



Istituto di Chimica dei Composti Organometallici

## **ICCOM Pisa incontra ICCOM Firenze**

**Venerdì 05 Luglio 2019**

**Alle ore 11:00**

presso Aula 27 - Edificio A - Piano terra  
Area della Ricerca CNR, Via Moruzzi 1 - Pisa

La **Dr.ssa Antonella Guerriero** di ICCOM-Firenze terrà il seguente seminario:

"From the traditional PTA ligand to novel CAP: synthetic modifications and applications of these two water soluble aminophosphines in catalysis and in medicinal chemistry"

**Dr. Francesco Vizza**  
ICCOM-CNR

## Abstract:

Organophosphines are among the most common ancillary ligands used in organometallic chemistry due to their ability to be easily modified thus allowing changes in the electronic and steric properties of the metal complexes. The solubility in water can be also added by modifying the phosphines structure and exploited for the application of the metal complexes containing these ligands in homogeneous aqueous biphasic catalysis. Among the few examples reported in the literature of water soluble monodentate phosphines, the cage adamantane-like PTA (1,3,5-triaza-7-phosphadamantane) has been largely used to produce a great number of PTA-based transition metal compounds with application in catalysis, photoluminescence and medicinal chemistry. After many years dedicated to the synthetic modification and the coordination chemistry of this ligand and its derivatives, the interest of our research group switched to the higher homologue CAP, namely 1,4,7-triaza-9-phosphatricyclo[5.3.2.1]tridecane. Although CAP has similar properties in terms of solubility and stability, it demonstrated a different behaviour compared to PTA, for example towards hydrogenation and alkylation reactions. Taking into account our expertise on PTA chemistry, we started to explore the reactivity and the coordination ability of CAP, obtaining several ruthenium complexes. Some of them have been tested as catalyst precursors in nitrile hydration reactions and in homogeneous catalytic hydrogenations of few selected unsaturated substrates under very mild transfer hydrogenation conditions. Furthermore, the ruthenium(II)-arene CAP complexes have been tested in vitro as cytotoxic compounds against selected cancer cell lines, revealing higher activity than the corresponding PTA analogues and a reasonable degree of cancer cell selectivity when used on noncancerous cells.

## Biographic sketch:

Antonella Guerriero graduated in Pharmacy in 2005 (University of Florence) with the thesis “Design and synthesis of new heterocondensed pyridazinones derivatives with antiplatelet activity” and then obtained a Master in “Drug Design and Synthesis” in 2006 (University of Siena) with the thesis “Fragment-Based approach for developing new metalloproteins inhibitors”. She received her PhD in chemistry in 2010 (University of Florence) with the project “Novel PTA-derivatives as ligands for selective catalytic hydrogenation and hydroformylation reactions” and she is currently a researcher at ICCOM-CNR in Florence. As visiting scientist she has been at École



Polytechnique Fédérale de Lausanne (EPFL, Switzerland), at the Department of Organic Chemistry and Technology in Budapest (Hungary) and Unité de Catalyse et de Chimie du Solide - CNRS in Lens Cedex and Université d'Artois in Lille (France). Her research interests range over organometallic chemistry, water-soluble ligands and transition metal compounds, cage-like aminophosphines, homogeneous and aqueous phase catalysis. She is co-author of 19 peer reviewed publications on ISI journals, 2 book chapters, 18 contributions to national and international conferences as poster and oral communications.