

Curriculum



Nome Name:	Lidia
Cognome Surname:	Castoldi

ORCID:	0000-0002-7962-1146
Scopus Author ID:	n.d.
WOS Author ID:	n.d.
Sito WEB WEB site:	www.lccp.polimi.it

POSIZIONE PROFESSIONALE ATTUALE / CURRENT PROFESSIONAL POSITION:

Posizione attuale Current position:	In servizio
Qualifica Qualification:	Professore Associato (L. 240/10)
Ateneo/Ente/Azienda University/Institution/Company:	Politecnico di MILANO
Nazione Ateneo/Ente/Azienda University/Institution/Company Country:	ITA
Anno inizio Start Year:	2015
Anno fine End Year:	n.d.

PRECEDENTI ESPERIENZE LAVORATIVE (ULTIMI 10 ANNI) / PREVIOUS WORK EXPERIENCE (LAST 10 YEARS):

Qualifica Qualification:	Professore Associato (L. 240/10)
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Ateneo/Ente/Azienda University/Institution/Company	Politecnico di MILANO
Posizione Sede Lavorativi (indicare Nazione e Città) Workplace Location (specify Country and City):	Milano, MI, Italia
Anno inizio Start Year:	2015
Anno fine End Year:	n.d.
Descrizione Description:	Associate Professor - full time (SSD ICHI-02/B - Chimica industriale tecnologica, ex ING-IND/27) Laboratory of catalysis and catalytic processes (LCCP) at Dipartimento di Energia, Politecnico di Milano Catalysis for environmental protection, catalytic processes for NOx and soot abatement (i.e. Lean NOx Trap, LNT; Passive NOx Adsorbers, PNA; Selective Catalytic Reduction, SCR), hydrogen production from fossil (and renewable) fuels (i.e. turquoise H2 production), advanced materials for CO2 capture and conversion (i.e. methanation reaction, fishery waste as a secondary raw material), advanced materials for catalytic decomposition of liquid monopropellant for space applications, interaction between surface reactions and gas phase reactions, coating formulation for metallic and/or ceramic materials of different geometries, zeolite-based membrane for selective separation of liquid mixture

LINGUE / LANGUAGES:

Lingua Language:	Inglese
Scrittura Writing:	C1
Comunicazione Communication:	B2

Lingua Language:	Francese
Scrittura Writing:	C2
Comunicazione Communication:	C2

AREA/SETTORE SCIENTIFICO-DISCIPLINARE / AREA/SECTOR SCIENTIFIC-DISCIPLINARY

Area scientifico-disciplinare Area scientific-disciplinary:	Ingegneria industriale e dell'informazione
Area scientifico-disciplinare codice Area scientific-disciplinary code:	09

Settore scientifico-disciplinare codice Sector scientific-disciplinary code:	-Chimica industriale tecnologica
Settore scientifico-disciplinare codice Sector scientific-disciplinary code:	-ICHI-02/B

**DESCRIZIONE DEI PRINCIPALI RISULTATI SCIENTIFICI
CONSEGUITI NEGLI ULTIMI 10 ANNI (CON ANNESSO ELENCO DI
MASSIMO 10 PUBBLICAZIONI) / DESCRIPTION OF THE MAIN
SCIENTIFIC RESULTS ACHIEVED IN THE LAST 10 YEARS (WITH
ATTACHED LIST OF MAXIMUM 10 PUBLICATIONS):**

Descrizione Description:	<p><i>My scientific activities can be framed in the branch of catalytic processes of industrial interest, especially relating to environmental sector. I've developed a specific expertise on different aspects related to heterogeneous catalytic processes, in particular on reactivity, reaction mechanisms and kinetic aspects of the reactions. I've a consolidated experience about NOx catalytic reduction using storage/reduction techniques. I contributed to implementing experimental apparatuses equipped with systems for the control, the regulation and the acquisition of experimental data for the studies of catalytic activity. I've achieved a high level of specialization in the preparation of catalytic materials and in their chemico-physical characterization, mastering techniques such as XRD (traditional and synchrotron), BET, FT-IR, SEM, TEM, DTA-TG. My research activity has been organized by following a multi-disciplinary approach: different aspects of the catalytic process have been considered in order to acquire specific skill and knowledge necessary to develop a complete comprehension of the different phenomena involved in a catalytic process, analyzing both gaseous and superficial species. Accordingly, I combined the study of the gaseous products with spectroscopic studies focused on the catalytic surface. By using FT-IR spectroscopy for example it was possible to identify which species are formed on the catalytic surface, which of them are intermediates of the reaction and which of them are final products. Studies on catalytic reactivity have been performed in both stationary and transient conditions, combining recorded data on the reactivity with kinetic analysis. This permitted to rationalize the role of each catalyst component in the catalytic process. The catalytic activity data were also correlated to morphological aspects like specific surface area, pore volume distribution, crystallinity, and/or to chemico-physical aspects like components loading, noble metal dispersion. This approach permitted to obtain some important results generally recognized by the scientific community in the sector, like to underline the role of the support in zeolite-based PNA catalysts for cold-start applications, to improve the low-T performances of NH3-SCR catalysts for vehicle applications, to propose new dual functioning</i></p>
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	<i>materials for cyclic CO2 capture and methanation for CCU processes, to point out mechanistic aspects of LNT catalysts for NOx removal, to deeply study the structure of Fe-based catalyst in CH4 pyrolysis for turquoise H2 production.</i>
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PUBBLICAZIONI / PUBLICATIONS:

Anno della pubblicazione Year of publication:	2025
Citazione Citation:	Morandi, Sara, Castoldi, Lidia, Matarrese, Roberto, Lietti, Luca (2025). Novel insights on the Pd speciation in Pd/SSZ-13 and on the role of H2O in the Pd reduction by CO. SPECTROCHIMICA ACTA. PART A, MOLECULAR AND BIOMOLECULAR SPECTROSCOPY, vol. 324, p. 1-9, ISSN: 1386-1425, doi: 10.1016/j.saa.2024.124945

Anno della pubblicazione Year of publication:	2023
Citazione Citation:	Castoldi, L, Morandi, S, Ticali, P, Matarrese, R, Lietti, L (2023). An Assessment of Zeolite Framework Effect for Low-Temperature NOX Adsorbers. CATALYSTS, vol. 13, p. 1-14, ISSN: 2073-4344, doi: 10.3390/catal13060962

Anno della pubblicazione Year of publication:	2022
Citazione Citation:	Azzoni M. E., Franchi F. S., Usberti N., Nasello N. D., Castoldi L., Nova I., Tronconi E. (2022). Dual-layer AdSCR monolith catalysts: A new solution for NOx emissions control in cold start applications. APPLIED CATALYSIS. B, ENVIRONMENTAL, vol. 315, p. 1-9, ISSN: 0926-3373, doi: 10.1016/j.apcatb.2022.121544

Anno della pubblicazione Year of publication:	2021
Citazione Citation:	Porta A., Visconti C. G., Castoldi L., Matarrese R., Jeong-Potter C., Farrauto R., Lietti L. (2021). Ru-Ba synergistic effect in dual functioning materials for cyclic CO2 capture and methanation. APPLIED CATALYSIS. B, ENVIRONMENTAL, vol. 283, p. 1-12, ISSN: 0926-3373, doi: 10.1016/j.apcatb.2020.119654

Anno della pubblicazione Year of publication:	2015
Citazione Citation:	CASTOLDI, LIDIA, RIGHINI, LAURA, MATARRESE, ROBERTO, LIETTI, LUCA, FORZATTI, PIO (2015). Mechanistic aspects of the release and the reduction of NOx stored on Pt-Ba/Al2O3. JOURNAL OF CATALYSIS, vol. 328, p. 270-279, ISSN: 0021-9517, doi: 10.1016/j.jcat.2015.02.005

Anno della pubblicazione Year of publication:	2017
Citazione Citation:	CASTOLDI, LIDIA, Righini, L., KUBIAK, LUKASZ MACIEJ, MATARRESE, ROBERTO, Morandi, S., LIETTI, LUCA, FORZATTI, PIO (2017). New Insights on the Release and Reduction of NOx Stored over PGM-Based LNT Catalysts. TOPICS IN CATALYSIS, vol. 60, p. 250-254, ISSN: 1022-5528, doi: 10.1007/s11244-016-0606-y

Anno della pubblicazione Year of publication:	2018
Citazione Citation:	Castoldi, L., Matarrese, R., Morandi, S., Righini, L., Lietti, L. (2018). New insights on the adsorption, thermal decomposition and reduction of NOx over Pt- and Ba-based catalysts. APPLIED CATALYSIS. B, ENVIRONMENTAL, vol. 224, p. 249-263, ISSN: 0926-3373, doi: 10.1016/j.apcatb.2017.10.019

Anno della pubblicazione Year of publication:	2020
Citazione Citation:	Castoldi, Lidia (2020). An Overview on the Catalytic Materials Proposed for the Simultaneous Removal of NOx and Soot. MATERIALS, vol. 13, p. 1-34, ISSN: 1996-1944, doi: 10.3390/ma13163551

Anno della pubblicazione Year of publication:	2016
Citazione Citation:	CASTOLDI, LIDIA, MATARRESE, ROBERTO, BRAMBILLA, LUIGI, SERAFINI, ANDREA, TOMMASINI, MATTEO MARIA SAVERIO, LIETTI, LUCA (2016). Effect of potassium on a model soot combustion: Raman and HRTEM evidences. AEROSOL SCIENCE AND TECHNOLOGY, vol. 50, p. 405-415, ISSN: 0278-6826, doi: 10.1080/02786826.2016.1158398

