

CURRICULUM VITAE OF ANDREA NICOLINI

1) Biography, main academic qualifications and work experience

He **graduated in Electronic Engineering** (July 22, 1998) at the University of Perugia (Italy) with the following thesis: "Analysis and experimental verification of a control system for induction motor without speed sensor (sensorless)".

He gained a **diploma enabling the engineering profession** in March 1999. He is member of the Engineers' Register of the Province of Perugia (N. A1670).

Since November 1999 he carried out his research activities at the Laboratories of Thermotechnics, Acoustics and Environmental Controls of the Department of Engineering (aforetime Department of Industrial Engineering) of the University of Perugia, Via G. Duranti 67, 06125 Perugia (ph. +39-075-5853714).

He was winner in 1999/2000 of Competition for a **PhD in "Environmental Applied Physics"** (XV Cycle with Administrative Seat at the University of Rome "La Sapienza" and headquartered at the University of Perugia). He obtained the PhD title of on May 27, 2003, with the thesis titled: "active control systems at the exhaust pipe of internal combustion engines".

He attended in the following **training courses**:

- Summer School of Computational Thermal Fluid Dynamics at the Certosa di Pontignano (Siena) on September 2001.
- Summer School of Experimental Thermal Fluid Dynamics and Measurement Techniques at the Certosa di Pontignano (Siena) on September 2003.

He was winner in November 2002 of a competition for a **two-years Research Fellowship at the University of Perugia** in the "Industrial Engineering Science" entitled "Railroad Active Noise Control".

On December 2004, he had a **contract with CIRIAF (at that period called "Interuniversity Research Centre on Pollution from Physical Agents")** for the "development of original models of prediction of noise from infrastructure transport in urban areas ", within a research contract between CIRIAF and CESI Spa.

Holder of a **contract with Consortium IPASS (Engineering for the Environment and Sustainable Development)** from June 2005 to work in a seven-months project entitled "Support to the monitoring of microclimatic conditions in the presence of non-ionizing radiation due to wireless networks" on behalf of the operative unit CIRIAF-Section of Applied Physics of the University of Perugia within the project Theme 1 "Exposure to electric fields, magnetic and electromagnetic" commissioned by APAT (Agency for Environmental Protection and Technical Services).

President and CEO of the spin-off TISS Ltd, promoted by CIRIAF (at that period called "Interuniversity Research Centre on Pollution from Physical Agents"), from 2005 to 2010.

Member of the directive board of the Consortium IPASS Scarl, shared by CIRIAF (Interuniversity Research Centre on Pollution and Environment "Mauro Felli") to 60% from 2009 to 2017. **Vice-President of the Consortium IPASS S.c.a.r.l.** from April 2010 to April 2017.

Winner of a competition for **Assistant Professor (Sector: ING-IND/10, Industrial Applied Physics) at the Faculty of Agriculture of the University of Perugia** in November 2005 (Rectoral Decree N. 2702 of 08/11/2005); he began his activities for the Faculty of Agriculture on November 21, 2005 and he worked at the Department of Engineering of the University of Perugia.

Member of the Scientific Board of CIRIAF ((Interuniversity Research Centre on Pollution and Environment "Mauro Felli") since 2005.

On December 2014 he received the **Italian Professorship Qualification required to become Associate Professor in the "09-C2 - Thermal sciences, energy technology, building physics and nuclear engineering" competition sector**.

On 20th November 2015 he was positively evaluated in a procedure for **Associate Professor (art.24 c.6., Italian Law 240/2010, Sector ING-IND/10 – Industrial Applied Physics) at the Department of**

Engineering of the University of Perugia (Rectoral Decree N.2442 of 22/12/2015). He began his activity as Associate Professor at the above mentioned Department on 28th December 2015.

Due to the D.R. n.1599 of 31st May 2024, he currently belongs to the Italian **GSD: 09/IIND-07 (Thermal Sciences, Energy Technology, Building Physics and Nuclear Engineering), SSD: IIND-07/A (Thermal Engineering and Industrial Energy Systems)**.

On July 2017 he received the **Italian Professorship Qualification required to become Full Professor in the “09-C2 - Thermal sciences, energy technology, building physics and nuclear engineering” competition sector**.

Member of the Steering and Management Committee of the Biomass Research Centre of the University of Perugia, structured section of CIRIAF, since June 2013.

Director of the Biomass Research Centre of the University of Perugia, structured section of CIRIAF, from March 2016 to June 2022.

Departmental Sustainability Manager of the Engineering Department of the University of Perugia from 2018 to 2019.

Member of the Board of the Department of Engineering of the University of Perugia from April 2014 to November 2016.

Manager of the Acoustics Lab of the Department of Engineering of the University of Perugia and CIRIAF since July 2015.

Operative representative of the University of Perugia for the Sustainable Development University Network (RUS) from April 2017 to June 2020.

Member of the "Energy" and "Climate Change" working groups of the Sustainable Development University Network (RUS) from June 2017 to June 2020.

Member of the Quality Board of the University of Perugia for the three-year period from March 23, 2019 to March 22, 2022.

Coordinator of the PhD in "Energy and Sustainable Development" of the University of Perugia since XXXVIII Cycle (i.e. since a.y. 2022/2023).

