cost
EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

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

AIRMONTECH Workshop
Air Pollution Monitoring Technologies for Urban Areas
Barcelona, 25-26 April 2012

Call Full Proposal reference oc-2011-1-9706 for a COST new Action TD1105

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

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COST ACTION TD1105
EuNetAir

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

OUTLINE

- *What is Program COST ?*
- *Objectives of a COST Action*
- *COST Action TD1105 EuNetAir:*

Objectives, Aims, Structure and Coordination

- *Dissemination of COST Action EuNetAir*

WHAT IS COST ?

COST is an intergovernmental framework for European Cooperation in Science and Technology, allowing the coordination of nationally-funded research on a European level.

COST has a very specific *mission and goal*.
It contributes to reducing the fragmentation in European research investments and opening the European Research Area to cooperation worldwide.

MISSION OF A COST ACTION

As a precursor of advanced multidisciplinary research, COST plays a very important role in building a European Research Area (ERA). It anticipates and complements the activities of the EU Framework Programmes, constituting a "bridge" towards the scientific communities of emerging countries. It also increases the mobility of researchers across Europe and fosters the establishment of scientific excellence in the nine key domains:

- Biomedicine and Molecular Biosciences
- Food and Agriculture
- Forests, their Products and Services
- Materials, Physics and Nanosciences
- Chemistry and Molecular Sciences and Technologies
- Earth System Science and Environmental Management
- Information and Communication Technologies
- Transport and Urban Development
- Individuals, Societies, Cultures and Health

In addition, Trans-Domain Proposals allow for broad, multidisciplinary proposals to strike across the nine scientific domains.

Eligible Costs and Reimbursement Rules

Costs are incurred along these following categories:

- **Travel and subsistence allowances for meeting participants.**
- **Organisation of meetings (Local Organiser Support).**
- **Short-Term Scientific Missions (STSMs).**
- **Training schools.**
- **Dissemination, e.g. Scientific Publication, Action website, Action promotion for meetings and training schools, Communication, Outreach activities.**
- **Other Expenses Related to Scientific Activities (such expenses need an approval from the COST Office).**
- **Financial and scientific administration and coordination of the Action (*Fee up to 15% of the actual science expediture*).**

NO FUNDING FOR RESEARCH !!

STEPS OF SELECTION FOR COST ACTION 2011

- OPEN COST CALL: ***5 FEBRUARY 2011***
- COLLECTION DATE FOR FIRST STAGE PROPOSAL: ***25 March 2011***

  ABOUT 2000 PROPOSALS IN THE 10 COST DOMAINS
- INVITATION FOR FULL PROPOSAL: ***15 MAY 2011***

  80 PROPOSALS INVITED TO SUBMIT FULL PROPOSAL
- DEADLINE FOR FULL PROPOSAL: ***29 JULY 2011***

  FULL PROPOSAL EUNETAIR SUBMITTED !
- HEARINGS AT TRANS-DOMAIN COMMITTEE: ***30 SEPTEMBER 2011***

  5 TD PROPOSALS INVITED TO HEARINGS at BRUSSELS:

  3 TD PROPOSALS SHORTLISTED TO BE APPROVED

  by Committee of Senior Officials (CSO) Meeting 1 DECEMBER 2011
- **KICK-OFF MEETING OF APPROVED ACTION *EuNetAir*:**

  16 MAY 2012

COST ACTION *EuNetAir*: *WHY* ?

PROPOSED SOLUTION

Networking of Coordinated Action on Integrated and Multidisciplinary Scale of Science and Technologies:
NANOMATERIALS, GAS SENSORS, WIRELESS TECHNOLOGY, AIR-QUALITY MODELLING, STANDARDS & PROTOCOLS

TARGETED OPEN PROBLEMS

- AIR QUALITY CONTROL
- INDOOR/OUTDOOR ENERGY EFFICIENCY
- ENVIRONMENTAL SUSTAINABILITY
- CLIMATIC CHANGES MONITORING
- HEALTH EFFECTS OF AIR-POLLUTION

EuNetAir

BENEFIT & IMPACT

European Leadership on AQC Science & AQC Technologies
Development of Green-Economy
Support to Sustainable Development
Monitoring System for Clean Air for Europe

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

ACTION *EuNetAir* KEY ISSUES

- Research and Development on **New Sensing Technologies for low-cost Air-Pollution Control** through field studies and laboratory experiments.
- Innovation and Transfer of the results in **preventive real-time control practises** and **global sustainability for monitoring climate changes** and **outdoor/indoor energy efficiency**.
- Networking of international experts and Coordination of AQC Research for **development of new environmental technologies** and **industrial applications**.

COST ACTION *EuNetAir*: AIM

Increase scientific and technological knowledge at integrated and multidisciplinary scale

to develop

- **Nanomaterials for AQC sensors**
- **Improved gas sensor systems & sensing microdevices**
- **Wireless Sensor Networks & Distributed Intelligence**
- **Air-Quality Modelling & Chemical Weather Forecasting**
- **New Protocols, Standards & Methods for AQC sensors**
- **Harmonisation of environmental measurements**
- **Guidelines for AQC systems & transducers**
- **Environmental Sustainability & Energy Efficiency**

in order to

implementation in real-world applications

support **green-economy of European Countries**

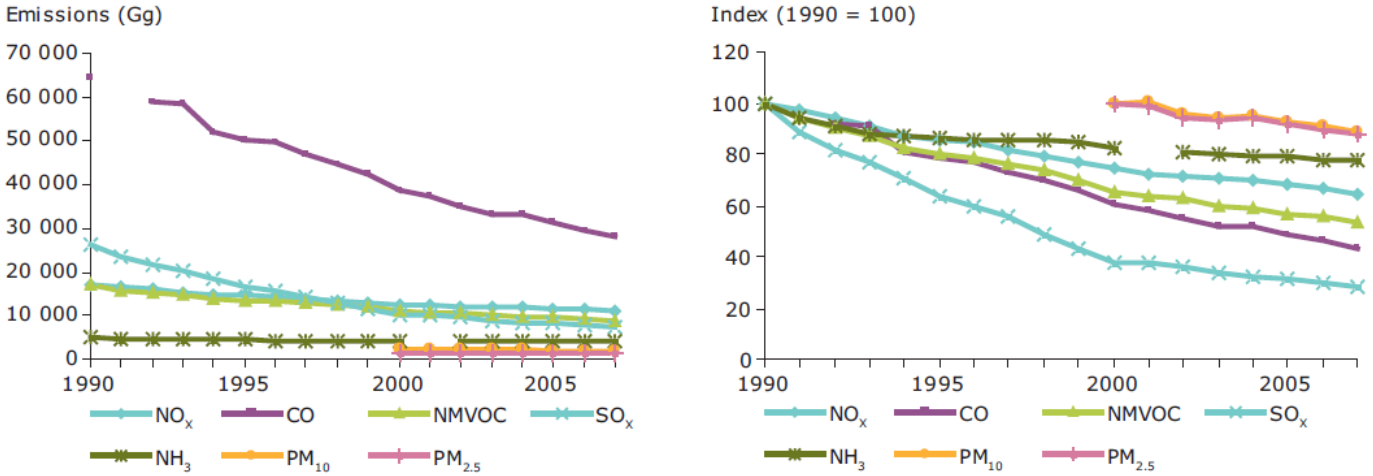
and *competitiveness of European SMEs*

COST ACTION *EuNetAir*: OBJECTIVES

- ***Establishment*** of a ***Pan-European and multidisciplinary research*** and technological platform including research institutions, universities, agencies, industries, stakeholders and policy-makers.
- ***Achievement*** of a ***common understanding and knowledge*** at the European level of requirements on AQC and global sustainability.
- **Definition** of ***protocols and pre-standardised methods for AQC sensors*** and ***harmonisation of environmental measurements***.
- **Training** and involvement of ***Early Stage Researchers*** in the Coordinated Action at multidisciplinary style and international level.
- **Creation** of long standing ***collaborative research teams*** in the area of nanomaterials, AQC sensors and systems, AQ modelling, environmental measurements, standards and protocols for AQC, commercialisation of AQC sensors and environmental technologies.
- **Razionalization** of ***European research on AQC*** with emphasis on environmental sustainability and energy efficiency, ***including top-level worldwide collaborations***.
- **Promotion** of ***women's participation*** in S&T for ***gender balance***.
- **Dissemination** activities on AQC for ***sustainable development***.

EuNetAir BACKGROUND: AIR QUALITY CONTROL

Figure ES1 EU-27 emission trends in absolute (Gg) and relative terms for NO_x, CO, NMVOCs, SO_x and NH_3 between 1990 and 2007 (index year 1990 = 100), and for PM_{10} and $PM_{2.5}$ between 2000–2007 (index year 2000 = 100)

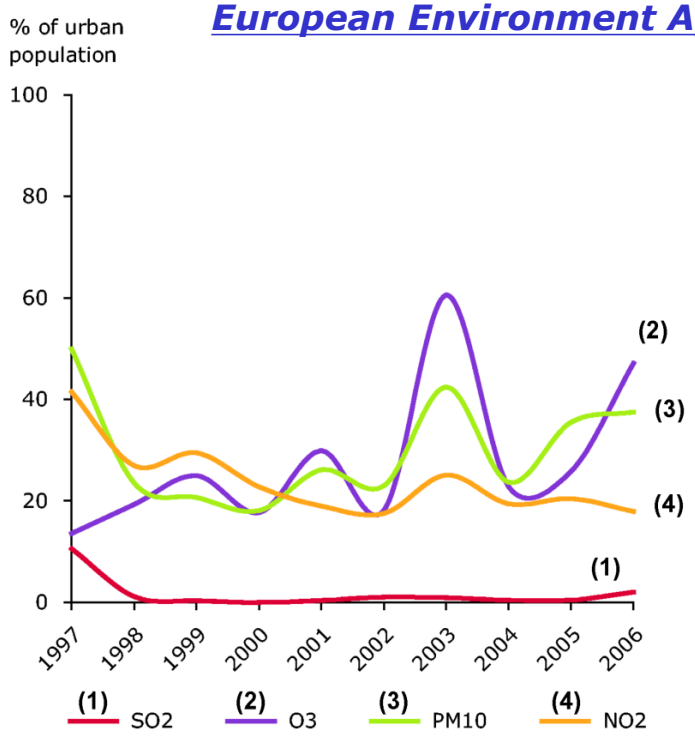


European Environment Agency, EEA Report 8/2009

Some Environmental Emergencies:

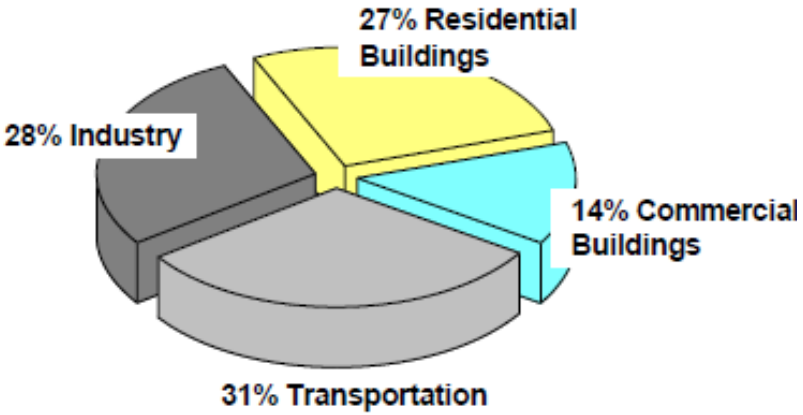
1930 - Meuse Valley (Belgium)
1952 - Great London Smog (UK)
1954 - Los Angeles (USA)
1984 - Bhopal (India)
2005 - Teheran (Iran)
2006 - Hong Kong (China)
2008 - Shanghai, Peking (China)
2009 - Taranto (Italy)
.....

