolate protected gold and more generally metal nanoclusters have metal-core diameters of 1-1.8 nm, and the number and nature of the metal atoms and capping ligands are clearly defined. Over the last years, synthetic and purification procedures have been implemented to such a high level that many of them could be prepared and extensively studied. Important properties could be assessed through careful studies of the nanoclusters' optical, magnetic, and electron-transfer behaviors. This course will showcase the chemistry and physical chemistry of nanoclusters, starting from the synthesis, purification, and main characterization techniques. Then, their magnetic, optical, photophysical, and electrochemical behaviors will be described and analyzed. Finally, the course will cover applications with a special focus on electro- and photo-catalysis.