Manager of the Biofuels and Biochemicals Laboratory of the CIRIAF-CRB section (Biomass Research Centre) of the University of Perugia since July 2023.

He is **competent technician in environmental acoustics**, according to the Italian Law 447/95, registered as n. 9604 in the ENTECA italian list (Managerial Determination N. 4337 of 22/05/2002, published in Umbrian Official Gazette N. 26 of 12/6/2002).

2) Teaching

Since the academic year 1999/2000, he collaborates to the supervision of degree theses and to the courses in the fields of Industrial Technical Physics and Environmental Technical Physics of the University of Perugia.

Appointed professor of a tutoring course in "Applied Physics I" (5 hours, Bachelor Degree in Mechanical Engineering, Faculty of Engineering, University of Perugia, Italy) for the academic year 2002/2003.

He worked as an educational supplement to support the course "Applied Physics for Food Factories" (5 hours, Master Degree in Food Biotechnology, Faculty of Agriculture, University of Perugia, Italy) for the academic year 2003/2004.

Appointed professor within the "Master Degree in Environmental Engineering" at the Faculty of Engineering, University of Reggio Calabria (Italy) on the subject: "Noise pollution" (12 hours, March 2004).

Appointed professor of the module "Applied Physics for Food Factories - Module: Applied Thermodynamics" (4 ECTS, Master Degree in Food Technology and Biotechnology, Faculty of Agriculture, University of Perugia, Italy) for the academic year 2004/2005.

Appointed professor of the remedial course in "Applied Physics" (10 hours, Bachelor Degree in Civil Engineering and Bachelor Degree in Environmental Engineering, Faculty of Engineering, University of Perugia, Italy) for the academic year 2004/2005.

Appointed professor of "Applied Physics for Food Factories" (4 ECTS, Master Degree in Food Technology and Biotechnology, Faculty of Agriculture, University of Perugia, Italy) for the academic year 2005/2006, from 22 November 2005.

Appointed professor of "Active Noise Control" (18 hours, 1.5 ECTS), "Electroacoustics" (24 hours, 2 ECTS) and "Acoustic Measurements and Instruments" (15 hours, 1.25 ECTS) of the II level Postgraduate Master Degree in "Environmental Acoustics" of the Faculty of Engineering of the University of Perugia (Italy) in the academic year 2005/2006.

Appointed professor of "Applied Acoustics and Lighting" (2 ECTS, Bachelor Degree in Mechanical Engineering, Faculty of Engineering, University of Perugia, Italy) for the academic year 2006/2007.

Appointed professor of "Active Noise Control" (10 hours, 1 ECTS) and "Electroacoustics" (20 hours, 2 ECTS) of the II Level Postgraduate Master Degree in "Environmental Acoustics" of the Faculty of Engineering of the University of Perugia (Italy) in the academic year 2006/2007.

Appointed professor of "Technical building systems - lighting and applied acoustics" (2 ECTS, Bachelor Degree in Mechanical Engineering, Faculty of Engineering, University of Perugia, Italy) for the academic year 2007/2008.

Appointed professor of "Elements of Thermo-Fluid Dynamics" (8 hours) of the II Level Postgraduate Master Degree in "Integrated Design of mechatronic systems" of the Faculty of Engineering of the University of Perugia (Italy) in the academic year 2007/2008.

Appointed professor of "Active Noise Control" (9 hours, 1 ECTS) and "Electroacoustics" (18 hours, 2 ECTS) of the II Level Postgraduate Master Degree in "Environmental Acoustics" of the Faculty of Engineering of the University of Perugia (Italy) in the academic year 2007/2008.

Appointed professor of "Technical building systems - applied acoustics" (2 ECTS, Bachelor Degree in Mechanical Engineering, Faculty of Engineering, University of Perugia, Italy) for the academic year 2008/2009.

Appointed professor, for the academic year 2009/2010, of "Physics" (6 ECTS, Bachelor Degree in Agro-Food Science and Technology, Faculty of Agriculture, University of Perugia, Italy), whose first 3 ECTS correspond to modules in "Physics" of the course in "Physics and Principles of Computer Science and Statistics" (Bachelor Degree in Economics and Food Culture of the Faculty of Agriculture, University of Perugia, Italy), the course in "Physics and Computer Science" (Bachelor Degree in Technical Management of the Landscape of the Faculty of Agriculture, University of Perugia, Italy) and the course in "Elements of Physics, Statistics and Computer Science" (Bachelor Degree in Agricultural and Environmental Sciences of the Faculty of Agriculture, University of Perugia, Italy).

Appointed professor of "Technical building systems – module: lighting and applied acoustics" (3 ECTS, Bachelor Degree in Mechanical Engineering, Faculty of Engineering, University of Perugia, Italy) from the academic year 2009/2010 to the academic year 2011/2012.

Appointed professor of "Urban renewal and energy saving" (10 hours) about energy efficiency and saving, within the II Level Postgraduate Master Degree in "Management of Urban Renewal" of the Faculty of Engineering of the University of Perugia (Italy) for the academic year 2011/2012.

Appointed professor (20 hours) of "Noise prediction and control in energy plants", a course (in English language) of the PhD in Energy Engineering (University of Perugia, Italy) in the a.y. 2013/2014.