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



Pollutant	Limit Level
NO_x	100, 200 ppb
CO	8 ppm
SO_2	130, 190 ppb
O_3	120 μg/m³
PM_{10}	50 μg/m³
BTEX	6 μg/m³
PAH (BaP)	1 ng/m³
$PM_{2.5}$	-

EuNetAir BACKGROUND: INDOOR/OUTDOOR ENERGY EFFICIENCY



Primary energy consumption in the EU[1]

[1] ***O. Seppanen,***

11th Conference on Indoor Air Quality

2008, Copenaghen, Denmark

41% Primary Energy consumed in Buildings:

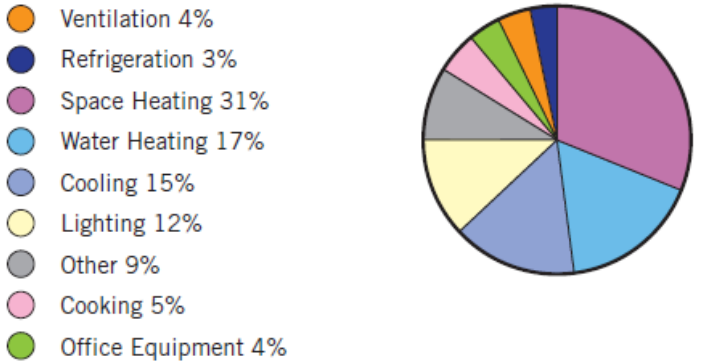
- 2/3 in Residential Buildings
- 1/3 in Commercial Buildings

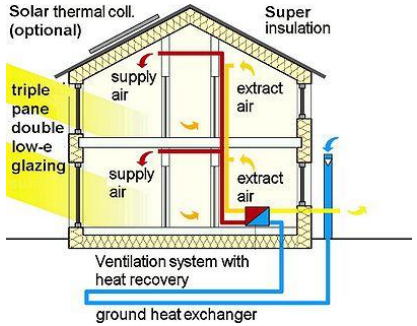
Energy Performance of Buildings EU Directive

EPBD 2010/31/EC

Figure 2 – Total Energy Consumption by End Use

Adapted from E Source, 2006





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

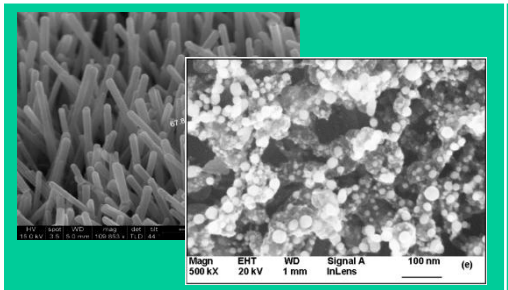
Indoor Air		Typical Substances		Cure
Contamination Source	Emission Source	VOCs	Others	
• Human Being	• Breath	Acetone, Ethanol, Isoprene		demand controlled ventilation
		CO_2		
		Humidity		
	• Skin Respiration & Transpiration	Nonanal, Decanal, α-Pinene		
		Humidity		
	• Flatus	Methane, Hydrogen		
	• Cosmetics	Limonene, Eucalyptol		
	• Household Supplies	Alcohols, Esters, Limonene		
	• Combustion (Engines, Appliances, Tobacco Smoke)	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)

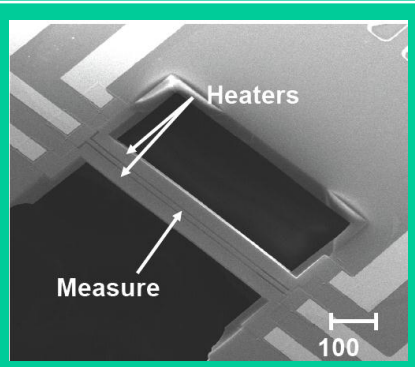
IAQ by WORLD HEALTH ORGANIZATION

COST Action EuNetAir: CHALLENGES

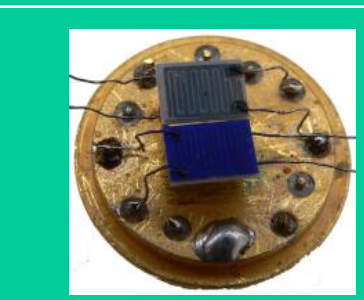
MATERIALS & GAS SENSORS



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

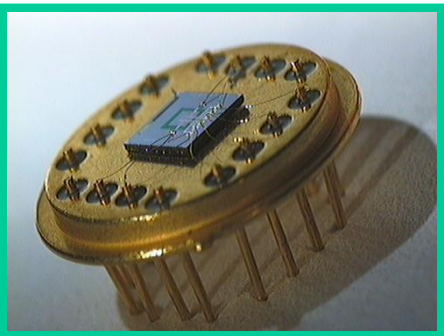


Cantilever Sensor by DTU, DK

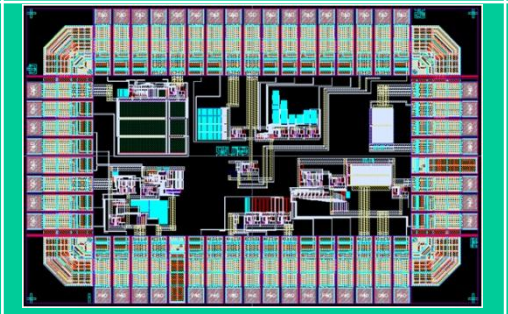


Phtalocyanine Gas Sensors by CNRS UBP-LASMEA, FR

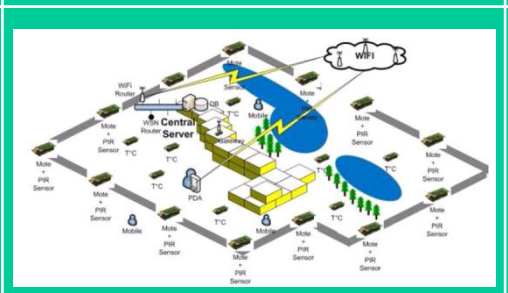
AQC SENSORS & SYSTEMS



GasFET by EPFL, Switzerland

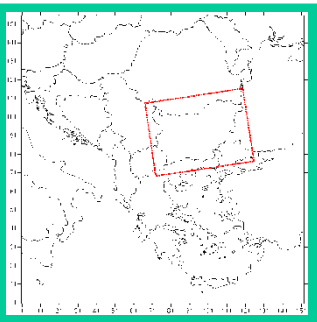


ASIC Circuit: CMOS SOI by WARWICK & CCMOS Ltd, UK

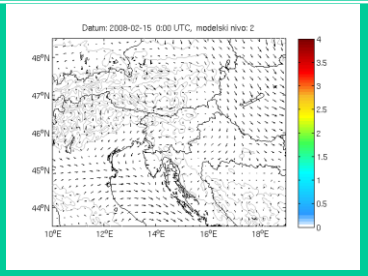


WIRELESS SENSORS NETWORK by ISI, Greece

AQ MODELLING



CMAQ Calculations by NIMH, BG

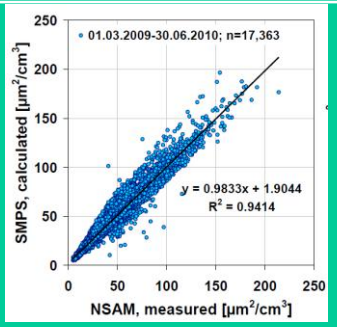


AQ Modelling dispersion in meteorological mesoscale by University of Ljubljana, SL

Chemical Weather Forecasting and Information System by Hungarian Meteo Service

STANDARDS & PROTOCOLS

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



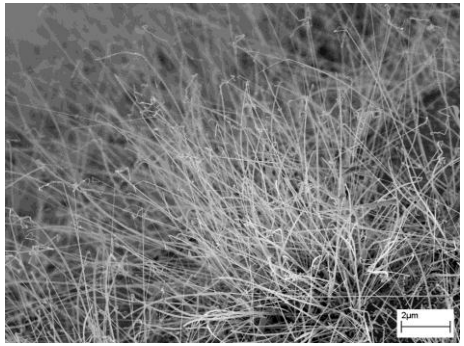
Particle Surface Area Measurements by IUTA eV, DE

?

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

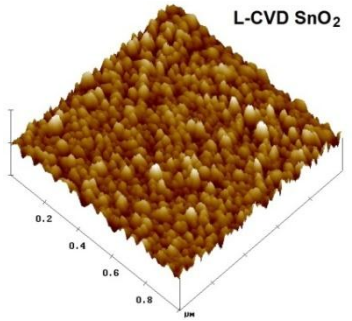
EuNetAir SOLUTIONS: NANOMATERIALS AND NANOTECHNOLOGIES

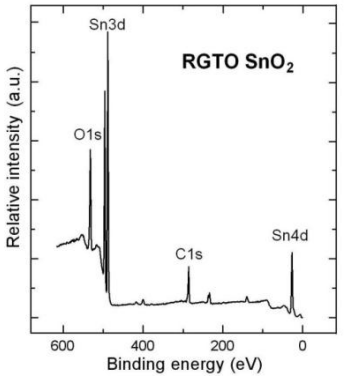
Metal Oxides Nanostructures by University of Brescia, Italy.

