Pier Ugo Foscolo

Professore Emerito nel Settore Scientifico Disciplinare ING-IND/24 (PRINCIPI DI INGEGNERIA CHIMICA); Università degli Studi dell'Aquila

POSIZIONE RICOPERTA

Docente a contratto di Reattori Chimici nel Corso di Laurea Magistrale in Ingegneria Chimica – Membro del Collegio di Dottorato del Dipartimento di Ingegneria Industriale e dell'Informazione e di Economia (DIIIE) – afferente al Laboratorio di Ingegneria delle Reazioni Chimiche e Fluidodinamica dei Reattori Chimici

ESPERIENZA PROFESSIONALE

ATTIVITÀ ACCADEMICA

1973-1975 **Borsista SIR distaccato presso Università degli Studi dell'Aquila**

1975-1978 **Professore Incaricato di Reattori Chimici presso Università degli Studi dell'Aquila**

1978-1983 **Professore Incaricato Stabilizzato**

1980-1982 **Research Assistant presso University College London (usufruendo di due anni di periodo sabbatico dall'Università dell'Aquila)**

1983-1989 **Professore Associato di Reattori Chimici presso l'Università dell'Aquila**

1990-1993 **Professore Straordinario di prima fascia presso l'Università dell'Aquila**

1993-2019 **Professore Ordinario ING-IND/24 (PRINCIPI DI INGEGNERIA CHIMICA)**

PRINCIPALI INCARICHI DI RICERCA

Partecipazione e coordinamento di contratti di ricerca europei:
BLAZE 85284 Horizon 2020 (2019 – 2002) Biomass Low cost Advanced Zero Emission small-to-medium scale integrated gasifier-fuel cell combined heat and power plant
LIG2LIC 796585 EC Research for Coal and Steel (2018 – 2022) Cost Effective Conversion of Lignite and Waste to Liquid Fuels
CLARA 817841 Horizon 2020 (2018 – 2022) Chemical Looping Gasification for Sustainable Production of Biofuels
ASCENT 608512 FP7 (2014 – 2018) Advanced Solid Cycles with Efficient Novel Technologies
UNIfHY 299732 FP7 FCH JU (2012-2015) UNIQUE gasifier for hydrogen production
UNIQUE 211517 FP7 (2008 - 2010) Integration of particulate abatement, removal of trace elements and tar reforming in one biomass steam gasification reactor yielding high purity syngas for efficient CHP plants.
ENK3-CT2000-0314 (2001 - 2004) Biomass-gasification and fuel-cell coupling via high-temperature gas clean-up for decentralised electricity generation with improved efficiency
JOR3-CT98-0196 (1998 - 2000) Hydrogen-rich gas from biomass steam gasification (local coordinator)
JOR3-CT95-0037 (1995 - 1997) Production of hydrogen-rich gas by biomass gasification: application to small-scale, fuel cell electricity generation in rural areas
TEMPUS Tacis Project JEP-10096; honorary professor at the Kazakh National Technical University, Almaty.

Partecipazione ai Piani Annuali di Realizzazione (PAR) sulla Ricerca di Sistema Elettrico in collaborazione con l'ENEA (Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile) e il Ministero dello Sviluppo e Economico (MiSE) nell'ambito delle seguenti linee di ricerca:

- **Gassificazione del carbone e CCS**
- **Produzione di energia da biomasse e scarti**
- **Bioenergie**
- **Generazione di energia elettrica con basse emissioni di carbonio**

