DIDIER ASTRUC

Didier Astruc's group in Bordeaux is working on the interplay between metallodendrimers and transition-metal nanoparticles. The starting point is hard-core transition-metal inorganic and organometallic chemistry, electron-transfer processes and molecular electronics. Applications of this basic research range, in his group, from molecular nanobatteries and catalysis inside nanoreactors in water to the use of functional gold nanoparticles for biological anion sensing and vectorization of anti-cancer drugs.

Didier Astruc was born in Versailles and studied in Rennes, Britanny, where he passed his Ph. D. under the guidance of René Dabard before a post-doc at MIT with Dick Schrock (2005 Nobel Laureate). He has been a Professor of Chemistry at the University Bordeaux 1 since 1984, except for a sabbatical year in U.C. Berkeley with K. Peter C. Vollhardt (1990-1) where he wrote his first book "***Electron Transfer and Radical Processes in Transition-Metal Chemistry***", prefaced by 1983 Nobel Laureate Henry Taube (VCH, New York, 1995). In 2000, he published a textbook in French "***Chimie Organométallique***" (EDP Sciences, Les Ullis; Spanish version: Reverte, 2003) that was completed to "***Organometallic Chemistry and Catalysis***" (Springer, Berlin, 2007). He is the author or co-author of 350 research papers and has given 340 research lectures. He has co-edited a volume of "***Handbook of Electron Transfer***" with V. Balzani and P. Mattay, and has edited three books including "***Modern Arene Chemistry***" (Wiley-VCH, 2004) and "***Nanoparticles and Catalysis***" (Wiley-VCH, 2007) and several special journal issues.

Didier Astruc was awarded the Prize of the Coordination Chemistry Division of the French Chemical Society (1981), the German-French Humboldt Prize (1989), the Iberdrola Prize (1999), the Le Bel Prize, Grand Prix of the French Chemical Society (2000) and the Gold Medal of the Italian Chemical Society (2009). He is a "Member of the Institut Universitaire de France (1995), a Fellow of the Royal Society of Chemistry (2005), a Member of the Academy Europaea (2006), the National German Academy Leopoldina (2006) and the European Academy of Sciences (2007), and he was Gauss Professor of the University of Göttingen in 2008.

3M Lecturers

1962	**Sir Derek H. R. Barton, Imperial College**
1963	Sir Ronald Nyholm, University College
1964	F. C. Tompkins, Imperial College
1965	S. Winstein, U.C.L.A.
1966	F. A. Cotton, M.I.T.
1967	J. O. Hirschfelder, Wisconsin
1968	A. Eschenmoser, E.T.H, Switzerland
1969	**H. Taube, Stanford**
1970	S. A. Rice, Chicago
1971	F. H. Westheimer, Harvard
1972	R. G. Pearson, Northwestern
1973	W. A. Klemperer, Harvard
1974	G. Stork, Columbia
1975	R. J. P. Williams, Oxford
1976	J. A. Morrison, McMaster
1977	D. Arigoni, E.T.H., Switzerland
1978	J. Chatt, Sussex
1979	**J. A. Pople, Carnegie-Mellon**
1980	W. P. Jencks, Brandeis
1981	J. Halpern, Chicago
1982	Sir John Meurig Thomas, Cambridge
1983	R. Breslow, Columbia
1984	M. L .H. Green, Oxford
1985	**D. R. Hershbach, Harvard**
1986	**J. M. Lehn, Strasbourg**
1987	M. H. Chisholm, Indiana
1988	**R. A. Marcus, Cal. Tech.**
1989	**D. J. Cram, U.C.L.A.**
1990	D. Seyferth, M.I.T.
1991	D. A. Shirley, Berkeley
1992	K. U. Ingold, NRC
1993	H. Schmidbauer, Munich
1994	A. J. Bard, U. Texas, Austin
1996	R. Huisgen, Munich
1998	J. M. J. Fréchet, Berkeley
1999	R. W. Field, M.I.T.
2000	I. Dance, New South Wales
2001	K. C. Nicolaou, San Diego
2002	R. R. Birge, Connecticut/Syracuse
2003	D. Fenske, Karlsruhe
2004	A. Padwa, Emory
2005	N. Dovichi, Washington State
2006	K. N. Raymond, Berkeley
2007	K. Tamao, RIKEN and Kyoto University
2008	P. Corkum, NRC, Ottawa
2009	D. Astruc, Univ. Bordeaux 1

