PERSONAL INFORMATION

Andrea Di Giuseppe, PhD

University of L'Aquila

Department of Physical and Chemical Sciences
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Gender M | *Date of birth* 12/01/1981 | *Nationality* Italian

Enterprise	University	EPR
☐ Management Level	☐ Full professor	☐ Research Director and 1st level Technologist / First Researcher and 2nd level Technologist / Principal Investigator
☐ Mid-Management Level	☐ Associate Professor	☐ Level III Researcher and Technologist
☐ Employee / worker level	☑ Researcher	☐ Researcher and Technologist of IV, V, VI and VII level / Technical collaborator

EMPLOYMENTS

CURRENT POSITION(S)

11/2020 to present

Researcher (RTD-B)

University of L'Aquila, Department of Physical and Chemical sciences, L'Aquila, Italy

- Development and mechanistic studies on homogeneous and heterogeneous (photo)catalytic systems based on earth abundant metals for the selective introduction of functional groups and more complex structural units into organic substrates

Teaching and Research

PREVIOUS POSITION(S)

From 2/2020 to 8/2020

Assistant Project Scientist

University of California Berkeley, College of Chemistry, Berkeley, USA

- Synthesis and analysis of f-block element species, in particular Group 3 and lanthanide complexes with unusual electronic structures and potential photocatalytic activity.

Research

From 3/2019 to 12/2019

Postdoctoral Research Associate

University of Edinburgh, School of Chemistry, Edinburgh, UK

- Synthesis of new frustrated Lewis pair systems developed from f-block-centers bearing a hemilable NHC ligand. Studies of their catalytic properties for the heterofunctionalization of cheap and abundant organic starting materials.

Research

From 7/12 to 12/2019

Postdoctoral Fellow

University of Zaragoza, Department of Inorganic Chemistry, Zaragoza, Spain

- Design and mechanistic studies of new homogeneous catalytic systems based on rhodium-NHC complexes for the selective hydrofunctionalization of unsaturated hydrocarbons.
- Development of Rh(I)-NHC complexes with nitrogen-based ligands for the stereoselective synthesis of gem-vinylsulfide throw hydrothiolation of alkynes
- Synthesis, characterization and post-polymerization modification of innovative sulfur containing polymers obtained by rhodium-catalyzed thiol-yne click reaction
- Rh(I)-NHC based catalyst for C-C bond formation via direct C-H activation
- First example of soft-metal based catalyst for the double hydrophosphination of alkynes

- Structure/activity studies of Rh(III)-NHC complexes on the catalyzed H/D exchange reaction of olefins
- Mechanistic studies on the aminocarbonylation of alkynes mediated by Rh(III)-NHC complexes
- Synthesis of new Rh(I)-NHC complexes with labile ligands and study of their stereo/electronic properties
- Synthesis of a Rh(I)-NHC-alkylidene complex and its reactivity in alkene metathesis
- Rh(III)-NHC-hydride based catalyst for the selective H/D exchange of α-olefins

Teaching and Research

EDUCATION AND ACADEMIC DEGREES

From 2008 to 2012

Ph.D. degree in Environmental and Cultural Heritage Chemistry.

University of L'Aquila, Department of Chemistry, L'Aquila (Italy)

Development of homogeneous and heterogeneous catalytic systems based on metal-oxide complexes for the oxyfunctionalization of organic substrates with mild and green oxidants.

•Synthesis and characterization of organic ligands and d and f block organometallic species from milligram to gram scale.

•Ability to carry out reactions under high temperature and/or pressure (Fisher-Porter and J. Young tubes) even using hazardous gases such as CO, NH_3, HCl and H_2S.

•Manipulation of highly air and moisture sensitive compounds (Schlenk techniques and glove box).

•Experienced in separation and purification by chromatographic column, preparative thin layer chromatography, distillation, crystallization, sublimation.

•Design and development of homogeneous and heterogeneous catalysts.

•Experimental and theoretical (DFT calculation) study of the structural and electronic properties of organometallic catalysts, ligand design and mechanistic elucidation.