PRINCIPALI INCARICHI ORGANIZZATIVI, SCIENTIFICI E GESTIONALI

1984-1987	**Responsabile della Commissione ERASMUS di Ateneo**
1987-1992	**Responsabile Progetto ERASMUS per scambio di studenti di Ingegneria Chimica**
1993	**Co-chairman della Fluid particle Interaction Conference, organizzata da Engineering Foundation, New York, a Davos, Svizzera**
2000-2003	**Presidente del Consiglio di Corso di Studio in Ingegneria Chimica**
2004–2007	**Membro del Consiglio di Amministrazione dell'Università dell'Aquila**
2007	**Membro del Comitato Scientifico della World Chemical Engineering Conference (Glascow, UK, 2007)**
2007-2012	**Preside della Facoltà di Ingegneria dell'Università dell'Aquila e membro del Senato Accademico dell'Ateneo**
2008	**Visiting Professor presso Università di Strasburgo, Francia**
2009	**Membro del Comitato Scientifico della Conferenza Internazionale Polygeneration Strategies (Vienna, Austria, 2009)**
2012	**Invited Speaker al International Seminar on Gasification (Stockholm, Svezia, 2012)**
2012-2016	**Membro del Consiglio di Amministrazione della Fondazione dell'Università dell'Aquila**
2012-2015	**Delegato del Rettore alla Coordinazione del Presidio di Qualità dell'Ateneo**
2015-	**Membro del Working Party "Chemical Reaction Engineering" della Federazione Europea di Ingegneria Chimica**
2017-	**Coordinatore dei delegati Italiani nei Working Parties dell'EFCE (designato dalla Associazione Italiana di Ingegneria Chimica – AIDIC)**
2017-2018	**Co-chairman della conferenza internazionale ISCRE 25 (Firenze, Maggio 2018)**
2018	**Guest Editor of Chemical Engineering journal**
2018-2019	**Decano dell'Università degli Studi dell'Aquila**
2018	**Inserito nella Lista degli Aspiranti Commissari ASN sorteggiabili del settore 09/D2 (26/10/2018)**

ISTRUZIONE E FORMAZIONE

1967	**Maturità classica presso il Liceo T. Tasso di Roma**	5
1972	**Laurea Magistrale in Ingegneria Chimica presso l'Università di Roma La Sapienza**	7

