

Curriculum Vitae

Mario Amelio

General Information:

Mario Amelio was born in Catanzaro on March, 8 1955. He graduated in Industrial Technologies Engineering, Electrical address, at the University of Calabria in 1980. He attended the fifth cycle Ph.D. in Machine Engineering at the University of Bari and holds the title of Doctor Research in 1993. On December 1, 1994 he joined the Faculty of Engineering of the University of Calabria as a researcher in the Scientific Area I04C-Energy Systems and technologies. Later, on May 2, 2002, he passed to the Associate Professor role, in the field of the Fluid-based Power Machines.

Area of scientific interest: energy systems, renewable energy. Has carried out research in the field of internal combustion engines (measurement of the flow field in the cylinder), in the field of wind energy (testing of wind turbines for the production of electricity and water pumping) and in the field of hydraulic energy (exploitation of resources of small entities with centrifugal pumps used as turbines). He has been interested in systems for the thermal treatment of polluted air from volatile organic compounds and he extended the modeling also to systems of post-treatment of the exhaust gases of Internal Combustion Engines.

The main research activities in progress include: the study of advanced energy systems for the control of CO₂ emissions through the application of membrane reactors (in collaboration with the Institute for Membrane Technology, ITM-CNR), the equipment for conversion energy from sea currents, methods of cooling the intake air of the gas turbines, to mitigate the performance degradation due to unfavorable weather conditions. Recently, have been initiated researches: on systems for the conversion of the energy potential of biomass; on the gas turbine installations powered by air heated by solar energy or even inserted in energy storage systems, based in the storage of large volumes of compressed air.

Organizational and Coordination: He has been a member of the Board for the Department of Mechanics for three years (1994/97) as Researcher and for three years (2003/06) as Associate Professor. From February 2004 to February 2007 he served as President of the Commission "Stages" of the Faculty of Engineering; from July 2008 to July 2011 he has been responsible for the Orientation of graduates as a delegate of the Rector. Since January 2013, with the establishment of the new Unical engineering departments, he is Delegate of the Director for the DIMEG Orientation Activities and coordinator of the Commission Paritetico professors-students of the Department. Since 2015 he is also vice-coordinator of the degree course master's degree in Energy Engineering.

List of publications

Books or chapters of books

1. Morrone P., Amelio M., Basile A., Gallucci F., Simulation of Membrane Reactors. Angelo Basile, Fausto Gallucci Chapter 1, " Membranes in gas separation: theoretical background and numerical simulation", Nova Science Publishers. 2009. pp. 1-34.

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2. M. Amelio, M. Belli, G.A. Danieli, "A Multidimensional Performance Model of a Spark Ignition Engine Characterized by a Single Step Reaction To Equilibrium", Combustion Science and Technology - n. 45, pp. 115 - 1985.
3. M. Amelio, S. Bova, "Exploitation of Moderate Wind Resources by Autonomous Wind Electric Pumping Systems," Renewable Energy, Vol. 21/2, pp.255-269, 2000.