Appointed professor (12 hours) of "Energetics and renewables – module: energetics" of the TFA (Active Training Internship) A033 class (Technology) activated by the University of Perugia, Italy, in the a.y. 2014/2015. President of the Qualification Board for the TFA (Active Training Internship) A033 class in the a.y. 2014/2015.

Appointed professor (40 hours) of "Analysis and safety techniques for the risk from noise and vibration" of the I Level Master Degree in "Safety engineering and risk analysis in industry" activated by the Department of Engineering of the University of Perugia in the a.y. 2015/2016.

Appointed professor (6 hours) of "Risks in the workplaces" about basics of acoustics and noise control, within the I Level Master Degree in "Safety engineering and risk analysis in industry"

activated by the Department of Engineering of the University of Perugia in the a.y. 2017/2018.

Appointed professor (7 video-recorded hours) of "Noise, vibration and related risks" of the I Level Master Degree in "Safety engineering and risk analysis in industry" activated by the Department of Engineering of the University of Perugia in a.y. 2019/2020.

Appointed professor of "**Applied Physics for Food Factories**" (6 ECTS, Master Degree in Food Technology and Biotechnology, Department of Agricultural, Food and Environmental Sciences – before 2014 Faculty of Agriculture - University of Perugia, Italy) since the academic year 2006/2007.

Appointed professor of "**Energy resources and alternative energies**" (8 ECTS, Master Degree in Mechanical Engineering, Department of Engineering - University of Perugia, Italy) from the academic year 2015/2016 to the academic year 2018/2019 and from the academic year 2020/2021 to the academic year 2022/2023.

Appointed professor of "**Energy Planning**", module of the course in "Energy Systems" (5 ECTS, Master Degree in Engineering for the Environment and Territory of the Department of Civil and Environmental Engineering of the University of Perugia) for the academic year 2018/2019.

Appointed professor of "**Energetics**" (12 ECTS, Master Degree in Industrial Engineering, Department of Engineering, Seat of Terni, University of Perugia, Italy) in the academic year 2019/2020.

Appointed professor of "**Environmental Technical Physics**", module of the course in "Prevention and safety at work 1" (2 ECTS, Degree in Prevention techniques in the environment and in the workplace of the Department of Experimental Medicine of the University of Perugia) since the academic year 2020/2021.

Appointed professor of "**Applied Thermodynamics and Thermal Management**" (in English language), module of the course in "Energy Management" (6 ECTS, Bachelor Degree in Engineering Management of the Engineering Department of the University of Perugia) since the academic year 2023/ 2024.

Visiting professor at the **Ryerson University of Toronto** (Canada) in September 2017 for research activities dealing with "Cool Materials", in collaboration with the local research group in "Urban Energy" (Prof. Berardi), and lecture for students of the Master Degree in "Architectural Science" titled "Retro-reflective materials: an opportunity to mitigate the urban heat island effect".

Tutor/supervisor of 14 PhD students of the PhD course in "Energy and Sustainable Development" of the University of Perugia (starting from the XXX cycle).

Member of the course committees of the Section of Applied Physics, Department of Engineering (aforementioned Department of Industrial Engineering) of the University of Perugia (Italy) since the academic year 2002/2003.

Expert member for the Industrial Area of the examination board for qualification in engineer's profession (November 2017).

Member of the Degree Boards (Bachelor and Master) where he has taught lectures at the University of Perugia since the academic year 2003/2004.

Member of the **PhD Professors' Committee in "Environmental Applied Physics"** of the Telematic Marconi University (Rome, Italy) in the academic years 2008/2009 and 2011/2012.

Member of the **PhD Professors' Committee in "Energy Engineering"** of the University of Perugia (Italy) from a.y. 2008/2009 to a.y. 2012/2013.

Member of the **PhD Professors' Committee in "Energy and Sustainable Development"** of the University of Perugia (Italy) since a.y. 2013/2014 and **Coordinator of the same PhD** since XXXVIII Cycle (a.y. 2022/2023).

He was also lecturer in the following schools or courses:

- N. 15 hours on the topic "Data Acquisition and Processing" of the Training Course titled "Technical experts in quality control chain" within the project "Advanced Training on Research, Development and Management of novel systems and processes with high technology to ensure food security" sponsored by the Animal Population Consortium (Co.An.An.). The course was

- held at the University of Perugia - Faculty of Engineering (Italy) on April-May 2004.
- N. 6 hours on the topic "Measurement equipment" for a Course in Environmental Acoustics designed to officials of the Province of Perugia. The course was held at the University of Perugia - Faculty of Engineering (Italy) on January 2005;
- N. 2 hours on the topic "Principles of Acoustics" at the Seminar "The noise of the Energy Production Plants: regulatory, legal and planning aspects", organized by ATI (Italian Association of Thermotechnics Section Lombardia (Milan, Italy, May 16, 2005).
- N. 9 hours on the topic "Acoustics in the workplace" within the course on "expert in acoustics" sponsored by the Italian Ministry of Labour and Social Affairs, Umbria Region and the European Union in January-February 2006 (Perugia, Italy, project code. UM.05.03.33.103 entitled "Expert in Acoustics);
- N. 7 hours in the "acoustic extended seminar", organized by the Engineers' Board of the Province of Terni in the Seat of Terni of University of Perugia, Italy (from 25 September to 27 October 2006).
- N. 1 hour in the specialist Seminar "Noise and vibration in the Environmental Impact Assessment" organized by the Commission for Environmental Impact Assessments and the Italian Ministry for the Environment, Land and Sea (Rome, Italy, November 8, 2006).
- N° 1 hour in the 5th Edition of the Summer School in Applied Physics (Benevento, Italy), titled "Simulation of the energetic needs for different configurations of natural lighting and innovative transparent materials" (July 2012).
- N° 10 hours on "Plants" within the ITS course "high level technician for housing innovation and quality" at the Building Secondary School of Perugia, Italy (2014).
- N° 4 hours (seminar) on "Biomass and biofuels" within the course of "Renewable energies for agriculture", Master Degree on GESVIS - Management and Sustainable Development of Mediterranean Rural Systems of the University of Bari (April 2021).

