

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

COST Action TD1105

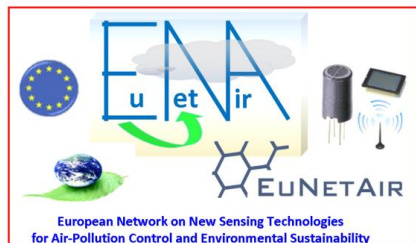
2nd International Workshop *EuNetAir* on New Sensing Technologies for Indoor and Outdoor Air Quality Control

**Palazzo Nervegna-Granafei, Brindisi Municipality Headquarters
ENEA - Brindisi Research Center, Brindisi, Italy, 25 - 26 March 2014**

Action Start date: 01/07/2012 - Action End date: 30/06/2016 - Year 2: 1 July 2013 - 30 June 2014

OVERVIEW of COST Action TD1105 EuNetAir

 **cost**
EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY



Michele Penza

**Function in the Action: Action Chair
ENEA - Brindisi, Italy**



Outline



- **Background / Problem Statement:**
 - ✓ *Scientific context*
 - ✓ *Challenges addressed by the Action*
- **MoU Action's Objectives: Main and Secondary**
- **Action Research Directions:**
 - ✓ *Methodology and Innovation*
- **Working Groups**
- **Future Plans and Challenges: Expected Impact**
- **Concluding Remarks**

Air-pollution: An International problem



Chernobyl, Ukraine



Yamuna-River, New-Delhi, India



Wastes in the Pacific Ocean are Equivalent to Texas-Area



Linfen, China

Polluted Cities, Europe



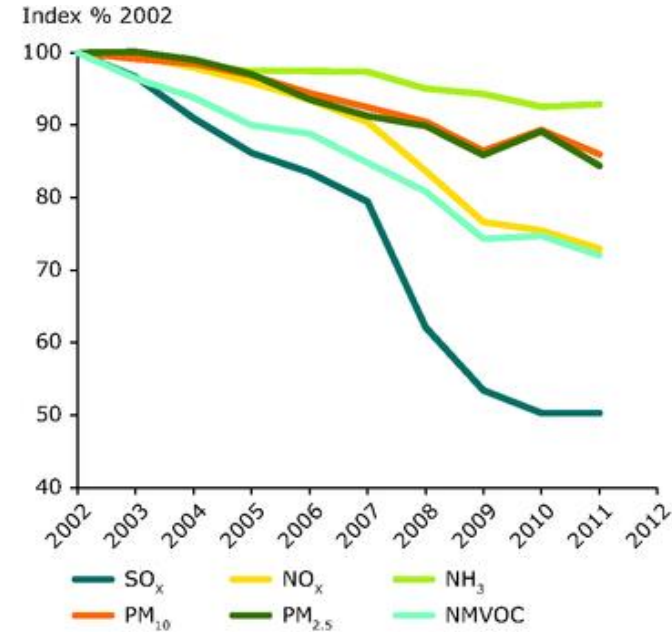
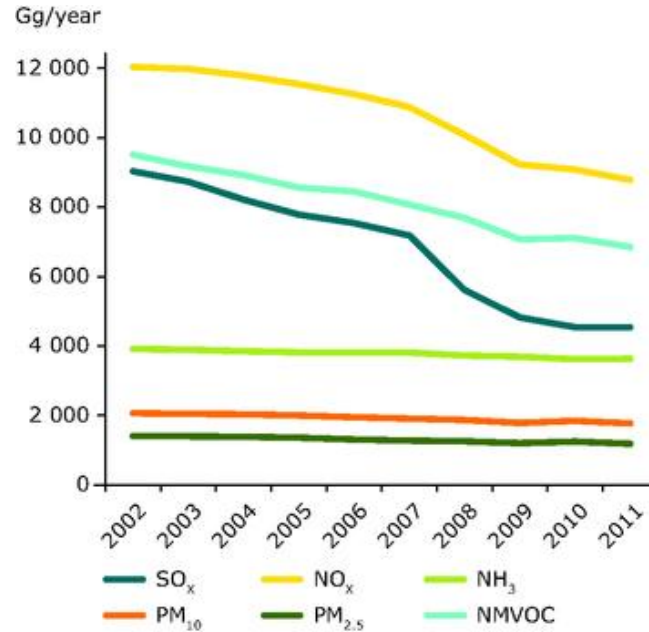
ATIIOI

River-Riachuelo, Buenos-Aires, Argentina



Scientific context: Air Quality Control (1/2)

European Environment Agency, EEA Report 9/2013

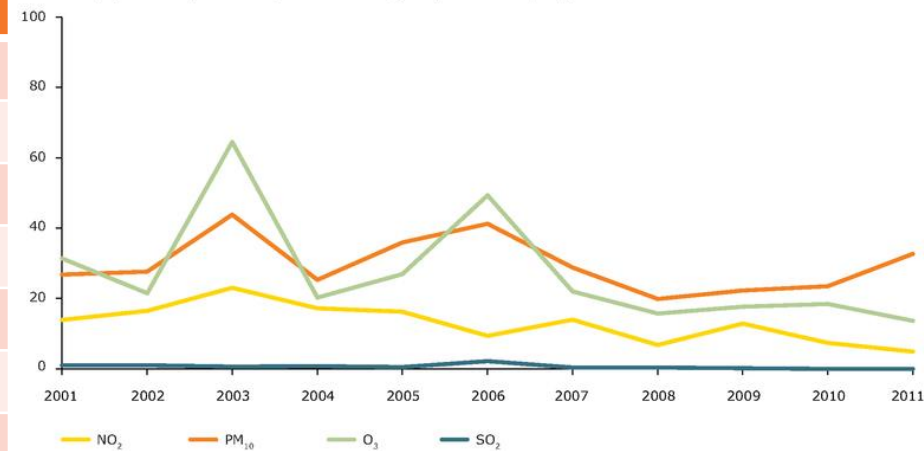


Some Environmental Emergencies:

- 1930 - Meuse Valley (Belgium)
- 1952 - Great London Smog (UK)
- 1954 - Los Angeles (USA)
- 1984 - Bhopal (India)
- 2005 - Teheran (Iran)
- 2006 - Hong Kong (China)
- 2008 - Shanghai, Peking (China)
- 2012 - Taranto (Italy)

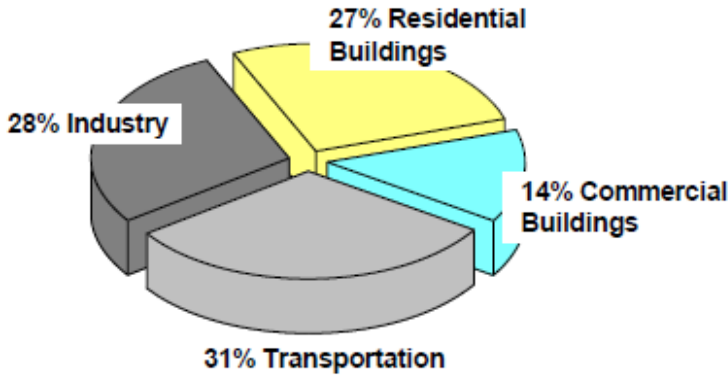
Pollutant	Limit Level
NO _x	100, 200 ppb
CO	8 ppm
SO ₂	130, 190 ppb
O ₃	120 µg/m ³
PM ₁₀	50 µg/m ³
BTEX	6 µg/m ³
PAH (BaP)	1 ng/m ³
PM _{2.5}	-

% of urban population exposed to air pollution exceeding acceptable EU air quality standard



**AMBIENT AIR QUALITY
EU DIRECTIVE 2008/50/EC
and Daughters**

Scientific context: Indoor/Outdoor Energy Efficiency (2/2)



Primary energy consumption in the EU¹

¹ O. Seppanen,

11th Conference on Indoor Air Quality
2008, Copenhagen, Denmark

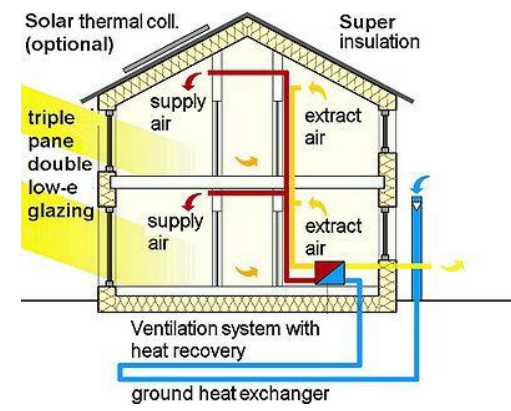
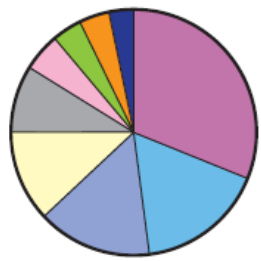
41% Primary Energy consumed in Buildings:

- 2/3 in Residential Buildings
- 1/3 in Commercial Buildings

Energy Performance of Buildings EU Directive
EPBD 2010/31/EC

Figure 2 – Total Energy Consumption by End Use
Adapted from E Source, 2006

- Ventilation 4%
- Refrigeration 3%
- Space Heating 31%
- Water Heating 17%
- Cooling 15%
- Lighting 12%
- Other 9%
- Cooking 5%
- Office Equipment 4%



Source: Environmental Protection Agency's National Action Plan for Energy Efficiency Sector Collaborative on Energy Efficiency Hotel Energy Use Profile

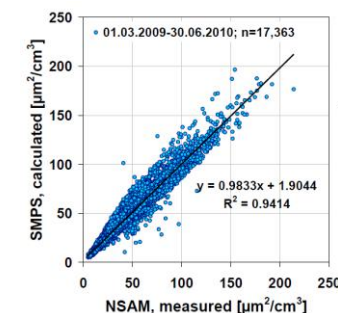
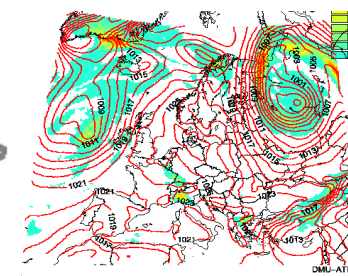
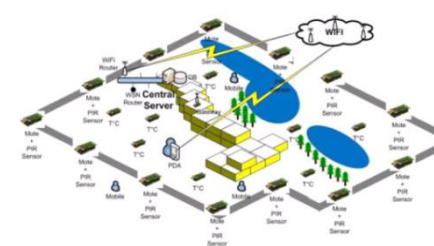
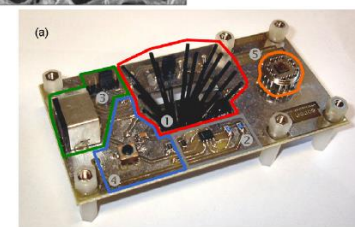
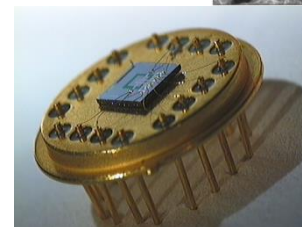
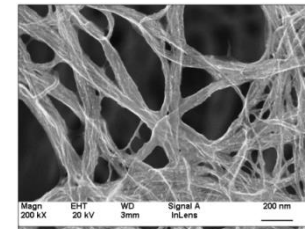
IAQ by WORLD HEALTH ORGANIZATION

Indoor Air		Typical Substances		Cure		
Contamination Source	Emission Source	VOCs	Others			
• Human Being	• Breath	Acetone, Ethanol, Isoprene	CO ₂	demand controlled ventilation		
		Humidity				
	• Skin Respiration & Transpiration	Nonanal, Decanal, α-Pinene	Humidity			
		Humidity				
	• Flatus	Methane, Hydrogen				
	• Cosmetics	Limonene, Eucalyptol				
	• Household Supplies	• Combustion (Engines, Appliances, Tobacco Smoke)	Alcohols, Esters, Limonene		Unburnt Hydrocarbons	
					CO	
					CO ₂	
					Humidity	
• Building Material • Furniture • Office Equipment • Consumer Products	• Paints, Adhesives, Solvents, Carpets	Formaldehyde, Alkanes, Alcohols, Aldehydes, Ketones, Siloxanes		permanent 5-10% ventilation		
		• PVC	Toluene, Xylene, Decane			
	• Printers, Copiers, Computers	Benzene, Styrene, Phenole				

Table 1 – Typical Indoor Air Contaminants (VOCs and others)

Challenges addressed by Action TD1105 (1/1)

- **Nanomaterials for AQC sensors**
- **Low-cost Gas Sensors**
- **Low-power Sensor-Systems**
- **Wireless Technology (*Environmental Sensors Network*)**
- **Air Quality Modelling**
- **Environmental Measurements**
- **Standards and Protocols**



Action's Objectives (1/3)

MoU Main Objectives of COST Action TD1105:

- To establish a *Pan-European multidisciplinary R&D platform* on new sensing paradigm for Air Quality Control (AQC) contributing to sustainable development, green-economy and social welfare.
- To create *collaborative research teams* in the ERA on the new sensing technologies for AQC in an integrated approach to avoid fragmentation of the research efforts.
- To train *Early Stage Researchers (ESRs)* and new young scientists in the field for supporting competitiveness of European industry by qualified human potential.
- To promote *gender balance* and involvement of ESRs in AQC.
- To disseminate *R&D results on AQC* towards *industry community* and policy makers as well as general public and high schools.

