

CV of Alceo Macchioni

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Education and Professional Profile

February 1988: Laurea in Chimica cum laude University of Perugia: "Oxidative Polymerization of 2,6-dimethylphenol", under the supervision of Prof. A. Nenz, Prof. P. Maltese and Dott. G. Roti (Enichem).
February 1992: PhD in Chemical Sciences, University of Perugia: "Investigation of the mechanism of CO and CNR insertion reactions: anionic catalysis and solvent effect", under the supervision of Prof. G. Cardaci.
November 1992-February 1995: Post Doctorate at the ETH-Zentrum of Zürich (Switzerland) under the supervision of Prof. P. S. Pregosin and Prof. L. M. Venanzi.
September 1994: **Researcher** at the Dipartimento di Chimica of the University of Perugia (sector C02X, physical chemistry).
15-19 September 2002: awarded with the gold medal "Raffaello Nasini" from the Inorganic Chemistry Division of the Italian Chemical Society.
December 2002: **Associate Professor** (sector CHIM03X, general and inorganic chemistry) at the Faculty of Sciences of the University of Perugia.
From 2006: delegate of the University of Perugia at the Directive Council of the Interuniversity Consortium of Chemical reactivity and Catalysis (CIRCC).
2008: coordinator of the Organizer Committee of the VIII Congress of the Interdivisional Group of Organometallic Chemistry (CoGICO), 25 – 28 June, Perugia.
From 2009: member of the directive councils of the Interdivisional Groups of Magnetic Resonance and Organometallic Chemistry of the Italian Chemical Society.
2013-2015: President of the Umbria Section of the Italian Chemical Society.
From July 2013: **Full Professor** (sector CHIM03X, general and inorganic chemistry) at the Faculty of Sciences of the University of Perugia.
From 2015: member of the directive council of the Division of Inorganic Chemistry of the Italian Chemical Society.
2nd May – 31th July 2017: Visiting Professor at the ETH of Zürich (Laboratory of Inorganic Chemistry, Prof. Christophe Copéret).

Research activity

The activity of our research group has been always focused on the synthesis, characterization and exploitation in catalysis of organometallics. At the present, two main research lines are active.

1) Development of efficient and robust water oxidation catalysts (WOCs). Water oxidation to molecular oxygen has been recognized as the essential process for producing reductive equivalents for the storage of solar fuels by means of artificial photosynthesis. Over the last few years, we have been engineering novel molecular,

heterogenized and heterogeneous WOCs principally using iridium-organometallic precursors. Promising results, in terms of possible applications, have been obtained exploiting heterogenized and hydrotalcite-like materials as WOCs that combine the positive features of homogeneous and heterogeneous catalysts; in fact they are easy to handle and generally robust and, at same time, exhibit a high activity due to the elevate percentage of properly designed active sites.

2) Investigation of metallocene and post-metallocene catalysts for olefin polymerization. Our main aim is to rationalize the mechanism of activation and speciation of catalysts for olefin polymerization of industrial relevance, by means of multinuclear and multidimensional NMR spectroscopy. Furthermore, particular attention is dedicated to the detection of effects of ion pairing and, in general, of co-catalyst/catalysts interactions on the performances of catalysts. Investigation of the intermolecular structure of aggregates in solution is carried out taking advantages of the NMR methodologies developed during the last decades.

Prof. Macchioni established many scientific collaborations with scientists of well-recognized international reputation. Furthermore, the applicative relevance of the discoveries of prof. Macchioni lead to (i) enter in contractual agreements with the Dow Chemical Company (Freeport, Texas, USA, 2004-2008) and Univation (Freeport, Texas, USA, 2012-2016) on the intra- and inter- molecular study of catalysts of olefin polymerization, (ii) the approval of two research projects for three years each (2007-2010, 2011-2014, 2016-2019) by the Dutch Polymer Institute (DPI) on the investigation of the polymerization mechanism mediated by metallocene and post-metallocene catalysts and (iii) sign a Research Agreement with SABIC on the development of new organometallic catalyst for water oxidation (2013-2017).

Prof. Macchioni is author of more than 170 papers published in the best international journals of chemistry (H-Index = 42, Total Citations > 6670). He presented more than 200 contributions at national and international scientific congresses and received several invitations to held seminars.