4. M. Amelio, S. Bova, C. De Bartolo, "The Separation between Turbulence and Mean Flow in ICE LDV data: the complementary point-of-view of different investigation tools", *ASME Journal of Engineering for Gas Turbines and Power*, Vol. 122 N. 4 pp. 579-587 - October 2000.
5. Morrone P., Di Renzo A., Di Maio F. P., Amelio M., "Modelling process characteristics and performance of fixed and fluidized bed Regenerative Thermal Oxidizer (RTO)". *Industrial & Engineering Chemistry Research*, 2006, pp. 4782-4790.
6. Amelio M., Morrone P., "Numerical evaluation of the Energetic Performances of Structured and Random Packed Beds in regenerative thermal oxidizers", *Applied Thermal Engineering*, 2007, Vol. 27 pp. 762-770 (presentato anche al convegno "ASME ATI", Milano, 14 -17 Maggio, 2006, Vol. 1, pp. 179-186).
7. Amelio M., Morrone P., Gallucci F., Basile A., "Integrated gasification gas combined cycle plant with membrane reactors: Technological and economical analysis", *Energy Conversion & Management*, 2007, Vol. 48, pp. 2680-2693.
8. Amelio M., Florio G., Morrone P., Senatore S., "The influence of rotary valve distribution systems on the energetic efficiency of regenerative thermal oxidizers (RTO)". *International Journal of Energy Research*, 2008, Vol. 32, n. 1, pp. 24-34.
9. Algieri A., Amelio M., Morrone P., "A numerical analysis of energetic performances of active and passive after treatment systems". *International Journal of Energy Research*, 2009, Vol. 33, n. 7, pp. 696-708.
10. Algieri A., Amelio M., Bova S., Morrone P., "Energy Efficiency Analysis of Monolith and Pellet Emission Control Systems in Unidirectional and Reverse-Flow Designs". *SAE International Journal of Engines*, 2010, pp. 684-693.
11. Amelio M., Barbarelli S., Florio G., Scornaienchi N. M., Cutrupi A., Minniti G., Sanchez Blanco M., "Innovative tidal turbine with central deflector for the exploitation of river and sea currents in on-shore installations". *Applied Energy*, 2012, Vol. 97, pp. 944-955.
12. Algieri, A., Amelio, M., Morrone, P., "A comparative energetic analysis of active and passive emission control systems adopting standard emission test cycles", (2012) *Modelling and Simulation in Engineering*, 2012, art. no. 786252
13. Barbarelli, S., Amelio, M., Castiglione, T., Florio, G., Scornaienchi, N.M., Cutrupi, A., Lo Zupone, G., "Analysis of the equilibrium conditions of a double rotor turbine prototype designed for the exploitation of the tidal currents". (2014) *Energy Conversion and Management*, 87, pp. 1124-1133.
14. Barbarelli S., Florio G., Amelio M., Scornaienchi N. M., Blanco M. S., Lo Zupone G., Cutrupi A., "Engineering Design Study on an Innovative Turbine with on Shore Foundation". *Journal of Energy and Power Engineering*, 2014, Vol. 8, n. 3, pp. 476-486.
15. Barbarelli, S., Florio, G., Amelio, M., Scornaienchi, N.M., Cutrupi, A., Lo Zupone, G., "Design procedure of an innovative turbine with rotors rotating in opposite directions for the exploitation of the tidal currents". (2014) *Energy*, 77, pp. 254-264. Cited 8 times.
16. Amelio, M., Ferraro, V., Marinelli, V., Summaria, A., "An evaluation of the performance of an integrated solar combined cycle plant provided with air-linear parabolic collectors". (2014) *Energy*, 69, pp. 742-748
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18. Lo Zupone, G., Amelio, M., Barbarelli, S., Florio, G., Scornaienchi, N.M., Cutrupi, A., "Levelized Cost of Energy: A First Evaluation for a Self Balancing Kinetic Turbine". (2015) *Energy Procedia*, 75, pp. 283-293.
19. Perrone, D., Amelio, M., "A Preliminary Study of Hydrodynamics and Heat Transfer in a Bubbling Fluidized Bed containing Sand Particle using CFD". (2015) *Energy Procedia*, 81, pp. 1041-1054.