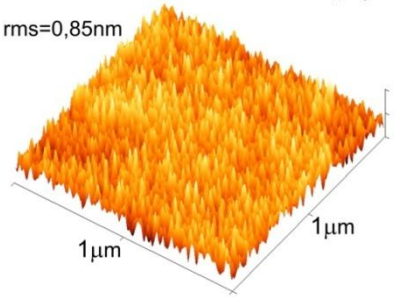


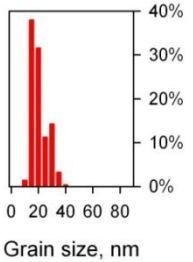
*The increasing scientific interest in **1-D systems** (**nanowires, nanobelts, nanorods, nanotubes**) and single-crystalline 1-D nanostructures (SnO_2, ZnO, WO_3, In_2O_3, MoO_3, TiO_2, etc.) are nowadays emerging as building blocks for a new generation of electronic, and optoelectronic **nanometer-scaled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

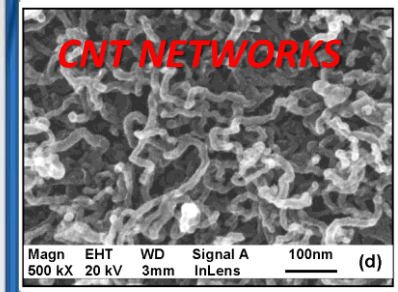
RGTO (RGVO) SnO_2 and In_2O_3 nanolayers by Silesian University of Technology, Poland

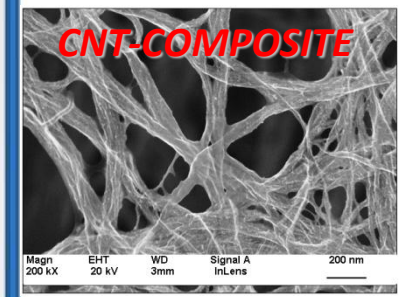












Carbon nanotubes (CNT) in the form of networks and composite as filler in an organic matrix by ENEA, Italy.

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 cm^2Vs^{-1}, at 300K
High structural/chemical reactivity	Bending at high angle (< 40°)
High thermal stability	1800 - 6000 $Wm^{-1}K^{-1}$ therm. cond.
Electrical Resistivity	1 - 100 kΩ (p-type Semiconductor)

EuNetAir SOLUTIONS: WIRELESS TECHNOLOGY

Production version of the mote technology from EPSRC MESSAGE.

3 electrochemical gas sensors, temperature, humidity & noise.

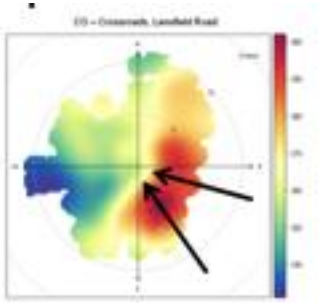
IEEE 802.15.4 wireless mesh networking of up to 100 motes (up to 100 m between motes).

Custom network protocols for routing and power management.

Solar rechargeable battery + Lithium D cell backup.

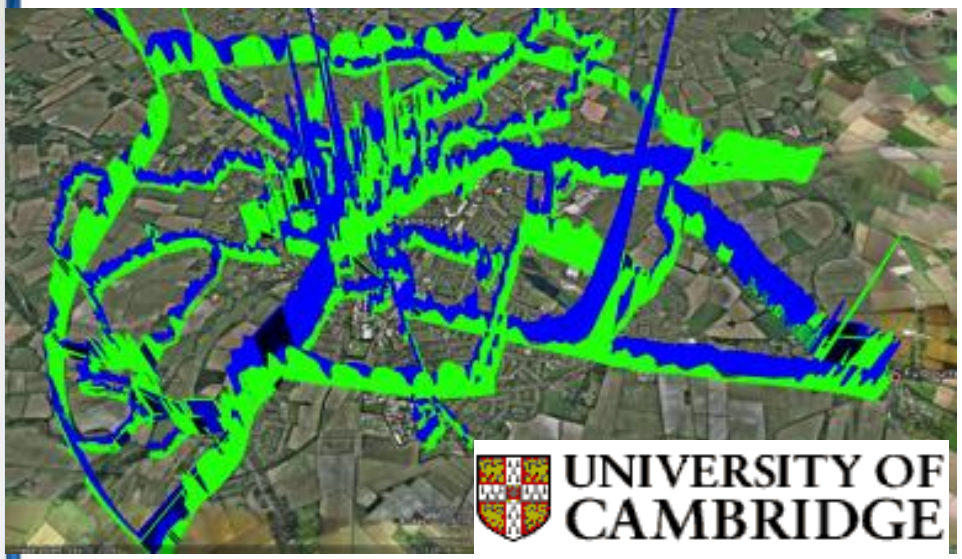
Designed for easy deployment on lighting columns etc.

Low cost, rapid deployment and high spatial resolution.



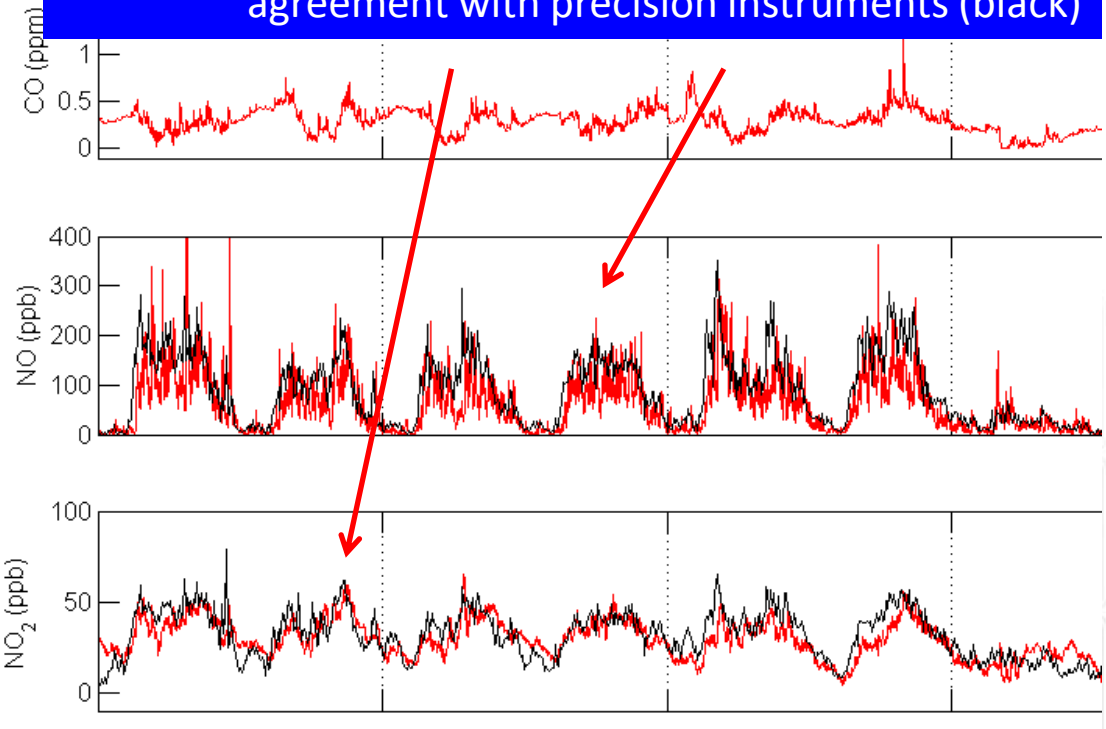
High granularity evaluation of air quality (e.g. NO_x, below), source attribution (right).