Action's Objectives (2/3)

MoU Secondary Objectives of COST Action TD1105:

- To provide a *platform between scientists* in the field of materials, nanotechnology and sensor-systems and other scientists such as environmental protection engineers, public agencies managers, stakeholders, decision-makers, aiming to improve best practices in AQC and explore the potential role of new generation of low-cost sensing devices.
- To investigate *sensing mechanisms* of functional nano-materials for gas measurement and identification of the best available nano-materials, providing concepts and harmonising pre-standardised methods; based on available datasets from partners.
- To assess *degradation rates and lifetime* of sensor elements in defined environmental conditions and evaluate interactions of sensitive materials with outdoor/indoor pollutants; based on datasets from ongoing and historical field deployments of low-cost sensors.
- To investigate *the best available technology* for sensor deployment, communication, power supply and data storage, analysis and display.

Action's Objectives (3/3)

MoU Secondary Objectives of COST Action TD1105:

- To monitor real-world environmental conditions with *experimental campaigns* to assess composition of *indoor air* (buildings: house and office) and *outdoor air* (urban areas and industrial sites) and to investigate how such data can be utilised in air pollution modelling.
- To approach *standardisation of methods* for air quality measurements, e.g. harmonisation of test procedures, chemical analysers, post processing, protocols, etc..
- To disseminate *knowledge* on functional materials and sensor-systems for AQC; to aid better focusing of Europe's resources by coordinated efforts in AQC and environmental sustainability to strengthen Europe's competitiveness and scientific excellence improving capacity building and networking to tackle global challenges in a big market in the mid-long term.

COST Action EuNetAir: Some National Research Projects

Nat. Res. Project:
NDIR-GAS SENSORS
Sector: ENV TECH, ICT
Lead Partner: CCMOS Ltd
Country: UK

Nat. Res. Project: SMART-GAS
Sector: ENV TECH
Lead Partner: SenseAir
Country: Sweden

Nat. Res. Projects: SMS-Nase, DFG
Sector: MATERIALS, AOC SENSORS
Lead Partner: ...

Nat. Res. Project: NANOSENSORS
Sector: MATERIALS, GAS SENSORS
Lead Partner: C - CN Academy of Science
Country: China

Nat. Res. Project: SNAQ-Heard
Sector: ...
Lead Partner: ... Cambridge
Country: UK

Nat. Res. Project: ... EFFICY
Sector: ...
Lead Partner: ...
Country: Germany

Nat. Res. Projects: RF-SENS, INTEGROSENS
Sector: ENV, GAS SENSORS, CONTROL
Lead Partner: University of Bayreuth
Country: Germany

Nat. Res. Project: SMART SENSOR
Sector: MATERIALS, GAS SENSOR
Lead Partner: NRC - Kurchatov Institute
Country: Russian Federation

Nat. Res. Project: HTS&M
Sector: Materials, NanoDev
Lead Partner: IMEC
Country: Netherlands

Nat. Res. Projects: VOC-IDS (EraNet), IGFL
Sector: ENV, SECURITY, ICT
Lead Partner: LMT-Saarland University
Country: Germany

Nat. Res. Project: CAPBTX
Sector: GAS SENSORS, ENV
Lead Partner: ...
Country: ...

Nat. Res. Project: CABTURES
Sector: NANO, SENSORS
Lead Partner: EPFL
Country: Switzerland

Nat. Res. Projects: IDEA, MOBILE SENSING
Sector: ENV, ICT
Lead Partner: VITO
Country: Belgium

Nat. Res. Project: SMART NANOSENSORS
Sectors: CNT NANOSENSORS FOR SPACE, COMMERCIAL/INDUSTRIAL APPLICATIONS
Lead Partner: NASA Ames Research Center
Country: USA

Nat. Res. Project: NAVACS, N...
Sector: NANO, GAS SENSORS
Lead Partner: IREC
Country: Spain

Nat. Res. Project: VALTEC, TEC
Sector: NANO, GAS SENSORS
Lead Partner: UB, IREC
Country: ...

Nat. Res. Projects: FC Aeth, Air Pollution
Sector: ENV TECHNOL
Lead Partner: Aerosol 2.0
Country: Slovenia

Nat. Res. Project: InTechFun
Sector: MATERIALS, SENSORS
Lead Partner: SUT
Country: Poland

Nat. Res. Projects: VAMOS, CARIATI
Sector: ENV
Lead Partner: CSIC
Country: Spain

Nat. Res. Projects: VOC&ODOR, SIMPA
Sector: ENV
Lead Partner: UNIBA
Country: Italy

Nat. Res. Projects: SIMS, RES...
Sector: ICT, Materials, Env
Lead Partner: ENEA
Country: Italy

Nat. Res. Projects: ...
Sector: ...
Lead Partner: ...
Country: Italy

Nat. Res. Projects: NOVANA, ARCTIC
Sector: ...
Lead Partner: Aarhus University
Country: Denmark

Nat. Res. Projects: FIRB, NANOTHER, CARIPLO
Sector: NANOMATERIALS, GAS SENSORS, ENERGY
Lead Partner: UNIBS; ...
Country: Italy

Nat. Res. Projects: EXOTHERMO
Sector: MATERIALS, GAS SENSORS, ENERGY
Lead Partner: FORTH; ...
Country: Greece

Nat. Res. Projects: CWFIS, SFO
Sector: ENV, AQ Modelling
Lead Partner: NIMH
Country: Bulgaria

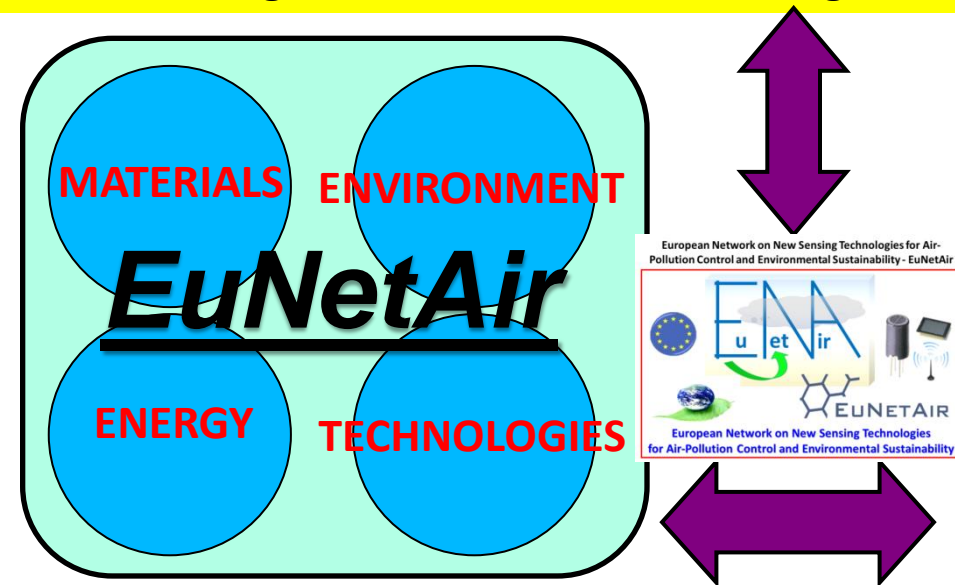
COST Action EuNetAir

COST Action EuNetAir

COST Action EuNetAir: **INNOVATION** (1/2)

Complementarity with other COST Actions:

- ES0602 Chemical Weather Forecasting and Information Systems
- ES1004 European Framework for Online Integrated Air Quality and Meteorology Modelling
- MP0701 Composites with Novel Functional and Structural Properties by Nanoscale Materials
- MP0901 Designing Novel Materials for Nanodevices: From Theory to Practice
- TU0902 Integrated Assessment Technologies to Support the Sustainable Development of Urban Areas



RELATED FP6-FP7 PROJECTS:

- NANOS4, NMP
- S3, EU-RUSSIA COOPERATION
- ORAMA, NMP
- NANO2HYBRIDS, NMP
- AIRMONTECH, ENV
- AQUILA, ENV
- OFFICAIR, ENV
- CITI-SENSE, ENV
- GOSPEL, Network of Excellence in Artificial Olfaction
- FLEXSMELL, PEOPLE Marie-Curie Action

INNOVATION of ACTION:

Integrated approach on AQC for environmental sustainability by cooperative networking of multidisciplinary research on nanomaterials, gas sensing technologies, wireless sensor technologies and networks, environmental measurements, ambient intelligence, air quality modelling, chemical weather forecasting, harmonisation of measurements, protocols, methods, standards and procedures for commercialisation of low-cost AQC sensors.

Innovation Highlights of COST Action TD1105 *EuNetAir*:

The Working Program includes multidisciplinary Research at integrated approach and trans-domain multi-scale level:

- Nanomaterials for low-cost AQC sensors
- Improved gas sensor systems and low-power sensing microdevices
- Wireless sensor networks and distributed intelligence
- Air-quality modelling and chemical weather forecasting
- New protocols, standards and methods for AQC sensors
- Harmonisation of environmental measurements
- Guidelines for AQC systems and transducers
- Environmental sustainability and energy efficiency



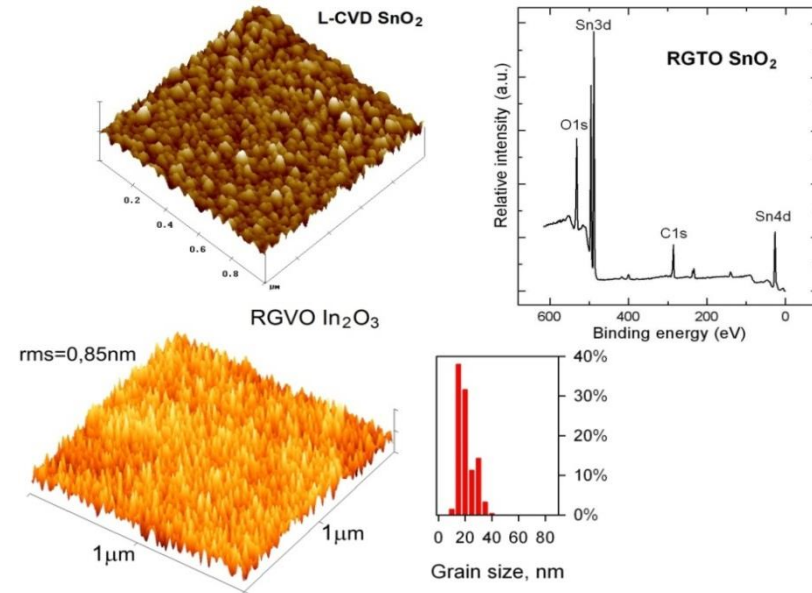
EuNetAir SOLUTIONS: NANOMATERIALS AND NANOTECHNOLOGIES

Metal Oxides Nanostructures by University of Brescia,

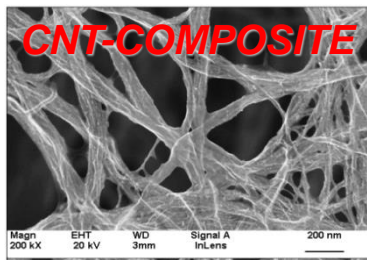
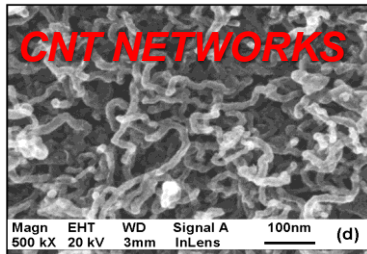


*The increasing scientific interest in **1-D systems** (nanowires, nanobelts, nanorods, nanotubes) and single-crystalline 1-D nanostructures (SnO_2 , ZnO , WO_3 , In_2O_3 , MoO_3 , TiO_2 , etc.) are nowadays emerging as building blocks for a new generation of electronic, and optoelectronic nanometer-scaled devices with superior performances for gas sensing and energy applications.*

RGTO (RGVO) SnO_2 and In_2O_3 nanolayers by Silesian University of Technology, Poland



Carbon nanotubes (CNT) in the form of networks and composite as filler in an organic matrix by ENEA, Italy



PROPERTY OF CNTs	VALUE
High surface area	100 - 1800 m^2/g
Hollow structure	1 - 5 nm diameter
Nanosized morphology	10 - 1000 Aspect ratio
High electron mobility	up to 10000 $\text{cm}^2\text{Vs}^{-1}$, at 300K
High structural/chemical reactivity	Bending at high angle ($< 40^\circ$)
High thermal stability	1800 - 6000 $\text{Wm}^{-1}\text{K}^{-1}$ therm. cond.
Electrical Resistivity	1 - 100 $\text{k}\Omega$ (p-type Semiconductor)

EuNetAir SOLUTIONS: WIRELESS TECHNOLOGY

Production version of the mote technology from EPSRC MESSAGE.

3 electrochemical gas sensors, temperature, humidity & noise.

IEEE 802.15.4 wireless mesh networking of up to 100 motes (up to 100 m between motes).

Custom network protocols for routing and power management.

Solar rechargeable battery + Lithium D cell backup.