Present Scientific Collaborations (in Alphabetical Order)

Martin Albrecht (University College of Dublin).

Peter H. M. Budzelaar (University of Manitoba, Winnipeg, Canada).

Vincenzo Busico (Università degli Studi di Napoli).

Luigi Cavallo (Università degli Studi di Salerno).

Robert H. Crabtree (Yale University, New Haven, USA).

Christophe Copéret (ETH Zurich, Switzerland)

Enrico Dalcanale (Università degli Studi di Parma).

Rossana Galassi (Università degli Studi di Camerino).

Muhammad S. Khan (Sultan Qaboos University).

Roger Kuhlman (UNIVATION).

Hicham Idriss (SABIC).

Fabio Marchetti (Università degli Studi di Pisa).

Tobin J. Marks (Northwestern University, Evanston, USA).

Carlo Nervi and Roberto Gobetto (Università degli Studi di Torino).

Maurizio Peruzzini and Luca Gonsalvi (ICCOM CNR, Firenze).

Claudio Pettinari (Università degli Studi di Camerino).

Massimiliano Valentini (Sultan Qaboos University).

Alexander Z. Voskoboynikov (Moscow State University).

Publications

- (171) V. Kumar, T. Pilati, G. Terraneo, G. Ciancaleoni, A. Macchioni, G. Resnati, P. Metrangolo “Dicarboxylic Acid Separation by Dynamic and Size-Matched Recognition in Solution and in the Solid State” **2017**, *Angew. Chem. Int. Ed.*, DOI: 10.1002/anie.201711822.
- (170) A. Orbelli Biroli, F. Tessore, S. Righetto, A. Forni, A. Macchioni, L. Rocchigiani, M. Pizzotti, G. Di Carlo “Intriguing Influence of –COOH-Driven Intermolecular Aggregation and Acid–Base Interactions with N,N-Dimethylformamide on the Second-Order Nonlinear-Optical Response of 5,15 Push–Pull Diarylzinc(II) Porphyrinates” **2017**, *Inorg. Chem.*, 56, 6438–6450.
- (169) G. Menendez Rodriguez, G. Gatto, C. Zuccaccia, A. Macchioni “Benchmarking Water Oxidation Catalysts Based on Iridium Complexes: Clues and Doubts on the Nature of Active Species” **2017**, *ChemSusChem* (special issue on *Artificial Photosynthesis for Sustainable Fuels*), 10, 4503 – 4509.
- (168) A. Bucci, S. Dunn, G. Bellachioma, G. Menendez Rodriguez, C. Zuccaccia, C. Nervi, A. Macchioni “A Single Organoiridium Complex Generating Highly Active Catalysts for both Water Oxidation and NAD⁺/NADH Transformations” **2017**, *ACS Catal.*, 7, 7788 – 7796.
- (167) L. Oliva, P. Oliva, N. Galdi, C. Pellecchia, L. Sian, A. Macchioni, C. Zuccaccia “Solution Structure and Reactivity with Metallocenes of AlMe₂F: Mimicking Cation–Anion Interactions in Metallocenium– Methylalumoxane Inner-Sphere Ion Pairs” **2017**, *Angew. Chem. Int. Ed.*, 56, 14227 – 14231.
- (166) D. Marchione, M. A. Izquierdo, G. Bistoni, R. W. A. Havenith, A. Macchioni, D. Zuccaccia, F. Tarantelli, L. Belpassi “¹³C NMR Spectroscopy of N-Heterocyclic Carbenes Can Selectively Probe σ Donation in Gold(I) Complexes” **2017**, *Chemistry-Eur. J.*, 23, 2722-2728.
- (165) I. Corbucci, K. Ellingwood, L. Fagiolari, C. Zuccaccia, F. Elisei, P. L. Gentili, A. Macchioni “Photocatalytic water oxidation mediated by iridium complexes” **2017**, *Catalysis Today*, 290, 10-18.
- (164) C. Zuccaccia, L. Tensi, R. L. Kuhlman, A. P. Gies, Jr., A. Macchioni “C–H Activation and Olefin Insertion as Sources of Multiple Sites in Olefin Polymerization Catalyzed by Cp^{Alkyl}Hf(IV) Complexes” **2017**, *ACS Catalysis*, 7, 563 – 567.
- (163) G. Menendez Rodriguez, A. Bucci, R. Hutchinson, G. Bellachioma, C. Zuccaccia, S. Giovagnoli, H. Idriss, A. Macchioni “Extremely Active, Tunable, and pH-Responsive Iridium Water Oxidation Catalysts” **2017**, *ACS Energy Lett.*, 2, 105 – 110.
- (162) G. Pastori, K. Wahab, A. Bucci, G. Bellachioma, C. Zuccaccia, J. Llorca, H. Idriss, A. Macchioni “Heterogenized water oxidation catalysts prepared by