WIRELESS SENSORS NETWORK for AQC



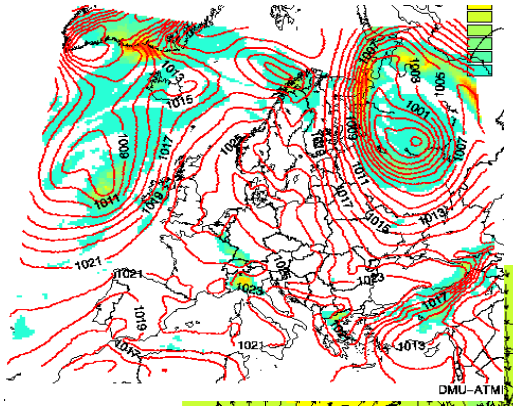
The Envirowatch mote

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

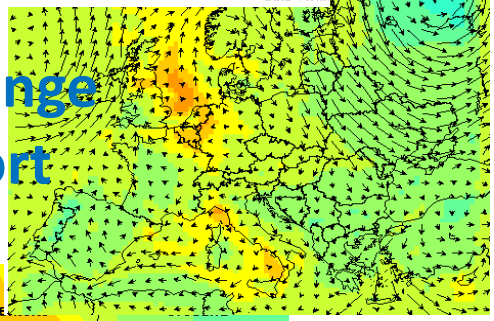


EuNetAir SOLUTIONS: AIR QUALITY MODELLING

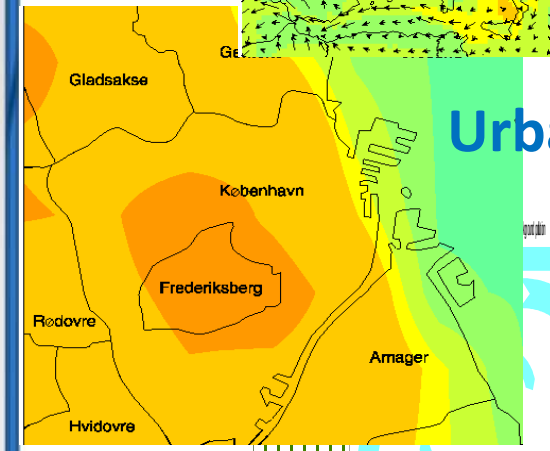
Chemical weather

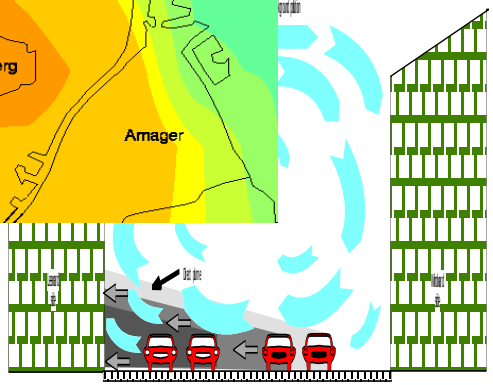


Long-range transport

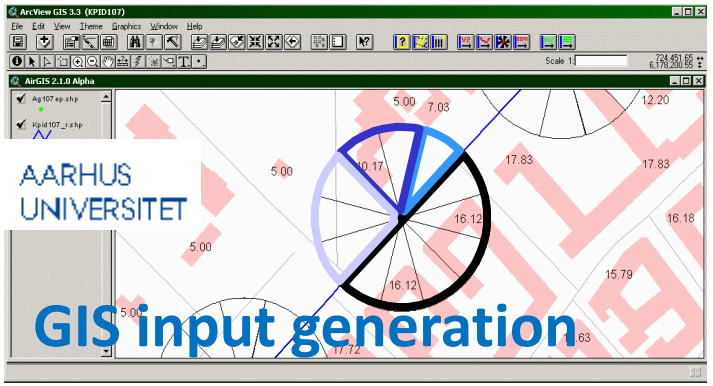


Urban scale



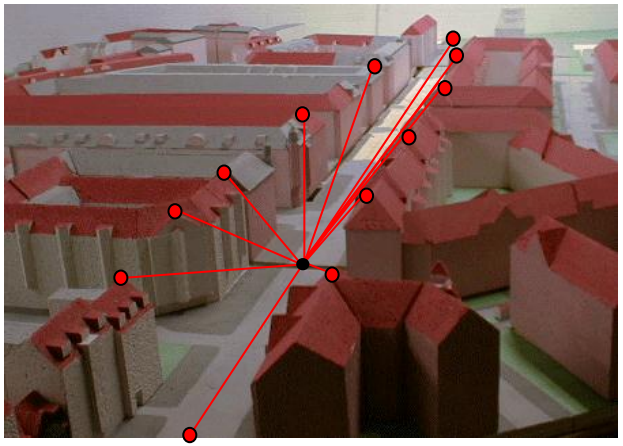


Street scale

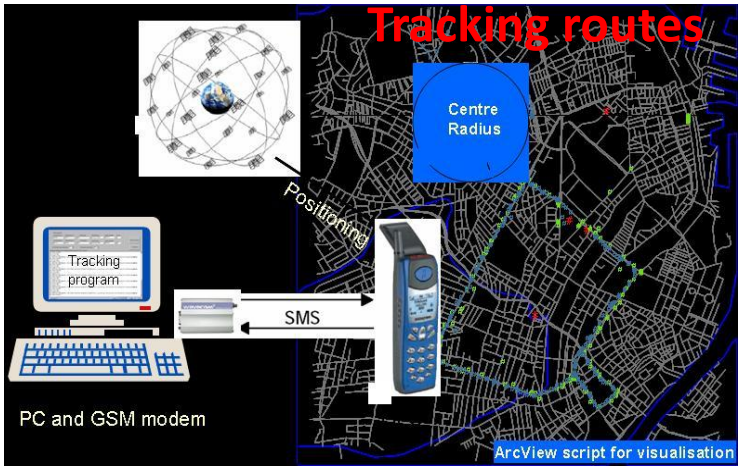


GIS input generation

Mapping addresses



Tracking routes

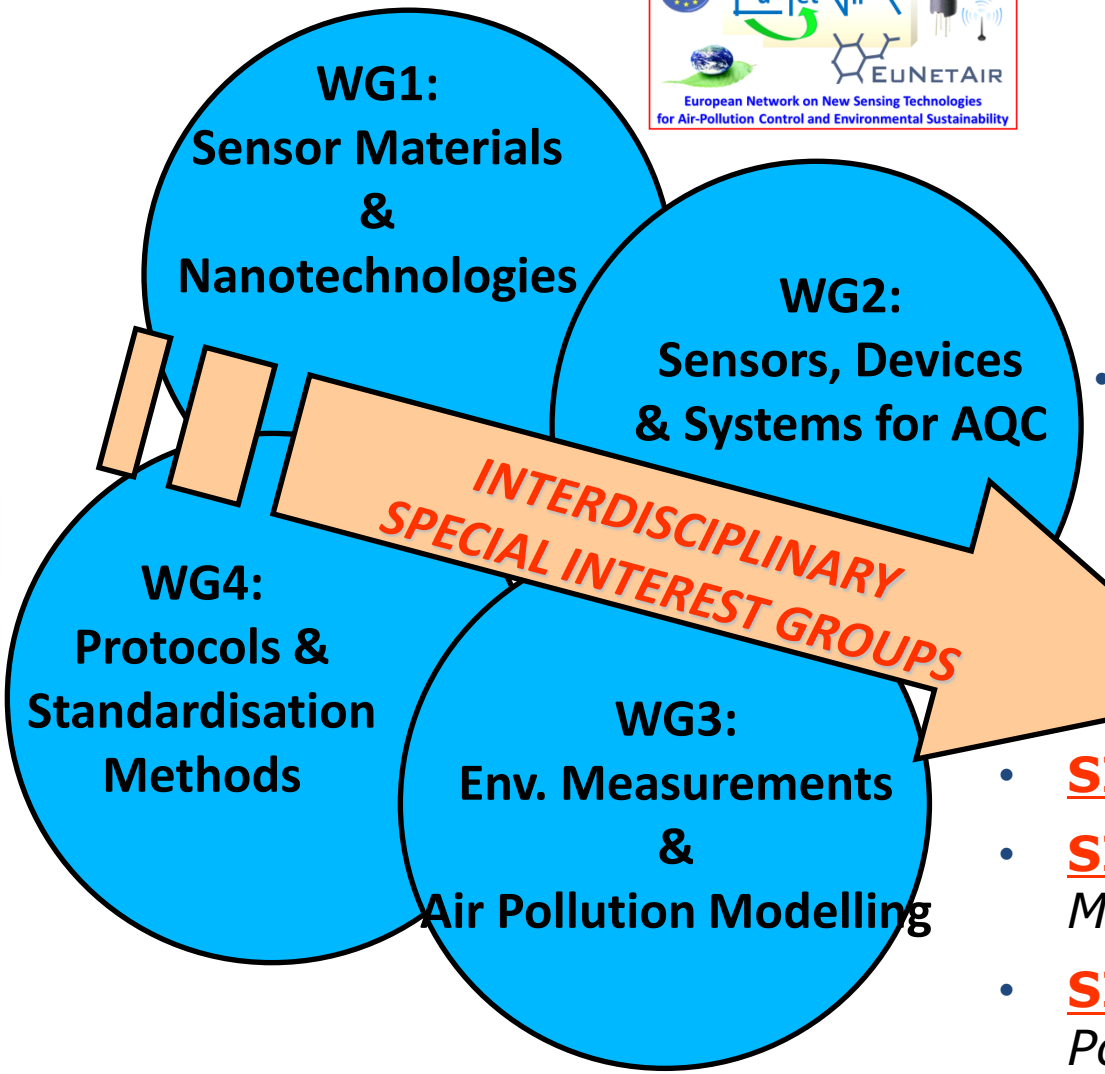


AirTHESS: operational AQ management and information system for Thessaloniki, Greece, employing Computational Intelligence for **AQ forecasting** and **mobile phone technology** for early warning messages.

By Aristotle University, Greece.

COST Action TD1105 EuNetAir:
Working Groups (WGs) and Special Interest Groups (SIGs)

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



MANAGEMENT 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)*

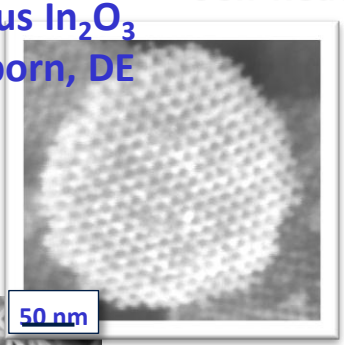
- **SIG 1**: *Network of Spin-offs*
- **SIG 2**: *Smart Sensors for Urban Air Monitoring in Cities*
- **SIG 3**: *Guidelines for Best Coupling Air Pollutant-Transducer*
- **SIG 4**: *Expert comments for the Revision of the Air Quality EU Directive*

COST - EuNetAir

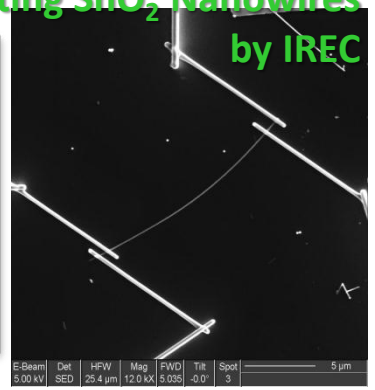
WG1: Sensor Materials and Nanotechnology

- **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.).