3) Research activities and scientific publishing

He conducts his research activities at the Laboratories of Thermotechnics, Acoustics and Environmental Controls of the Department of Engineering (before 2014 Department of Industrial Engineering, University of Perugia, Italy) since 1999 in the fields of Thermotechnics, Energetics, Applied Acoustics and Heat Transfer.

The main research topics are the followings:

- Applied Acoustics with particular reference to the impact of transport infrastructures, environmental protection, passive and active noise control.
- Heat transfer in energy production systems.
- Production of Hydrogen from renewable energies by means of innovative processes (sonolysis, advanced photocatalysis sonophotolysis, etc.) with low environmental impact.
- Small size molten carbonate fuel cells.
- Innovative photovoltaic systems: study of original concentration plant configurations for the simultaneous production of electricity and heat.
- Innovative technology based on gas hydrates for the filtration and storage of gas in energy applications, aimed at the storage and transportation of natural gas, CO₂ capture and sequestration, upgrading of biogas from anaerobic digestion.
- Environmental impact and carbon footprint of energy plants.
- Novel techniques for energy storage, such as PCM for CAES systems and solar energy storage by electrolysis and methanation.
- Energy from biomass.
- Biomass valorization in the context of biorefineries.
- Energy saving in buildings.
- Materials and techniques to control and mitigate urban heat island and global warming.
- Study of innovative supply chains for the energy use of biomasses.

- Study of the effect of electromagnetic fields on human health, with particular reference to the effect on the thermophysical properties of the cells.
- Study of the energy and environmental aspects relating to the use of electric vehicles.

This research activity was carried out within the activities of *Department of Engineering (before 2014 Department of Industrial Engineering) of the University of Perugia (Italy), CIRIAF (Interuniversity Research Centre on Pollution and Environment “Mauro Felli”), Scientific Pole of Terni (University of Perugia), CRB (Biomass Research Centre, structured section of CIRIAF, University of Perugia)*, also during the execution of many research projects, scientific and technical works and consultancy services on behalf of important institutions and companies; those where Andrea Nicolini assumed management functions are the followings:

- Collaboration agreement relating to the conduction of research and scientific support for the operation of the Committee for the prevention and reduction of electromagnetic pollution (Ministry for the Environment and Territory, 2003), in which Andrea Nicolini was **Technical Manager**;
- Innovative systems for the production of hydrogen from renewable energy sources (Ministries of Economy and Finance, Education, University and Research, Environment Protection of Land, Agriculture and Forestry – FISR Project, 2006-2009), in which Andrea Nicolini was the **Scientific Manager** of CIRIAF Operative Unit;
- Energy from agriculture and forestry biomass: improving and integrating the biofuel sector and fibers for the production of electricity and thermal energy (Ministry of Agriculture and Forestry Program and the Convention and Agreement between CRB and Foundation for Education and Agriculture of Perugia, 2006); in the Convention and Agreement Program, Andrea Nicolini was the **Chief Operating Manager** of the Additional Protocol;
- Collaboration agreement for the conduction of research and scientific support for the operation of the Committee for the prevention and reduction of electromagnetic pollution (Ministry for the Environment and Territory, 2006), in which Andrea Nicolini was the **Technical Manager**;
- BEPE - Bio-Energy Production Europe (Lifelong Learning Programme – Leonardo da Vinci Partnerships, Isfol, 2011-2013), in which Andrea Nicolini from 2013 was **Reference Manager** of CRB (Biomass Research Centre) Operative Unit.
- Carbon footprint assessment of a system to collect and supply drinking water for the years 2014-2015-2016 (Siciliacque S.p.a., 2015-2017), in which Andrea Nicolini was the **Scientific Manager**.
- Agreement between University of Perugia and CIRIAF for support activities to the technical offices about the acoustic definitive design of the “Sport and Health City” (2015), in which Andrea Nicolini was the **Scientific Manager**.
- Identification of eco-friendly materials for vertical smart refrigerated showcase produced by ISA, as well as LCA characterization and comparison of two types of refrigerated showcase before and after the adoption of energy and environmental optimization solutions (ISA srl, 2016-2017), in which Andrea Nicolini was the **Scientific Manager**.
- Carbon footprint calculation within the Volunteer Agreement between the Italian Ministry for the Environment, Land and Sea and the Municipality of Bastia Umbra about joint projects aimed at the analysis, reduction and neutralization of the climate impacts of the Municipality of Bastia Umbra with the purpose of creating a "sustainable city model" (Municipality of Bastia Umbra, 2016), in which Andrea Nicolini was a **Scientific Manager**.
- Natural dyes from indigenous crops: an enterprise and rural development opportunity (Foundation Cassa di Risparmio di Perugia, 2017-2018), of which Andrea Nicolini was the **Scientific Manager**.
- Agreement between CIRIAF-CRB of the University of Perugia and ARPA Umbria for collaboration in the field of odour emissions and immissions (2017-2019 and 2020-2023), of which Andrea Nicolini is the **Manager**.