Anno della pubblicazione Year of publication:	2019
Citazione Citation:	Castoldi L., Matarrese R., Daturi M., Llorca J., Lietti L. (2019). Al2O3-supported Pt/Rh catalysts for NOx removal under lean conditions. APPLIED CATALYSIS A: GENERAL, vol. 581, p. 43-57, ISSN: 0926-860X, doi: 10.1016/j.apcata.2019.05.013

DESCRIZIONE DEI PRINCIPALI PROGETTI DI RICERCA E PREMI CONSEGUITI NEGLI ULTIMI 10 ANNI (CON ANNESSO ELENCO DI MASSIMO 10 RISULTATI, INCLUDENDO, A TITOLO DI ESEMPIO, PRINCIPAL INVESTIGATOR O COORDINATORE LOCALE DI PROGETTI DI RICERCA COMPETITIVI NAZIONALI O INTERNAZIONALI, SIGNIFICATIVI PREMI CONSEGUITI PER LA PROPRIA ATTIVITÀ DI RICERCA)/ DESCRIPTION OF THE MAIN RESEARCH PROJECTS AND AWARDS AWARDED IN THE LAST 10

YEARS (WITH ATTACHED LIST OF MAXIMUM 10 ACHIEVEMENTS, INCLUDING, FOR EXAMPLE, PRINCIPAL INVESTIGATOR OR LOCAL COORDINATOR OF NATIONAL OR INTERNATIONAL COMPETITIVE RESEARCH PROJECTS, SIGNIFICANT AWARDS AWARDED FOR YOUR RESEARCH ACTIVITY):

Descrizione Description:	<i>As expert in catalyst preparation, characterization and testing, she was involved in many research project committed by industrial partners and/or by MIUR (e.g. PRIN, PNRR...). The main topics was the environmental protection (NOx reduction, soot abatment...) and the production of e-fuel like turquoise H2 and CH4.</i>
Descrizione Description:	Invited & key-note lectures 2025 "Waste-derived Silica-based porous solids for CO2 methanation" presented at "8th World Congress on Materials Science and Engineering", Berlin, Germany, March 27-28, 2025
Descrizione Description:	Invited & key-note lectures 2020 "NOx adsorption in DeNOx after-treatment systems: the problem of the cold-start emissions" presented at "6th Annual Automotive Exhaust Systems Summit", Munich, Germany; November 19 - 20, 2020
Descrizione Description:	2022-2025 NEST - Network 4 Energy Sustainable Transition, Spoke 4 "Missione 4, Componente 2, Investimento 1.3". PROJECT ASSOCIATED INVESTIGATOR - RESPONSIBLE FOR CATALYSTS SYNTHESIS AND CHARACTERIZATION
Descrizione Description:	2022-2024 Alternative materials for emissions control in hybrid vehicle devices (Acronym: AMELIE) - RESEARCH UNIT COORDINATOR
Descrizione Description:	2022-2025 Waste-derived silica-based porous solids for carbon dioxide capture, storage and re-use (Acronym: SILCO). PROJECT ASSOCIATED INVESTIGATOR; RESPONSIBLE FOR WP
Descrizione Description:	2022-2026 Hydrogen production by methane pyrolysis. PROJECT ASSOCIATED INVESTIGATOR; RESPONSIBLE FOR WP
Descrizione Description:	2023 Supporto allo sviluppo ed alla progettazione di un impianto pilota per l'abbattimento catalitico delle emissioni di metano nei gas di coda del processo AMIS. PROJECT ASSOCIATED INVESTIGATOR - RESPONSIBLE FOR CATALYSTS CHARACTERIZATION AND CATALYTIC TESTS

Descrizione Description:	2023 Analisi di catalizzatori DeNOx per centrale termica. PROJECT ASSOCIATED INVESTIGATOR - RESPONSIBLE FOR CATALYSTS CHARACTERIZATION AND CATALYTIC TESTS
Descrizione Description:	2023 PH3 Valorization: Purification and Conversion to TBP. PROJECT COORDINATOR 2023, 2021, 2019, 2016, 2013 Analisi su catalizzatori DeNOx . PROJECT COORDINATOR
Descrizione Description:	2020 - 2021 Development and optimization of formulations and methods for the washcoating of metallic foams with alpha-alumina-based materials.