ULTERIORI INFORMAZIONI

Pubblicazioni dal 2012 ad oggi

- Hot gas filtration in the freeboard of a fluidized bed gasifier: development of a CFD model; A. Di Carlo and P.U. Foscolo; Powder Technology, 222 (2012) pp 117-130, Elsevier Science Ltd.
- First Al2O3 based catalytic filter candles operating in the fluidized bed gasifier freeboard; S. Rapagnà, K. Gallucci, M. Di Marcello, P.U. Foscolo, M. Nacken, S. Heidenreich, M. Matt; Fuel 97 (2012) pp 718–724; Elsevier Science Ltd.
- The Unique project - integration of gasifier with gas cleaning and conditioning system; P.U. Foscolo; Int. Seminar on Gasification 2012; 18-19 October 2012, Stockholm, Sweden; http://www.sgc.se/gasification2012/
- DeTar catalytic filter with integrated catalytic ceramic foam: activity under model and real bio syngas conditions; M. Nacken, S. Heidenreich, L. Ma, G.V. Baron, S. Rapagnà, M. Di Marcello, K. Gallucci, P.U. Foscolo; ICC 2012
- The UNIfHY Project - Pure hydrogen from biomass: Unique gasifier for hydrogen production; P.U. Foscolo; SEP, Int. Exhibition dedicated to the environment; 19-22 Marzo 2013; invited lecture
- Gasification apparatus and method for generating syngas from gasifiable feedstock material; S. Heidenreich, M. Nacken, P.U. Foscolo and S. Rapagnà; US Patent no 8,562,701 B2, October 22, 2013.
- Experimental evaluation of Mg- and Ca- based synthetic sorbents for CO2 capture; A. Zhenissova, F. Micheli, L. Rossi, S. Stendardo, P.U. Foscolo, K. Gallucci; Chem Eng Research and Design 92 (2014), pp. 727-740
- Hydrogen Rich Gas from Catalytic Steam Gasification of Biomass in a Fluidized Bed Containing Catalytic Filters; S. Rapagnà, A. D'Orazio, K. Gallucci, P.U. Foscolo, M. Nacken, S. Heidenreich; Chem Eng Transactions 37 (2014) 157-162; ISBN 978-88-95608-28-0; ISSN 2283-9216.
- A Biomass Gasifier Including An Ionic Transport Membrane System For Oxygen Transfer; T. Antonini, K. Gallucci, P.U. Foscolo; Chem Eng Transactions 37 (2014) 91-96; ISBN 978-88-95608-28-0; ISSN 2283-9216.
- New concepts in biomass gasification; S. Heidenreich, P.U. Foscolo; Progress in Energy and Combustion Science 46 (2015) pp. 72-95.
- Biomass to fuel cells State of the Art: a review of the most innovative technology solutions; E. Bocci, A. Di Carlo, S.J. McPhail, K. Gallucci, P. U. Foscolo, M. Moneti, M. Villarini, and M. Carlini; Int J Hydrogen Energy, 39 (2014) pp. 21876-895, Elsevier Science Ltd.
- Oxygen transport by ionic membranes: Correlation of permeation data and prediction of char burning in a membrane-assisted biomass gasification process; T. Antonini, K. Gallucci, V. Anzoletti, S. Stendardo, P.U. Foscolo; Chemical Engineering and Processing: Process Intensification, 94 (2015) 39-52.
- H2 from SERP: CO2 Sorption by Double-Layered Hydroxide at Low and High Temperatures; F. Micheli, L. Parabello, L. Rossi, P.U. Foscolo, K. Gallucci; in World Sustainable Energy Days Next 2014 (conference proceedings), DOI: 10.1007/978-3-658-04355-1_18, Print ISBN 978-3-658-04354-4, Online ISBN 978-3-658-04355-1; Springer Fachmedien Wiesbaden (2015) pp 145-153.
- New DeTar Catalytic Filter with Integrated Catalytic Ceramic Foam: Catalytic Activity under Model and Real Bio Syngas Conditions; M. Nacken, G.V. Baron, S. Heidenreich, S. Rapagnà, A. D'Orazio, K. Gallucci, J.F.M. Denayerb, P.U. Foscolo; Fuel Processing Technology 134 (2015) pp. 98-106.
- Gas conditioning in H2 rich syngas production by biomass steam gasification: experimental comparison between three innovative ceramic filter candles; A. D'Orazio, S. Rapagnà, P.U. Foscolo, K. Gallucci, M. Nacken, S. Heidenreich, A. Di Carlo, A. Dell'Era; Int. Journal Hydrogen Energy 40 (2015) 7282-7290.
- Influence of temperature on oxygen permeation through ion transport membrane to feed a biomass gasifier; T Antonini, P U Foscolo, K Gallucci, S Stendardo; Journal of Physics: Conference Series 655 (2015) 1-10.
- Development of a CFD model for the simulation of tar and methane steam reforming through a ceramic catalytic filter; E. Savuto, A. Di Carlo, E. Bocci, A. D'Orazio, M. Villarini, M. Carlini, P.U. Foscolo; Int. Journal Hydrogen Energy 40 (2015) 7991-8004.
- High quality syngas production via steam-oxygen blown bubbling fluidised bed gasifier; S. Stendardo, P.U. Foscolo, M. Nobili, S. Scaccia; Energy 103 (2016) 697-708.
- Hydrogen by sorption enhanced methane reforming: a grain model to study the behavior of bi-functional sorbent-catalyst particles; I. Aloisi, N. Jand, S. Stendardo, P.U. Foscolo; Chemical

Engineering Science 149 (2016) 22-34.