•Proficient in the application of standard analytical techniques including 1D and 2D (VT) NMR spectroscopy, FTIR, MS (ESI, EI, MALDI), UV-Visible spectroscopy, GC, HPLC (and coupled techniques, GC-MS, LC-MS).

•Ability to organize and optimize laboratory tasks. Supervision and training of postgraduate and undergraduate students on instrumentation and advanced synthetic inorganic/organic chemistry techniques.

From 2004 to 2007

M.Phil. degree in Chemical Sciences

University of L'Aquila, Department of Chemistry, L'Aquila (Italy)

Development of a new biopolymer based support for the heterogenization of transition metal complexes

From 2000 to 2004

B.Sc. degree in Chemistry

University of L'Aquila, Department of Chemistry, L'Aquila (Italy)

- Synthesis of new cephalosporins derivatized with a potential antiinflamatory moiety and their in vitro elastase inhibitory activity

ACHIEVEMENTS AND AWARD

Awards

Parmaliana Award for the best Italian PhD Thesis in catalysis, 2013, granted by Italian Chemical Society (SCI)
Postdoctoral Fellowship "Juan de la Cierva - Incorporación", 2017-2019, granted by the Spanish Ministry of Economy and Competitiveness
Postdoctoral Fellowship "Subprograma de Formación Postdoctoral", 2015-2016, by the Spanish Ministry of Economy and Competitiveness

Grants (last 10 years)

"Heavy drugs 2022: Design and preparation of new catalysts for the H/D exchange reactions of bioactive molecules", 2022, financed by Dompé Farmaceutici, € 25.000,00, PI: Di Giuseppe, Andrea; Crucianelli, Marcello
"Heavy drugs 2021: Design and preparation of new catalysts for the H/D exchange reactions of bioactive molecules", 2021, financed by Dompé Farmaceutici, € 12.000,00, PI: Di Giuseppe, Andrea; Crucianelli, Marcello

"A Novel Approach for the Energy Transfer in Catalyzed Chemicals Reactions: Nanocatalyts for Magnetically Induced Production of Fine Chemicals (Nanoheat)", financed by University of L'Aquila, 2021-2022, € 10.000,00, PI: Di Giuseppe, Andrea
"Dotación Adicional Ayuda Juan de la Cierva Incorporación (18840 IJCI-2015-27029)" 2017-2019. Financed by Ministry of Economy and Competitiveness (Spain), € 6.000,00, PI: Di Giuseppe, Andrea
"Grupo de Referencia Catálisis Homogénea por Compuestos Organometálicos (18852 E42_17R)" 2017-2019, financed by Aragón Government (Spain), € 38.529,00, PI: Pérez Torrente, Jesús Julián
"Grupo Consolidado E07 Catálisis Homogénea por compuestos Organometálicos (18824/3 E07)" 2016, financed by Aragón Government (Spain), € 16.666,00, PI: Oro Giral, Luis Antonio
"Grupo Consolidado E07 Catálisis Homogénea por compuestos Organometálicos (18824/2 E07)" 2015. financed by Aragón Government (Spain), € 17.627,00, PI: Oro Giral, Luis Antonio
"Grupo Consolidado E07 Catálisis Homogénea por compuestos Organometálicos (18824/1 E07)" 2014. financed by Aragón Government (Spain), € 22.623,00, PI: Oro Giral, Luis Antonio
"Desarrollo de Catalizadores más Eficientes para el Diseño de Procesos Químicos Sostenibles y Producción Limpia de Energía (MULTICAT) (18817 CSD2009-00050)" 2013-2016. financed by Spanish National Research Council (CSIC) (Spain), 374.929,00 €. PI: Oro Giral, Luis Antonio
"Grupo Consolidado E07 Catálisis Homogénea por compuestos Organometálicos (18819/3 E07)" 2013. Financed by Aragón Government (Spain), € 16.410,00, PI: Oro Giral, Luis Antonio
"Síntesis, Reactividad y Aplicaciones en Catálisis de Complejos de Metales de Transición con Ligandos Polidentados (17074 CTQ2010-15221)" 2012-2013. Financed by Ministry of Economy and Competitiveness (Spain), € 173.030,00, PI: Pérez Torrente, Jesús Julián

