

Leonardo Marchese

- Graduated in Industrial Chemistry with top marks (110/110 with laude) at the University of Turin (July 1985);
- PhD degree in Chemistry at the University of Torino (September 1990);
- Research Assistant of the University of Torino (February 1992);
- Researcher of the University of Torino (November 1994);
- Associate Professor of the "Università del Piemonte Orientale - Amedeo Avogadro " (November 1998);
- Full Professor in Physical Chemistry of the "Università del Piemonte Orientale - Amedeo Avogadro " (since 2005 on).

RESEARCH ACTIVITY

He is leading a research group of 14 professors and young researchers (2 Associate Professors, 4 Researchers, 5 post docs, 3 PhD) focusing on the development of innovative layered or porous materials, with application in/as: i) polymeric composite materials with enhanced flame retardant properties; ii) acid and/or redox catalysts for sustainable chemistry; iii) light emitting materials for optoelectronics; iv) magnetic or optic materials for biomedicine; v) electrolytes or absorbing layer for sensitized solar cells; vi) polymers or carbons for gas storage/separation or hydrocarbons removal. These systems have been studied by a combined experimental (prominently FTIR and SS-NMR, also with the use of molecular probes) and computational approach. The research activity has been published on high impact factor journals such as Science, Angew. Chem., Adv. Funct. Mater., J. Catal., Chem. Mater. J. Mater. Chem., Chem. Comm., J. Phys. Chem., Chem. Eur. J., Solar En. Mat. Sol. Cells, etc.

SCIENTIFIC OUTPUT

He has co-authored over 247 original publications on peer-reviewed international scientific journals and/or books and 8 patents: 7851 citations and h-index 49 (Scopus, 20.04.2019).

TEACHING ACTIVITY

- Laboratory of Physical Chemistry for the Chemistry course (from 1998 on)
- Molecular Spectroscopy for the Chemistry course (1998-2012)
- Catalysis for the Chemistry course (2002-2005)
- Environmental Physical Chemistry for the Chemistry course (1998-2011)
- Physical Chemistry for the Materials Science course (2004-2015)

Supervisor of 26 Bachelor and Master thesis, 16 PhD and 13 Post-doc

PROJECTS

Principal Investigator (PI)

- European Project of H2020: "MULTI-site organic-inorganic HYbrid CATalysts for MULTI-step chemical processes" (2017- 2020), MULTI2HYCAT; Funding for the unit: € 963.863; total funding of the project: € 5.346.958;
- European Project of the FP7: "Global solar spectrum harvesting through highly efficient photovoltaic and thermoelectric integrated cells" (2013-2016), GLOBASOL; Funding for the unit: € 567.200; total funding of the project: € 2.995.040;
- European Project of the FP7 (joint call NMP-ENERGY): "Innovative Materials for Future Generation Excitonic Solar Cells" (2009-2012), INNOVASOL; Funding for the unit: € 600.160; total funding of the project: € 2.899.510;

- European Project of the FP6: "Novel Inorganic Nanostructured Materials and Devices with Enhanced Photoemission Activity and Thermal Stability" (2005-2008), STABILIGHT; Funding for the unit: € 480.000; total funding of the project: € 2.331.869;
- MIUR PRIN 2005: "Progettazione e sintesi di Silsesquiossani Poliedrici Multifunzionali per Compositi Polimerici Innovativi Termicamente Stabili"(2007-2009); Funding for the unit: € 154.868; total funding for the project: € 325.000,00;
- MIUR Project of "Internazionalizzazione" titled "Sviluppo di materiali innovativi micro e mesoporosi: materiali inorganici lamellari e porosi per la catalisi e per nanocomposti polimerici" (2005-2008) with the University of Campinas (Brazil); Funding: € 76.500;
- Regional Project (CIPE2006): "Novel Nanostructured Materials for Light Emitting Devices and Application to Automotive Displays" (2007-2010), NANOLED; Funding for the unit: € 563.264; total funding for the project: € 900.007;
- Fondazione S. Paolo di Torino (competitive call with European peer review): "Design and Preparation of Host-Guest Nanostructures to Master Light and Energy Transfer Processes in Optoelectronic and Photovoltaic Devices "(2013-2015), MASTERLIGHT. Funding: € 99.000;
- Fondazione Cassa di Risparmio di Alessandria: "Sviluppo di catalizzatori nanostrutturati per il reforming interno di celle a combustibile a carbonati fusi" (2007-2008), NANOCAT-RIC3F; Funding € 100.000.

Responsible of Research Units:

- MIUR PRIN2002: "Advanced polymer hybrids and nanocomposites with low environmental impact"; Principal Investigator (PI) Prof. G. Camino; Funding: € 43.000;
- MIUR FIRB: "Basic and Functional aspects of Nanostructured Inorganic-Organic Hybrid Polymeric Materials " (2003-2007); PI Prof. G. Camino; Funding: € 300.000;
- MIUR FISR: "Matrici di Microcombustori ad Idrogeno" (2004-2008), PI Dr. P. Perlo, Centro Ricerche Fiat; Funding € 300.000;
- European Project of the FP6: "Environmentally friendly multifunctional fire retardant polymer hybrids and nanocomposite" (2005-2008), NANOFIRE; Funding: € 261.500;
- Ministry of the Environment: "Produzione di miscele di metano-idrogeno con cicli termochimici alimentati da energia solare e sistemi di stoccaggio a bordo veicolo - METISOL" (2011-2014), coordinated by Fiat Research Centre in collaboration with ENEA; Funding: € 60.000;
- MIUR PRIN2010-11 "Meccanismi di attivazione della CO2 per la progettazione di nuovi materiali per l'efficienza dell'energia e delle risorse" (2013-2016); Funding: € 108.207;
- Regional Project (Disc. Comun. 96/C 45/06): "Sviluppo di micro fuel cells a metanolo ed etanolo diretto per applicazioni portatili" (2005-2008), MICRO CELL; Funding: € 173.103;
- Regional Project (POR FESR 2007-2013): "Celle fotovoltaiche DSSC flessibili basate su materiali innovativi e coloranti di origine naturale e sintetica di nuova concezione" (2011-2013), FLEXMAT; Funding: € 105.020;
- Regional Project (POR FESR 2007-2013): "Assorbimento di energia elettromagnetica mediante materiali nanocompositi a matrice polimerica per applicazioni di incollaggio innovativo e di schermatura da interferenze elettromagnetiche" (2010-2012), POLIMAG; Funding: € 66.515;
- Regional Project (DOCUP 2000/2006): "Nanotecnologie applicate ai rivestimenti innovativi (funzionali e decorativi) e ai materiali compositi polimerici e magnetici"(2007-2008), NANOMAT; Funding: € 720.000;
- POR FESR 2014-2020, Technological Platform, "Fabbrica Intelligente", "Filiera produttiva dispositivi polimerici (SMART3D)" (2018-2020). Funding: € 98.912.

INDUSTRIAL CONTRACTS & SERVICES

- OMB-Saleri S.p.A. and SOL Group: "Materiali innovativi per lo stoccaggio di metano e idrogeno (2012); Funding € 78.000;
- ENI: "Trattamento di acque contaminate da miscele di idrocarburi: selettività di adsorbimento su materiali micro e mesoporosi da sistemi modello rappresentativi di acque di falda e di produzione" (2013-2015). Funding: € 75.000;
- SOL Group: "Sviluppo di materiali adsorbenti per lo stoccaggio di gas" (2015-2016); Funding € 217.200
- External services for Spectroscopic, Volumetric and SEM analysis: over 50.000 €

FUNDING for the group (last 10 years): over 6M €

FUNDING Managed (last 10 years): over 15M €

INTERNATIONAL ACTIVITY

- Visiting scientist (1992-1994) for overall 18 months at the Royal Institution of Great Britain (worked with Prof. Sir John M. Thomas);
- Visiting scientist (1996) at the "Instituto de Tecnología Química" (ITQ) in Valencia (Spain) for two weeks (Prof. A. Corma);
- Visiting Professor (2000-2008) for several periods (overall ca. 6 months) at the Institute of Chemistry of the University of Campinas (Brazil);
- Evaluation Committee of four PhD students at the University of Paris, Delft, Campinas, Terragona (Spain);
- Invited Lecture of International Congresses/workshop (11) and Summer schools (4);
- Chair or co-chair of five International Congresses;
- Reviewer for the highest impact international journals in Chemistry, Physical Chemistry and Material Chemistry, such as Nature Communications, Angewante Chemie, Mater. Chem., J. Mater. Chem., J. Phys Chem., J. Catal., Chem. Eur. J., etc.;
- Guest Editor of four themed issues on: i) J. Mater. Chem. and ii) Microporous and Mesoporous Materials dedicated to layered materials and their applications in Catalysis and Nanotechnology; iii) Physical Chemistry Chemical Physics, dedicated to physical chemistry at the cross-road of advanced oxide materials and iv) Catalysis Today, where the most recent results on molecular sieves and catalysis have been collected.

ACADEMIC POSITIONS

- President of the courses of Chemistry and Chemical Sciences, Università del Piemonte Orientale (2005-2008);
- Director of the Department of Science and Advanced Technologies", Università del Piemonte Orientale (2008-2011);
- Director of the Master "Materials for Energy and Environment", Università del Piemonte Orientale (2008-2013);
- President of the course "Materials Science", Università del Piemonte Orientale (2011-2015);
- Vice-Director of the Department of Science and Technological Innovation, Università del Piemonte Orientale (2011-2015);
- Director of the Department of Science and Technological Innovation, Università del Piemonte Orientale (2015-)
- Member of the Academic Senate, Università del Piemonte Orientale (2015-)

NATIONAL AND INTERNATIONAL ACKNOWLEDGMENTS

- Visiting scientist (1992-1994) for overall 18 months at the Royal Institution of Great Britain (worked with Prof. Sir John M. Thomas);
- Visiting scientist (1996) at the “Instituto de Tecnología Química” (ITQ) in Valencia (Spain) for two weeks (Prof. A. Corma);
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- Invited Lecture of International Congresses/workshop (11) and Summer schools (4);
- Chair or co-chair of five International Congresses, one Italian Congress and one summer school;
- Reviewer for the highest impact international journals in Chemistry, Physical Chemistry and Material Chemistry, such as Nature Communications, Angewante Chemie, Mater. Chem., J. Mater. Chem., J. Phys Chem., J. Catal., Chem. Eur. J., etc.;
- Guest Editor of four themed issues on: i) J. Mater. Chem. and ii) Microporous and Mesoporous Materials dedicated to layered materials and their applications in Catalysis and Nanotechnology; iii) Physical Chemistry Chemical Physics, dedicated to physical chemistry at the cross-road of advanced oxide materials and iv) Catalysis Today, where the most recent results on molecular sieves and catalysis have been collected;
- Scientific Board of PROPLAST, an Italian Consortium of more than 20 Italian Universities and over 250 SME and multinational companies involved in the research/production of plastic materials;
- Co-Founder and Coordinator (since 2005) of the Interdisciplinary Centre Nano-SiSTeMI of the University of Piemonte Orientale, which includes over 40 young and senior researchers.
- Coordinator (PI) of 4 European projects (with the participation of 11 top level public Institutions and 9 private companies) and 5 national projects;