DESCRIZIONE DEI PRINCIPALI RISULTATI CONSEGUITI NEGLI ULTIMI 10 ANNI IN TERMINI DI SVILUPPO DI RETI E RELAZIONI SCIENTIFICHE NAZIONALI E INTERNAZIONALI (CON ANNESSO ELENCO DI MASSIMO 5 RISULTATI, INCLUDENDO, A TITOLO DI ESEMPIO, PARTECIPAZIONE O ORGANIZZAZIONE DI CONVEGNI NAZIONALI E INTERNAZIONALI; CONTRIBUTI A CONSORZI DI RICERCA) / DESCRIPTION OF THE MAIN RESULTS ACHIEVED IN THE LAST 10 YEARS IN TERMS OF DEVELOPMENT OF NATIONAL AND INTERNATIONAL SCIENTIFIC NETWORKS AND RELATIONS (WITH ATTACHED LIST OF MAXIMUM 5 RESULTS, INCLUDING, FOR EXAMPLE, PARTICIPATION OR ORGANIZATION OF NATIONAL AND INTERNATIONAL CONFERENCES; CONTRIBUTIONS TO RESEARCH CONSORTIA):

Descrizione Description:	
Descrizione Description:	Organizing and scientific board of XX Congresso Nazionale di Catalisi - XX Congresso Nazionale della Divisione di Chimica Industriale 2-5 September, 2018, Milano, Italy
Descrizione Description:	Scientific board of 5th International Symposium on Catalysis for Clean Energy and Sustainable Chemistry (CCESC2020) in Torremolinos (Malaga), Spain, from June 28 to July 1, 2020

DESCRIZIONE DEI PRINCIPALI RISULTATI CONSEGUITI NEGLI ULTIMI 10 ANNI IN TERMINI DI SUPPORTO ALLA COMUNITÀ SCIENTIFICA (CON ANNESSO ELENCO DI MASSIMO 5 RISULTATI, INCLUDENDO, A TITOLO DI ESEMPIO, RESPONSABILITÀ DI DIREZIONE DI COMITATI EDITORIALI; INCARICHI DI VALUTAZIONE DELLA RICERCA PRESSO ISTITUZIONI NAZIONALI O INTERNAZIONALI; RESPONSABILITÀ

ISTITUZIONALI ALL'INTERNO DELL'ISTITUZIONE DI APPARTENENZA O DI ALTRE ISTITUZIONI) / DESCRIPTION OF THE MAIN RESULTS ACHIEVED IN THE LAST 10 YEARS IN TERMS OF SUPPORT TO THE SCIENTIFIC COMMUNITY (WITH ATTACHED LIST OF MAXIMUM 5 RESULTS, INCLUDING, FOR EXAMPLE, MANAGEMENT RESPONSIBILITIES OF EDITORIAL COMMITTEES; RESEARCH EVALUATION ROLES AT NATIONAL OR INTERNATIONAL INSTITUTIONS; INSTITUTIONAL RESPONSIBILITIES WITHIN THE INSTITUTION OF AFFILIATION OR OTHER INSTITUTIONS):

Descrizione Description:	
Descrizione Description:	Guest Editor 2021 "Selective Catalytic Reduction of NOx by NH3" Special Issue in Catalysts (MDPI)
Descrizione Description:	Guest Editor 2018 "NOx Trap Catalysts and Technologies: Fundamentals and Industrial Applications", Catalysis Series published by The Royal Society of Chemistry
Descrizione Description:	Editorial Board 2012-2020 Journal of Catalysts (Hindawi Publishing Corporation), a peer-reviewed, open access journal
Descrizione Description:	Member of Evaluation Committee for both National (PNRR-PRIN, PRIN, FIRB) and international research projects.
Descrizione Description:	Member of REPRISE, the digital register of independent scientific experts of the MUR, for the scientific evaluation of Italian research
Descrizione Description:	Member of Evaluation Committee for European PhD thesis (France, Spain).
Descrizione Description:	Reviewer for several international journals in the fields of catalysis and chemical engineering. I received the Certificate of Outstanding Contribution in Reviewing in 2016, 2018 and Reviewer Acknowledgements in 2019, 2020, and 2023

DESCRIZIONE DEI PRINCIPALI RISULTATI CONSEGUITI NEGLI ULTIMI 10 ANNI IN TERMINI VALORIZZAZIONE DELLE CONOSCENZE (CON ANNESSO ELENCO DI MASSIMO 3 RISULTATI, RELATIVI ALLA PARTECIPAZIONE DEL CANDIDATO

**ALLE ATTIVITÀ DI VALORIZZAZIONE DELLE CONOSCENZE) /
DESCRIPTION OF THE MAIN RESULTS ACHIEVED IN THE LAST 10
YEARS IN TERMS OF KNOWLEDGE VALORIZATION (WITH
ATTACHED LIST OF MAXIMUM 3 RESULTS, RELATING TO THE
CANDIDATE'S PARTICIPATION IN KNOWLEDGE VALORIZATION
ACTIVITIES):**

Descrizione Description:	
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Informazioni aggiornate alla data di candidatura 21-05-2025

Lidia Castoldi

Il presente curriculum costituisce allegato e parte integrante dell'incarico sottoscritto