immobilizing Klauß-type organometallic precursors” **2016**, *Chemistry-Eur. J.*, *22*, 13459 – 13463.

(161) A. Bucci, G. Menendez Rodriguez, G. Bellachioma, C. Zuccaccia, A. Poater, L. Cavallo, A. Macchioni “An Alternative Reaction Pathway for Iridium-Catalyzed Water Oxidation Driven by Cerium Ammonium Nitrate (CAN)” **2016**, *ACS Catalysis*, *6*, 4559–4563.

(160) L. Fagiolari, A. Scafuri, F. Costantino, R. Vivani, M. Nocchetti, A. Macchioni “A ternary Zn-Al-Ir hydrotalcite-like compound exhibiting high efficiency and recyclability as water oxidation catalyst” **2016**, *ChemPlusChem* (special issue on *Catalytic Systems for Water Splitting*), *81*, 1060 – 1063.

(159) G. Ciancaleoni, A. Macchioni, L. Rocchigiani, C. Zuccaccia “A PGSE NMR approach to the characterization of single and multi-site halogen-bonded adducts in solution” **2016**, *RSC Advances*, *6*, 80604-80612.

(158) L. Biasiolo, L. Belpassi, C. A. Gaggioli, A. Macchioni, F. Tarantelli, G. Ciancaleoni, D. Zuccaccia “Cyclization of 2-Alkynyldimethylaniline on Gold(I) Cationic and Neutral Complexes”, **2016**, *Organometallics*, *35*, 595-604.

(157) L. Rocchigiani, V. Busico, A. Pastore, A. Macchioni “Comparative NMR Study on the Reactions of Hf(IV) Organometallic Complexes with Al/Zn Alkyls” **2016**, *Organometallics*, *35*, 1241-1250.

(156) L. Rocchigiani, A. Macchioni “Disclosing the multi-faceted world of weakly interacting inorganic systems by means of NMR spectroscopy” **2016**, *Dalton Trans.*, *45*, 2785-2790.

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(154) L. E. E. Broeckx, A. Bucci, C. Zuccaccia, M. Lutz, A. Macchioni, C. Mueller “Cyclometalated Phosphinine-Iridium(III) Complexes: Synthesis, Reactivity, and Application as Phosphorus-Containing Water-Oxidation Catalysts” **2015**, *Organometallics*, *34*, 2943-2952.

(153) L. Rocchigiani, J. Minqiang, M. Bandini, A. Macchioni “Assessing the Role of Counterion in Gold-Catalyzed Dearomatization of Indoles with Allenamides by NMR Studies” **2015**, *ACS Catalysis*, *5*, 3911-3915.

(152) L. Biasiolo, L. Belpassi, G. Ciancaleoni, A. Macchioni, F. Tarantelli, D. Zuccaccia “Diffusion NMR measurements on cationic linear gold(I) complexes” **2015**, *Polyhedron*, *92*, 52-59.

(151) I. Corbucci, A. Petronilho, H. Muller-Bunz, L. Rocchigiani, M. Albrecht, A. Macchioni “Substantial Improvement of Pyridine-Carbene Iridium Water Oxidation

Catalysts by a Simple Methyl-to-Octyl Substitution” **2015**, *ACS Catalysis*, 5, 2714-2718.

(150) G. Ciancaleoni, R. Bertani, L. Rocchigiani, P. Sgarbossa, C. Zuccaccia, A. Macchioni “Discriminating Halogen-Bonding from Other Noncovalent Interactions by a Combined NOE NMR/DFT Approach” **2015**, *Chemistry-Eur. J.*, 21, 440-447.

