



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

FOURTH INTERNATIONAL ACTION WORKSHOP on Innovations and Challenges for Air Quality Control Sensors

Vienna (Austria), 25 - 26 February 2016

hosted at FFG - Austrian Research Promotion Agency - AT COST Association
Sensengasse 1, 1090 Vienna, Austria

<p>organized by Materials Center Leoben Forschung GmbH</p>	
<p>co-supported by Techkonnex - High-Tech Promotion</p>	

AGENDA	
25 February 2016 - Thursday	
09:00 - 18:00	REGISTRATION
09:30 - 10:00	Welcome Address
10:00 - 11:00	Session 1: Plenary Session
11:00 - 11:30	<i>Coffee Break</i>
11:30 - 13:00	Session 2: Oral Presentations
13:00 - 14:30	<i>Lunch</i>
14:30 - 16:00	Session 3: Oral Presentations
16:00 - 16:30	<i>Coffee Break</i>
16:30 - 18:00	Session 4: Oral Presentations
20:00 - 23:00	<i>Social Dinner</i>
26 February 2016 - Friday	
09:00 - 16:00	REGISTRATION
09:00 - 11:00	Session 5: Oral Presentations
11:00 - 11:30	<i>Coffee Break</i>
11:30 - 13:00	Session 6: Oral Presentations
13:00 - 14:30	<i>Lunch</i>
14:30 - 15:30	Session 7: Poster Presentations
15:30 - 17:00	Session 8: Keynote Presentations
17:00	Closure of Meeting



Background and goals

About COST Action TD1105 *EuNetAir*

COST Action TD 1105 *EuNetAir*, a Concerted Action on New Sensing Technologies for Air-Pollution Control and Environmental Sustainability, is a running Networking funded in the framework *European Cooperation in the field of Scientific and Technical Research (COST)* during 2012-2016.

The main objective of the Concerted Action is to develop new sensing technologies for Air Quality Control at integrated and multidisciplinary scale by coordinated research on nanomaterials, sensor-systems, air-quality modelling and standardised methods for supporting environmental sustainability with a special focus on Small and Medium Enterprises.

This international Networking, coordinated by ENEA (Italy), includes over 120 big institutions from 31 COST Countries (EU-zone: *Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Luxembourg, The Former Yugoslav Republic of Macedonia, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom*) and 7 International Partners Countries (extra-Europe: *Australia, Canada, China, Morocco, Russia, Ukraine, USA*) to create a S&T critical mass in the environmental issues.

About the 4th *International Action Workshop* at FFG, Vienna, 25 - 26 February 2016

The 4th *International Workshop EuNetAir on Innovations and Challenges for Air Quality Control Sensors* will be held at FFG - Austrian Research Promotion Agency, Vienna (Austria) under management of the MCL, and locally coordinated by Dr. Anton Köck (AT MC Member). This fourth workshop of the Action TD1105 *EuNetAir* follows the first one organized at Barcelona, Spain (20 June 2013) as Satellite Event inside *Transducers 2013 - Eurosensors XXVII*, the second one organized at Brindisi, Italy (25-26 March 2014), and the third one organized at Riga, Latvia (26-27 March 2015).

The core-issues of the COST Action TD1105 on the **new trends and challenges** in the sensing technologies for indoor and outdoor monitoring and air quality control will be surveyed by Action partners in **visionary approach** with emphasis at *functional materials and nanotechnologies for gas sensors, low-cost and low-power chemical sensors, portable sensor-systems, sensor-instrumentations, air-pollution modelling, methods, measurements and protocols for air quality control and environmental monitoring, experimental campaigns of air quality monitoring, air-pollutants and new metrics, health-effects of air pollution, guidelines and regulations.*

Fruitful discussions between Action TD1105 participants, international experts, speakers and international institutional organizations delegates are strongly expected. At the **Open Fourth Action Workshop** of the COST Action TD1105 *EuNetAir*, a strong impact on critical environmental issues would be mutual benefit.