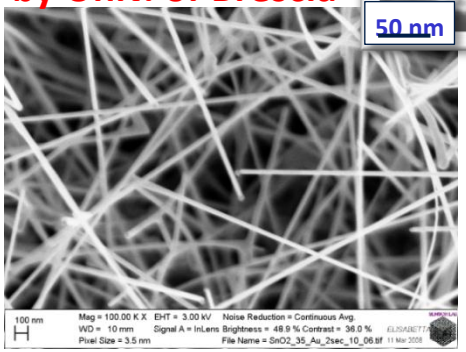
Mesoporous In_2O_3 by Univ. of Paderborn, DE

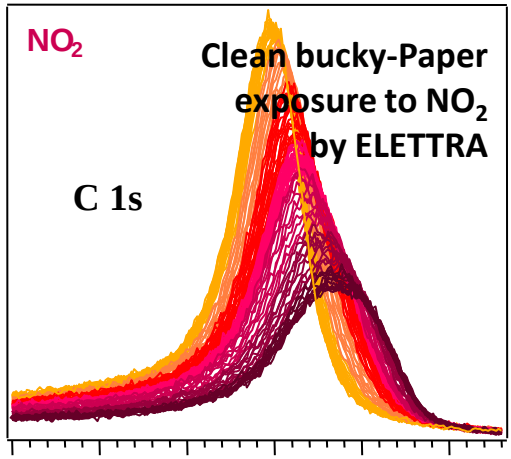


Self-heating SnO_2 Nanowires by IREC

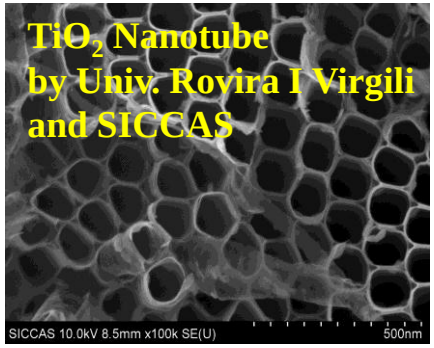


Metal oxide (SnO_2) Nanowires nets by Univ. of Brescia

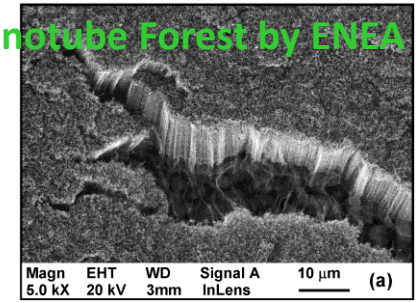


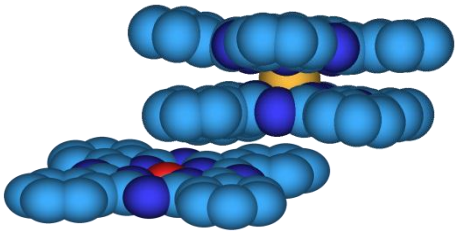


TiO_2 Nanotube by Univ. Rovira I Virgili and SICCAS



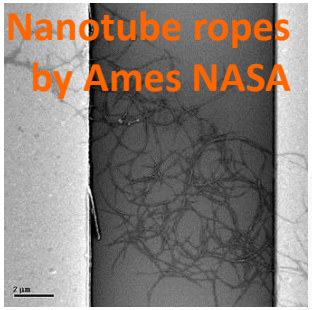
Carbon Nanotube Forest by ENEA



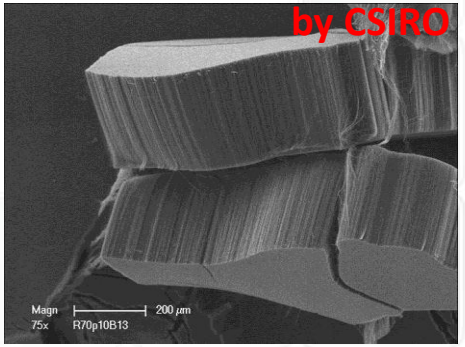


New molecular materials of polymer-macrocycles as transducers for polluting gas sensing by University of Bourgogne

Carbon Nanotube ropes by Ames NASA



Carbon Nanotube yarns by CSIRO



COST - EuNetAir
WG2: Sensors, Devices and Systems for AQC

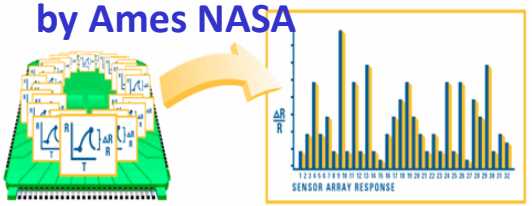
- **Sub-Working Group 2.1**: Gas sensors and new transducers.
- **Sub-Working Group 2.2**: Portable gas sensor-systems.
- **Sub-Working Group 2.3**: Wireless technology and AQC sensors network.
- **Sub-Working Group 2.4**: Intelligence algorithms and distributed computing for networked AQC gas sensors.

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

IT PATENT ENEA
Carbon Nanotube Gas Sensors

EnviroWatch mote by Newcastle University

by Ames NASA

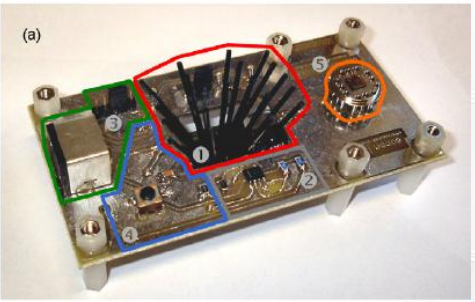


Using pattern matching algorithms, the data is converted into a unique response pattern

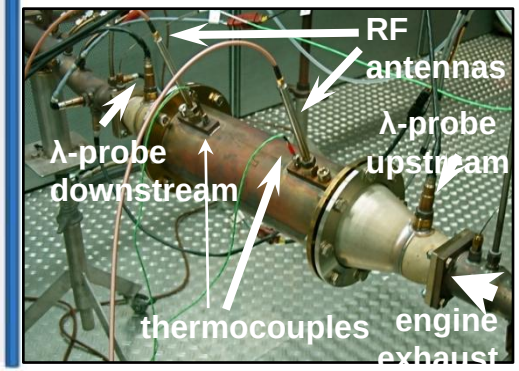
A versatile platform for the efficient development of gas detection systems based on automatic device adaptation by University of Saarland.

Environmental Sensor demo by IMEC, NL

Low-ppb sensitivity for NO_2 GaN-based sensor concept



Autonomous Gas Sensor System by IREC and Univ. of Barcelona



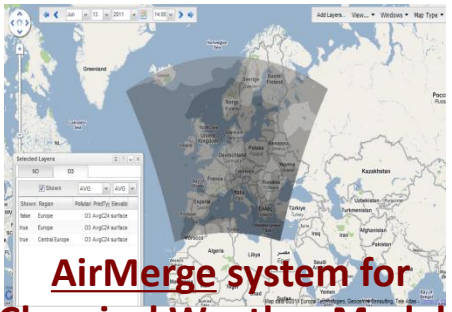
Direct status measurement of automotive catalysts by radio-frequency technique by University of Bayreuth, DE.

COST - EuNetAir

WG3: Environmental Measurements and Air-Pollution Modelling

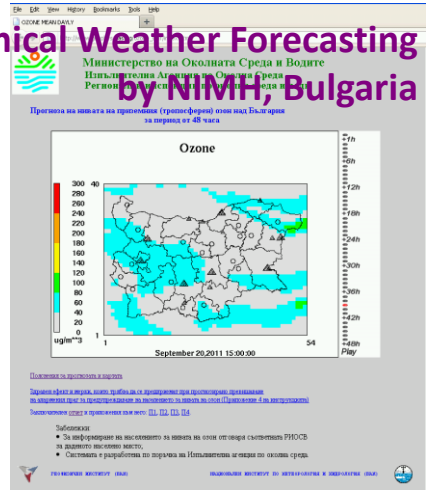
- **Sub-Working Group 3.1**: Environmental measurements at laboratory and in field air-quality stations.
- **Sub-Working Group 3.2**: Air-quality modeling and chemical weather forecasting.
- **Sub-Working Group 3.3**: Harmonisation of environmental measurements

by Aristotle University, EL

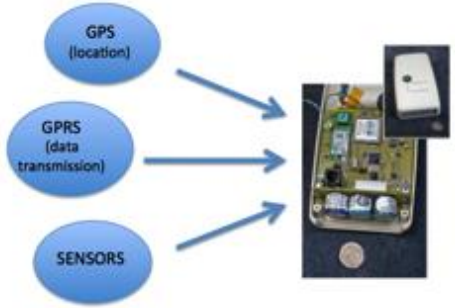


AirMerge system for Chemical Weather Models

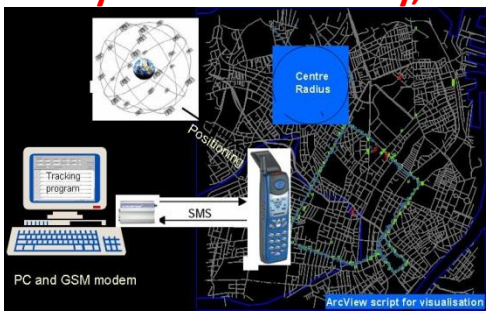
Chemical Weather Forecasting by NIMH, Bulgaria



Mobile and static sensor network configurations by University of Cambridge.



AQ Modeling: Tracking routes by Aarhus University, DK



Environmental measurements of PM and air pollution: Protocols and standardisation methods by CSIC, ES

AQ monitoring station by ARPA-PUGLIA, IT

AQ monitoring station by Aarhus University, DK

AQ monitoring station by Lithuanian EPA

COST - EuNetAir
WG4: Protocols and Standardisation Methods

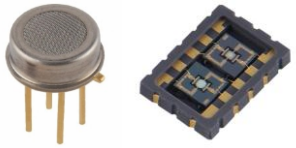
- **Sub-Working Group 4.1**: Protocols, standards and methods for AQC by analyzers/instruments (no-sensors) technologies.
- **Sub-Working Group 4.2**: Protocols, standards and methods for AQC by sensors (no-analyzers) technologies.
- **Sub-Working Group 4.3**: Benchmarking of new products and market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

European Directive 2008/50/EC: Ambient Air Quality

EU standard EN 13725/2003: Dynamic Olfactometry

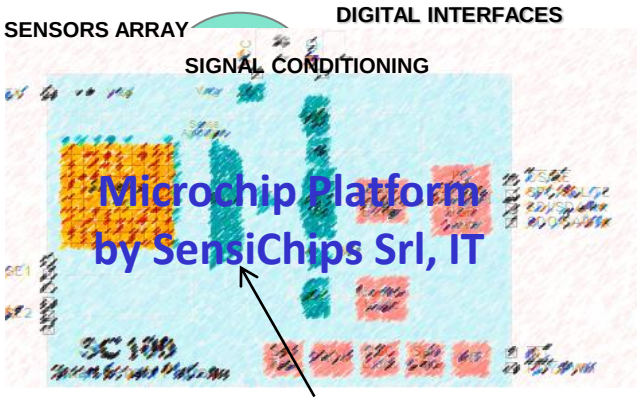
Protocols and Standardised Methods for Gas Sensors

Guidelines of Best Transducers applied to specific gases

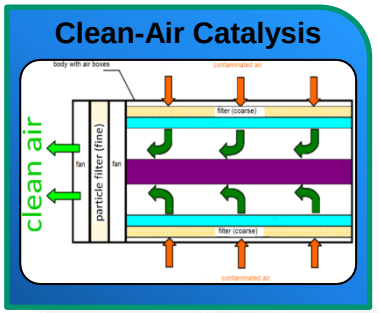


Packaged sensors by E2V, CH

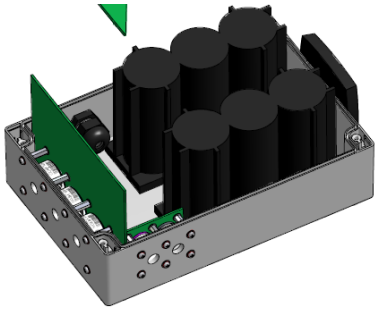
Dynamic olfactometry EN13725 by Univ. of Liege, Odometric SA, Univ. of Bari, Lenviros srl.