(149) G. Ciancaleoni, L. Biasiolo, G. Bistoni, A. Macchioni, F. Tarantelli, D. Zuccaccia, L. Belpassi “Selectively Measuring π Back-Donation in Gold(I) Complexes by NMR Spectroscopy” **2015**, *Chemistry-Eur. J.*, 21, 2467-2473.

(148) L. Biasiolo, G. Ciancaleoni, L. Belpassi, G. Bistoni, A. Macchioni, F. Tarantelli, D. Zuccaccia “Relationship between the anion/cation relative orientation and the catalytic activity of nitrogen acyclic carbene-gold catalysts” **2015**, *Catalysis Science & Technology*, 5, 1558-1567.

(147) A. Savini, A. Bucci, M. Nocchetti, R. Vivani, H. Idriss, A. Macchioni “Activity and Recyclability of an Iridium-Edta Water Oxidation Catalyst Immobilized onto Rutile-TiO₂” **2015**, *ACS Catalysis*, 5, 264-271.

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(145) A. Macchioni “Homogeneous and heterogenized iridium water oxidation catalysts”, **2014**, *Proc. SPIE* 9176, Solar Hydrogen and Nanotechnology IX, 917608 (October 7, 2014); doi:10.1117/12.2060957; <http://dx.doi.org/10.1117/12.2060957>.

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- (140) C. Zuccaccia, G. Bellachioma, O. Bortolini, A. Bucci, A. Savini, A. Macchioni “Transformation of a Cp*-Iridium(III) Precatalyst for Water Oxidation when Exposed to Oxidative Stress” **2014**, *Chemistry - A European Journal*, 20, 3446-3456.
- (139) L. Rocchigiani, V. Busico, A. Pastore, G. Talarico, A. Macchioni “Unusual Hafnium-Pyridylamido/ER_n Heterobimetallic Adducts (ER_n=ZnR₂ or AlR₃)” **2014**, *Angewandte Chemie, International Edition*, 53, 2157-2161.
- (138) L. Rocchigiani, G. Ciancaleoni, C. Zuccaccia, A. Macchioni “Probing the Association of Frustrated Phosphine-Borane Lewis Pairs in Solution by NMR Spectroscopy” **2014**, *Journal of the American Chemical Society*, 136, 112-115.
- (137) A. Savini, A. Bucci, G. Bellachioma, L. Rocchigiani, C. Zuccaccia, A. Llobet, A. Macchioni, Alceo “Mechanistic Aspects of Water Oxidation Catalyzed by Organometallic Iridium Complexes” **2014**, *European Journal of Inorganic Chemistry*, 690-697.
- (136) G. Li, C. Zuccaccia, C. Tedesco, I. D'Auria, A. Macchioni, C. Pellecchia, “NMR Spectroscopy and X-Ray Characterisation of Cationic N-Heteroaryl-Pyridylamido ZrIV Complexes: A Further Level of Complexity for the Elusive Active Species of Pyridylamido Olefin Polymerisation Catalysts” **2014**, *Chemistry - A European Journal*, 20, 232-244.
- (135) R. Galassi, S. Ricci, A. Burini, A. Macchioni, L. Rocchigiani, F. Marmottini, S. M. Tekarli, V. N. Nesterov, M. A. Omary “Solventless Supramolecular Chemistry via Vapor Diffusion of Volatile Small Molecules upon a New Trinuclear Silver(I)-Nitrated Pyrazolate Macrometallo-cyclic Solid: An Experimental/Theoretical Investigation of the Dipole/Quadrupole Chemisorption Phenomena” **2013**, *Inorganic Chemistry*, 52, 14124-14137.
- (134) G. Ciancaleoni, L. Biasiolo, G. Bistoni, A. Macchioni, F. Tarantelli, D. Zuccaccia, L. Belpassi “NHC-Gold-Alkyne Complexes: Influence of the Carbene Backbone on the Ion Pair Structure” **2013**, *Organometallics*, 32, 4444-4447.
- (133) D. Zuccaccia, L. Belpassi, A. Macchioni, F. Tarantelli “Ligand effects on bonding and ion pairing in cationic gold(I) catalysts bearing unsaturated hydrocarbons” **2013**, *European Journal of Inorganic Chemistry*, 4121-4135.
- (132) L. Rocchigiani, V. Busico, A. Pastore, A. Macchioni “Probing the interactions between all components of the catalytic pool for homogeneous olefin polymerisation by diffusion NMR spectroscopy” **2013**, *Dalton Transactions*, 42, 9104-9111.
- (131) G. Gianluca, L. Belpassi, F. Tarantelli, D. Zuccaccia, A. Macchioni “A combined NMR/DFT study on the ion pair structure of [(PR₁₂R₂)Au(η²-3-hexyne)]BF₄ complexes” **2013**, *Dalton Transactions*, 42, 4122-4131.
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- (129) A. Bucci, A. Savini, L. Rocchigiani, C. Zuccaccia, S. Rizzato, A. Albinati, A. Llobet, A. Macchioni “Organometallic Iridium Catalysts Based on Pyridinecarboxylate Ligands for the Oxidative Splitting of Water” **2012**, *Organometallics*, 31, 8071-8074.
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- (126) L. Rocchigiani, A. Macchioni, C. Zuccaccia “NMR Studies on the Dynamic Behavior of Zirconaaziridinium Ion Pairs in Solution” **2012**, *Organometallics*, 31, 4076-4079.
- (125) G. Ciancaleoni, N. Fraldi, R. Cipullo, V. Busico, A. Macchioni, P. H. Budzelaar “Structure/Properties Relationship for Bis(phenoxyamine)Zr(IV)-Based Olefin Polymerization Catalysts: A Simple DFT Model To Predict Catalytic Activity” **2012**, *Macromolecules*, 45, 4046-4053.
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- (122) C. Zuccaccia, G. Bellachioma, S. Bolaño, L. Rocchigiani, A. Savini, A. Macchioni “An NMR Study on the Oxidative Degradation of Cp*Ir-Catalysts for Water Oxidation: Evidence for a Preliminary Attack on the Quaternary Carbon Atom of the $-C-CH_3$ Moiety” **2012**, *Eur. J. Inorg. Chem.*, 9, 1462-1468.
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Invited lectures