More Information

Dr. Michele PENZA

MC Chair/Proposer of COST Action TD1105 EuNetAir

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

Department for Sustainability - Laboratory of Functional Materials and Technologies for Sustainable Applications

PO BOX 51 Br-4, I-72100 Brindisi, ITALY. Email: michele.penza@enea.it. Action webpages: www.cost.eunetair.it

Dr. Anton KÖCK

MC AT Member and Local Organizing Team Chair

Material Center Leoben Forschung GmbH

Roseggerstrasse 12, 8700, Leoben, AUSTRIA

Email: Anton.Koeck@mcl.at

DI (FH) Margit MALATSCHNIG

Local Organizing Team Co-Chair

Techkonnex - High Tech Promotion

URL: <http://www.techkonnex.at>, Vienna, AUSTRIA

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FOURTH INTERNATIONAL ACTION WORKSHOP on Innovations and Challenges for Air Quality Control Sensors

Vienna (Austria), 25 - 26 February 2016

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Sensengasse 1, 1090 Vienna, Austria

 EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY



Action Workshop Programme Committee

Michele Penza, ENEA, Brindisi, Italy
Anita Lloyd Spetz, Linköping University, Sweden
Anton Köck, MCL, Austria
Iveta Steinberga, University of Latvia, Riga, Latvia
Gita Sakale, Riga Technical University, Riga, Latvia
Andreas Schuetze, Saarland University, Germany
Zafer Ziya Ozturk, GEBZE Technical University, Turkey
Carlos Borrego, IDAD, University of Aveiro, Portugal
Ole Hertel, Aarhus University, Denmark
Ingrid Bryntse, SenseAir AB, Sweden
Juan Ramon Morante, IREC, Spain
Marco Alvisi, ENEA, Italy
Corinna Hahn, Eurice GmbH, Saarbrücken, Germany
Juliane Roszbach, Eurice GmbH, Saarbrücken, Germany
Annamaria Demarinis Loiotile, University of Bari, Italy
Stefan Defregger, MCL, Austria
Margit Malatschnig, Techkonnex - High-Tech Promotion, Austria
Nicole Schmidt, FFG - AT COST Association, Austria

COST Action TD1105 EuNetAir Steering Committee

Michele Penza, ENEA, Brindisi, Italy - *Action Chair*
Anita Lloyd Spetz, Linköping University, Sweden - *Action Vice-Chair*
Juan Ramon Morante, IREC, Spain
Andreas Schuetze, Saarland University, Germany
Ole Hertel, Aarhus University, Denmark
Ingrid Bryntse, SenseAir AB, Sweden
Jan Theunis, VITO, Belgium
Marco Alvisi, ENEA, Brindisi, Italy
Gianluigi De Gennaro, University of Bari, Italy
Fabio Galatioto, Newcastle University, UK
Ralf Moos, University of Bayreuth, Germany
Mar Viana, CSIC-IDAEA, Barcelona, Spain
Iveta Steinberga, University of Latvia, Riga, Latvia
Corinna Hahn, Eurice GmbH, Saarbrücken, Germany - *Grant Holder*
Julian Gardner, University of Warwick, UK
Rod Jones, University of Cambridge, UK
Giorgio Sberveglieri, University of Brescia, Italy
Eduard Llobet, Universitat Roviri i Virgili, Tarragona, Spain
Thomas Kuhlbusch, IUTA eV, Duisburg, Germany
Albert Romano-Rodriguez, Universitat de Barcelona (UB), Spain
Carlos Borrego, IDAD, University of Aveiro, Portugal
Annamaria Demarinis Loiotile, University of Bari, Italy - *Secretary*

URL: www.cost.eunetair.it



Thursday, 25 February 2016

COST Action TD1105 EuNetAir WORKSHOP

**hosted at FFG - Austrian Research Promotion Agency - AT COST Association
Sensengasse 1, 1090 Vienna, Austria**

09:00 - 18:00 COST Event Registration

Welcome Address

09:30 - 10:00 *Chairperson: Anton Köck, Local Organizing Committee Chair and MC AT Member - Materials Center Leoben Forschung GmbH (MCL), Leoben, Austria*

Welcome: Austrian COST Association - FFG, Austria
Nicole Schmidt, Member of AT CNC COST Association, Austria

Welcome: Material Center Leoben Forschung GmbH
Anton Köck, Delegate MCL, Leoben, Austria