20. Rovense, F., Amelio, M., Ferraro, V., Scornaienchi, N.M., "Analysis of a concentrating solar power tower operating with a closed joule brayton cycle and thermal storage". (2016) *International Journal of Heat and Technology*, 34 (3), pp. 485-490
21. Perrone, D., Amelio, M., "Numerical simulation of MILD (Moderate or Intense Low-Oxygen Dilution) combustion of coal in a furnace with different coal gun positions". (2016) *International Journal of Heat and Technology*, 34 (Special Issue 2), pp. S242-S248.
22. Barbarelli, S., Amelio, M., Florio, G., "Predictive model estimating the performances of centrifugal pumps used as turbines", *Energy*, 2016, Volume 107, Pages 103-121
23. Amelio, M., Beraldi, P., Ferraro, V., Scornaienchi, M., Rovense, F., "Optimization of Heliostat Field in a Thermal Solar Power Plant with an Unfired Closed Joule-Brayton Cycle", (2016) *Energy Procedia* 101, pp472-479
24. Perrone, D., Amelio, M., "Numerical Investigation of Oxy-mild Combustion of Pulverized Coal in a Pilot Furnace", (2016) *Energy Procedia* 101, pp. 1191-1198.
25. Lo Zupone, G., Amelio, M., Barbarelli, S., Florio, G., Scornaienchi, N.M., Cutrupi, A., "Lcoe evaluation for a tidal kinetic self balancing turbine: Case study and comparison". (2015) *Applied Energy*, Article in Press.
26. Barbarelli, S., Amelio, M., Florio, G., "Experimental activity at test rig validating correlations to select pumps running as turbines in microhydro plants" (2017) *Energy Conversion and Management*, 149, pp. 781-797.
27. Barbarelli, S., Amelio, M., Florio, G., Scornaienchi, N.M., "Procedure Selecting Pumps Running as Turbines in Micro Hydro Plants", (2017) *Energy Procedia*, 126, pp. 549-556.
28. Rovense, F., Perez, M.S., Amelio, M., Ferraro, V., Scornaienchi, N.M., "Feasibility analysis of a solar field for a closed unfired Joule-Brayton cycle", (2017) *International Journal of Heat and Technology*, 35 (Special Issue 1), pp. S166-S171
29. Rovense, F., Amelio, M., Scornaienchi, N.M., Ferraro, V., "Performance analysis of a solar-only gas micro turbine, with mass flow control", (2017) *Energy Procedia*, 126, pp. 675-682
30. Amelio, M., Barbarelli, S., Rovense, F. and Scornaienchi, N.M., "Possibility of employing a small power tangential flow turbine prototype in a micro solar concentration plant" (2017), *International Journal of Heat and Technology* 35(4), pp. 785-792
31. Amelio, M., Pèrez, M.S., Ferraro, V., Rovense, F., Bova, S., "Dynamic simulation of the temperature inlet turbine control system for an unfired micro gas turbine in a concentrating solar tower", (2018), *Energy Procedia*, 148, pp. 712-719
32. Perrone, D., Castiglione, T., Morrone, P., Barbarelli, S., Amelio, M., "NOx emissions for oxy-mild combustion of pulverized coal in high temperature pre-heated oxygen.", (2018) *Energy Procedia* 148, pp.567-574
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34. Barbarelli, S., Florio, G., Amelio, M., Scornaienchi, N.M., "Preliminary performance assessment of a novel on-shore system recovering energy from tidal currents" (2018), *Applied Energy* 224, pp. 717-730
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38. Amelio M., Belli M., Danieli G.A., Florio G., "Un primo confronto fra un modello fenomenologico (ASIES) ed uno multidimensionale (REC-P3) nella simulazione dei motori ad accensione comandata", presentato al terzo Combustion Workshop, C.R.F. Orbassano (TO), Giugno 80. Pubblicato su A.T.A n. 6 Giugno 1982.
39. Settino J., Amelio M., Schildhauer T. J., Di Maio F. P., Di Renzo A., "Desolforazione a caldo mediante chemical looping", La Termotecnica, Ottobre 2016

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44. Amelio M., Bova S., De Bartolo C., "Analysis of ICE LDV data: influence of engine speed and measurement location on the separation between turbulence and mean flow," in Proc. of 3rd Int. Conf. Internal Combustion Engines: Experiments and Modeling ICE97, Capri 17-19 Sett. 1997, pp. 201-209, CNR- Istituto Motori (NA), 1997.
45. Amelio M., Bova S., Florio G. "Water delivery maximisation in Autonomous Wind Electric Pumping Systems" in Atti del XV Congresso Brasileiro de Engenharia Mecânica – Engenharia comprometida com a qualidade de vida, November 22-26, 1999 Águas de Lindóia – São Paulo – Brazil.
46. Bova S. and Amelio M. "LDA Investigation on Valve Wall and Valve Valve Flow Interaction in High-Performance 4-Valve I.C.E.," SAE paper n. 2001-01-1309;2001
47. Algieri A., Amelio M., Bova S., "Global and LDA Steady Flow Measurements in two High-Performance I.C.E. Head Configurations" 5th INTERNATIONAL CONFERENCE on Internal Combustion Engines - ICE2001, Napoli, Settembre 2001
48. Amelio M., Barbàra F., Bova S., Oliva P., "Experimental Investigation on an ICE Cooling System Under Nucleate Boiling Conditions," SAE paper 2001 01 1795; 2001 in Proc. of Small Engine Technology Conference & Exposition – Vol. II, pagg. 697-703, 28 - 30 November 2001- Palazzo dei Congressi - Pisa, Italy
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51. Amelio M. and Barbarelli S., "A one-dimensional numerical model for calculating the efficiency of Pumps As Turbines for implementation in micro-hydro power plants" Proceedings of ESDA: 7th Biennial ASME Conference Engineering Systems Design and Analysis July 19-22, 2004 Manchester, UK