- “Organo-Iridium Catalysts Relevant to Artificial Photosynthesis”, Green and Sustainable Chemistry, Muscat (Oman), 12-15 November 2017.
- “Organoiridium Complexes as Catalysts Relevant to the Photosynthesis of Solar Fuels”, EuCheMS International Organometallic Conference XXII, Amsterdam (The Netherlands), 11-13 July 2017.
- “Organoiridium Catalysts Relevant to Artificial Photosynthesis”, XXXVI Reunión BIENAL de la Real Sociedad Española de QUÍMICA, Sitges (Spain) 26-29 June 2017.
- “Organoiridium Catalysts Relevant to Artificial Photosynthesis”, Department of Chemistry, University of Zurich (Switzerland), 16 June 2017.
- “Organoiridium Catalysts Relevant to Artificial Photosynthesis”, Department of Chemistry and Biochemistry, University of Bern (Switzerland), 29 May 2017.
- “Molecular, heterogenized and heterogeneous iridium catalysts for water oxidation”, Department of Chemistry and Applied Biosciences, ETH Zurich (Switzerland), 16 May 2017.
- “Oxidative water splitting with molecular, heterogenized and heterogeneous iridium catalysts”, 253rd ACS National Meeting, San Francisco, California (USA), 2-6 April 2017.
- “Molecular, Heterogenized and Heterogeneous Water Oxidation Catalysts Based on Iridium”, 4th International Workshop on Nanotechnology, Renewable Energy and Sustainability, Xi’an (China), 19 September 2016.
- “Molecular, heterogenized and hydrothermalite-like iridium water oxidation catalyst”, 6th EuCheMS Chemistry Congress, Seville (Spain), 10-15 September 2016.
- “Organometallic Chemistry, the Hero of Two Worlds: from Olefin Polymerization to Water Oxidation Catalysts”, Gordon Research Conference in Organometallic Chemistry, Newport (RI, USA), 10-15 July 2016.