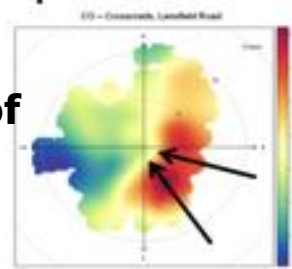
Designed for easy deployment on lighting columns etc.

Low cost, rapid deployment and high spatial resolution.



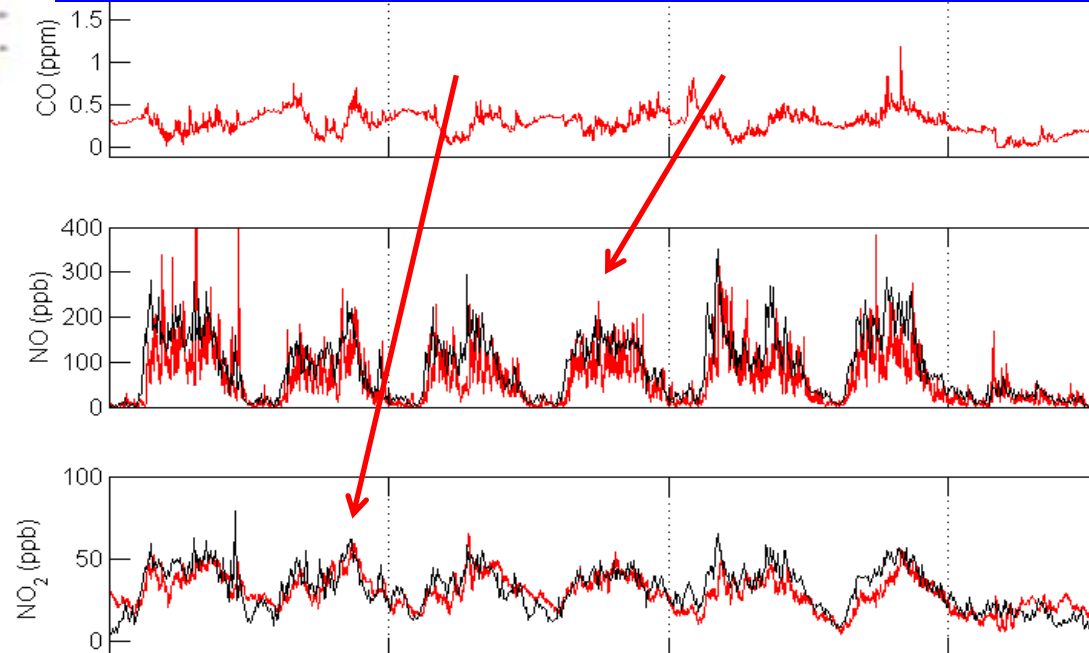
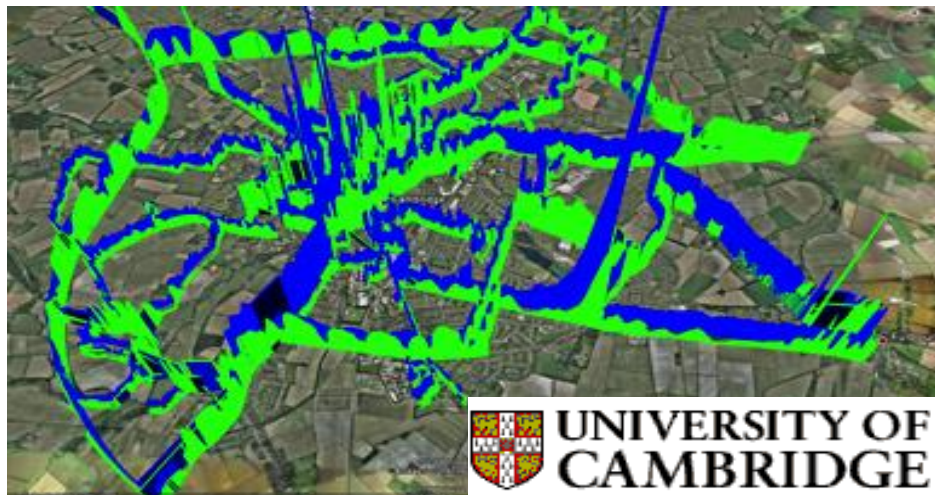
The Envirowatch mote

Automatically corrects mote electrochemical sensor data for temp and humidity (red) to achieve excellent agreement with precision instruments (black)



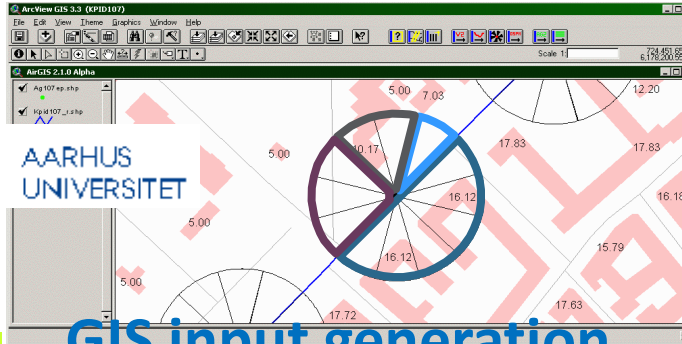
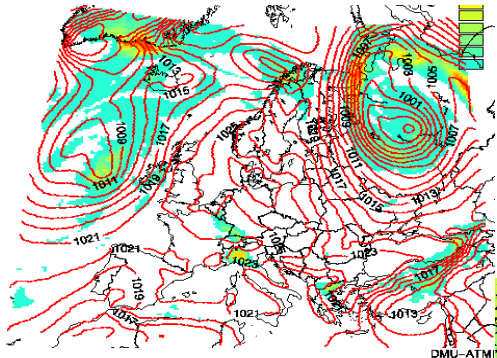
High granularity evaluation of air quality (e.g. NO_x , below), source attribution (right).

WIRELESS SENSORS NETWORK for AQC



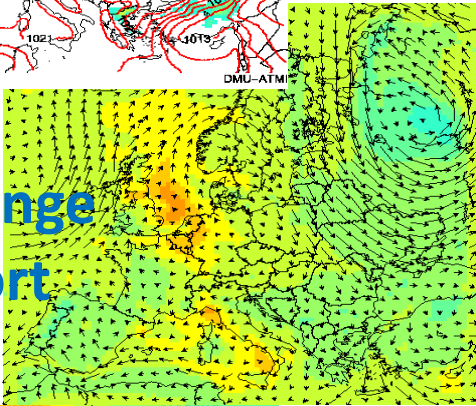
EuNetAir SOLUTIONS: AIR QUALITY MODELLING

Chemical weather

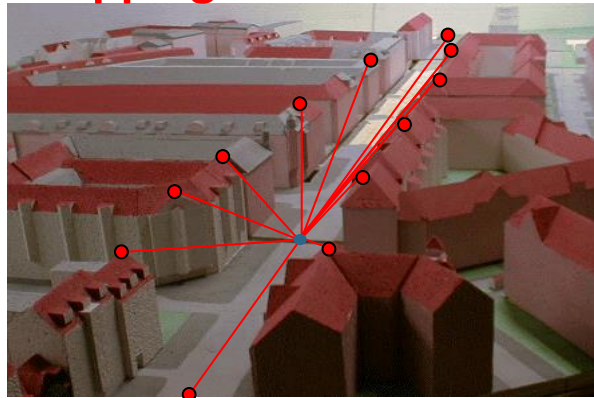


GIS input generation

Long-range transport



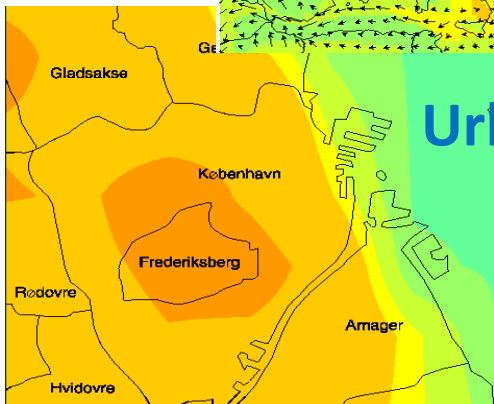
Mapping addresses



AirTHESS: operational AQ management and information system for Thessaloniki, Greece, employing Computational Intelligence for AQ forecasting and mobile phone technology for early warning messages.

By Aristotle University, Greece.

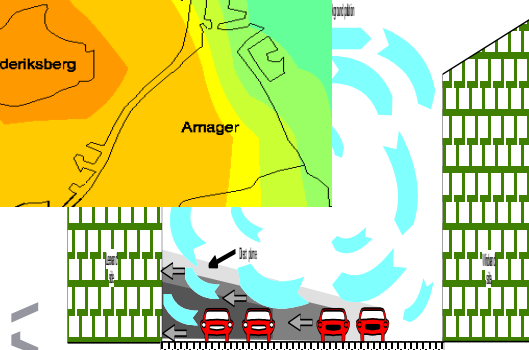
Urban scale



Tracking routes



Street scale



ArcView script for visualisation

Action TD1105 *EuNetAir*: Working Groups (1/5)



WG1:
**Sensor Materials
&
Nanotechnologies**

WG2:
**Sensors, Devices
& Systems for AQC**

WG4:
**Protocols &
Standardisation
Methods**

WG3:
**Env. Measurements
&
Air Pollution Modelling**

**INTERDISCIPLINARY
SPECIAL INTEREST GROUPS**

MANAGEMENT COMMITTEE:

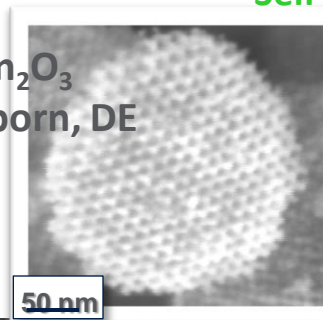
CORE-GROUP & STEERING COMMITTEE

- *Editorial Board*
- *Dissemination*
- *Training Schools*
- *Gender Balance*
- *Early Stage Researchers (ESR)*
- *Short-Term Scientific Mission (STSM)*
- *Intellectual Property Rights (IPR)*
- *Local Organizing Committee (LOC)*

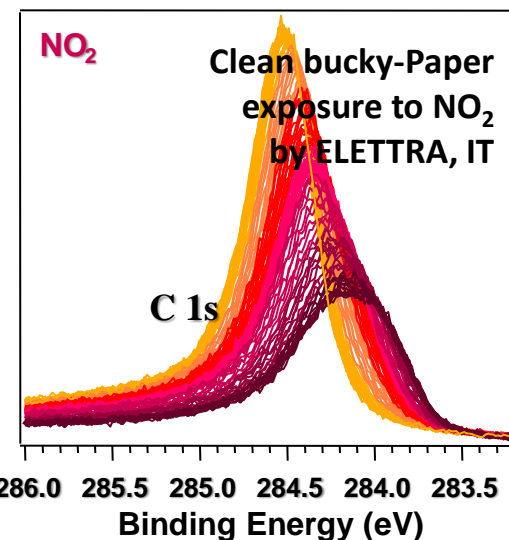
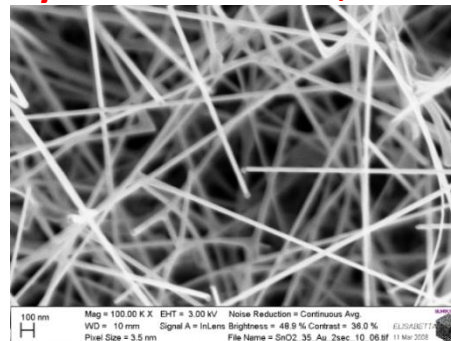
- **SIG 1: Network of Spin-offs**
- **SIG 2: Smart Sensors for Urban Air Monitoring in Cities**
- **SIG 3: Guidelines for Best Coupling Air Pollutant-Transducer**
- **SIG 4: Expert comments for the Revision of the Air Quality EU Directive**

- **Sub-Working Group 1.1:**
Metal oxides nanostructures for AQC gas sensors.
- **Sub-Working Group 1.2:**
Carbon nanomaterials for AQC gas sensors.
- **Sub-Working Group 1.3:**
Emerging sensor materials (organic/inorganic, hybrid, nanocomposites, polymers, functional, etc.).