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53. Amelio M., Basile A., Bovalino D., Gallucci F., “Integrated Gasification Gas Combined Cycle plant with Membrane Reactors: A technological and Economical Analysis”, Proc. of the ICCMR7 Book of Abstracts, pp. 197-203, Sept. 11-14, 2005, Cetraro (CS, Italy). (Poster communication).
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55. Braccio G., Fiorenza G., Amelio M., Canonaco J., “An Advanced Model for Biomass Steam Gasification Processes”, 15th European Biomass Conference&Exhibition, Berlin, 8th May 2007
56. Amelio M., Morrone P., Basile A., Gallucci F., "Comparison between the performances of an IGCC (Integrated Gasification Gas Combined Cycle) plant with the capture of CO₂ and an IGCC with membrane reactors: exergetic analysis". Proc. of the Int. conf. Engineering with Membranes 2008, Portugal, May 25-28, 2008, pp. 334-
57. Algieri A. , Amelio M. , Bova S. , Morrone P. , “Active and Passive Aftertreatment Systems: A Numerical Analysis of Energetic Performances”. Atti del convegno “International Conference on Automotive Technologies - ICAT 2008”, Istanbul (Turkey), 13-14 November, 2008, 2008, pp.
58. Algieri A., Amelio M., Morrone P., “Energetic Analysis of the Performances of Innovative Aftertreatment Systems”. Atti del convegno "SAE Powertrains, Fuels and Lubricants Meeting", Florence (Italy), 2009
59. Algieri A., Amelio M., Bova S., Morrone P., "Energy Efficiency Analysis of Conventional and Pellet Emission Control Systems in Flow-through and Reverse-Flow Designs". Atti del convegno "9th International Conference on Engines & Vehicles - ICE 2009", Capri (Italy), 2009
60. Algieri A., Amelio M., Morrone P., "Energetic Performances of Monolith and Random Packed Beds Aftertreatment Systems". Atti del convegno "JUMV - 22nd International Automotive Conference - Science and Motor Vehicles 2009", Beograd (Serbia), 2009
61. Algieri A., Amelio M., Morrone P., "Energy Efficiency Comparison Between Active and Passive Emission Control Systems Adopting Standard Emission Test Cycles". Atti del convegno "Fisita 2010 World Automotive Congress", Budapest (Hungary), 2010
62. Amelio M., Barbarelli S., Florio G., Scornaienchi N. M., Cutrupi A., Minniti G., Sanchez Blanco M., "Innovative Tidal Turbine with Central Deflector for the Exploitation of River and Sea Currents in On-Shore Installations". Atti del convegno "ICAE 2011 (International Conference on Applied Energy)", Perugia, 16-18 May, 2011
63. Amelio M., Barbarelli S., Florio G., Scornaienchi N. M., Cutrupi A., Sanchez Blanco M., Lo Zupone G., "Engineering design study of an innovative hydrokinetic turbine with on shore foundation". Atti del convegno "OWEMES 2012 Offshore wind and Other Renewables Energies in Mediterranean and European Seas", Roma, 2012, pp. 215-230.
64. Barbarelli S., Amelio M., Florio G., “Waste Energy Recovery in Water Pipelines Using Pumps Running As Turbines“, 11th Conference on Sustainable Development of Energy, Water and Environment Systems – SDEWES Conference, Lisbon 4-9 September 2016
65. Barbarelli, S., Amelio, M., Florio, G., Scornaienchi, N.M. “Study of a hydraulic system converting energy from sea waves near the coast”, (2018), MATEC Web of Conferences 240,0100