- Influence of the main gasifier parameters on a real system for hydrogen production from biomass; M. Moneti, A. Di Carlo, E. Bocci, P.U. Foscolo, M. Villarini, M. Carlini; Int. Journal Hydrogen Energy (2016), online publication complete: 10-JUN-2016, DOI information: 0.1016/j.ijhydene.2016.05.171
- Performance evaluation at different process parameters of an innovative prototype of biomass gasification system aimed to hydrogen production; Energy Conversion and Management
- Silvera Scaccia, Stefano Stendardo, Giuseppina Vanga, Leandro Pagliari, Stefano Cassani, Mirko Nobili, Giuseppe Messina, Andrea Assettati, Giuliano Guidarelli, Salvatore Attanasi, Caterino Stringola, Andrea Grasso, Ivano Cassani, Antonio Calabró, Pier Ugo Foscolo; Natural Resources, 2014, 5, 433-441
- Simulation of an industrial turbulent fluidized bed reactor for n-butane partial oxidation to maleic anhydride; A. Romano, A. Di Giuliano, K. Gallucci, P.U. Foscolo, C. Cortelli, S. Gori, M. Novelli; Chemical Engineering Research and Design, 114 (2016) 79-88.
- Sorption enhanced catalytic steam methane reforming: experimental data and simulations describing the behaviour of bi-functional particles; I. Aloisi, A. Di Giuliano, A. Di Carlo, P.U. Foscolo, C. Courson, K. Gallucci; Chemical Engineering Journal, 314 (2017) 570-582.
- Comparison between Ancient and Fresh Biochar Samples, A Study on The Recalcitrance ofCarbonaceous Structures During Soil Incubation; E. Pusceddu, A. Montanaro, G. Fioravanti, S. F. Santilli, P.U. Foscolo, I. Criscuoli, A. Raschi , F. Miglietta; International Journal of New Technology and Research (IJNTR) ISSN:2454-4116, Volume-3, Issue-3, March 2017 Pages 39-46.
- Étude expérimentale du vaporeformage du méthane amélioré par absorption de CO2 sur des catalyseurs Ni-mayenite et des absorbants CaO-mayenite; A. DI GIULIANO, F. GIANCATERINO, K. GALLUCCI, P.U. FOSCOLO, C. COURSON; Récents Progrès en Génie des Procédés, Numéro 110 – 2017; ISSN: 1775-335X ; ISBN: 978-2-910239-85-5, Ed. SFGP, Paris, France.
- Analysis of syngas methanation for bio-SNG production from wastes: kinetic model development and pilot scale validation; M. Materazzi, F. Grimaldi, P.U. Foscolo, P. Cozens, R. Taylor, C. Chapman; Fuel Processing Technology 167 (2017) 292–305.
- Olivine, dolomite and ceramic filters in one vessel to produce clean gas from biomass; S. Rapagnà, K. Gallucci, P.U. Foscolo; Waste Management 71 (2018) 792-800.
- Sorption enhanced steam methane reforming on catalyst-sorbent bifunctional particles: a CFD fluidized bed reactor model; Andrea Di Carlo, Ilaria Aloisi, Nader Jand, Stefano Stendardo, Pier Ugo Foscolo; Chemical Engineering Science 173 (2017) 428-442.
- CO2 sorption by hydrotalcite-like compounds in dry and wet conditions; Gallucci K., Micheli F., Poliandri A., Rossi L., Foscolo P.U.; INTERNATIONAL JOURNAL OF CHEMICAL REACTOR ENGINEERING, (2015) ISSN: 1542-6580, doi: 10.1515/ijcre-2014-0167.
- CO2 sorption enhanced processes by hydrotalcite like compounds at different temperature levels; Gallucci K., Micheli F., Barisano D., Villone A., Foscolo P.U., Rossi L.; INTERNATIONAL JOURNAL OF CHEMICAL REACTOR ENGINEERING 13 (2015), ISSN: 1542-6580, DOI: https://doi.org/10.1515/ijcre-2014-0131.
- Integration of Biomass Gasification and Hot Gas Cleaning Processes; Sergio Rapagnà, Elisa Savuto, Andrea Di Carlo, Katia Gallucci and Pier Ugo Foscolo; Chemical Engineering Transactions 67 (2018).
- Development of a Ni-CaO-mayenite combined sorbent-catalyst material for multicycle sorption enhanced steam methane reforming; A. Di Giuliano, F. Giancaterino, C. Courson, P. U. Foscolo, K. Gallucci; Fuel 234 (2018) 687–699, DOI: https://doi.org/10.1016/j.fuel.2018.07.071.
- Catalytic and sorbent materials based on mayenite for sorption enhanced steam methane reforming with different packed-bed configurations; A. Di Giuliano, F. Giancaterino, C. Courson, P. U. Foscolo, K. Gallucci; Int. J. of Hydrogen Energy 43 (2018) 21279-21289; doi.org/10.1016/j.ijhydene.2018.10.003
- Multicycle sorption enhanced steam methane reforming with different sorbent regeneration conditions: Experimental and modelling study; A. Di Giuliano, K. Gallucci, F. Giancaterino, C. Courson, P.U. Foscolo; Chemical Engineering Journal 377 (2019) 119874; doi.org/10.1016/j.cej.2018.09.035.
- Fluidized bed reactor assisted by oxygen transport membranes: numerical simulation and experimental hydrodynamic study; T. Antonini, A. Di Carlo, P.U. Foscolo, K. Gallucci, S. Stendardo; Chemical Engineering Journal 377 (2019) 120323; doi.org/10.1016/j.cej.2018.11.021.
- International Symposium ISCRE 25 in Florence – resoconto del congresso; P.U. Foscolo; La Chimica e l'Industria 5(8) (2018) 33-37.
- Effect of Ni precursor salts on Ni mayenite catalysts for steam methane reforming and on Ni-CaO-mayenite materials for sorption enhanced steam methane reforming; Andrea DI GIULIANO, Katia

GALLUCCI, Pier Ugo FOSCOLO, Claire COURSON; Int. J. of Hydrogen Energy (2019), 44 (2019) 6461-6480; doi.org/10.1016/j.ijhydene.2019.01.131.