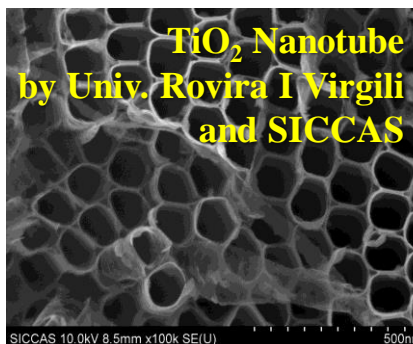
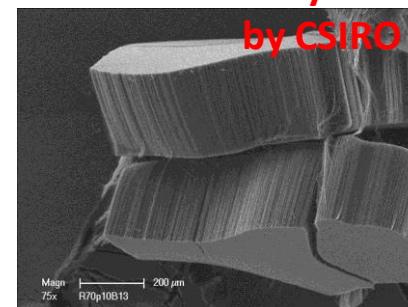
Mesoporous In₂O₃
by Univ. of Paderborn, DE



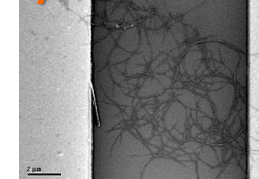
Metal oxide (SnO₂)
Nanowires nets
by Univ. of Brescia, IT



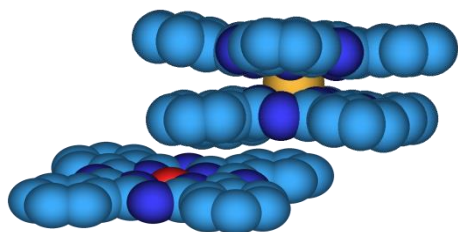
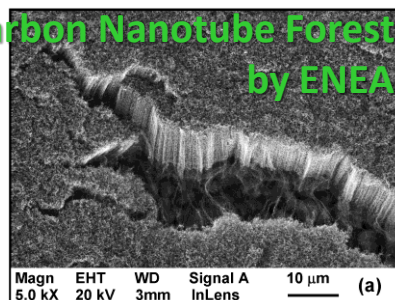
Carbon Nanotube yarns
by CSIRO



Carbon Nanotube ropes
by Ames NASA



Carbon Nanotube Forest
by ENEA



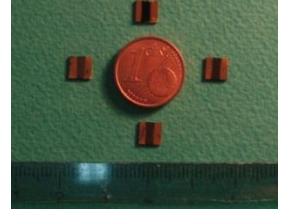
New molecular materials of polymer-macrocycles as transducers for polluting gas sensing by University of Bourgogne

TD1105 *EuNetAir* **WG2**: Sensors, Devices and Systems for AQC (3/5)

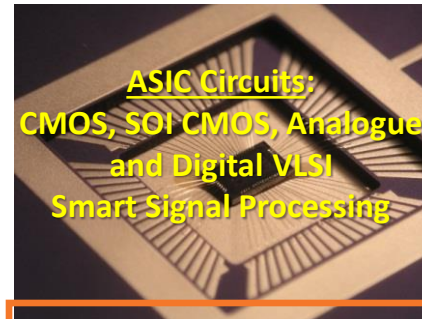
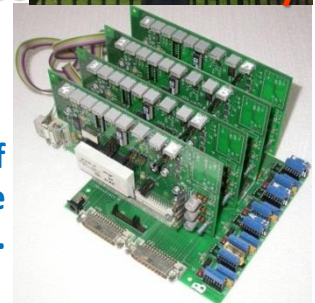
WG2 Chair: Prof. Andreas Schuetze, Saarland University, Germany

IT PATENT ENEA

Carbon Nanotube Gas Sensors

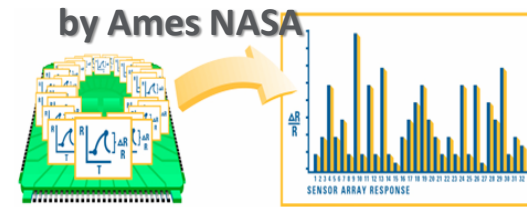


EnviroWatch mote by Newcastle University



ASIC Circuits:
CMOS, SOI CMOS, Analogue
and Digital VLSI
Smart Signal Processing

Warwick University in collaboration with
Cambridge University, EPFL, PennState.



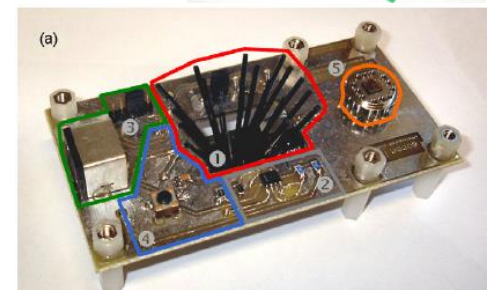
Using pattern matching algorithms, the data is converted into a unique response pattern

A versatile platform for the efficient development of gas detection systems based on automatic device adaptation by University of Saarland.



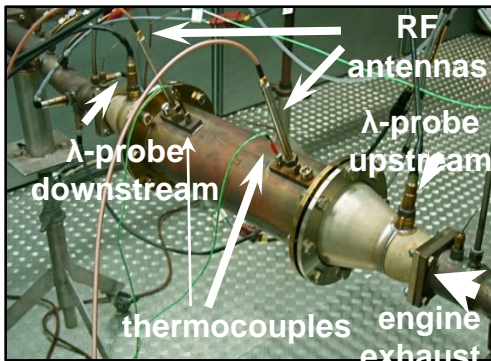
Environmental Sensor demo by IMEC, NL

Low-ppb sensitivity for NO₂ GaN-based sensor concept



Autonomous Gas Sensor System by IREC and Univ. of Barcelona

- **Sub-Working Group 2.1:**
Gas sensors and new transducers.
- **Sub-Working Group 2.2:**
Portable gas sensor-systems.
- **Sub-Working Group 2.3:**
Wireless technology and AQC sensors network.
- **Sub-Working Group 2.4:**
Intelligence algorithms and distributed computing for networked AQC gas sensors.



Direct status measurement of automotive catalysts by radio-frequency technique by University of Bayreuth, DE.

ERATION IN SCIENCE AND TECHNOLOGY

Sub-Working Group 3.1:

Environmental measurements at laboratory and in field air-quality stations.

Sub-Working Group 3.2:

Air-quality modelling and chemical weather forecasting.

Sub-Working Group 3.3:

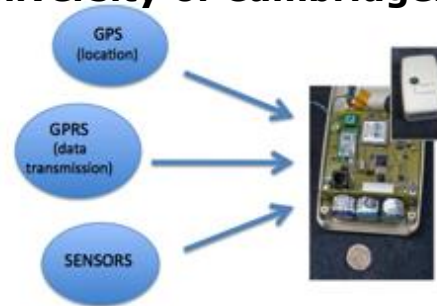
Harmonisation of environmental measurements.

by Aristotle University, EL

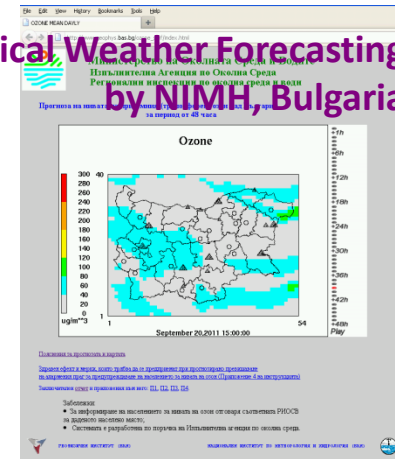


AirMerge system for Chemical Weather Models

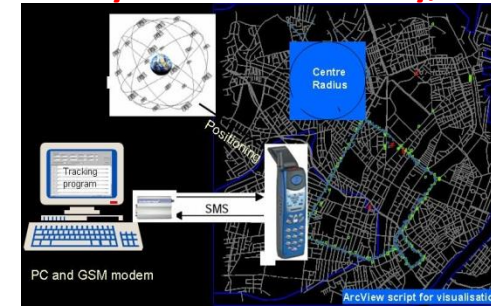
Mobile and static sensor network configurations by University of Cambridge.



Chemical Weather Forecasting by NIMH, Bulgaria



AQ Modeling: Tracking routes by Aarhus University, DK



Environmental measurements of PM and air pollution by CSIC, ES

AQ monitoring station by ARPA-PUGLIA, IT

AQ monitoring station by Aarhus University, DK

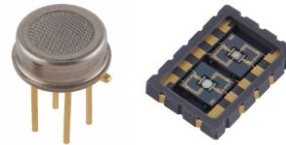
AQ monitoring station by Lithuanian EPA

- **Sub-Working Group 4.1**:
Protocols, standards and methods for AQC by analyzers/instruments (no-sensors) technologies.
- **Sub-Working Group 4.2**:
Protocols, standards and methods for AQC by sensors (no-analyzers) technologies.
- **Sub-Working Group 4.3**:
Benchmarking of new products and market of commercial AQC sensors.

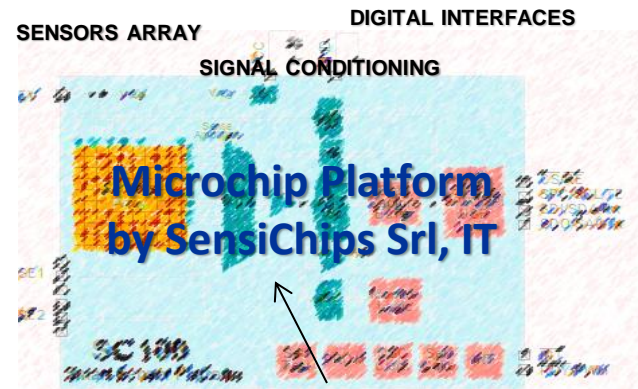
European Directive 2008/50/EC: Ambient Air Quality
EU standard EN 13725/2003: Dynamic Olfactometry

Protocols and Standardised Methods for Gas Sensors
Guidelines of Best Transducers applied to specific gases

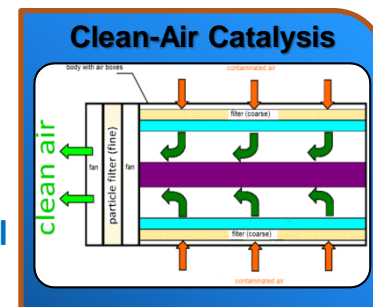
Dynamic olfactometry EN13725
by Univ. of Liege, Odometric SA,
Univ. of Bari, Lenviros srl.



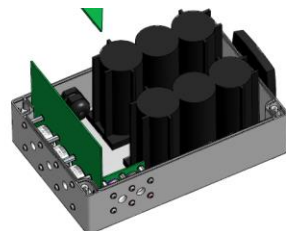
Packaged Sensors
by **SGX-Sensortech, CH**



New precision multi-parametric analytical tool



Becker Gruppe, DE

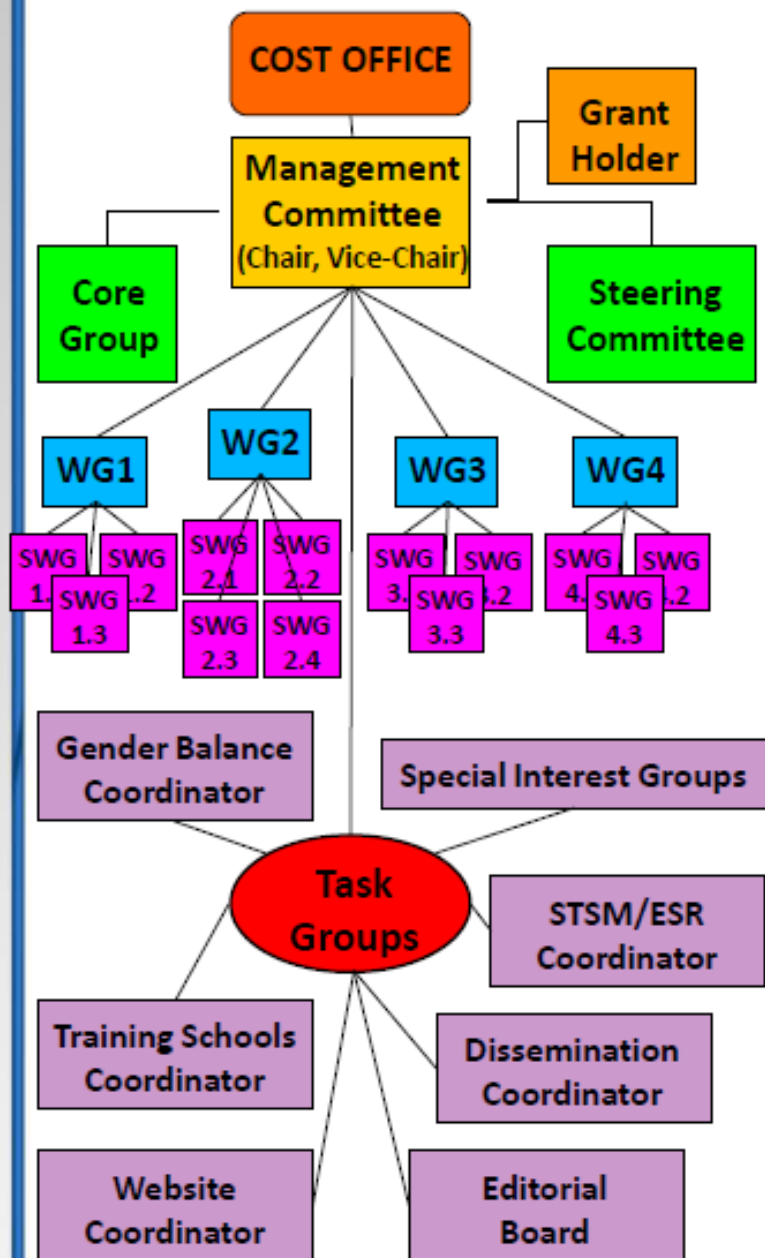


Battery-Powered Sensors by Alphasense Ltd, UK



CO₂ IR sensor for alarm
System by SenseAir AB, Sweden

COST Action EuNetAir: COORDINATION AND ORGANIZATION



MANAGEMENT COMMITTEE

2 Representatives of participating Countries

Steering Committee:

- ✓ Action Monitoring
- ✓ Milestones settings
- ✓ Prepare MC meetings
- ✓ Management of IPR issues

Core Group:

- ✓ Prepare Documents for MC
- ✓ Prepare MC meetings
- ✓ Executive tasks in Action

- Meet every 6 months
- S&T exchange
- Cooperation
- Researcher mobility (STSM)
- Budget management
- Report to COST Office
- Organize Workshops/Conferences
- Organize Training Schools
- Promote Gender Balance
- Action Results Dissemination
- Evaluation plans

CORE GROUP

Action Chair
Action Vice Chair
Secretary

WGs Coordinator

- Organize WG meetings
- Coordination
- Monitoring
- Promote joint-activities
- Report to MC and SG

STSM/ESR Coordinator

- STSM/ESR agenda
- Training agenda

Gender Coordinator

- Gender agenda
- Care for gender balance

Dissemination Coordinator

- Dissemination activities
- Action Website
- Local Organizing Committee

NETWORKING

- Special Interest Groups (SIGs)
- Network of spin-offs
- International Experts
- Keynote Speakers

COST Action TD1105 ROADMAP (2012-2016)

YEAR	Quarter 1	Quarter 2	Quarter 3	Quarter 4
1	<p><u>M</u>: Kick-Off Meeting. MC Meeting 1.</p> <p><u>D</u>: MC setup and Action Workplan established</p>	<p><u>M</u>: Editorial Board for Leaflet, Brochure, Newsletter. Action website setup.</p> <p><u>D</u>: Definition of WGs and WGs Workplans</p>	<p><u>M</u>: MC Meeting 2.</p> <p>WGs Meeting 1.</p> <p><u>D</u>: Scientific activities, ESR/STSM program, Dissemination</p>	<p><u>M</u>: Workshop 1. Training School 1.</p> <p>State-of-Art on AQC.</p> <p><u>D</u>: Evaluation and Activity Report. Scientific strategies</p>
2	<p><u>M</u>: MC Meeting 3. WGs Meeting 2. Update Action website.</p> <p><u>D</u>: Scientific activities. Liason with EU Programs</p>	<p><u>M</u>: Editorial Board meeting. ESR/STSM.</p> <p><u>D</u>: Dissemination. Newsletter. Reporting</p>	<p><u>M</u>: MC Meeting 4.</p> <p>WGs Meeting 3.</p> <p>Workshop 2. Training School 2.</p> <p><u>D</u>: S&T strategies</p>	<p><u>M</u>: International Conference 1. Edit. Board. ESR/STSM.</p> <p><u>D</u>: Dissemination. Reporting</p>
3	<p><u>M</u>: MC Meeting 5. WGs Meeting 4.</p> <p><u>D</u>: Dissemination. Strategies & Activities</p>	<p><u>M</u>: Edit. Board: State-of-art AQC. ESR/STSM</p> <p><u>D</u>: Dissemination. Strategies. Reporting</p>	<p><u>M</u>: MC Meeting 6.</p> <p>WGs Meeting 5.</p> <p>Workshop 3. Training School 3.</p> <p><u>D</u>: S&T strategies</p>	<p><u>M</u>: Edit. Board: Newsletter. ESR/STSM</p> <p><u>D</u>: Dissemination. Reporting</p>
4	<p><u>M</u>: . MC Meeting 7. WGs Meeting 6.</p> <p><u>D</u>: S&T strategies. Link to EU programs, Industry</p>	<p><u>M</u>: Workshop 4. Training School 4.</p> <p><u>D</u>: Dissemination. ESR/STSM. S&T strategic activity.</p>	<p><u>M</u>: WGs Meeting 7.</p> <p><u>D</u>: S&T strategies and activities. ESR/STSM. Dissemination</p>	<p><u>M</u>: International Conference 2. MC Meeting 8.</p> <p><u>D</u>: Final Evaluation. Reporting</p>

M: Milestones **D: Deliverables**

COST Action TD1105 *EuNetAir*: Dimension

PARTIES

Already accepted MoU: 28 Countries

Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Former Yugoslav Republic of Macedonia, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom.

Non-COST Countries: 5

Australia, Canada, China, Russia, USA

New Approved NNCs: Morocco, Ukraine

Number of Participants: > 150

N.r of Research Teams including Academia, Research, Industry, Agencies: > 80

 AT - Austria	Materials Center Leoben Forschung GmbH	
 BE - Belgium	VITO, Université de Liège, Odometric S.A.	
 BG - Bulgaria	National Institute of Meteorology and Hydrology - BAS; Institute of Electronics - BAS	
 CH - Switzerland	Ecole Polytechnique Fédérale de Lausanne; e2v Microsensors S.A.; EnvEve S.A.; EMPA	
 CZ - Czech Republic	Academy of Sciences of the Czech Republic	
 DE - Germany	Institute of Energy and Environmental Technology; Saarland University; MPI for Biogeochemistry Univ. of Bayreuth; Univ. of Paderborn; Univ. Applied Sci. Ostwestfalen-Lippe; UST; Alfred Becker; 3S	
 DK - Denmark	Aarhus University; Technical University of Denmark - DTU	
 EL - Greece	Aristotle University; FORTH; Athena/ISI; University of Piraeus	
 ES - Spain	Catalonia Institute for Energy Research - IREC; Spanish National Research Council - CSIC; University Rovira i Virgili; University of Barcelona, Worldsensing S.L.	
 FI - Finland	University of Oulu; University of Helsinki; Tampere University of Technology	
 FR - France	University of Bourgogne; University Blaise Pascal; Ecole des Mines de Douai; CEA-CNRS; ETHERA	
 HU - Hungary	Hungarian Meteorological Service	
 IS - Iceland	Agricultural University of Iceland	 MK - Republic of Macedonia Ministry of Environment and Physical Planning
 IE - Ireland	Trinity College Dublin; University College Cork	
 IL - Israel	AirBase Systems; TECHNION	 RS- Serbia Institute of Public Health of Belgrade; VINCA
 IT - Italy	ENEA; ELETTRA; Univ. of Bari; Univ. of Brescia; Univ. of Trieste; Lenviros; Sensichips, ARPA-Puglia	
 LV - Latvia	University of Latvia	
 NL - Netherlands	IMEC - Holst Centre; ECN	
 NO - Norway	NILU - Norwegian Institute for Air Research	
 PL - Poland	Silesian University of Technology; Warsaw University of Life Science	
 PT - Portugal	Univ of Coimbra; Instit. of Environment & Development; National Health Institute; Univ of Lisbon	
 RO - Romania	National R&D Institute for Nonferrous and Rare Metals; SC IPA SA - Research & Development	
 SE - Sweden	Linköping University; Chalmers University of Technology; SenSiC AB; SenseAir AB	
 SI - Slovenia	University of Ljubljana; Aerosol d.o.o.	
 UK - United Kingdom	Imperial College London; Newcastle University; University of Manchester; Cambridge; University of Warwick; University of Edinburgh; Cambridge CMOS Sensors; Alphasense	
 TR - Turkey	GEBZE Institute of Technology; Middle East Technical University of Ankara	

EuNetAir: List of Experts

170 EXPERTS from **28** COST Countries and **7** Non-COST Countries

AT - Austria

Dr. Anton KOCK
Dr. Stefan DEFREGGER

BE - Belgium

Prof. Anne-Claude ROMAIN
Dr. Jan THEUNIS
Dr. Julien DELVA

BG - Bulgaria

Dr. Dimiter SYRAKOV
Dr. Ivan NEDKOV

CH - Switzerland

Dr. Danick BRIAND
Dr. Marco BRINI
Dr. Christine ALEPEE
Dr. Nicolas MOSER
Dr. Christoph HUEGLIN

CZ - Czech Republic

Dr. Vera KURKOVA
Dr. Roman NERUDA
Dr. Zdenek ZELINGER

DE - Germany

Dr. Thomas A. J. KULHUSCH
Dr. Ulrich QUASS
Prof. Andreas SCHUETZE
Dr. Tilman SAUERWALD
Prof. Ralf MOOS
Dr. Daniela SCHONAUER-KAMIN
Dr. Thorsten WAGNER
Dr. Olaf KIESEWETTER
Dr. Thorsten CONRAD
Dr. Thomas BECKER
Prof. Wrenger Burkhard
Dr. Jost Valentin Lavric
Dr. Corinna HAHN

DK - Denmark

Prof. Ole HERTEL
Dr. Lise Lotte SORENSEN
Prof. Anja BOISEN
Dr. Silvan SCHMID

EL - Greece

Prof. Kostas KARATZAS
Prof. George KIRIAKIDIS
Dr. Christos KOULAMAS
Prof. George PAPAPOPOULOS
Prof. Tatiana TAMBOURATZIS

ES - Spain

Prof. Juan Ramon MORANTE
Dr. Francisco HERNANDEZ
Dr. Xavier QUEROL
Dr. Mar VIANA
Prof. Eduard LLOBET
Dr. Radu IONESCU
Prof. Albert ROMANO
Dr. Juan Daniel PRADES
Dr. Jordi LLOSA

FI - Finland

Prof. Heli JANTUNEN
Prof. Jyrki LAPPALAINEN
Dr. Jari JUUTI
Prof. Kaarle HAMERI
Prof. Jorma KESKINEN

FR - France

Prof. Marcel BOUVET
Prof. Jerome BRUNET
Prof. Alain PAULY
Dr. Jean SUISSE
Dr. Amadou NDYAE
Dr. Thu-Hoa THRAN-THI
Dr. Philippe KARPE
Prof. Jerome ROSSIGNOL
Prof. Nadine LOCOGE

HU - Hungary

Dr. Zita FERENCZI
Dr. Krisztina LABANCZ

IS - Iceland

Dr. Arngrimir THORLACIUS

IE - Ireland

Dr. Francesco PILLA
Prof. John WENGER

IT - Italy

Dr. Michele PENZA
Dr. Marco ALVISI
Dr. Saverio DE VITO
Dr. Andrea GOLDONI
Dr. Magda BRATTOLI
Dr. Annamaria DEMARINIS
Dr. Gianluigi DE GENNARO
Dr. Luigi BARBIERI
Prof. Giorgio ASSENNATO
Dr. Roberto SIMMARANO
Prof. Giorgio SBERVEGLIERI

MK - Rep. of Macedonia

Dr. Igor ATANASOV
Dr. Ljupcho GROZDANOSVKI

NL - Netherlands

Dr. Sywert BRONGERSMA
Dr. Ernie WEIJERS
Dr. Rene OTJES

PL - Poland

Dr. Monika KWOKA
Prof. Stanislaw GAWRONSKI
Prof. Jacek SZUBER

PT - Portugal

Prof. Bernadete RIBEIRO
Prof. Carlos BORREGO
Dr. Joao Paulo TEIXEIRA
Prof. Cristina MAGUAS
Dr. Miguel COUTINHO
Dr. Ana Margarida COSTA

SE - Sweden

Prof. Anita LLOYD SPETZ
Dr. Marina VOINOVA
Dr. Mike ANDERSSON
Dr. Donatella PUGLISI
Dr. Ulf THOLE
Prof. Ingrid BRYNTSE

IL - Israel

Dr. Liad ORTAR
Prof. Hossam HAICK

UK - United Kingdom

Prof. Julian GARDNER
Prof. Roderic JONES
Prof. Krishna PERSAUD
Prof. John POLAK
Dr. Robin NORTH
Dr. Jeff NEASHAM
Dr. Fabio GALATIOTO
Prof. Florin UDREA
Dr. John SAFFELL
Prof. John LEE

NO - Norway

Dr. Nuria Castell-BALAGUER
Dr. Philippe SCHNEIDER

RO - Romania

Dr. Roxana Mioara PITICESCU
Dr. Marcel IONICA
Dr. Cristina RUSTI
Dr. Radu Adrian IONICA

TR - Turkey

Prof. Zafer Ziya OZTURK
Prof. Mehmet Fatih DANISMAN

RS - Serbia

Anka CVETKOVIC
Milena JOVASEVIC-STOJANOVIC

SI - Slovenia

Rahela ZABKAR
Grisa MOCNIK
Branko STER

LV - Latvia

Prof. Iveta STEINBERGA

COST Action TD1105 *EuNetAir*: 28 COST Countries (Parties) have already signed Memorandum of Understanding (MoU)

PARTIES

already accepted
MoU: 28 Countries

Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, The Former Yugoslav Republic of Macedonia, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom.