PUBLICATIONS

Bibliometric parameters

Total number of publications in peer-review journals: 28
Total number of citations: 871
H index: 17

Relevant publications (last 10 years)

Galiana-Cameo, Maria; Passarelli, Vincenzo; Perez-Torrente, Jesus J.; **Di Giuseppe, Andrea;** Castarlenas, Ricardo. Variation on the π-Acceptor Ligand within a Rh^{I}-N-Heterocyclic Carbene Framework: Divergent Catalytic Outcomes for Phenylacetylene-Methanol Transformations. *Eur. J. Inorg. Chem,* **2021**, 29, 2947-2957.

Galiana-Cameo, Maria; Borraz, Marina; Zelenkova, Yaroslava; Passarelli, Vincenzo; Lahoz, Fernando J.; Perez-Torrente, Jesus J.; Oro, Luis A.; **Di Giuseppe, Andrea;** Castarlenas, Ricardo. Rhodium(I)-NHC Metal-Ligand Cooperative Proton Transfer as an Efficient Trigger for Rhodium-NHC-Pyridonato Catalyzed gem-Specific Alkyne Dimerization. *ACS Catal.,* **2021**, 11, 7553-7567.

Galiana-Cameo, Maria; Borraz, Marina; Zelenkova, Yaroslava; Passarelli, Vincenzo; Lahoz, Fernando J.; Perez-Torrente, Jesus J.; Oro, Luis A.; **Di Giuseppe, Andrea;** Castarlenas, Ricardo. Rhodium(I)-NHC Complexes Bearing Bidentate Heteroacidato Ligands as gem-Selective Catalysts for Alkyne Dimerization. *Chem. Eur. J.*, **2020**, *26*, 9598-9608

Azpíroz, Ramon; **Di Giuseppe, Andrea**; Urriolabeitia, Asier; Passarelli, Vincenzo; Polo, Victor; Perez-Torrente, Jesus J.; Oro, Luis A.; Castarlenas, Ricardo. Hydride–Rhodium(III)-*N*-Heterocyclic Carbene Catalyst for Tandem Alkylation/Alkenylation via C–H Activation. *ACS Catal.,* **2019**, 9, 9372-9386.

Funes-Hernando, Daniel; Hermosilla, Pablo; Vispe, Eugenio; **Di Giuseppe, Andrea**; Castarlenas, Ricardo; Oro, Luis A.; Perez-Torrente, Jesus J. Vinylidene-based polymers by Rh(I)-NHC catalyzed thiol-yne click polymerization: synthesis, characterization and post-polymerization modification. *Polym. Chem.*, **2018**, *9*, 1298-1302.

Palacios, Laura; **Di Giuseppe, Andrea**; Polo, Victor; Lahoz, Fernando J.; Castarlenas, Ricardo; Perez-Torrente, Jesus J.; Oro, Luis A. Mechanistic insight into the pyridine enhanced α-selectivity in alkyne hydrothiolation catalysed by quinolinolate–rhodium(I)–N-heterocyclic carbene complexes. *Catal. Sci. Technol.*, **2016**, *6*, 8548-8561.

Di Giuseppe, Andrea; De Luca, Roberto; Castarlenas, Ricardo; Perez-Torrente, Jesus J.; Crucianelli, Marcello; Oro, Luis A. Double Hydrophosphination of Alkynes Promoted by Rhodium: the Key Role of an N-Heterocyclic Carbene Ligand. *Chem. Commun.*, **2016**, *52*, 5554-5557.