- Agreement between CIRIAF and the Municipality of Perugia concerning the drafting of a noise abatement plan for the critical areas of the municipal territory (2017-2018), of which Andrea Nicolini assumed the position of **Technical Manager**.
- Life Cycle Assessment (Sub-measure 16.1 of Umbria Region PSR, Support for the establishment and management of PEI Operational Groups in the field of productivity/sustainability of agriculture, 2018-2020), of which Andrea Nicolini assumed the position of Scientific Manager of CIRIAF operative unit.
- Individual financing of basic research activities, referred to the ANVUR (National agency for university system and research evaluation) public notice related to Article 1, paragraphs 295 and following of the Law 11 December 2016 n.232 (2017)
- SMEET-WELL: SMart building managEment for Energy saving meets WELLbeing (Umbria Region, Call "Umbria A.R.C.O.": activation of research fellowships, 2018-2019), in which Andrea Nicolini is the **Scientific Manager** of the Department of Engineering.
- LCA evaluation of fridge exhibitors and showcases for ice creams (ISA s.p.a., 2019-2020), of which Andrea Nicolini is the **Scientific Manager**.
- Evaluation of pre-treatment technologies for biofeedstock production and upgrading for biofuel production (Collaboration agreement with the University of Tuscia as part of the project Biofeedstock - Development of Integrated Technological Platforms for the Enhancement of Residual Biomasses, funded by MIUR under the DD n.1735/Ric of 07/13/2017, 2019-2020), of which Andrea Nicolini is the CIRIAF **Manager**.
- BEST4U – Technology for 4-terminal high-efficiency double-sided solar cells for utility scales (MIUR - Call for the presentation of Projects of Industrial Research and Experimental Development in the 12 areas of specialization identified in the National PNR 2015-2020, referred to the DD of 13 July 2017 n. 1735, 2020-2022), of which Andrea Nicolini, who works on behalf of University of Perugia - CIRIAF, is the **Manager** of Task 5.2 “Analysis of aging and soiling of reflective surfaces”.
- ANC and AVC technology for the protection of workers and prevention of extra-auditory effects of noise: case studies relating to an operator on an agricultural tractor and to pupils and teachers in school environments (INAIL, BRIC Call 2019, 2020-2022), of which Andrea Nicolini, who works on behalf of the Coordinator University of Perugia - CIRIAF, is the **Manager** of the University of Perugia - CIRIAF - Acoustics Laboratory operative unit.
- Agreement between CIRIAF-University of Perugia and ARPA Umbria for research, development and innovation activities relating to energy efficiency, environmental sustainability and comfort of the ARPA Umbria buildings (2020-2023) of which Andrea Nicolini is the **Manager**.
- Adaptation to climate change and resilience actions in the inland areas of the south-west of Orvieto, project titled “A.C.A.R.O” – A.daptation C.limate A.ctions R.esilient O.rvieto (Sub-measure 16.5, Intervention 16.5.1 of Umbria Region PSR, Support for joint actions for the mitigation of climate change and adaptation to it and support for common approaches to ongoing environmental projects and practices, 2020-2021), of which Andrea Nicolini is the **Scientific Manager** of the CIRIAF-CRB operating Unit.
- Determination of the durability of pellet samples according to UNI EN ISO 17831-1 (ICAT srl, 2021), of which Andrea Nicolini is the **Scientific Manager**.
- Characterization with TGA analysis and metal determination of wood samples (Chemical Empowering AC, 2021), of which Andrea Nicolini is the **Scientific Manager**.
- Acoustic characterization of I-Mesh panels as a solution for the building envelope of civil and industrial constructions (Sailmaker International srl, 2022), of which Andrea Nicolini is the **Scientific Manager**.
- Technical-scientific consultancy relating to thermal aspects for the suitability for use of the ice cream refrigerator counter ISA 3D Show VG170 RVTB (ISA s.p.a., 2022), of which Andrea Nicolini is the **Scientific Manager**.