- “Searching for Truly Mononuclear Iridium Water Oxidation Catalysts”, 2nd International Symposium on Chemical Energy Conversion Processes, Fukuoka (Japan), 22-26 March 2016.
- “A ternary Zn/Al/Ir Layered Hydroxide as Efficient Water Oxidation Catalyst” 251th ACS Meeting, San Diego (USA), 13-18 March 2016.
- “Activation and Reactivity of Group(IV) Metal-Pyridylamido Catalysts for Olefin Polymerization as Disclosed by NMR Studies” 251th ACS Meeting, San Diego (USA), 13-18 March 2016.
- “Molecular and immobilized iridium catalysts for water oxidation”, PACIFICHEM 2015, Honolulu (USA), 15-20 December 2015.
- “Oxidative Splitting of Water Catalysed by Iridium Molecules and Materials”, GDCh-Wissenschaftsforum Chemie 2015 Chemie verbindet, 30-8/2-9 2015, Dresden (Germany).
- “Chemical and light-driven oxidation of water catalyzed by iridium complexes”, 250th ACS Meeting, Boston (USA), August 16 - 20 2015.
- “Modulating the activity of iridium(III) water oxidation catalysts by small modifications of the ancillary ligands”, COST CARISMA Meeting, Venice, May 5 - 7 2014.
- “Homogeneous and Heterogenized Iridium Catalysts for Water Oxidation”, NIS Colloquium on Photo and Electrochemical Cells for Solar Fuels, Torino (Italy), March 28th 2014.
- “Hafnium-pyridylamido organometallics: Unusual reactivity of exceptional catalysts for olefin polymerization”, 248th ACS Meeting, San Francisco (USA), August 10-14, 2014.
- “Homogeneous and heterogenized iridium water oxidation catalysts”, Solar Hydrogen and Nanotechnology IX, 19-20 August 2014, San Diego (USA).
- “Iridium Coordination Complexes as Efficient (pre)Catalysts for Water Oxidation”, Molecules and Materials for Artificial Photosynthesis, 6-9 February 2014 Cancun (Mexico).
- “NMR as an Essential Tool for Investigating Molecular Transition Metal Catalysts”, XLIII National Congress, 22-24 September 2014, Bari (Italy).
- “NMR Studies on Catalytic Pools for Olefin Polymerization”, UNIVATION, Houston (USA), 12 April 2013.
- “Water Oxidation Catalyzed by Iridium Coordination Complexes”, XLI Congresso Nazionale di Chimica Inorganica, Parma (Italy), 3 - 6 September 2013.
- “Oxidative splitting of water catalyzed by iridium complexes”, 245th ACS Meeting, New Orleans (USA), 7-11 April 2013.
- “Iridium complexes as efficient catalysts for water oxidation”, 40th International Conference on Coordination Chemistry, Valencia (Spain), 9-13 September 2012.
- “Investigating the Molecular and Supramolecular Structure of Catalysts by NMR Techniques”, WISPO-12, Bressanone (Italy), 29-31 January 2012.
- “Oxidative Splitting of Water Catalyzed by Iridium Complexes”, Department of Chemistry, University of Girona (Spain), 29 June 2012.
- “NMR Techniques for Investigating the Supramolecular Structure in Solution”, Universite Aix-Marseille, Spectropole, Marseille (France), 30 April 2010.