New precision multi-parametric analytical tool



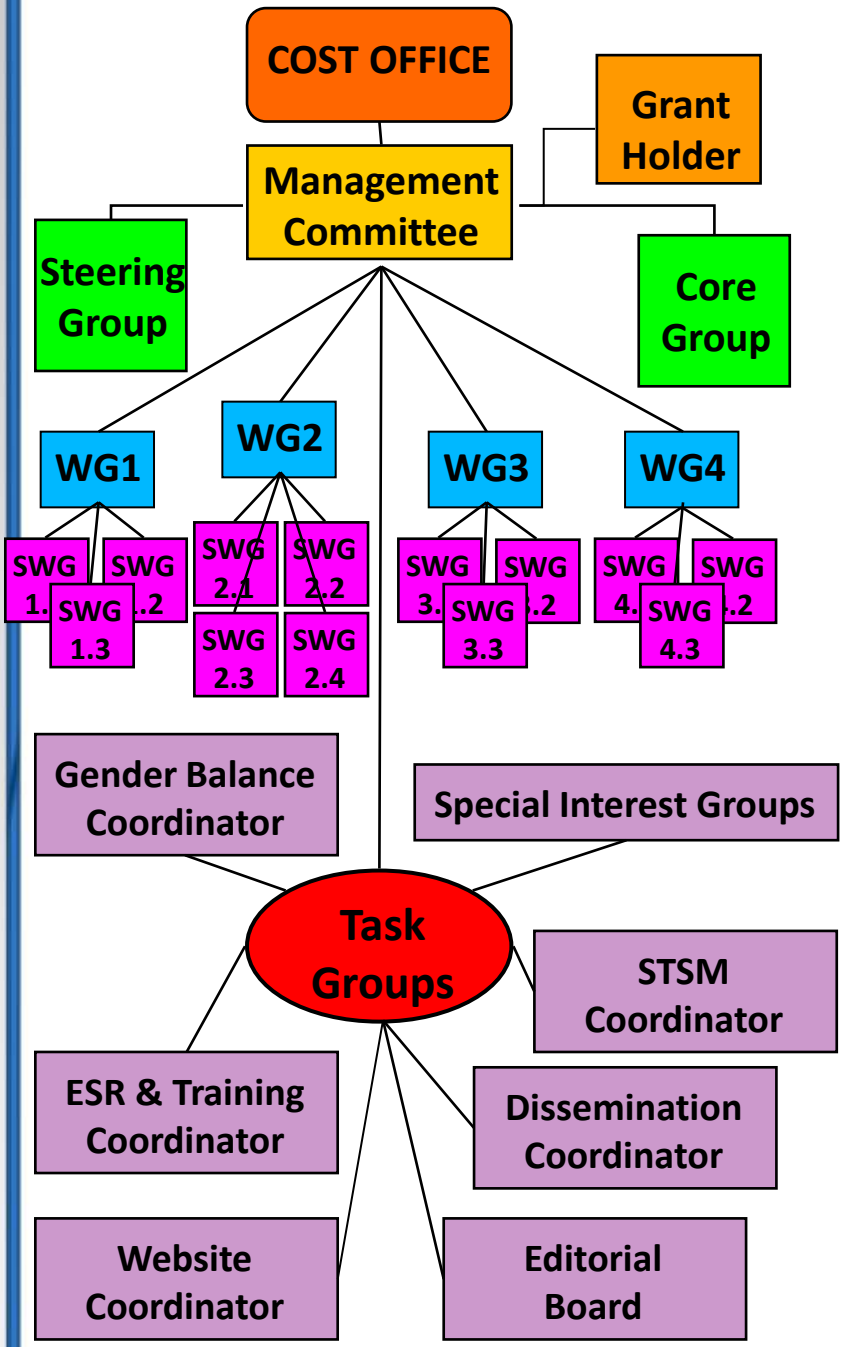
Becker Gruppe, DE



Battery-Powered Sensors by Alphasense Ltd, UK

CO_2 IR sensor for alarm System by SenseAir AB, Sweden

COST Action EuNetAir: COORDINATION AND ORGANIZATION



MANAGEMENT COMMITTEE

2 Representatives of participating Countries

Steering Group:
- ✓ *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

STEERING GROUP

Action Chair
Action Vice Chair
Secretary

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

ESR Coordinator
- *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 EuNetAir: TIMETABLE

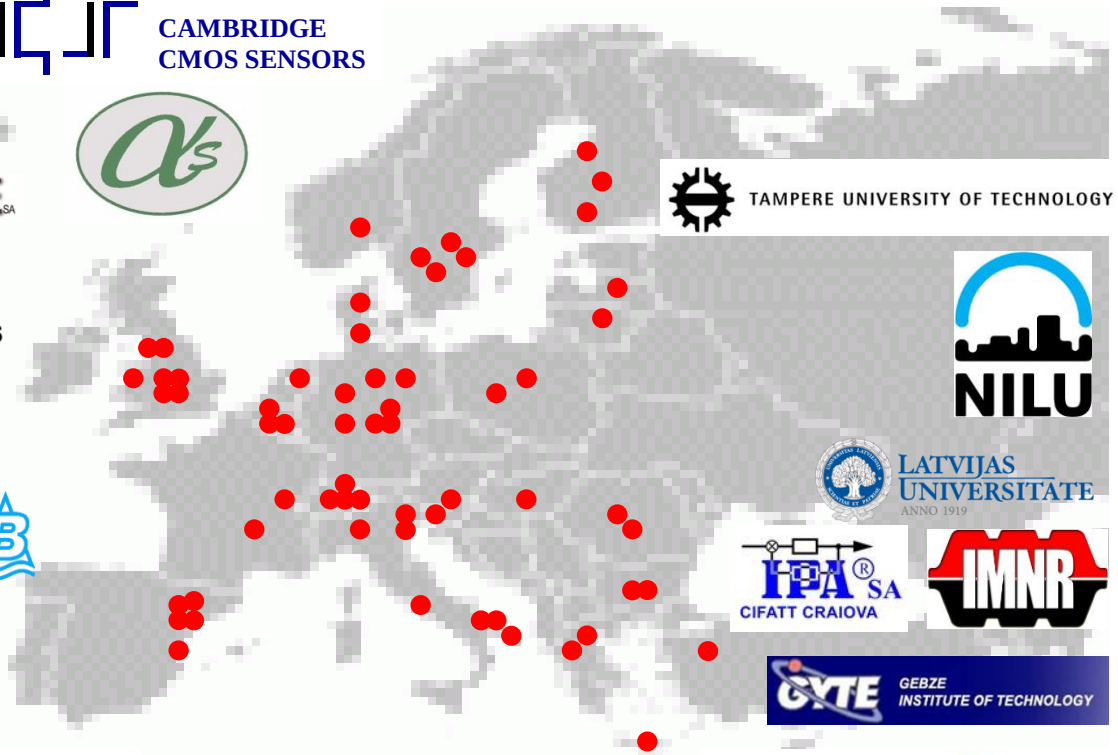
YEAR	Quarter 1	Quarter 2	Quarter 3	Quarter 4
1	**M**: Kick-Off Meeting. MC Meeting 1. **D**: MC setup and Action Workplan established	**M**: Editorial Board for Leaflet, Brochure, Newsletter. Action website setup. **D**: Definition of WGs and WGs Workplans	**M**: MC Meeting 2. WGs Meeting 1. **D**: Scientific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

M: **Milestones** **D**: **Deliverables**

COST Action: EuNetAir PARTICIPANTS

BE - Belgium	VITO, Universitè de Liège, Odometric S.A.
BG - Bulgaria	National Institute of Meteorology and Hydrology - BAS; Institute of Electronics - BAS
CH - Switzerland	Ecole Polytechnique Fèdèrale de Lausanne; e2v Microsensors S.A.; EnvEve S.A.; EMPA
DE - Germany	Institute of Energy and Environmental Technology – IUTA eV; Saarland University; University of Bayreuth; University of Paderborn; UST GmbH; Alfred Becker GmbH; 3S GmbH
DK - Denmark	Aarhus University; Technical University of Denmark - DTU
EL - Greece	Aristotle University; Foundation of Research and Technology; Industrial Systems Institute
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
HU - Hungary	Hungarian Meteorological Service
IS - Iceland	Agricultural University of Iceland
IT - Italy	ENEA; ELETTRA; University of Bari; University of Brescia; University of Trieste; Lenviros srl; Sensichips srl
LT - Lithuania	Lithuania Environmental Protection Agency
LV - Latvia	University of Latvia
NL - Netherlands	IMEC - Holst Centre
NO - Norway	NILU - Norwegian Institute for Air Research
PL - Poland	Silesian University of Technology; Warsaw University of Life Science
RO - Romania	National R&D Institute for Nonferrous and Rare Metals; SC IPA SA - Research & Development
SE - Sweden	Linkoping 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; University of Cambridge; University of Warwick; Cambridge CMOS Sensors Ltd; Alphasense Ltd
TR - Turkey	GEBZE Institute of Technology

COST Action EuNetAir PARTICIPANTS



vito vision on technology

Université de Liège

Arlon campus environnement

ODOMETRIC

CAMBRIDGE CMOS SENSORS

EPFL ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

e2v

ENVEVE SA

EMPA Materials Science & Technology

FM FUNCTIONALMATERIALS

TAMPERE UNIVERSITY OF TECHNOLOGY

UNIVERSITÄT DES SAARLANDES

iuta

UNIVERSITÄT PADERBORN Die Universität der Informationsgesellschaft

NILU

LATVIJAS UNIVERSITATE ANNO 1919

3S Gas sensing solutions

UST UMWELT SENSOR TECHNIK

BECKER GRUPPE

IPA SA CIFATT CRAIOVA

IMNR

AARHUS UNIVERSITET

DTU

Aristotle University Thessaloniki

GYTE GEBZE INSTITUTE OF TECHNOLOGY

FORTH Foundation for Research & Technology - Hellas

i.S.I. Industrial Systems Institute

IREC Institut de Recerca en Energia de Catalunya Catalonia Institute for Energy Research