Welcome: COST Action TD1105 EuNetAir
Michele Penza, Action Chair, ENEA, Brindisi, Italy

Session 1 - Plenary Session

10:00 - 11:00 *Chairperson: Anton Köck, Local Organizing Committee Chair and MC AT Member - Materials Center Leoben Forschung GmbH (MCL), Leoben, Austria*

10:00 - 10:30 **COST Action TD1105: European Network on New Sensing Technologies for Air-Pollution Control and Environmental Sustainability. Overview and Plans of COST Action TD1105**
Michele Penza, Action Chair, ENEA, Brindisi, Italy

10:30 - 11:00 **Air Quality Current Status in Europe**
Cristina Guerreiro, EEA Report Leader, NILU - Norwegian Institute for Air Research, Kjeller, Norway

11:00 - 11:30 Coffee Break

Session 2 - Environmental Informatics and AQ Sensors Calibration

11:30 - 13:00 *Chairperson: Michele Penza, Action Chair - ENEA, Brindisi, Italy*

11:30 - 12:00 **Air Quality Modelling at Different Scales**
Camillo Silibello, WG Member, Project manager, ARIANET srl, Milan, Italy

12:00 - 12:20 **Challenges for Environmental Information Services Resulting from Sensors Integrated to Smartphones**
Kostas Karatzas, Aristotle University of Thessaloniki, Greece

12:20 - 12:40 **A New Approach for On-site Calibration and Calibrated Quantification of VOCs with Low-Cost Sensors**
Andreas Schuetze, Action WG2 Leader & MC Member, Saarland University, Saarbrücken, Germany

12:40 - 13:00 **Noise-Based Techniques for Gas Sensing**
Dionyz Pogany, Vienna University of Technology, Institute for Solid State Electronics, Vienna, Austria

13:00 - 14:30 Lunch Break



Session 3 - Sensors for Environmental Sustainability

14:30 - 16:00 *Chairperson: Andreas Schuetze, Action WG2 Leader & MC Member, Saarland University, Saarbrücken, Germany*

14:30 - 15:00 **New Strategies for Odor Annoyance Assessment: from Sampling to Dispersion Modelling**
Carlos Borrego, IDAD and University of Aveiro, MC Member, Aveiro, Portugal

15:00 - 15:20 **Use of Novel Sensor Technologies in the Environmental Health and Climate Change Domain: The Citi-Sense-MOB Experience in Oslo, Norway**
Nuria Castell-Balaguer, NILU - Norwegian Institute for Air Research, MC Member, Kjeller, Norway

15:20 - 15:40 **O₃ and NO₂ Sensor Network in Zurich: Operation and Strategies for QA/QC**
Michael Mueller, WG Member, EMPA, Zurich, Switzerland

15:40 - 16:00 **On Field Stochastic Calibration of Fast Indicative Air Quality Sensing Systems with Dynamic Approaches**

Saverio De Vito^a, E. Esposito^a, M. Salvato^a, V. Bright^b, R. L. Jones^b, O. Popoola^b
^a ENEA, CR Portici (Napoli), Italy; ^b Dept. Of Chemistry, University of Cambridge, Cambridge, UK

16:00 - 16:30

Coffee Break

Session 4 - Modelling and Applications for Air Quality Control

16:30 - 18:00 *Chairperson: Carlos Borrego, MC Member, IDAD and University of Aveiro, Aveiro, Portugal*

16:30 - 16:50 **The Air Pollution in the Cross-Border Region Turkey-Bulgaria: Model Simulations vs. Measurements**
Emilia Georgieva, Bulgarian Academy of Sciences, WG Member, Sofia, Bulgaria

16:50 - 17:10 **Chemical Characterization of the Sea Surface and Ambient Marine Aerosols of Middle Adriatic Area During Spring and Summer Seasons**
Ana Cvitešić¹, Sanja Frka^{1,2}, Ana Kroflič², Martin Šala², Irena Grgič², Irena Ciglencički¹
¹ Laboratory for Physical Chemistry of Aquatic Systems, Division for Marine and Environmental Research, Rudjer Boskovic Institute, Zagreb, Croatia
² Analytical Chemistry Laboratory, National Institute of Chemistry, Ljubljana, Slovenia