- “Self-aggregation tendency of salts bearing fluorinated counterions and long alkylic chains in aromatic and aliphatic low polar solvents”, ACS Spring 2010 National Meeting, San Francisco (USA) 21-25 March 2010.
- “Ion Pairing in Molecular Catalysts for Olefin Polymerization”, DPI (Duch Polymer Institute) Research Training Course In Polyolefins, Napoli (Italy), 2-6 November 2009.
- “NMR Techniques for Investigating the Supramolecular Structure in Solution”, Dipartimento di Scienze Chimiche, Università di Trieste, Trieste (Italy), 16 September 2009.
- “NMR Techniques for Investigating the Supramolecular Structure in Solution of Organometallics”, International School of Organometallic Chemistry, Camerino (Italy), 5-9 September 2009.
- “NMR Studies on Catalytically-Important Transition-Metal Complexes”, VIII International Conference "Mechanisms of Catalytic Reactions" to commemorate the 70th anniversary of the birth of Professor Kirill I. Zamaraev, Novosibirsk (Russia), 29 June – 2 July 2009.
- “NMR Studies on the Supramolecular Structure of Catalytically-Important Transition-Metal Complexes” IXth Netherlands Catalysis and Chemistry Conference, Noordwijkerhout (The Netherlands), 2-4 March 2009.
- “NMR Studies on the Supramolecular Structure of Catalytically-Important Transition-Metal Complexes”, PSP 65 Workshop in occasione del 65° compleanno del Prof. Paul S. Pregosin, Zurich (Switzerland), 27 October 2008.
- “Detecting and Quantifying Intermolecular Interactions in Solution by NMR”, Workshop in occasione del 70° compleanno del Prof. R. Romeo: Aspetti meccanicistici e sintetici in chimica di coordinazione ed organometallica, Lecce (Italy), 5 September 2008.
- “NMR Studies on the Supramolecular Structure of Transition Metal Catalysts in Solution”, International Symposium on Homogeneous Catalysis, ISHC XVI, Firenze (Italy), 6-11 July 2008.
- “Advanced NMR Techniques for Investigating the Supramolecular Structure in Solution: the Case of Catalysts for Olefin Polymerizations”, Dow Research Laboratories of Freeport (TX, USA) and Midland (MI, USA), 19-23 April 2008.
- “Supramolecular investigation of non-covalent organometallic aggregates through advanced NMR techniques”, Dipartimento di Chimica, Università di Vigo, Vigo (Spain), 14 January 2008.
- “Tecniche NMR avanzate per la caratterizzazione di addotti organometallici non-covalenti in soluzione”, Dipartimento di Chimica, Università degli Studi di Salerno, Seminario per Dottorandi di Ricerca, Salerno (Italy), 3 December 2007.
- “Combining Diffusion NMR and Conductometric Measurements to Evaluate the Hydrodynamic Volume of Ions and Ion pairs”, XXXV Congresso di Chimica Inorganica, Milano (Italy) 3-7 September 2007.
- “Ion-pairing in transition-metal catalysts for olefin polymerizations: interionic structure (by NOE and diffusion NMR techniques)-activity-stereoselectivity relationship”, NIS Colloquium on “Olefin polymerization heterogeneous and homogeneous catalysts: structure-activity-selectivity relationship”, Torino (Italy), 5 October 2006.

- “NOE and PGSE NMR studies on the effects of second-coordination-sphere in organometallic catalysts”, ICCOM CNR Firenze, IDECAT Lecture, Firenze (Italy), 31 October 2006.
- “Structural characterization of intermolecular adducts in solution through NOE and diffusion NMR experiments”, Department of Chemistry, University of Oslo, Oslo (Norway), 8 November 2006.
- “Remarkable Self-Aggregation Tendency in Solution of Half-Sandwich Ru(II) Complexes Bearing Amino-Acidate Ligands” XXII Congresso Nazionale della Società Chimica Italiana, Firenze (Italy) 10–15 September 2006.
- “NMR intramolecular and interionic studies on Hf non-metallocene catalysts for olefin polymerizations”, 231nd ACS National Meeting, BMGT-21, Atlanta (USA), 26–30 March, 2006.
- “Fenomeni di aggregazione di composti metallorganici: caratterizzazione intermolecolare degli addotti in soluzione e implicazioni chimiche”, Dipartimento di Chimica Analitica, Inorganica e Metallorganica, Università degli Studi di Milano, Seminario per Dottorandi di Ricerca, Milano (Italy), 10 April 2005.
- “Aggregation in solution of neutral half-sandwich Ru(II) precatalysts for transfer hydrogenation”, XVI FEChem Conference on Organometallic Chemistry, Budapest (Hungary), 3 – 8 September 2005.
- “NOE (Nuclear Overhauser Effect)” Scuola di NMR – Corso Base, Villa Gualino (Torino, Italy), 12 - 16 September 2005.
- “Interionic structure in solution of catalysts for olefin polymerization and copolymerization by means of NMR” XXXV National Congress on Magnetic Resonance, August 31 – September 3, 2005, Monte Porzio Catone (Italy).
- “NMR Intermolecular Structural Studies on (Pre-)Catalysts for Olefin Polymerizations and Co-Polymerizations” 2nd Blue Sky Conference on Catalytic Olefin Polymerizations, 26-29 June 2005, Sorrento (Italy).
- “NMR techniques for investigating the intermolecular structures of metallorganic compounds” IX Scuola Avanzata per Dottorandi: La Chimica Organometallica e Le Tecnologie Avanzate, 27 June – 1 July, 2004, Venezia (Italy).
- “NMR studies on the aggregation and structure of ionic transition metal complexes in solution”, Laboratoire de Structure et Dynamique des Systèmes Moléculaires et Solides, Université Montpellier II, Montpellier (France), 24 May 2004.
- “Elucidation of the Solution Structures of Transition Metal Complex Ionic Adducts by NMR Methodologies”, Organic Chemistry Department of the University of Geneva, Geneva (Switzerland), 13 May 2004.
- “Elucidation of the Solution Structures of Transition Metal Complex Ionic Adducts by NMR Methodologies”, School of Chemistry and Chemical Engineering of EPFL, Lausanne (Switzerland), 12 May 2004.
- “Interionic Structure in Solution of Organometallic Catalytic Precursors”, Department of Chemistry, ETHZ, Zürich (Switzerland), 25 November 2003.
- “Application of NOE and PGSE NMR Methodologies to Investigate the Interionic Structure of Organometallic Catalytic Precursors in Solution: the Case of Metallocenium Ion-Pairs”, Dipartimento di Chimica, Università degli Studi di Napoli “Federico II”, 16 October 2003 (Italy).
- “Effetto Overhauser in 1 e 2D”, Scuola Avanzata NMR, Villa Gualino (Torino, Italy), 1-5 September 2003.