- Methanol production by CO2 hydrogenation: analysis and simulation of reactor performance; Grazia Leonzio, Edwin Zondervan, Pier Ugo Foscolo; Int. J. of Hydrogen Energy 44 (2019) 7915-7933, https://doi.org/10.1016/j.ijhydene.2019.02.0560360-3199.
- An outlook towards 2030: optimization and design of a CCUS supply chain in Germany; Grazia Leonzio, Edwin Zondervan, Pier Ugo Foscolo; Computers and Chemical Engineering 125 (2019) 499-513, https://doi.org/10.1016/j.compchemeng.2019.04.001.
- Sustainable utilization and storage of carbon dioxide: analysis and design of an innovative supply chain; Grazia Leonzio, Pier Ugo Foscolo, Edwin Zondervan; Computers and Chemical Engineering, 131 (2019), doi.org/10.1016/j.compchemeng.2019.106569.
- Scenario analysis of carbon capture, utilization (particularly producing methane and methanol) and storage (CCUS) systems; Grazia Leonzio, Pier Ugo Foscolo, Edwin Zondervan, I. David L.Bogle; Industrial and Engineering Chemistry Research (2019), (2020), doi.org/10.1021/acs.iecr.9b05428.
- Optimization of CCUS supply chains in the UK: a strategic role for emissions reduction; Grazia Leonzio, David Bogle, Pier Ugo Foscolo, Edwin Zondervan; Chemical Engineering Research and Design, 155 (2020) 211–228.
- Analysis of a 2-D model of a packed bed reactor for methanol production by means of CO2 hydrogenation; Grazia Leonzio, Pier Ugo Foscolo; Int. J. Hydrogen Energy, 45 (2020) 10648-10663.
- Determination of kinetic and diffusion parameters needed to predict the behavior of CaO-based CO2 sorbent and sorbent-catalyst materials; Andrea Di Giuliano, Katia Gallucci, Pier Ugo Foscolo; Industrial and Engineering Chemistry Research, 59 (2020) 6840–6854 doi.org/10.1021/acs.iecr.9b05383.
- 166 Sorption enhanced steam methane reforming by Ni/CaO/mayenite combined systems: overview of experimental and modelling results from European research project ASCENT; Andrea Di Giuliano, Katia Gallucci, Andrea Di Carlo, Stefano Stendardo, Claire Courson, Pier Ugo Foscolo; Canadian J. of Chemical Engineering 98 (2020) 1907-1923, doi: 10.1002/cjce.23779.
- Optimization of CCUS supply chains for some European countries under the uncertainty; Grazia Leonzio, Pier Ugo Foscolo, Edwin Zondervan; Processes, 8 (2020) 960; doi.org/10.3390/pr8080960.
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Contributi in volume:

- FOSCOLO, Pier Ugo, GALLUCCI, KATIA (2015). Bioenergy–Intensified Biomass Utilization. In: Katia Gallucci Pier Ugo Foscolo. (a cura di): Fausto F. Gallucci and Martin van Sint Annaland, Process Intensification for Sustainable Energy Conversion. p. 331-385, John Wiley & Sons, Ltd., ISBN: 978-1-118-44935-6.
- Advanced biomass gasification – New concepts for efficiency increase and product flexibility; S. Heidenreich, M. Mueller, P.U. Foscolo; Academic Press (2016).
- Substitute Natural Gas from Wastes; edited by M. Materazzi and P.U. Foscolo; Academic Press (2019).
- ISCRE 25 Special Issue: Bridging Science and Technology; edited by Enrico Tronconi, Pier Ugo Foscolo; Chemical Engineering J., 377 (2019);

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- Nessuno