PUBLIC INSTITUTION ENEA

European Network on New Sensing Technologies for Air-Pollution Control and Environmental Sustainability - EuNetAir

M. Penza, Researcher

ENEA

Italian National Agency for New Technologies, Energy, and Sustainable Economic Development

Brindisi Technical Unit of Technologies for Materials, PO Box 51 Br-4, I-72100 Brindisi, Italy

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URL: www.enea.it

ENEA - *ITALIAN NATIONAL AGENCY FOR NEW TECHNOLOGIES, ENERGY AND SUSTAINABLE ECONOMIC DEVELOPMENT*

Pursuant to art. 37 of Law no. 99 of July 23rd, 2009, the Agency's activities are targeted to research, innovation technology and advanced services in the fields of energy - especially nuclear. **ENEA** performs **research activities** and provides **agency services** in support to public administrations, public and private enterprises, and citizens. ***www.enea.it***

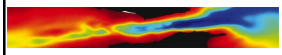
RESEARCH - The Agency's main research issues are as follows:

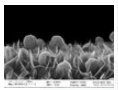
ENERGY

Nuclear Fusion - Nuclear Fission - Renewable Energy Sources
Advanced Technologies for Energy and Industry

SUSTAINABLE ECONOMIC DEVELOPMENT

Environmental Characterization, Prevention and Recovery
Environmental Technologies - Seismic Protection
Radiation Biology and Human Health
Sustainable Development and Innovation of the Agro-Industrial System



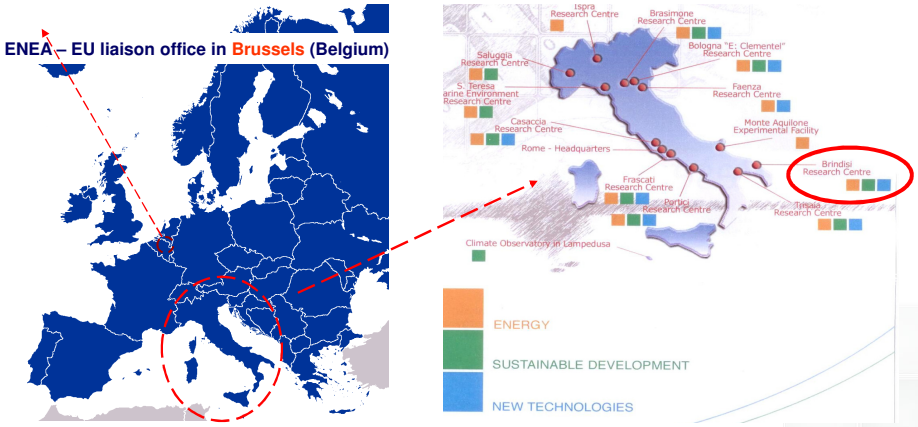


NEW TECHNOLOGIES

Radiation Applications
Materials Technologies
Energy and Environmental Modeling
ICT

ENEA - *ITALIAN NATIONAL AGENCY FOR NEW TECHNOLOGIES, ENERGY AND SUSTAINABLE ECONOMIC DEVELOPMENT*

ENEA Research Centres



PEOPLE: ≈ 2700 Researchers, Technical and Administrative Staff

Technical Unit for Materials Technologies Brindisi Facilities, Laboratories and Research Activities at the ENEA Brindisi Research Center

Leander Tapfer

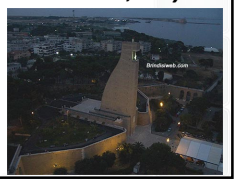
Technical Unit for Materials Technologies Brindisi (UTTMATB)