- “Aggregation and Interionic Structure in Solution of Cationic Arene Ru(II) Complexes Bearing α -Diimine Ligands”, XVth FEChem Conference, Zürich (Switzerland), 10-15 August 2003.
- “Application of NOE and PGSE NMR Methodologies to Investigate Intermolecular Organometallic Adducts in Solution”, Gordon Research Conference on Organometallic Chemistry, New Port, Rhode Islands (USA), 21 July 2003.
- “Aggregation and Interionic Structure in Solution of Metallorganic Catalysts”, 11th International Symposium on Relation between Homogeneous and Heterogeneous Catalysis, Evanston, Illinois (USA), 24 July 2003.
- “Interionic structure in solution of some palladium and ruthenium catalysts”, 7th FIGIPS Meeting in Inorganic Chemistry, Lisboa (Portugal), 11-14 June 2003.
- “Determinazione della struttura in soluzione di aggregati metallorganici non covalenti in relazione alla loro reattività”, XXX Congresso di Chimica Inorganica, Modena (Italy) 15-19 September 2002.
- “Interionic and Intermolecular Solution Structure of Transition Metal Complexes by NMR”, XXth International Conference on Organometallic Chemistry, Corfù (Greece), 7-12 July 2002.
- “Solution structure of transition metal complex ion pairs by NMR”, Faculteit der Natuurwetenschappen, Wiskunde en Informatica, Instituut voor Moleculaire Chemie Coordinatie- en Organometaalchemie, Universiteit van Amsterdam, Amsterdam (The Netherlands), 21 June 2002.
- “Transition Metal Complex Ion Pairs: Interionic Solution Structure by NMR – 1. Qualitative Experiments 2. Quantitative NOE and PGSE Experiments”, Department of Chemistry, Northwestern University, Evanston, Illinois, USA, 9-18 January 2001.
- “NMR in soluzione di coppie ioniche metallorganiche”, Istituto “G. Donegani” di Novara (Enichem, Italy), 19 October 2000.
- “NMR of Charged Organometallic Complexes: Determination of the Cation-Anion Relative Position in Solution”, Conferenze-SAPIO “Incontri di Risonanza Magnetica Nucleare”, nell’ambito della Conferenza “Nuove Applicazioni NMR in Chimica Organometallica”, Università degli Studi di Torino (Italy), 10 February 1999.
- “Determinazione della Struttura Interionica in Soluzione di Composti Organometallici Carichi con Tecniche 1D- e 2D-NMR: Implicazioni in Catalisi Omogenea”, Dipartimento di Scienze Chimiche dell’Università di Camerino (Italy), 30 April 1997.

Perugia, 21 – December – 2017

Alceo Macchioni

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