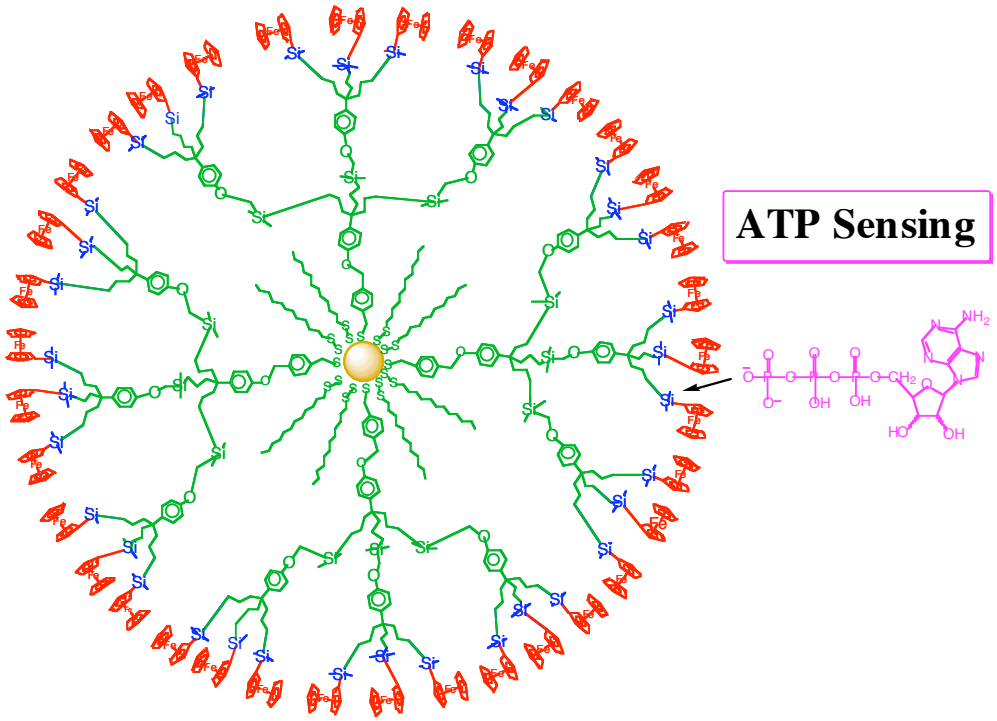
NATO Advanced Research Workshop: "*From Simplicity to Complexity in Chemistry and Beyond: Interplay Theory and Experiment*", Baku, Azerbaijan, 26 - 28 May 2008.

METALLODENDRIMERS: A PRECISE AND WELL-ORGANIZED NANOWORLD INCLUDING APPLICATIONS TO SENSING AND CATALYSIS

Didier ASTRUC

ISM, UMR CNRS N° 5255, University Bordeaux I, 33405 TALENCE Cedex, FRANCE

In this lecture, we will indicate how organometallic chemistry could be used to assemble giant dendrimers (covalent, ionic, supramolecular, coordinative) [1]. Examples of functional dendrimers will be shown for their use as efficient, re-usable sensors [2] and catalysts [3]
In particular, a novel family of dendrimers with gold and palladium-nanoparticle-cored dendrimers [2,3], (see figure below) and its uses, will be highlighted.



[1] J. Ruiz, G. Lafuente, S. Marcen, C. Ornelas, J.-C. Blais and D. Astruc, *J. Am. Chem. Soc*., **2003**, *125*, 7250; C. Ornelas, J. Ruiz , E. Cloutet, S. Alves, D. Astruc *Angew. Chem. Int. Ed*., **2007,** 46 (1) 872.
[2] M.-C. Daniel, J. Ruiz, S. Nlate, J.-C. Blais and D. Astruc, *J. Am. Chem. Soc*., **2003**, *125*, 2617-2628; D. Astruc, M.-C. Daniel and J. Ruiz, *Chem. Commun*, **2004**, 2637-2649 (Feature Article); M.-C. Daniel and D. Astruc, *Chem. Rev*., **2004**, *104*, 293-346 (comprehensive review on gold nanoparticles).
[3] D. Astruc, J. Ruiz, F. Lu, *Angew. Chem. Int. Ed*., **2005,** *44,7852* A. Diallo, C. Ornelas, J. Ruiz, L. Salmon, D. Astruc, *Angew. Chem. Int. Ed*., **2007,** *46,* 8644; *Nanoparticles and Catalysis*, D. Astruc Ed. Wiley, Weinheim, **2007** ; D. Astruc, *Organometallic Chemistry and Catalysis*, Springer, Berlin, 2007, Chap. 20: C. Ornelas, D. Méry, E. Cloutet, J. Ruiz Aranzaes, D. Astruc *J. Am. Chem. Soc*. **2008**, *130*, 1495-1506

Didier Astruc has been a Professor of chemistry at the University Bordeaux I since 1984, a Member of the Institut Universitaire de France since 1995, a Member of the National CNRS committee since 2000 and the President of the Coordination Chemistry Division of the French Chemical Society (2002-5). He did his PhD in Rennes on ferrocene cages (**R. Dabard**), a post-doc at MIT on early organotransition metal aryl and alkylidene complexes (**R. R. Schrock**) and a sabbatical leave in Berkeley (**KPC Vollhardt**) where he wrote his first book on ***Electron Transfer Processes*** (VCH, 1995). He also is the author of a textbook on ***Organometallic Chemistry*** in French (2000), Spanish (2004) and English (Springer, Berlin, 2007). His interests are now in the applications of inorganic chemistry to catalysis, molecular sensing, electronic devices and nanomedicine**.**
e-mail: d.astruc@lcoo.u-bordeaux1.fr