ENEA Brindisi Research Centre

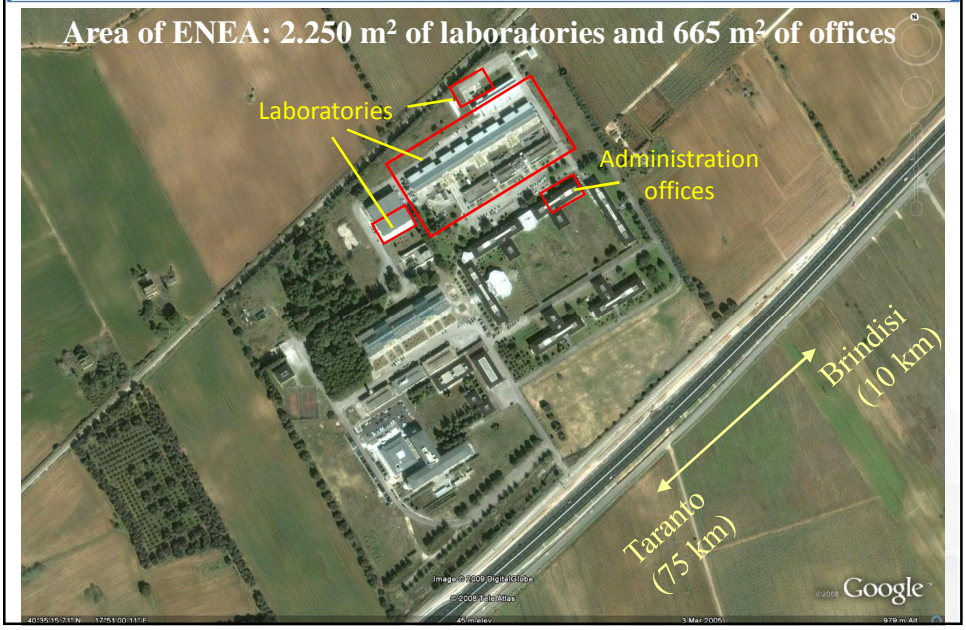
Research Centre of ENEA

Brindisi Research Center Laboratories

Brindisi, Italy



Cittadella della Ricerca



ENEA Brindisi Research Centre

Technical Unit Brindisi Material Technologies (UTTMATB)

Laboratory for Nanostructured and Composite Materials (UTTMATB-COMP)

laboratories

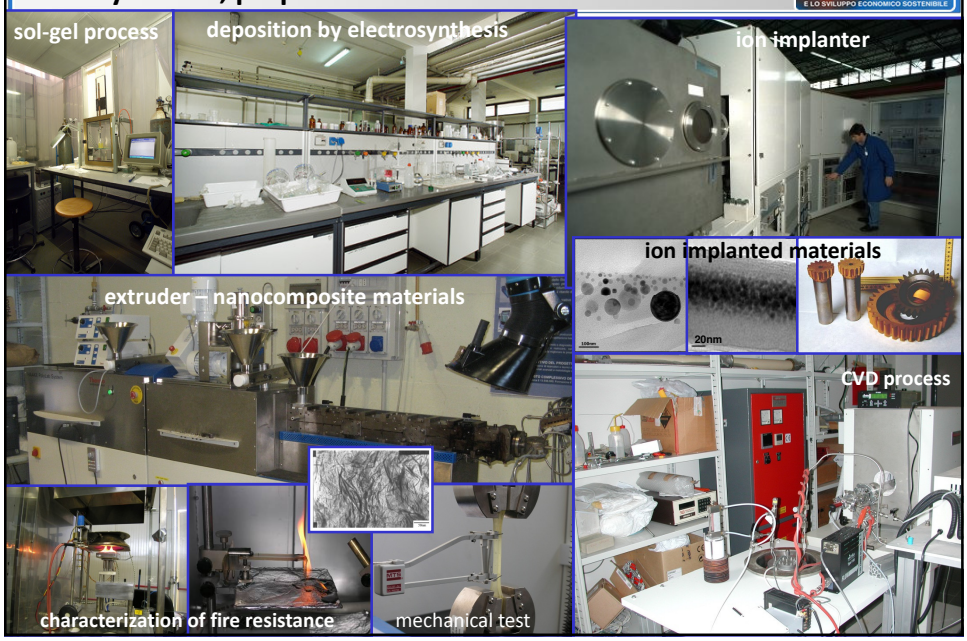
- chemical synthesis (colloids, nanomaterials)
- electrochemical synthesis (hybrid materials)
- sol-gel synthesis (oxides, ceramics)
- microstructural and microanalytical characterization of materials
- transmission (TEM) and scanning electron microscopy (SEM)
- X-ray diffraction and small and wide angle scattering
- morphological (AFM) and spectroscopic analysis of surfaces (STM, XPS, SIMS)
- gas-mass spectrometry and elemental analysis optical spectroscopy analyses (photoluminescence, FTIR, UV-Vis-NIR)
- development and test of sensors

Laboratory for Materials Technology (UTTMATB-TEC)