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67. M. Amelio, S. Bova, "Azionamento di Valvole per Motori Alternativi mediante Solenoidi comandati con Logica Digitale," in Atti del 43° Congresso Nazionale ATI, pp. IIIc 3-14, Ancona, 21-23 Sett. 1988.
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74. M. Amelio, S. Bova "Analisi delle Prestazioni di un Sistema di Elettropompaggio Eolico mediante Simulazione al Banco," in ATTI del 50° Congresso Nazionale ATI, St.Vincent, 10-15 Sett. 1995, Vol. II, pp. 1613-1626, S.G.E., Padova, 1995.
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Patents

101. M. Amelio, P. Morrone, "Rigeneratori termici a flusso continuo", N.ro CZ2005A000018, Anno 2005, Depositario: Università della Calabria
102. M. Amelio, S. Senatore, "Sistema Valvolare rotante con tenuta fluidodinamica per la distribuzione dei flussi in un RTO" Brevetto ITALIA, N.ro CZ2005A000019, Anno 2005, Depositario: Università della Calabria
103. Barbarelli, S., Amelio, M., Florio, G., Scornaienchi, N.M. "Study of a hydraulic system converting energy from sea waves near the coast", (2018), MATEC Web of Conferences 240,0100

Links with the scientific community, organizations and industries

1. Scientific Collaborator on research "Combustion in SI engine and effects of the shape of the combustion chamber on the flame propagation" (agreement between UNICAL and Fiat SpA, 15/12/76 - 12/31/80).
2. Scientific Collaborator to the National Research Council Project "Trasporti", for the preparation of the Engine test bench at Department of Mechanical Engineering – UNICAL; 1979-1981.
3. Scientific Collaborator in Project "Trasporti" CNR (National Research Council) contract No. 84.00407.93, 85.00118.93 and 86.001194.93, for the preparation of a single cylinder with optical access.
4. Participation to research activities of the project "3D Facsimile," BRITE PROGRAMME of the EEC (Research contract no. RI.IB.0247.C) for the application of visualization techniques and Laser Doppler Anemometry (LDA) to the optical accessible single-cylinder of the Department.
5. Participation to the research: "Study of Pumps as Turbines", Project POP 89/93 Calabria; Measure: Scientific and Technological Research (Agreement with the Region of Calabria 21

- nov 1994). This activity was carried out in collaboration with the University of Trento and CNR-CNPM Milan.
6. Participation to the research: "Study of the thermo-fluid dynamic processes and techniques for the reduction of polluting emissions in internal combustion engines," Coordinated Project of the CNR (Contribution no. 95.00051.CT07, Scientific Manager: Prof. Bova, Coordinator: Prof. Catania).
 7. Participation to research activities of the project "Implementation of a Pilot Laboratory for testing commercial Engines and their components" (Agreement between the Department of Mechanics and the Region of Calabria in force since 15.12.1998, the laboratory is still operating).
 8. Participation to research activities of the project "Experimental Verification and Preliminary Optimization of Control Parameters, for Engine Cooling System with Phase Change" (agreement between the Department of Mechanical Engineering and ELASIS SCpA, Fiat Research System in the South, in force from 01.05.1999 to 31.12.2000).
 9. Participation to research activities of the project coordinated by CNR: "LDA measurement of the flow distribution at the exit of the intake valves of a head with four valves per cylinder" (Contribution no. 99.01973.CT07, Scientific Manager: Prof. Bova, Coordinator: Prof. Catania).
 10. Participation to the research carried out under the collaboration agreement between the Department of Mechanical Engineering and CNR-ITM (Institute for Membrane Technology), signed in the Framework Convention between CNR and UNICAL, 22/03/2002.
 11. Scientific responsible of "SES - Smart aEolic System" project activities - POR 2000-2006, Measure: 3.16 Regional System for Research and Innovation; Partners: Calpark SCpA (Rende) and TecAp Ltd. (Rende)
 12. Scientific responsible of the Research Contract "Search for new electronic safety systems for modern elevators facilities" between the EDP - Power Electronics Devices - LTD Rende and the Department of Mechanical Engineering at the University of Calabria; 1/4/2003-31/3/2004
 13. Scientific responsible of the Research Contract "Performance evaluation of innovative systems for energy exploitation from citrus pulp" between SMEC Ltd. Pianopoli (CZ) and the Department of Mechanical Engineering at the University of Calabria; 1/12/2006-31/3/2008