COST Action *EuNetAir* PARTICIPANTS

The following list includes logos of participating institutions and organizations:

- vito
- UNIVERSITÄT DE LIÈGE
- Arion campus
- ODOMETRIC
- ICICJR
- CAMBRIDGE CMOS SENSORS
- TRINITY COLLEGE DUBLIN
- MPI-BCC
- UNIVERSITY OF LIEDER
- UNIVERSITY OF LIEDER
- ENEA
- EPFL
- e2v
- ENVEVE
- EMPA
- UNIVERSITÄT DES SAARLANDES
- FM FUNCTIONAL MATERIALS
- ethera
- UNIVERSITÄT PADERBORN
- UST
- UMWELT SENSOR TECHNIK
- BECKER GRUPPE
- 3S Gas sensing solutions
- AARHUS UNIVERSITET
- DTU
- Aristotle University Thessaloniki
- FORTH
- i.s.i. Industrial Systems Institute
- IREC
- MINISTERIO DE CIENCIA E INNOVACION
- CSIC
- UNIVERSITAT DE BARCELONA
- UNIVERSITAT ROVIRA I VIRGI
- world sensing
- UNIVERSITY OF OULU
- UB
- UNIVERSITE BLAISE PASCAL
- HMS
- imec
- ENEA
- elettra
- UNIVERSITA DRII STUDI DI TRIESTE
- Dipartimento di Scienze Chimiche e Farmaceutiche
- UNIVERSITAS ST. AUGUSTINUS
- lenviros
- sensichips
- CHALMERS
- SenseAir
- SENSIC
- Clean air sensors
- Aerosol
- Linköpings universitet
- Imperial College London
- Newcastle University
- UNIVERSITY OF CAMBRIDGE
- WARWICK
- MANCHESTER 1824

EuNetAir: List of Experts from NNC and IPC



170 EXPERTS from **28** COST Countries and **7** Non-COST Countries



AU - Australia

Dr. Phil MARTIN



CA - Canada

Prof. John YEOW



CN - China

Dr. Yongxiang LI

Dr. Zhifu LIU



RU - Russian Federation

Dr. Alexey VASILIEV



US - United States

Prof. Andrei KOLMAKOV

Dr. Meyya MEYYAPPAN



MA - Morocco

Dr. Radouane LEGHRIB

Dr. Houda LAHLOU



UA - Ukraine

Dr. Olena TUROS

Dr. Arina PETROSIAN

Dr. Oksana ANANYEVA

Dr. Liudmyla MYKHINA

Dr. Liliia PETRUK

Dr. Tetiana MAREMUKHA

Country

MC Members (52): Male (73%) - Female (27%)

Austria	Dr. Anton KOCK
Belgium	Dr Jan THEUNIS; Dr Anne-Claude ROMAIN
Bulgaria	Dr Dimiter SYRAKOV; Dr Ivan NEDKOV
Czech Republic	Dr. Vera KURKOVA; Dr. Zdenek ZELINGER
Denmark	Prof. Ole HERTEL
Finland	Prof. Kaarle HAMERI; Prof. Jyrki LAPPALAINEN
France	Prof. Marcel BOUVET; Prof. Jerome BRUNET
Germany	Prof. Andreas SCHUETZE; Dr Corinna HAHN
Greece	Prof. George PAPADOPOULOS; Prof. Kostas KARATZAS
Hungary	Ms Krisztina LABANCZ; Dr Zita FERENCZI
Iceland	Dr Arngrimir THORLACIUS
Ireland	Dr. Francesco PILLA; Prof. John WENGER
Israel	Dr. Liad ORTAR; Prof. Hossam HAICK
Italy	Dr Michele PENZA; Prof. G. SBERVEGLIERI; Dr. G. DE GENNARO
Latvia	Dr Iveta STEINBERGA
Macedonia Rep.	Dr. Igor ATASANOV; Dr. Ljupcho GROZDANOVSKI
Netherlands	Dr Sywert BRONGERSMA; Dr. Ernie WEIJERS
Norway	Dr Nuria CASTELL BALAGUER; Dr. Philipp SCHENEIDER
Poland	Dr Monika KWOKA; Prof. Janislaw GAWRONSKI
Portugal	Prof. Bernadete RIBEIRO; Prof. Carlos BORREGO
Romania	Dr Marcel IONICA; Dr Roxana Mioara PITICESCU
Serbia	Dr. Anka CVETKOVIC
Slovenia	Dr Grisa MOCNIK; Dr Rahela ZABKAR
Spain	Prof. Juan Ramon MORANTE; Prof. Eduard LLOBET VALERO
Sweden	Prof. Anita LLOYD SPETZ; Prof. Ingrid BRYNTSE
Switzerland	Dr Danick BRIAND; Dr. Nicolas MOSER
United Kingdom	Dr John SAFFELL; Prof. Roderic JONES
Turkey	Prof. Zafer ZIYA OZTURK; Prof. Mehmet Fatih DANISMAN

MC Chair: Michele Penza, ENEA, IT

MC Vice Chair: Anita Lloyd Spetz, Linkoping University, SE

Grant Holder: Eurice GmbH, Saarbrucken, DE

Country

MC Substitutes (28)

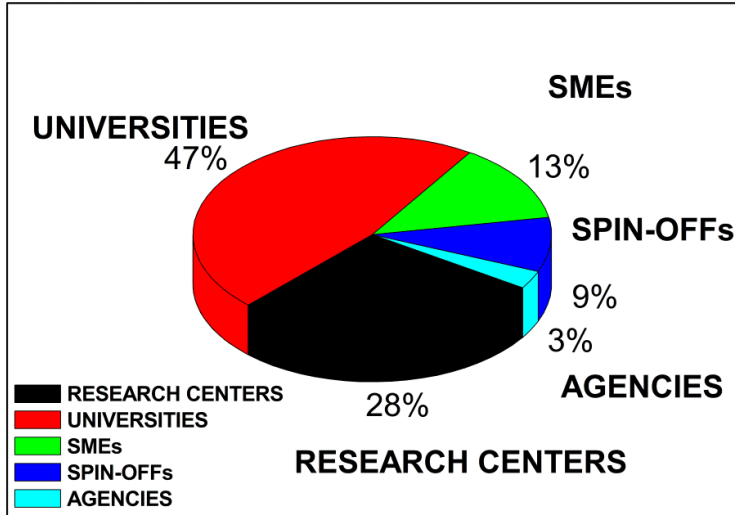
Austria	Dr Stefan DEFREGGER
Belgium	Dr Julien DELVA
Czech Republic	Dr. Roman NERUDA
Denmark	Dr. Lise Lotte SORENSEN
Finland	Prof. Jorma KESKINEN
France	Dr Jean SUISSE Prof. Alain PAULY
Germany	Dr. Daniela SCHONAUER-KAMIN Dr. Thomas KUHNBUSCH Dr. Juliane ROSSBACH
Greece	Prof. George KIRIKIADIS Dr. Roberto SIMMARANO
Italy	Dr. Marco ALVISI Dr. Saverio DE VITO
Netherlands	Dr. Rene OTJES
Poland	Prof. Jacek SZUBER
Portugal	Dr. Joao Paulo TEIXEIRA
Romania	Dr. Cristina RUSTI Dr. Marcel Adrian IONICA
Slovenia	Prof. Andrej DOBNIKAR
Spain	Prof. Albert ROMANO-RODRIGUEZ Dr. Jordi LLOSA
Sweden	Dr Ulf THOLE Dr. Marina VOINOVA
Switzerland	Dr Christoph HUEGLIN Prof. Julian GARDNER
UK	Dr Robin NORTH Prof. Florin UDREA

MANAGEMENT COMMITTEE

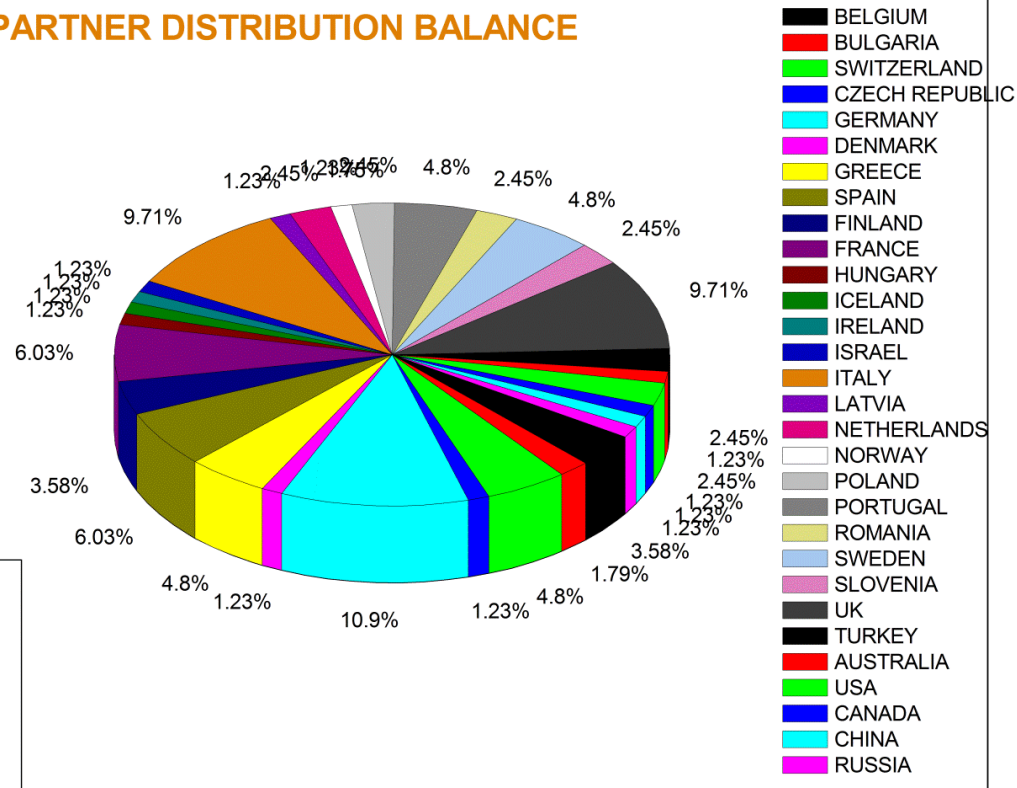
Kick-off Meeting at Brussels on 16 May 2012

COST Action TD1105 *EuNetAir*: STATISTICS

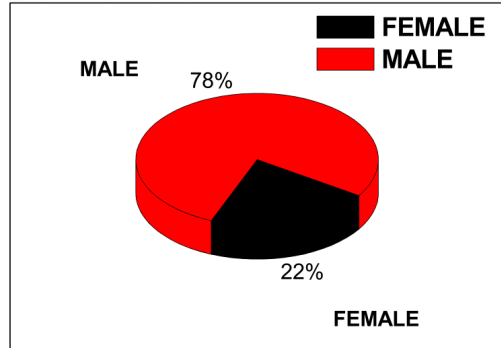
PARTNERSHIP



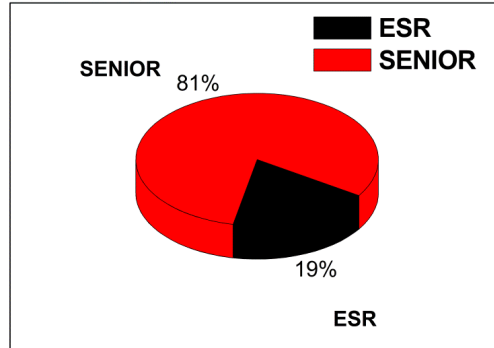
COUNTRY PARTNER DISTRIBUTION BALANCE



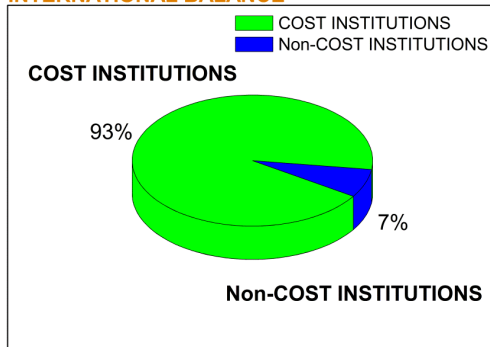
GENDER BALANCE



ESR BALANCE



INTERNATIONAL BALANCE



PARTIES: 28
Action Coordinating Partner: IT (ENEA)
Grant Holder: DE (Eurice GmbH)



COST ACTION TD1105 DISSEMINATION EVENTS: 2012 - 2013



IMCS 2012

The 14th International Meeting on Chemical Sensors
May 20 - 23, 2012, Nürnberg/Nuremberg



Special Session: Chemical Sensors and New Technologies for Air-Pollution Control

COST Action TD1105 EuNetAir

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

IMCS 2012 - The 14th International Meeting on Chemical Sensors, May 20-23, 2012 - Nuremberg, Germany



VIII International Workshop on
Semiconductor Gas Sensors

11-15 September 2012, City Hotel Cracow, Poland

SGS 2012

VIII International Workshop on
Semiconductor Gas Sensors

September 11 - 15, 2012, Cracow, Poland



3th Intelligent Systems for Quality of Life information
Services Workshop (ISQL 2012)

8th AIAI Conference, September 27- 30, 2012,
Halkidiki, Greece



TCM 2012

The 4th International Symposium on Transparent
Conductive Materials
October 21- 26, 2012, Hersonissos, Crete, Greece



EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

COST ACTION TD1105 MEETINGS (1/2)

1 July 2012 - 30 June 2013 (Year 1)



COST ACTION TD1105 *EuNetAir*
Kick-off Meeting of Action Management Committee
COST Office, 16 May 2012, Brussels (BE)



COST ACTION TD1105 *EuNetAir*
First Meeting and 2nd Management Committee and Working Groups
ENEA Headquarters
4-6 December 2012, Rome (IT)



COST ACTION TD1105 *EuNetAir*
WG3-WG4 Meeting joined to AirMonTech project
Fraunhofer Inhaus Zentrum
4-6 March 2013, Duisburg (DE)