- Chemical-physical characterization of wood chip samples (Italia Pellet srls, 2022), of which Andrea Nicolini is the **Scientific Manager**.
- Chemical-physical characterization of wood chips samples (SA.RI.CA Energy srl, 2022), of which Andrea Nicolini is **Scientific Manager**.
- Technical-scientific consultancy aimed at evaluating any R&D characteristics of 5 projects carried out in the 2015-2018 period (ISA s.p.a., 2022), of which Andrea Nicolini is the **Scientific Manager**.
- LCA evaluation of a vertical cold cabinet at positive temperature and a horizontal display cabinet for ice creams before and after their redesign according to circular economy principles (ISA s.p.a., 2022-2023), of which Andrea Nicolini is the **Scientific manager**.
- Analysis of eco-friendly thermal insulation solutions and electricity generation technologies for a meat cabinet for commercial refrigeration (ISA s.p.a., 2023-2024), of which Andrea Nicolini is the **Scientific manager**.
- Specialist assistance to the Biofuels Committee - specific insights, relating to the analysis of the potential and prospects for the production of bio-hydrogen (Steam Reforming) obtained from biomethane deriving from the biogas chain from sugary-starchy biomass (Italian Ministry of Agriculture, food and forests, 2023-2024), of which Andrea Nicolini is the **Scientific manager**.
- Carbon and water footprint assessment of a system to collect and supply drinking water for the years 2022 and 2023 (Siciliacque S.p.a., 2023-2024), in which Andrea Nicolini is the **Scientific Manager**.
- Catalytic production of hydrogen and chemicals from biomasses (Project financed by the University Basic Research Fund, University of Perugia, 2023-2024), of which Andrea Nicolini is the **Scientific Manager** of the Research Unit Department of Engineering.
- Evaluation of acoustic characteristics of the Welcoming Gateways architectural complex – King Salman Airport – Gateway Road, Riyadh, Saudi Arabia (Studio Schiattarella e Associati S.r.l., 2024), in which Andrea Nicolini is **the Scientific Manager**.

The research activity is documented by more than 250 scientific publications. Paper published on international journals and relevant Scopus indexed conference proceedings are listed below:

- 1) F.Rossi, A.Nicolini, “A simple model to predict train-induced vibration: theoretical formulation and experimental validation”, *Environmental Impact Assessment Review*, Volume 23, Issue 3, pp. 305-322, Elsevier, May 2003, doi: 10.1016/S0195-9255(03)00005-2.
- 2) F.Rossi, A.Nicolini, “Theoretical and experimental investigation of the aerodynamic noise generated by air flows through car windows”, *Acta Acustica united with Acustica*, Vol. 89, Suppl.1, S90, May-June 2003.
- 3) F.Cotana, A.Nicolini, “Noise mapping: The evolution of Italian and European legislation”, *Acta Acustica united with Acustica*, Vol. 89, Suppl.1, S108, May-June 2003.
- 4) F.Cotana, F.Rossi, A.Nicolini, “A New Geometry High Performance Small Power MCFC”, *Journal of Fuel Cell Science and Technology*, Vol.1, Issue 1, pp.25-29, ASME, November 2004, doi:10.1115/1.1782924.
- 5) M.Busso, G.Tosti, F.Roncella, M.Bagaglia, G.Nucciarelli, R.Fastellini, O.Straniero, M.Dolci, M.Ragni, I.Di Varano, L.Corcione, C.Abia, I.Dominguez, F.Rossi, A.Nicolini, “The IRAIT Project Infrared Astronomy from Antarctica”, *EAS Publications Series*, Vol.14, pp.181-186, EAS, 2005, doi: 10.1051/eas:2005028.
- 6) F.Rossi, A.Nicolini, M.Filipponi, “An integrated index for airport noise”, *Internoise 2005*, Rio de Janeiro, Brazil, 7-10 August 2005, Volume 1, pp.545-554, ISBN: 978-162276339-9.
- 7) A.Nicolini, M.Filipponi, “Control of noise from a fan in a wall gas boiler”, *Noise Control Engineering Journal*, Vol.54, Issue 1, pp.41-46, January-February 2006, doi: 10.3397/1.2888778.
- 8) F.Rossi, A.Nicolini, “Acoustic Performances of nickel-based materials”, *Internoise 2006*, Honolulu, USA, 3-6 December 2006, Vol.4, pp.2282-2289, ISBN: 978-160423136-6.

- 9) F.Cotana, F.Rossi, A.Nicolini, S.Simoni, "Acoustic tests on original concrete and inert mixture materials", 14th International Congress on Sound and Vibration – ICSV14, Cairns, Australia, 9-12 July 2007, Vol.4, pp.3300-3305, ISBN: 978-162748000-0.
- 10) F.Rossi, A.Nicolini, P.Di Profio, "Small Size Cylindrical Molten Carbonate Fuel Cells and Future Approaches for Decreasing Working Temperature", ECS Transactions, Volume 12, Issue 1, pp.455-466, April 2008, doi:10.1149/1.2921572.
- 11) F.Rossi, A.Nicolini, "Squeaking noise psychoacoustic evaluation for car passengers", 15th International Congress on Sound and Vibration – ICSV15, Daejeon, Korea, 6-10 July 2008, Vol.3, pp.2182-2187, ISBN: 978-162748151-9.
- 12) F.Rossi, A.Nicolini, "A Cylindrical Small Size Molten Carbonate Fuel Cell: Experimental Investigation on Materials and Improving Performance Solutions", Fuel Cells, Vol.9, Issue 2, Wiley-VCH, pp. 170-177, April 2009, doi:10.1002/face.200800064.
- 13) A.Nicolini, M.Filipponi, "Evaluation of Noise Levels produced by Operation and Maintenance Activities of a Continuous Movement Funicular", 16th International Congress on Sound and Vibration – ICSV16, Krakow, Poland, 5-9 July 2009, Vol.1, pp.414-421, ISBN: 978-161567736-8.
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Bibliometric indicators (source Scopus, July 2024):