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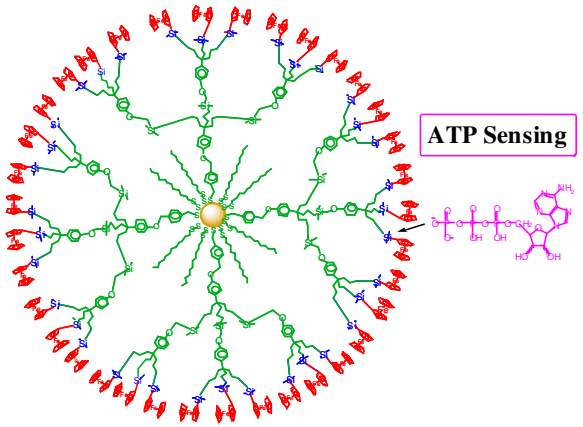
The 3M University Lecturer in Chemistry 2009

DIDIER ASTRUC

Université Bordeaux 1
Bordeaux, France



http://astruc.didier.free.fr/

Prof. Astruc will present three lectures:

Monday, April 26, 2010
4:00 p.m.
Conron Hall
University College - Room 224
REFRESHMENTS WILL BE SERVED
FOLLOWING **THE LECTURE IN ROOM UC224A**

Lecture 1

From Organotransition-metal Chemistry to Metallodendrimers: Applications to Sensing and Molecular Electronics

Organo-iron activation of small arene molecules provides a rare, but very simple and powerful way to multifunctionalize aromatics, leading to dendritic cores, dendrons and giant dendrimers, the characterizations of which were carried out using nanoscience techniques. Further functionalization using olefin metathesis and click reactions led to water-soluble and redox-active dendritic nano-objects that have specific sensing redox properties for inorganic and biological anions. Of particular interest are the electron-transfer and electrochemical properties of ferrocenyldendrimers including those of dendrimer-derivatized electrodes with sensing applications.

Metallocenyl Dendrimers and their Applications in Molecular Electronics, Sensing and Catalysis. D. Astruc, C. Ornelas, J. Ruiz, *Acc. Chem. Res*., **2008**, *41* (7) 841-856.

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Tuesday, April 27, 2010
4:00 p.m
Conron Hall
University College -Room 224

REFRESHMENTS WILL BE SERVED
FOLLOWING **THE LECTURE IN ROOM UC224A**

Lecture 2

The Chemistry of Gold Nanoparticles and its Use in Nanomedicine

Gold nanoparticles already have a long history with ceramic applications two thousand year ago (Lycurgus cup, 4th century) and during the renaissance period when it was used for various curative purposes (even so up to the 20th century). Since the first truly scientific article by Michael Faraday in 1857, and later the master publication by Mie in 1908 rationalizing the plasmon absorption band, their colors have fascinated the chemists and biochemists, with modern applications in medical diagostics and photothermal therapy. Contrary to bulk gold that is mostly inert, some gold nanoparticles can on the contrary be excellent catalysts at very low temperature (cf Haruta's work). While illustrating these general aspects, the lecture will detail the design, syntheses and chemistry of functional gold nanoparticles for medical use including the vectorization of anti-cancer drugs.

Gold Nanoparticles in Nanomedicine : Peparations, Diagnostic, Therapy and Toxicity. E. Boisselier, D. Astruc, *Chem. Soc. Rev*,. **2009**, 38, 1759–1782.

Wednesday, April 28, 2010
4:00 p.m.
3M Centre
Room 3250

REFRESHMENTS WILL BE SERVED 15 MIN.
PRIOR **TO LECTURE**

Lecture 3

Green Catalysis inside Dendritic Nanoreactors

The modern ecological and economical contraints are pushing the chemical community to think of the replacement of organic solvents by water for organic synthesis. With these ideas in mind, we and others have designed nanoreactors that should allow us to reach this goal, even with water insoluble substrates and catalysts under mild conditions. Dendrimers provide magic media that can be designed for that purpose. The lecture will compare metallodendritic catalysis whereby the catalyst is located inside the dendrimer or not, and will point out and illustrate the advantages of intradendritic catalysis. Examples will be choosen in redox catalysis, catalysis by transition-metal nanoparticles and using commercial molecular catalysts.

Dendrimers Designed for Functions: From Physical, Photophysical and Supramolecular Properties to Applications in Sensing, Catalysis, Molecular Electronics, Photonics and Nanomedicine. D. Astruc, E. Boisselier, C. Ornelas, *Chem. Rev*. in press **(2010)**.

Our website: http://www.uwo.ca/chem/