COST ACTION TD1105 MEETINGS (2/2)

1 July 2012 - 30 June 2013 (Year 1)



COST ACTION TD1105 *EuNetAir*

***Third Meeting* of Action Management Committee**

IREC, 21 June 2013, Barcelona (ES)



COST ACTION TD1105 *EuNetAir*

Action Workshop* - Open Satellite Event to *Transducers 2013 - Eurosensors XXVII

**Barcelona International Convention Centre
20 June 2013, Barcelona (ES)**



COST ACTION TD1105 *EuNetAir*

**1st Training School of COST Action EuNetAir
University of Barcelona
*13-15 June 2013, Barcelona (ES)***



1ST TRAINING SCHOOL OF COST ACTION TD1105

Green Week 2013
satellite event



Training school on Environmental Technologies and Air-Quality Monitoring

13-15 June 2013

Barcelona

08:30 - 18:30

Spain



ec.europa.eu/environment/greenweek

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



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

Training school on Environmental
Technologies and Air-Quality Monitoring

Green Week 2013
satellite event



ORGANIZED BY

Universitat de Barcelona (UB)

MIND-IN2UB Department of Electronics

In collaboration with

Institute of Environmental Assessment and Water Research (IDAEA-CSIC)

Within the framework of

COST Action TD1105 European Network on New Sensing Technologies for Air-Pollution Control and Environmental Sustainability (EuNetAir)

VENUE

Universitat de Barcelona (UB)

Faculty of Physics

C/ Martí i Franquès, 1, 08028 Barcelona, Spain



MORE INFORMATION

• Michele Penza, MC Chair/Proposer of COST Action TD1105 EuNetAir
ENEA, Brindisi, Italy. michele.penza@enea.it

• Albert Romano-Rodríguez, Coordinator of Action Training School Committee
U. Barcelona, Barcelona, Spain. aromano@el.ub.es

Statistics

Received Trainees Applications: 39. Participating Trainees: 36. Assigned Trainees Grants: 20

Involved Trainers: 14

COST Countries involved from Action partnership: 15

Training School Programme Committee

Albert Romano-Rodríguez, U. Barcelona, Spain

Juan Daniel Prades, U. Barcelona, Spain

Mar Viana, CSIC-IDAEA, Spain

María Cruz Minguiñón, CSIC-IDAEA, Spain

Eduard Llobet, U. Rovira i Virgili, Spain

Annamaria Demarinis Loiotile, U. Bari, Italy

Michele Penza, ENEA, Italy

Training School Action Committee

Albert Romano-Rodríguez, U. Barcelona, Spain

Juan Daniel Prades, U. Barcelona, Spain

Mar Viana, CSIC-IDAEA, Spain

María Cruz Minguiñón, CSIC-IDAEA, Spain

George Kiriakidis, FORTH, Greece

Philippe Schneider, NILU, Norway

Monika Kwoka, Silesian U. Technology, Poland

Rahela Zabkar, U. Ljubljana, Slovenia

Francoiso Hernandez-Ramirez, IREC, Spain

Zafer Ziya Ozturk, Gebze Institute of Technology, Turkey

Julian Gardner, U. Warwick, United Kingdom



CSIC

In collaboration with the



EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY



Short Term Scientific Missions (STSMs): A tool for networking

“COST Strategy towards increased support for Early Stage Researchers” - COST 295/09 giving ESRs support and measures like STSMs, Training Schools, Action Think Thank, Conference Grants, inclusion of ESR in WGs, ESRs as national MC delegates.

In order to increase visibility of ESRs in this COST Action:

- ***11 STSMs have been funded in the First Year (1 July 2012 - 30 June 2013)***
- Workshop participation of ESRs
- Selection of ***best independent ideas*** from ESRs are awarded with ***grants for participation in S&T events***
- ***Invitation*** of high schools and University students to the ***training sessions and training schools***
- ***Social Scientific Network services (LinkedIn)*** based on free web software to promote cohesion in the ESRs community to outline needs
- Proposals to ***European Research Council - Starting Independent Research Grant*** and ***Marie-Curie Fellowships*** from Action ESRs are encouraged.

INTERNATIONAL WG1-WG4 MEETING on
New Sensing Technologies and Methods for Air-Pollution Monitoring
European Environment Agency - EEA
Copenhagen, Denmark, 3 - 4 October 2013



**Meeting Proceedings
at Action webpages:**

www.cost.eunetair.it

SECOND INTERNATIONAL WORKSHOP *EuNetAir*:

New Sensing Technologies for Air-Pollution Control and Environmental Sustainability

- **Special Issue Urban Climate** (*Elsevier*)

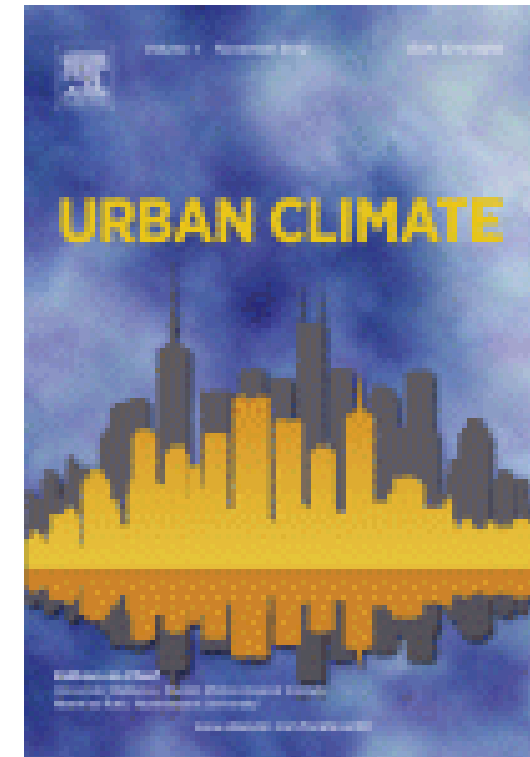
New Sensing Technologies and Methods for Air-Pollution Monitoring

Proceedings of the Action EEA Meeting open to external contributors.

Peer-review process (<http://ees.elsevier.com/uclim/>)

- *Guest Editors*:

- ✓ Michele Penza, ENEA, Italy
- ✓ Anita Lloyd Spetz, Linkoping University, Sweden
- ✓ Ole Hertel, Aarhus University, Denmark
- ✓ Ulrich Quass, IUTA eV, Germany
- Deadline for submission: 28 February 2014 (**Close**)
- Number of Submissions: **20 Manuscripts**
- Expected Publication: *Fall 2014 (Nov-Dec 2014)*





The poster features a green background with a stylized leaf and a grid of numbers from 0.2 to 0.9. At the top left, it reads 'SPRING MEETING 2014' in large white letters, with 'Lille Congress Center France' and 'May 26th-30th' below it. The website 'www.european-mrs.com' is at the top right, next to the 'E-MRS' logo. The central text says 'CALL FOR PAPERS'. Below this, it lists 'Conference chairs' including Ian BOYD, Gilles DENNLER, Roberto FARIA, Roberto FORNARI, and Elvira FORTUNATO. It also mentions a 'Bilateral Energy conference' with Hans RICHTER and William TUMAS. The bottom section is divided into 'SCIENTIFIC PROGRAMME' with categories like 'MATERIALS FOR ENERGY AND ENVIRONMENT', 'NANOMATERIALS', 'MATERIALS AND LIGHT', 'HYBRID, ORGANIC AND BIO-MATERIALS', 'CRYSTAL GROWTH IN MATERIALS SCIENCE', and 'BILATERAL ENERGY CONFERENCE'. A 'WORKSHOP: grand challenges in materials' is also listed. At the very bottom, a green banner states 'Deadline for abstract submission: 16 Jan 2014'.

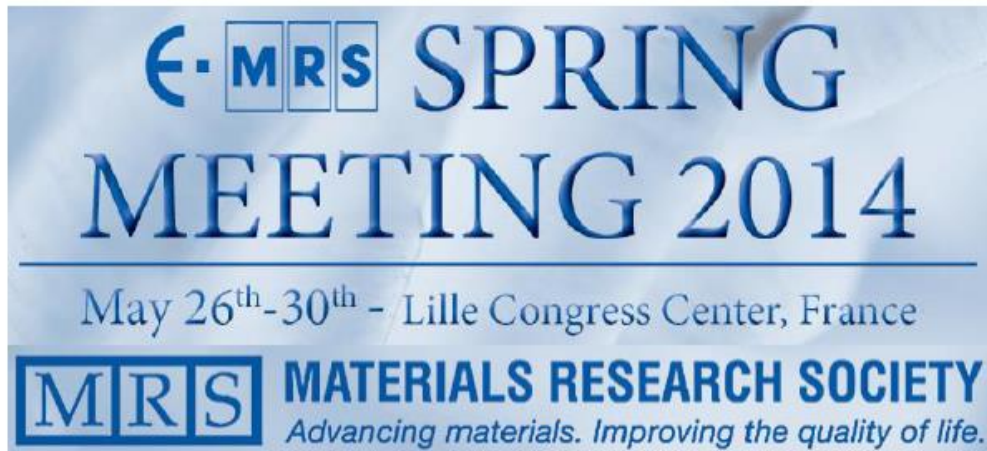


SPRING MEETING
May 26-30, 2014
Lille

Deadline for
abstract submission:

January 16, 2014

- Special Issue in *Journal of Sensors and Sensor Systems (JSSS)*
- Deadline for JSSS submission of accepted Abstracts: 15 June 2014
- URL: (http://www.journal-of-sensors-and-sensor-systems.net/submission/manuscript_submission.html)



E-MRS SPRING MEETING 2014
 May 26th-30th - Lille Congress Center, France
MRS MATERIALS RESEARCH SOCIETY
Advancing materials. Improving the quality of life.



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



Call for Abstracts and Papers

Symposium B: Advanced Functional Materials for Environmental Monitoring and Applications

E-MRS - Spring Meeting 2014, May 26 - 30, Lille Congress Center, France

Symposium Organizers and Guest Editors

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 Technologies for Materials
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**EMRS-2014 Symposium B Proceedings
 In Special Issue JSSS
 Journal of Sensors and Sensor Systems**

**Number of EMRS Submissions:
 202 Abstracts**

Letter of Commitment

to host 4th MC Meeting
and *WG1-WG4 Meeting*
from Prof. Rod Jones, Cambridge
Action SIG2 Leader and UK MC Member

18-20 December, 2013, Cambridge, UK

Research & Innovation Needs
discussed and defined
by Action TD1105

Location and date:

4rd MC Meeting, 20 December 2013, and
WG1-WG4 Meeting, 18-19 December 2013
Queens' College, Cambridge, UK



Expected Impact by Action TD1105

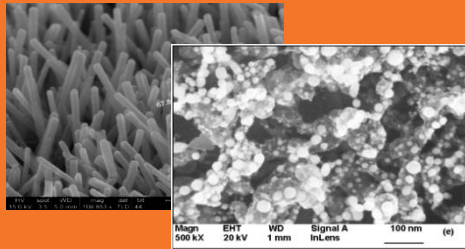
European Network on New Sensing Technologies for Air-Pollution Control and Environmental Sustainability - EuNetAir



- **European Leadership on AQC Science & Technology**
- **Development of Green-Economy**
- **Support to Sustainable Development**
- **Support to Monitoring System of Clean Air for Europe**
- **Fostering Research & Innovation on New Sensing Technologies for Environmental Monitoring**

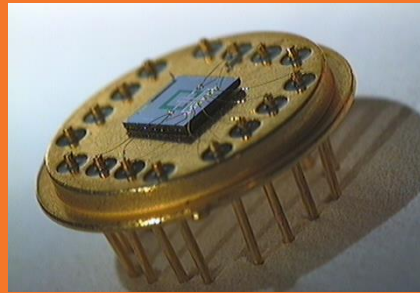
COST Action EuNetAir: CHALLENGES

MATERIALS & GAS SENSORS



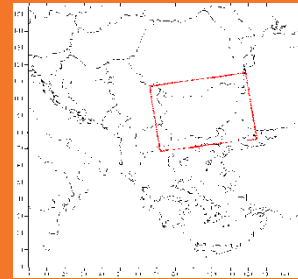
MOX by UNIBS IREC UB SICCAS
CNT by ENEA NASA URV CSIRO

AQC SENSORS & SYSTEMS



GasFET by EPFL, Switzerland

AQ MODELLING

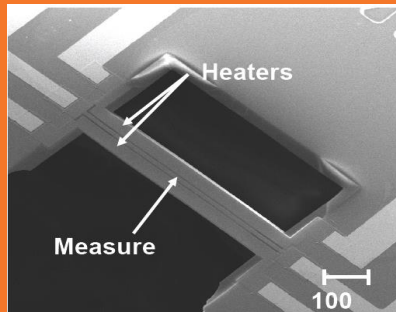


CMAQ Calculations
by NIMH, BG

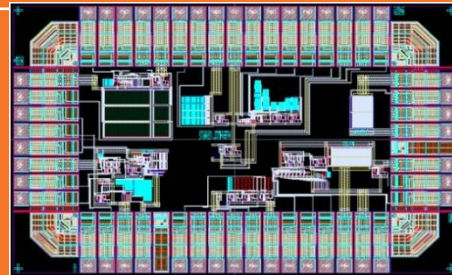
STANDARDS & PROTOCOLS



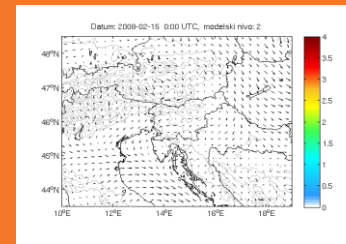
Dynamic Olfactometry (EN 13725/2003) by Univ. of Bari and Lenviros srl, IT