n. articles: 137

n. citations: 2.778

h-index: 32

4) Awards and patents

- On July 2005, Andre Nicolini received the 2005 Start Cup Award of the University of Perugia for business innovation of TISS S.r.l. spin-off company (design and development of acoustic and environmental mitigation techniques by active noise control devices, noise abatement ventilated windows, noise barriers equipped by photovoltaic cells).
- During the Group Exhibit Hydrogen + Fuel Cells 2006, Hannover, Germany, 24-28 April 2006, Consorzio Ipass received the Hydrogen Ambassador award, in which the activity coordinated by Andrea Nicolini in the development of cylindrical MC fuel cells was selected and awarded as promising idea for the emerging industry.
- On June 20th, 2013 Andrea Nicolini received the Award of the City of Perugia (Italy) together with researchers and collaborators of CIRIAF and CRB research centers (University of Perugia), for the high scientific contribution to the growth and sustainable development of the municipal area in many activities and joint initiatives in the areas of protection from noise pollution, sustainable and alternative urban mobility, energy and environmental planning, testing and construction of pilot plants based on innovative renewable energy sources in different areas of the municipality.
- He received, during the 75th ATI (Italian Thermotechnical Association) National Congress, held in videoconference on 15-16 September 2020 based in Rome, the Alfano Award for the best work presented on issues related to Industrial and Environmental Applied Physics for the paper "Experimental Analysis of the CO₂/CH₄ Replacement Efficiency due to Sodium Chloride Presence in Natural Gas Hydrates Reservoirs" (authors: A.M.Gambelli, B.Castellani, M.Filipponi, A.Nicolini, F.Rossi).

He is author of the following italian patents (as utility models):

- F.Cotana, F.Rossi, A.Nicolini, G.Cavalaglio (2018). “High albedo membrane for global warming mitigation, mulching and sub-irrigation” (obtained on 10/11/2020, n.202018000003874).
- F.Cotana, A.Nicolini, M.Palombo, F.Rossi (2015). “Device for cultivation, growth and harvesting of algae in aquatic surfaces” (obtained on 03/11/2017, n.202015000054873).
- F.Cotana, F.Rossi, A.Nicolini, A. Petrozzi (2015). “Solar concentrator for biomass torrefaction” (obtained on 03/11/2017, n. 202015000041970).
- F. Rossi, A.Nicolini (2012). “Transportable, autonomous and logistically advanced module for the production of electricity and drinking water and for food storage (PHLOWER - Photovoltaic, Logistic, Water, Energy Reservoir)” (obtained on 09/06/2015, n.0000279960).
- F.Cotana, F. Rossi, A.Nicolini, B.Castellani, E.Morini (2014). “Compressed air energy storage system (CAES - compressed air energy storage) with heat recovery system integrated to a gas turbine for electricity production” (obtained on 01/08/2016, n.0000281961).

- F.Cotana, A. Petrozzi, A. Nicolini (2013). “Device for electrification of road infrastructures and photovoltaic noise barrier (DEIS)” (obtained on 01/08/2016, n.0000281960).

5) Reviewer activities

- Member of the MIUR Expert Register (art. 7, comma 1, Italian Legislative Decree of 27th July 1999, n. 297) and member of REPRISE which replaced it since 2015;
- Member of the list of experts for the evaluation and verification activities of the System Research projects as art. 9 of the Italian Ministerial Decree of 16 April 2018 (CSEA Commissioner resolution of 25 June 2019)
- Reviewer for the evaluation of PRIN 2009 and PRIN 2012 italian research projects;
- Reviewer for the evaluation of scientific papers for Italian VQR (Research Quality Evaluation) 2011-2014
- Reviewer for the evaluation of FIRB (Future in Research) 2010 and FIRB (Future in Research) 2013 italian research projects;
- Reviewer of the U.S. Department of Agriculture for the evaluation of R&D projects submitted for the Small Business Innovation Research (SBIR) program (from 2012 to 2015).
- Reviewer of the Swiss National Science Foundation for the evaluation of research projects in the field of urban energy simulation (since 2020).
- Reviewer on behalf of the Autonomous Region of Sardinia of research projects relative to the Call "Two years-fellowships for PhD students/researchers. Second step: selection of researchers for the realization of Research Projects at companies registered and/or operating in the Sardinia region" (2013).
- Member of the Editorial Board of “Frontiers in Energy Research” (Frontiers Media S.A., since March 2023), “Sustainability” (MDPI, since May 2018), “Current Alternative Energy” (Bentham Science Publishers, since March 2017) and “Open Science Journal” (Open Science Journal, since April 2017);
- Guest editor of one special issue of Sustainability (title: “17th CIRIAF National Congress – Energy - Environmental Sustainability and Seismic Retrofit of Built Heritage”, MDPI, 2017) and two special issues of Processes (title: “Analysis and Experimental Study on Natural Gas Hydrate Exploitation Processes”, MDPI, 2019; title: “Green processes for sustainable fuel production”, MDPI, 2021);
- Reviewer for the international scientific journals “Applied Energy” (Elsevier, since 2010), “Heat Transfer Research” (Begell House Inc., since 2011), “Korean journal of chemical engineering” (Springer, since 2011), “International Journal of Vehicle Noise and Vibration” (InderScience Pub., since 2012), “Journal of Mechanical engineering Research” (Academic Journals, since 2012), “Journal of Renewable and Sustainable Energy” (AIP, since 2012), “Journal of the Taiwan Institute of Chemical Engineers” (Elsevier, since 2013), “International Journal of Photoenergy” (Hindawi, since 2014), “Catalysts” (MDPI, since 2014), “Composite Interfaces” (Taylor&Francis, since 2015), “Energy and Buildings” (Elsevier, since 2015), “Environmental Engineering and Management Journal” (GH Asachi Technical Univ Iasi, since 2015), “Energy Efficiency” (Springer, since 2015), “Information Processing in Agriculture” (Elsevier, since 2015), “Energy Technology” (Wiley, since 2016), “The Open Fuels & Energy Science Journal” (Bentham Open, since 2016), “Sustainable Cities and Society” (Elsevier, since 2016), “Energies” (MDPI, since 2016), “Urban Climate” (Elsevier, since 2016), “Applied Ocean Research” (Elsevier, since 2017), “Journal of Natural Gas Science and Engineering” (Elsevier, since 2017), “Applied Sciences” (MDPI, since 2017), “Sustainability” (MDPI, since 2017), “Urban Science” (MDPI, since 2018), “Current Alternative Energy” (Bentham Science Publishers, since 2018), “Building and Environment” (Elsevier, since 2018), “Journal of Chemical and Engineering Data” (ACS, since 2018), “International Journal of Environmental Research and Public Health” (MDPI, since 2018), “Construction and Building Materials” (Elsevier, since 2018), “Environments” (MDPI, since 2018), “Industrial & Engineering