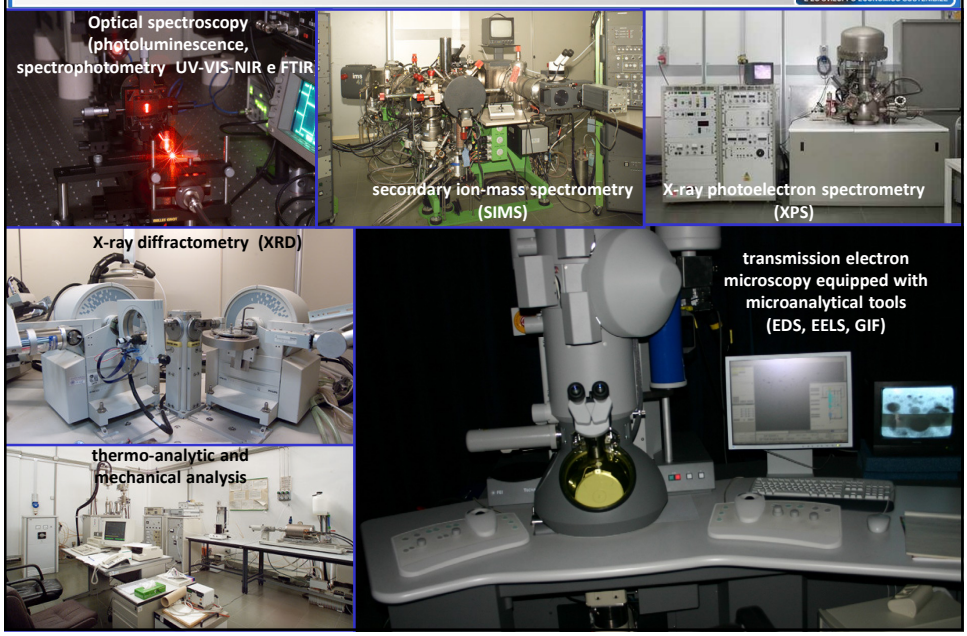
laboratories

- polymer technology (processing and treatment)
- physical deposition methods (sputtering, PECVD, CVD)
- plasma spray technology (APS)
- ion implatation equipment
- extrusion equipment
- mixer (organic/polymer – inorganic materials)
- mechanical and thermomechanical analysis
- thermoanalytic characterization (TGA, DSC)
- dynamic mechanical analysis (DMA)
- rheological analysis
- laboratory for materials treatment (heat treatment and gas exposure)
- permeabilimetry analysis (gas and liquids)
- testing of corrosion

facilities and equipment for synthesis, preparation and treatment of materials



Equipment for the characterization and analysis



Personnel of the Technical Unit ENEA Brindisi

Permanent technical staff of the Technical Unit of ENEA Brindisi

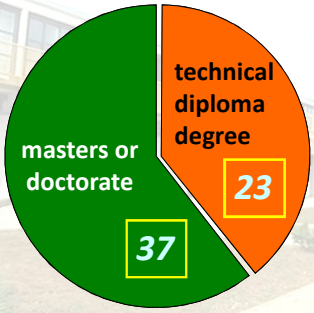
Personnel: 65 researchers and technicians

Interdisciplinary competence and expertise:

experimental and theoretical

Researchers

- physicists
- engineers
- informaticians
- chemists
- biologists



Technicians

- chemistry
- mechanics
- electronics
- informatics
- telecommunications

+ fellowships, PhD students,....

Technical Unit for Materials Technologies Brindisi

Role and Activity

Pursue the objectives of research, technological innovation and advanced services of ENEA in energy and sustainable economic development sectors:
through research, development and engineering of advanced materials (metals, polymers and ceramics) for structural and functional applications with the aim to minimize the energy content and the environmental impact during the phases of realization, uses and their disposal (and/or recycling), and to improve their properties in general.

Development of innovative methodologies in:

- surface treatment and modification
- synthesis and preparation of materials
- processing and treatment of materials
- micro- and nano-characterization
- functional and behavioural performances

classes of materials e technologies

nanomaterials and composites
polymers and hybrid nanocomposites
thin films and coatings
methods for synthesis and deposition
surface treatment

functional properties

structural, mechanical, thermal, chemical, optical, electronic and sensing

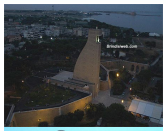
CV of MICHELE PENZA

BRINDISI TECHNICAL UNIT OF TECHNOLOGIES FOR MATERIALS

Michele Penza, Degree in Physics in 1990 (University of Bari). First he worked with CNRSM SCpA (IT S&T Park) and then joined ENEA in 2001. He manages currently **research projects** (regional, national, international) and **teams** on material science, sensors and solid-state devices in the research centre of Brindisi, Italy. **The research interests are in sensor materials, nanomaterials, gas sensors, portable sensor-systems, functional applications, environmental technologies and measurements**.

Author of 2 filed national patents and 140 scientific publications, 10 invited speakers, 2 book-chapters, co-organizer of scientific meetings, chair of conference-sessions, member of international scientific committees, international expert for FP7-projects and national research agency/council, international reviewer, research manager with SMEs partnership, associate editor for *Journal of Sensors*, guest editor of special issues.

He was proposer of COST Action TD1105 EuNetAir (2012-16) including over 50 teams from 21 COST Countries and 5 Non-COST Countries.



AWARD:
EXCELLENCE-ENEA 2008
SPECIAL MENTION FOR ENVIRONMENTAL RESEARCH
Rome, 18 Dec. 2008

FESTIVAL OF INNOVATION
Bari, 3 Dec. 2008

GAS SENSORS AND NANOMATERIALS TEAM
ENEA UTTMATB - Brindisi Research Center

NASUS 1 WORKING IN FIELD

NASUS 1 IN AN AIR-QUALITY STATION AT ARPA-PUGLIA PUBLIC NETWORK

Michele Penza
Riccardo Rossi
Marco Alvisi
Domenico Suriano
Valerio Pfister
Emanuele Serra
Gennaro Cassano
Patrizia Aversa
Domenico Di Maio
Rocco Pentassuglia

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