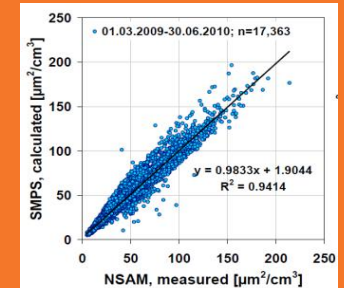
Cantilever Sensor by DTU, DK



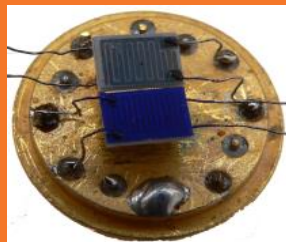
ASIC Circuit: CMOS SOI
by WARWICK & CCMOS Ltd, UK



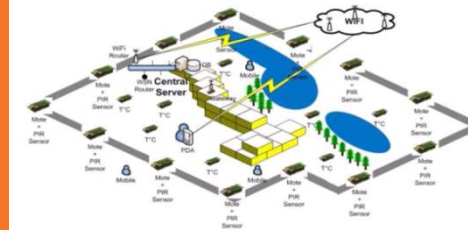
AQ Modelling dispersion in meteorological mesoscale by University of Ljubljana, SL



Particle Surface Area Measurements by IUTA eV, DE



Phtalocyanine Gas Sensors
by CNRS UBP-LASMEA, FR



WIRELESS SENSORS NETWORK
by ISI, Greece



Chemical Weather Forecasting and Information System
by Hungarian Meteo Service



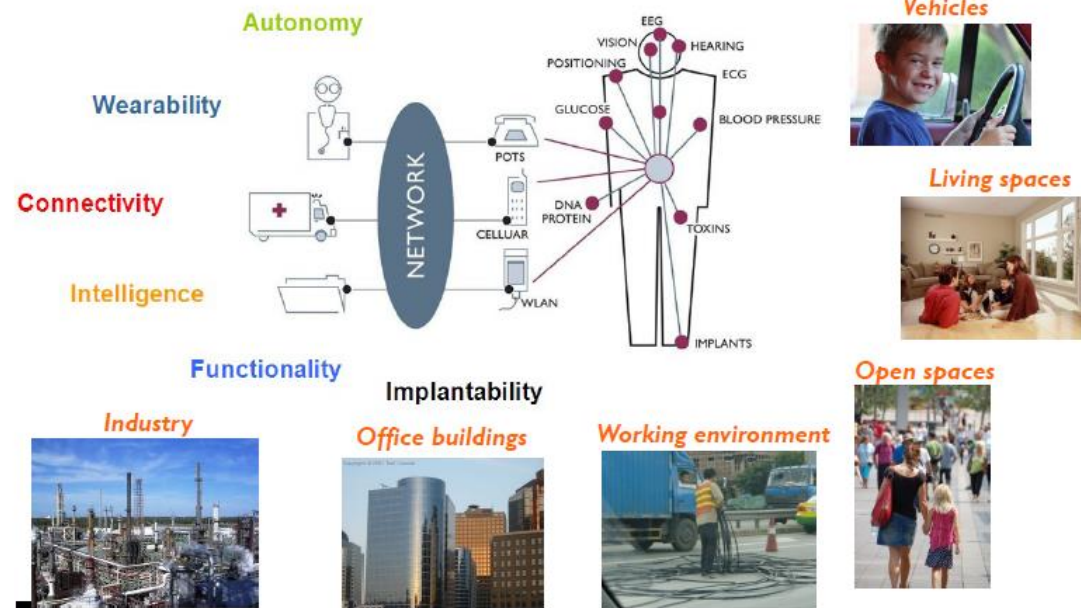
HARMONISATION:
Definition of protocols and standards for gas sensing measurements and gas sensors

CONCLUSIONS

COST Action TD1105 *EuNetAir* is proposed to solve problems in the area of:

- Air Quality Control
- Environmental Sustainability
- Indoor/Outdoor Energy Efficiency
- Climate Change Monitoring
- Health Effects of Air-Pollution

From *Body Area Network* to *Personal Area Network*



UPDATING AND BREAKING NEWS from Action TD1105

COST Action TD1105 - EuNetAir

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

Action website:

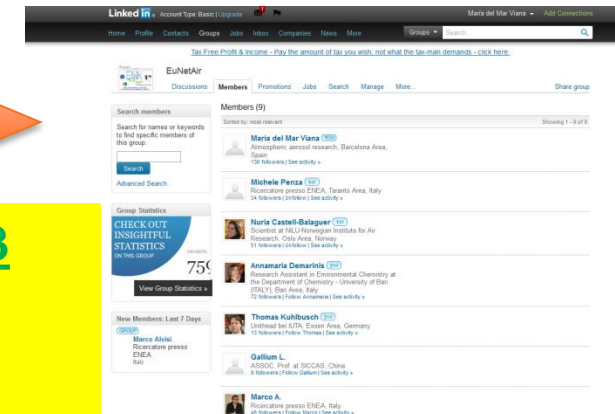
www.cost.eunetair.it

hosted by ENEA

Dr. Marco Alvisi, *Webmaster Coordinator*

Sebastiano Dipinto, Valerio Pfister, Gianfranco Zingarelli, *Webmaster Team*

Social Scientific ESRs Network (SSEN) by LinkedIn
Moderator(s): Mar Viana, Mariacruz Minguillon



2° CALL for Short Exchange Visits launched on Sept. 2013
(STSM - Short Term Scientific Mission)

Dr. Jan Theunis, STSM Coordinator EuNetAir

Issue 1: published on Dec. 2012 ✓

Issue 2: published on June 2013 ✓

Issue 3: published on December 2013 ✓

Issue 4: planned on May-June 2014 ✎



EuNetAir Newsletter

COST Action TD1105 Iss. 1/Dec 2012

Opening Editorial

Prof. Ralf Moos, *Editor-in-Chief*

Dr. Daniela Schonauer-Kamin, *Editorial Board Manager*



Video/Interview at Action Webpages:

www.cost.eunetair.it

Section VIDEO

- **Tim Watkins**

Deputy Director US EPA Air, Climate and Energy Programme

- **Andrea C. Ferrari**

Chairman of Executive Board of Graphene Flagship

- **Cristina Guerreiro**

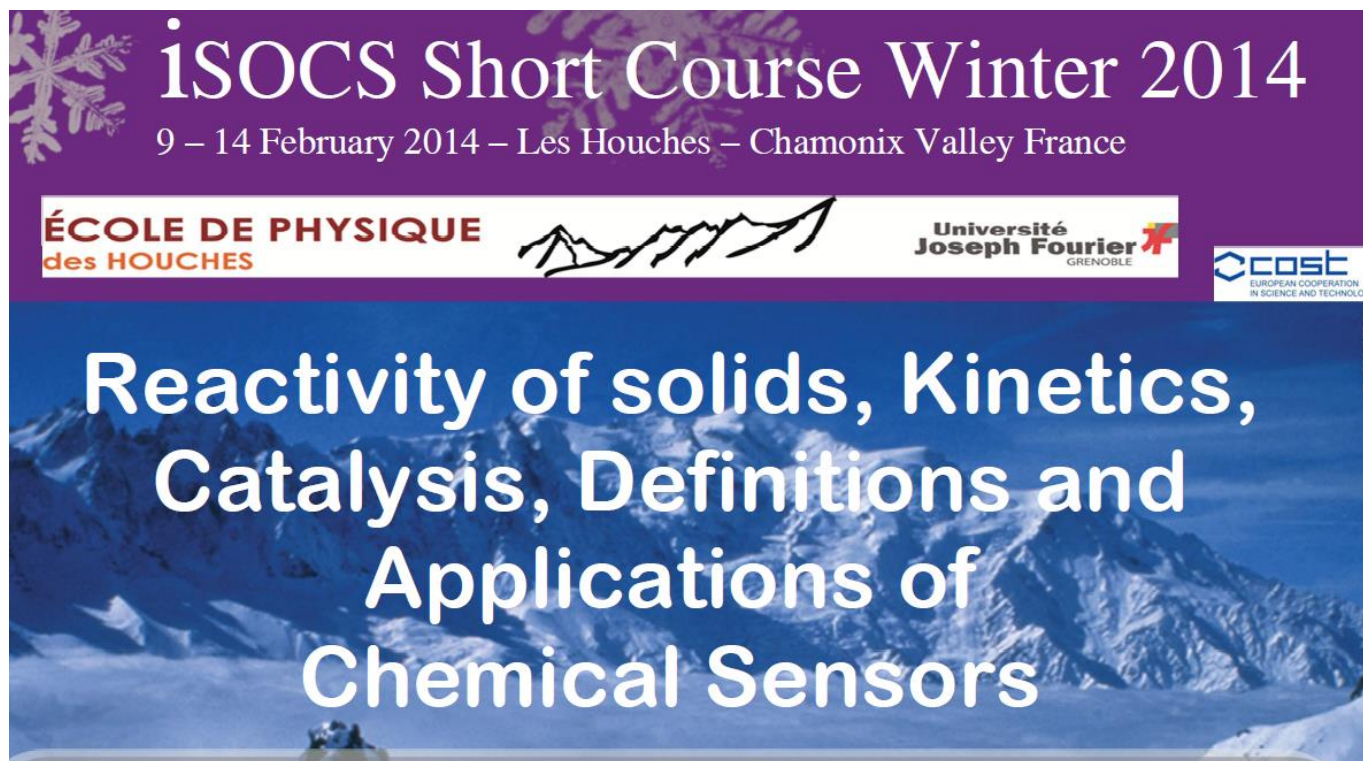
Coordinator of EEA AQ Report 2012 and 2013

- **Meyya Meyyappan**

Chief Scientist at NASA Ames Research Center

Les Houches (France), 9 - 14 February 2014

**Call for Participation of the Trainees:
5 Grants for Trainees have been assigned to 5 ESRs
from 5 COST Countries (Close)**



The poster features a purple header with a white snowflake icon on the left. The main title 'iSOCS Short Course Winter 2014' is in white serif font, with the dates '9 - 14 February 2014 - Les Houches - Chamonix Valley France' below it. A white horizontal bar contains logos for 'ÉCOLE DE PHYSIQUE des HOUCHES', a mountain range sketch, 'Université Joseph Fourier GRENOBLE', and the 'cost' logo. The bottom half of the poster shows a blue-tinted photograph of a snowy mountain range with the text 'Reactivity of solids, Kinetics, Catalysis, Definitions and Applications of Chemical Sensors' overlaid in white sans-serif font. A small vertical credit '© JESS STOCK' is on the right edge.

iSOCS Short Course Winter 2014
9 - 14 February 2014 - Les Houches - Chamonix Valley France

ÉCOLE DE PHYSIQUE
des HOUCHES

Université
Joseph Fourier
GRENOBLE

cost
EUROPEAN COOPERATION
IN SCIENCE AND TECHNOLOGY

© JESS STOCK

Reactivity of solids, Kinetics,
Catalysis, Definitions and
Applications of
Chemical Sensors

COST Action TD1105 EuNetAir:

2nd Training School at Saarland University, Saarbrücken, Germany, 31 March - 2 April 2014

Open Call for Participation of the Trainees

Deadline for Application of Grants: 14 February 2014 (**Close**)

More info at [Action webpages](#) - Section *Training Schools*



COST Action TD1105 EuNetAir:

1st EuNetAir Air Quality Joint-Exercise Intercomparison

Aveiro, Portugal, 14 - 28 April 2014

organized by

IDAD - Institute of Environment & Development, Campus Unversitario, Aveiro, Portugal

Contact Persons: Prof. Carlos Borrego, IDAD, (cborrego@ua.pt)

Dr. Anna Margarida Costa, IDAD, (amcosta@ua.pt)

Dr. Michele Penza, ENEA, (michele.penza@enea.it)

Open Call for Participation of the Interested Teams

Deadline for Applications: 31 March 2014

NO FUNDING IS AVAILABLE from COST Action TD1105 (!!!)

More info at Action webpages - Section *Meetings*



ACKNOWLEDGEMENTS

*KICK-OFF MEETING of Action TD1105
COST Office, Brussels, 16 May 2012*

TD1105 MANAGEMENT COMMITTEE



www.cost.eunetair.it

Link of COST Action TD1105 EuNetAir:

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Rapporteur CMST: Prof. Antonio Lagana (IT)
lagana05@gmail.com

COST Action TD1105 EuNetAir Workshop at Palazzo Nervegna-Granafei (Municipality of Brindisi) in Brindisi, Italy

Brindisi (Italy), 25 - 26 March 2014



THANK YOU VERY MUCH FOR YOUR KIND ATTENTION!
and SERVE EuNetAir by YOUR TALENT!



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



Municipality of Brindisi