MINISTERIO DE CIENCIA E INNOVACIÓN

CSIC Consejo Superior de Investigaciones Científicas

UNIVERSITAT DE BARCELONA

Universitat Rovira i Virgili La universitat pública de Tarragona

world sensing

UNIVERSITY of OULU OULUN YLIOPISTO

UNIVERSITÉ BLAISE PASCAL CLERMONT-FERRAND

HMS

POLITECHNIKA ŚLĄSKA

imec

ENEA AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE, L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE

elettra

UNIVERSITÀ DEGLI STUDI DI TRIESTE Dipartimento di Scienze Chimiche e Farmaceutiche

UNIVERSITAS STUDIORUM BRIXIAE

LENVIROS SUSTAINABLE SOLUTIONS

sensichips

Univerza v Ljubljani

CHALMERS

SenseAir

SenSiC AB sensors for a clean environment

Aerosol

Linköpings universitet

Imperial College London

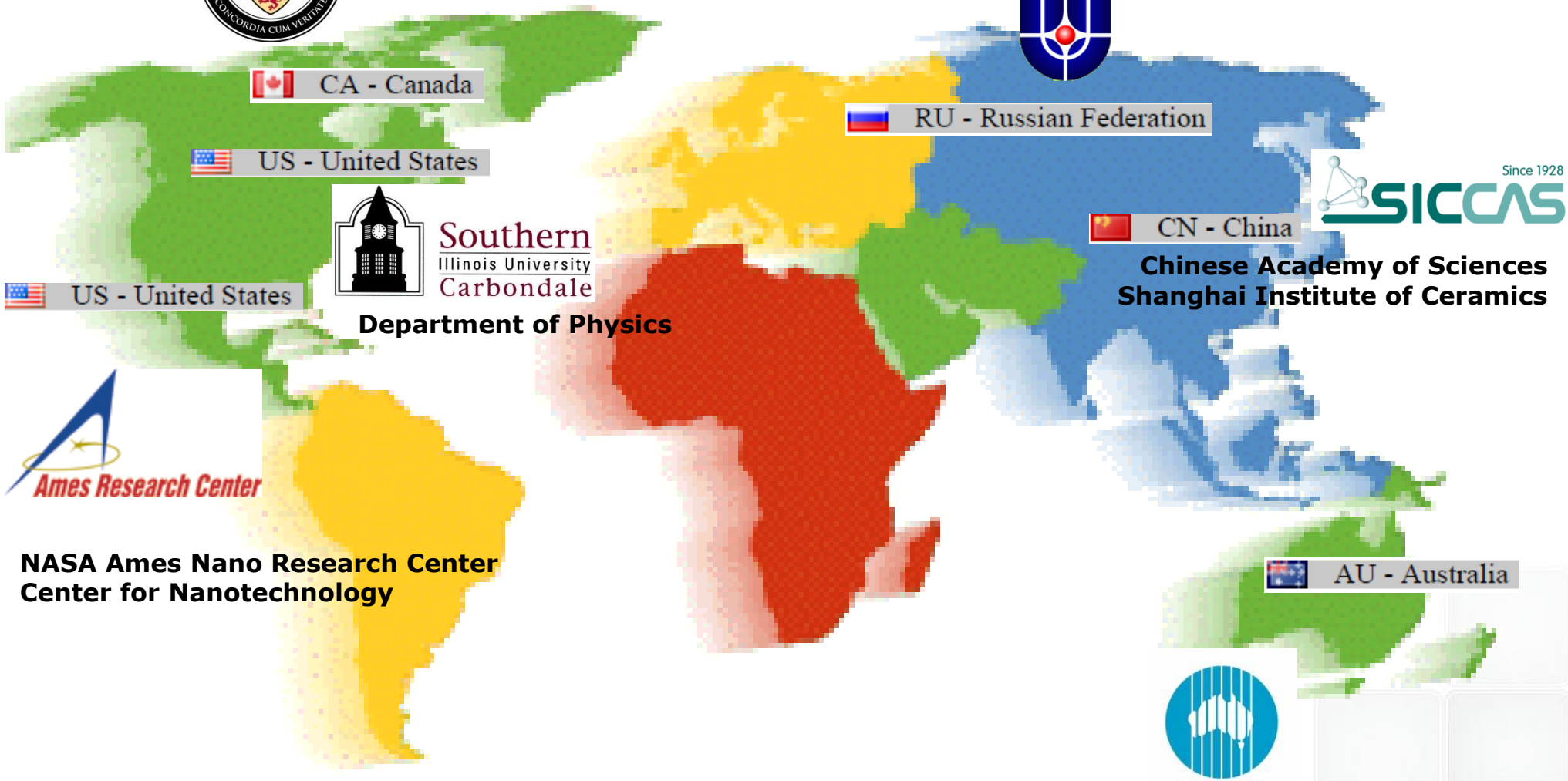
Newcastle University

UNIVERSITY OF CAMBRIDGE

WARWICK

MANCHESTER 1824

Non-COST EuNetAir PARTICIPANTS



University of Waterloo
Systems Design Engineering

National Research Center Kurchatov Institute
Institute of Applied Chemical Physics

Since 1928
SICCAS

Chinese Academy of Sciences
Shanghai Institute of Ceramics

Southern Illinois University Carbondale

Department of Physics

Ames Research Center

NASA Ames Nano Research Center
Center for Nanotechnology

CSIRO

Materials Science and Engineering

COST Action EuNetAir: List of Experts

Total of Experts: **95** from **21** COST Countries and **5** Non-COST Countries

(* *Reciprocal Agreement*)

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

DE - Germany
Dr. Thomas A. J. KUHLBUSCH
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

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 PAPADOPOULOS

ES - Spain
Prof. Juan Ramon MORANTE
Dr. Francisco HERNANDEZ
Dr. Xavier QUEROL
Dr. Mar VIANA
Prof. Eduard LLOBET
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

HU - Hungary
Dr. Zita FERENCZI
Dr. Krisztina LABANCZ

IS - Iceland
Dr. Arngrimur THORLACIUS

IT - Italy
Dr. Michele PENZA
Dr. Marco ALVISI
Dr. Andrea GOLDONI
Dr. Livia TRIZIO
Dr. Annamaria DEMARINIS
Dr. Gianluigi DE GENNARO
Dr. Luigi BARBIERI
Dr. Roberto SIMMARANO
Prof. Giorgio SBERVEGLIERI

LT - Lithuania
Dr. Donatas PERKAUSKAS

LV - Latvia
Prof. Iveta STEINBERGA

NL - Netherlands
Dr. Sywert BRONGERSMA

PL - Poland
Dr. Monika KWOKA
Prof. Stanislaw GAWRONSKI
Prof. Jacek Szuber

SE - Sweden
Prof. Anita LLOYD SPETZ
Dr. Marina VOINOVA
Dr. Mike ANDERSSON
Dr. Ruth PERACE
Dr. Ulf THOLE
Prof. Ingrid BRYNTSE

SI - Slovenia
Prof. Rahela ZABKAR
Dr. Grisa MOCNIK
Prof. Andrej DOBNIKAR

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

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

AU - Australia
* Dr. Phil MARTIN

CA - Canada
Prof. John YEOW

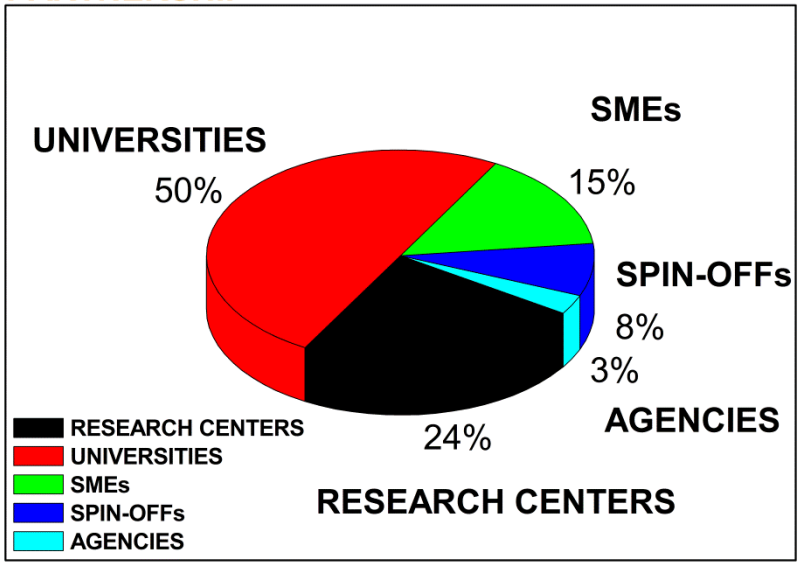
CN - China
Dr. Yongxiang LI
Dr. Zhifu LIU

RU - Russian Federation
Dr. Alexey VASILIEV

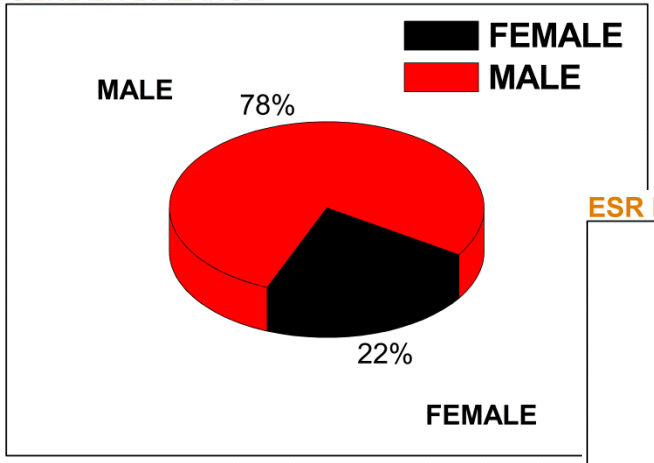
US - United States
Prof. Andrei KOLMAKOV
Dr. Meyya MEYYAPPAN