Di Giuseppe, Andrea; Castarlenas, Ricardo; Oro, Luis A. Mechanistic Considerations on Catalytic H/D Exchange

Mediated by Organometallic Transition Metal Complexes. *C. R. Chim.*, **2015**, *18*, 713-741.
14) Palacios, Laura; **Di Giuseppe, Andrea**; Castarlenas, Ricardo; Lahoz, Fernando J.; Perez-Torrente, Jesus J.; Oro, Luis A. Pyridine versus Acetonitrile Coordination in Rhodium–N-Heterocyclic Carbene Square-Planar Complexes. *Dalton Trans.*, **2015**, *44*, 5777-5789.

Di Giuseppe, Andrea; Castarlenas, Ricardo; Perez-Torrente, Jesus J.; Lahoz, Fernando J.; Oro, Luis A. Hydride-Rhodium(III)-N-Heterocyclic Carbene Catalysts for Vinyl-Selective H/D Exchange: A Structure-Activity Study. *Chem. Eur. J.*, **2014**, *20*, 8391-8404.

Di Giuseppe, Andrea; Castarlenas, Ricardo; Perez-Torrente, Jesus J.; Crucianelli, Marcello; Polo, Victor; Sancho, Rodrigo; Lahoz, Fernando J.; Oro, Luis A. Ligand-controlled regioselectivity in the hydrothiolation of alkynes by rhodium N-heterocyclic carbene catalysts. *J. Am. Chem. Soc.*, **2012**, *134*, 8171-8183.

Book chapters and monographs

Di Giuseppe, Andrea; Castarlenas, Ricardo; Oro, Luis A. Rhodium Catalysts for C–S Bond Formation. In: Claver C. (eds) Rhodium Catalysis. *Top. Organomet. Chem.*, Springer, Cham, **2018**, *61*, 31-67.

ADDITIONAL INFORMATION

Institutional responsibilities

From 2022 to present — Member of the Board of the PhD programme in Physics and Chemistry, University of L'Aquila (Italy)

Commission of trust

From 2020 to present — Member of the Early Career Advisory Board of Chemistry – A European Journal

Member of scientific societies

From 2020 to present — Member of the Italian Chemical Society

Mentorship of students/young researchers/fellows

From 2018 to 2022 — Maria Galiana Cameo, PhD degree in Chemistry, "Design and Applications of Rh–NHC complexes in catalytic hydrofunctionalization of alkynes"

2018 — Marina Borraz Casanova, M.Phil. degree in Chemistry, "Design of Rhodium-NHC based catalysts for C-H activation reactions"

2019 — Andrés Acín Lalanza, B.Sc. degree in Chemistry, "Preparation of Rhodium amide complexes bearing an N-heterocyclic carbene ligand as catalyst for the dimerization of alkynes"

2018 — Luis de los Rios Martín, B.Sc. degree in Chemistry, "Synthesis and Characterization of new catalytic systems based on rhodium complexes bearing N-heterocyclic carbene ligands for the hydrofunctionalization of alkynes"

2017 — Marina Borraz Casanova, B.Sc. degree in Chemistry, "Design of Rhodium-N-heterocyclic carbene ligand catalysts for C-H activation reactions"

2016 — Arturo Blasco Silva, B.Sc. degree in Chemistry, "Synthesis of new Rh-NHC complexes as potential catalysts for C-C coupling reaction"

Major invited presentations

"Homogeneous Catalysis for Fine Chemical Production: NHC-Rhodium Complexes Catalyzed Carbon-Heteroatom and Carbon-Carbon Bond Formation" in XVII National Congress of Catalysis (GIC 2013), 16-18th September 2013, Riccione (Italy).

"Selectivity control by design of Rh bearing N-heterocyclic carbene ligands" in XXXI Convegno Interregionale Toscana Umbria Marche Abruzzo (TUMA-XXXI), 18-20th June 2012, Francavilla (Italy).

Editorial and Reviewing activities

Reviewer of Chemistry Europe Wiley Journals

Replace with dates (from - to) — Scientific Advisory Board/Review Board/Review Panel Member/Editorial Board/Reviewer, Name of Journal.