Chemical Research” (ACS, since 2019), “Materials” (MDPI, since 2019), “Energy” (Elsevier, since 2019), “Journal of Cleaner Production” (Elsevier, since 2019), “Processes” (MDPI, since 2019), “Measurement” (Elsevier, since 2020), “Buildings” (MDPI, since 2020), “Recycling” (MDPI, since 2020), “Aerospace” (MDPI, since 2021), “Bioresource Technology Reports” (Elsevier, since 2021), “Surfaces and Interfaces” (Elsevier, since 2021), “Science of the Total Environment” (Elsevier, since 2021), “Sensors” (MDPI, since 2021), “Chemical Engineering Science” (Elsevier, since 2021), “Resources” (MDPI, since 2021), “Materials Today Sustainability” (Elsevier, since 2022), “Electronics” (MDPI, since 2022), “Environmental Technology & Innovation” (Elsevier, since 2022), “Heliyon” (Cell Press, since 2023), Journal of Building Engineering (Elsevier, dal 2023).

- He was member of the Commission to evaluate programs for the use and implementation of Local Agenda 21 at the Ministry for the Environment and Territory in 2003.

6) Other qualifications

- Member of the Joint Commission of the Memorandum of Understanding aimed at supporting the diffusion of renewable energy communities between the University of Perugia, ARPA Umbria and the Municipality of Perugia (2023-2026);
- Member of the AICARR (Italian Association for Air Conditioning, Heating and Refrigeration) Coordination Committee for the Relations with the Universities (from November 2014 to 2017).
- Member of the Technical and Scientific Committee of Eureka Project (noise component), for the implementation of a web-portal for estimating the impacts of renewable energy plants, promoted by Orizzontenergia, Italy (2014).
- Representative of CIRIAF at the ECRC - European Cool Roof Council (since 2011).
- Representative of CIRIAF at ISES Italy (International Solar Energy Society Italy, from 2014 to 2018).
- Member of the international workgroup “Cool Building Solutions for a Warming World Working Group” (since 2019).
- Representative of University of Perugia at the National Energy Technology Cluster – CTN ENERGIA (2019, designed by the Rector).
- Member, representing the University of Perugia - Department of Engineering, of the working group for the drafting of regional guidelines for the implementation of reconstruction or relocation of zootechnical buildings as required by the Umbria Regional Law n.8 of 22 October 2018;
- Secretary of ATI – Umbria Section (Thermotechnical Italian Association) from 2004 to 2007;
- He was member of the Commission to evaluate "Enel – Energia in Gioco” projects at the P. Vannucci Power Plant in Bastardo (Perugia) in 2005;
- Member of the inspection teams of the Italian Manager of Energy Services - GSE SpA since February 2011 (pursuant to art. 2 of the resolution GOP 43 of July 16, 2010 of the Electricity and Gas National Authority).
- Member of the Commission of the Regione Umbria for the examination of applications for competent technician in environmental acoustics (appointed with D.G.R. n.310 of 18 March 2019)

7) National and International Congresses

He was member of the Organizing Committee of the following national and international conferences:

- CIRIAF National Congress "Mauro Felli Award", every year from the 6th edition (7-8 April 2006) to the 8th edition (4-5 April 2008), 10th edition (9-10 April 2010), 12th edition (30-31 March 2012), every year from the 14th edition (4-5 April 2014) to the 21st edition (8-9 April 2021), 24th edition (11-12 April 2024)
- 61st ATI National Congress, Perugia, Italy, 12-15 September 2006

- 40th UIT International Conference, Assisi, Italy, 26-28 June 2023

Member of the Scientific Committee of 22nd CIRIAF National Congress “Mauro Felli Award” (Perugia, Italy, 7-8 April 2022).

Member of the International Advisory Committee of 38th UIT International Conference (21-23 June 2021, online conference, Gaeta, Italy).

He participated as speaker or chairman at many national and international conferences and he also took part in numerous other international and national workshops and seminars.