COST Action EuNetAir: STATISTICS

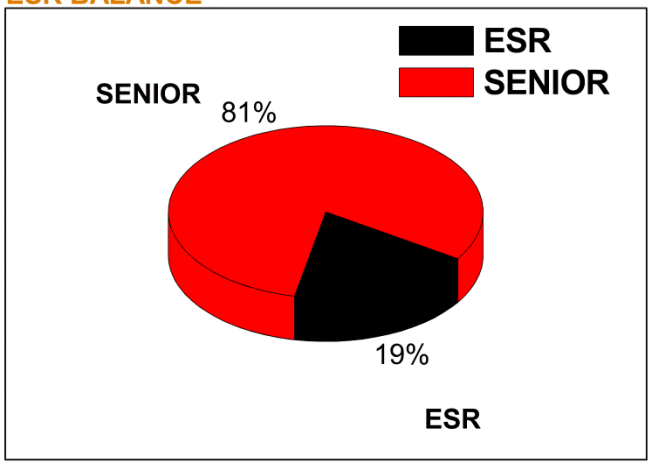
PARTNERSHIP



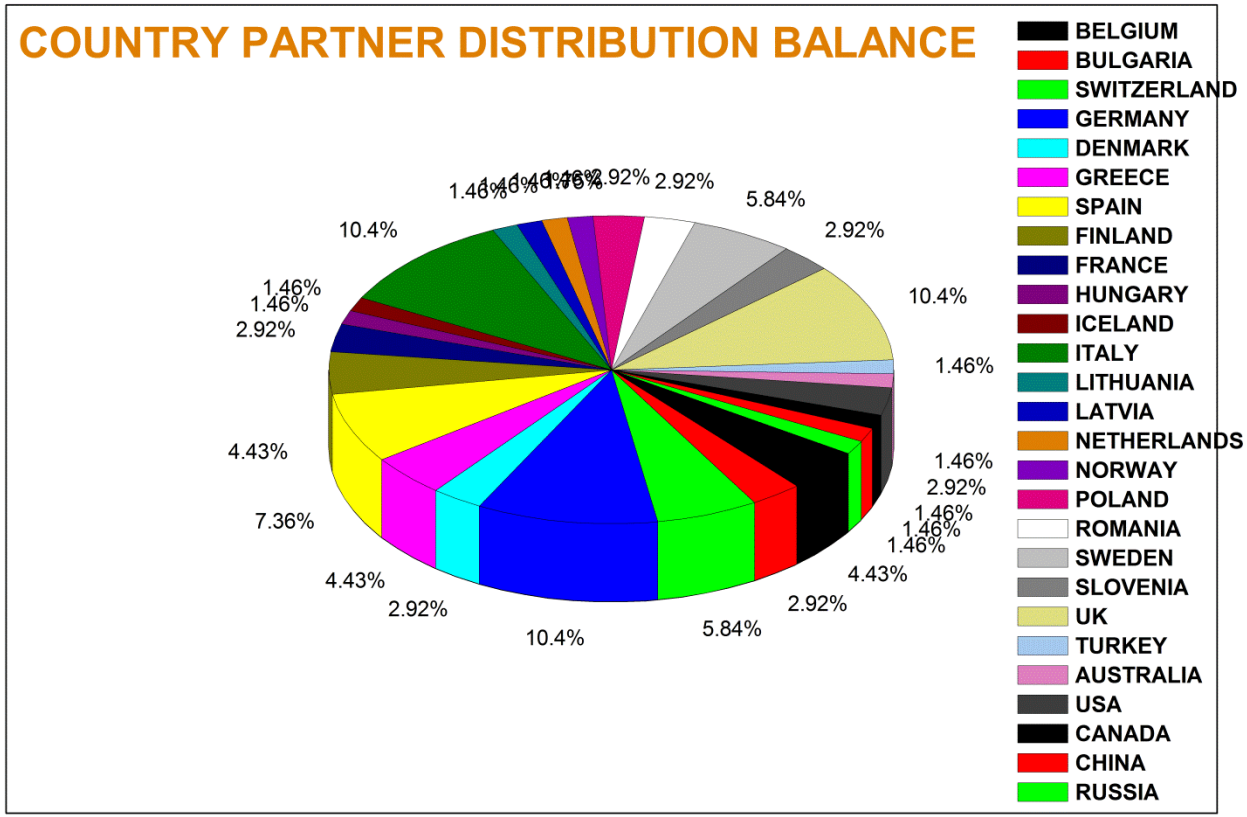
GENDER BALANCE



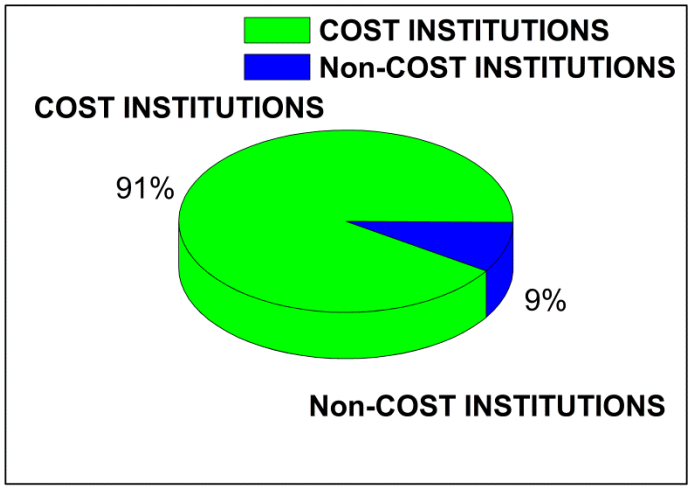
ESR BALANCE



COUNTRY PARTNER DISTRIBUTION BALANCE



INTERNATIONAL BALANCE



ACTION TD1105 EuNetAir MANAGEMENT COMMITTEE

COST Countries that signed MoU: 21

Kick-off Meeting on 16 May 2012 at Brussels

MC Chair	TBA
MC Vice Chair	TBA
Grant Holder	TBA

Country	MC Members (37)
Belgium	Dr Jan THEUNIS; Dr Anne-Claude ROMAIN
Bulgaria	Dr Dimiter SYRAKOV; Dr Ivan NEDKOV
Denmark	Prof. Ole HERTEL
Finland	Prof. Kaarle HAMERI; Prof. Jyrki LAPPALAINEN
France	Prof. Marcel BOUVET; Prof. Jerome BRUNET
Germany	Prof. Andreas SCHUETZE; Dr Thorsten CONRAD
Greece	Prof. George PAPADOPOULOS; Prof. Kostas KARATZAS
Hungary	Ms Krisztina LABANCZ; Dr Zita FERENCZI
Iceland	Dr Arngrimur THORLACIUS
Italy	Dr Michele PENZA; Prof. Giorgio SBERVEGLIERI
Latvia	Dr Iveta STEINBERGA
Netherlands	Dr Sywert BRONGERSMA
Norway	Dr Nuria CASTELL BALAGUER; Dr. Philipp SCHENEIDER
Poland	Dr Monika KWOKA; Prof. Janislaw GAWRONSKI
Romania	Dr Marcel IONICA; Dr Roxana Mioara PITICESCU
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

Country	MC Substitutes (23)
Belgium	Dr Julien DELVA
Denmark	Dr. Lise Lotte SORENSEN
Finland	Prof. Jorma KESKINEN
France	Dr Jean SUISSE Prof. Alain PAULY
Germany	Dr. Daniela SCHONAUER-KAMIN Dr. Thomas KUHLBUSCH
Greece	Prof. George KIRIKIADIS
Italy	Dr. Roberto SIMMARANO Dr. Marco ALVISI Dr. Gianluigi DE GENNARO
Poland	Prof. Jacek SZUBER
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
UK	Prof. Julian GARDNER Dr Robin NORTH Prof. Florin UDREA

ELIGIBLE PARTICIPANTS

- **MANAGEMENT COMMITTEE MEMBERS**

Each Country participating in an Action can nominate up to 2 MC Members (in addition to the MC Chair) and up to 2 MC Substitutes (Deputies). Members are nominated by COST National Coordinator (CNC).
In Italy, CNC is MIUR - Ministry of Education, University and Research.

- **WORKING GROUP (WG) MEMBERS**

The Working Groups usually consist of a small number of researchers selected by the MC or by a procedure decided by the MC.
WG members may be MC members or other researchers from a participating Country contributing to the achievement of the objectives of the Action, under balance of COST Countries, that have signed MoU.
*As a general rule, 2 Experts per participating Country could be included in a Working Group. **More flexibility** could be explored to enlarge partnership in a WG coming from the same COST Country, that signed Memorandum of Understanding (MoU).*

- ***KICK-OFF MEETING of COST Action TD1105 at Brussels on 16 May 2012***.

Visit Link of COST Action TD1105 EuNetAir:
http://www.cost.eu/domains_actions/essem/Actions/TD1105?

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

Tuesday 22 May 2012
10.30 - 12.30

SPECIAL SESSION PROGRAM
Session Chair(s): Prof. G. Sberveglieri and Dr. Michele Penza

PART I: Sensor Materials and Techniques

Speaker 1: Dr. Michele Penza, ENEA, IT - Action Coordinator
Speaker 2: Prof. Juan Ramon Morante, IREC, ES
Speaker 3: Prof. Eduard Llobet, University Roviri I Virgili, ES
Speaker 4: Dr. Daniela Schonauer-Kamin, University of Bayreuth, DE
Speaker 5: Dr. Andrea Ponzoni, SENSOR Lab. CNR-IDASC, Brescia, IT
Speaker 6: Dr. Danick Briand, EPFL, CH

Wednesday 23 May 2012
10.30 - 12.30

SPECIAL SESSION PROGRAM
Session Chair(s): Prof. G. Sberveglieri and Dr. Michele Penza

PART II: Sensor-Systems, Technologies and Applications

Speaker 7: Prof. Andreas Schutze, Saarland University, DE
Speaker 8: Prof. Anita Lloyd Spetz, Linkoping University, SE
Speaker 9: Dr. Sywert Brongersma, IMEC-Holst Centre, NL
Speaker 10: Prof. Rod Jones, University of Cambridge, UK
Speaker 11: Dr. Saverio De Vito, ENEA, IT
Speaker 12: Prof. Julian W. Gardner, University of Warwick, UK

Thank you very much for your kind attention !