17:10 - 17:30 **Evaluation of Monitoring PM with Low-Cost Monitor and Conventional Devices**
Milena Jovašević-Stojanović¹, Alena Bartonova², Dušan Topalović^{3,1}, Miloš Davidović¹, Ivan Lazović¹, Zoran Ristovski⁴
¹ Vinča Institute of Nuclear Sciences, University of Belgrade, Belgrade Serbia
² NILU Norwegian Institute for Air Research, Kjeller, Norway
³ School of Electrical Engineering, University of Belgrade, Belgrade, Serbia
⁴ LAQH, Queensland University of Technology, Brisbane, Australia

17:30 - 17:50 **Complexity of Softcomputing Models for Big Data Processing**
Vera Kurkova, MC Member, Institute of Computer Science, Academy of Sciences of the Czech Republic, Prague, Czech Republic

18:00 *Gathering of Day*

20:00 - 23:00

Social Dinner



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Friday, 26 February 2016

COST Action TD1105 EuNetAir WORKSHOP

**hosted at FFG - Austrian Research Promotion Agency - AT COST Association
Sensengasse 1, 1090 Vienna, Austria**

09:00 - 16:00 COST Event Registration

09:00 - 11:00 Session 5 - Advanced Materials for Chemical Sensors

Chairperson: Michele Penza, Action Chair - ENEA, Brindisi, Italy

09:00 - 09:20 Functionalization of Carbon Nanomaterials: Towards Devices for the Molecular Recognition of Aromatic Compounds in the Environment

Eduard Llobet, MC Member, Universitat Roviri I Virgili, Tarragona, Spain

09:20 - 09:40 MSDI Heterojunctions, How Conductivity and Impedance Allow for Discrimination between Ammonia and Humidity

M. Bouvet¹, T. Sauerwald², M. Schüler², J.-M. Suisse¹, A. Schütze², ¹Université de Bourgogne, Institut de Chimie Moléculaire, MC Member, Dijon, France; ²Saarland University, Action WG2 Leader & MC Member, Saarbrücken, Germany

09:40 - 10:00 Site-Selective Synthesis of SnO₂ Nanowires for Ammonia Sensing in the Presence of High Levels of Humidity

J. Samà¹, S. Barth², G. Domènech-Gil¹, J.D. Prades¹, O. Casals¹, F. Hernández-Ramírez^{1,3}, I. Gracia⁴, C. Cané⁴, A. Romano-Rodríguez¹, MC Substitute, ¹Universitat de Barcelona, Barcelona, Spain; ²Technical University of Vienna; ³IREC, Barcelona, Spain; ⁴CSIC-CNM-IMB, Bellaterra, Spain

10:00 - 10:20 Developing Air Quality Sensors by Laser Deposition on Graphene

Raivo Jaaniso, Institute of Physics, University of Tartu, Estonia

10:20 - 10:40 Metal Loaded Titania Nanostructures for Air Quality Sensors

E. Sennik and Zafer Ziya Ozturk, Gebze Technical University, Kocaeli, Turkey

10:40 - 11:00 Monitoring of Hydrocarbon Contamination Gas and Emission from Water using Pervaporation Membrane Unit and MOX Sensors

Alexey A. Vasiliev^{1,2}, ¹National Research Center "Kurchatov Institute", Moscow, Russia; ²Institute of Problems of Chemical Physics, Chernogolovka, Moscow region, Russia

11:00 - 11:30 Coffee Break

11:30 - 13:00 Session 6 - Sensors and Systems for Air Quality Control

Chairperson: Eduard Llobet, MC Member, Universitat Roviri I Virgili, Tarragona, Spain

11:30 - 12:00 Environmental Sensors and Miniaturization

Martin Schrems, ams AG, Director R&D, Unterpremstätten, Austria

12:00 - 12:20 What Brings Formaldehyde's Continuous Monitoring to the Analysis of Building's Air Quality and Ways to Manage/Improve it?

Frederic Hammel, Ethera, Gif-sur-Yvette Cedex, France

12:20 - 12:40 CMOS Infrared Emitters and Detectors for Environmental Monitoring

Foysoyl Chowdhury, Action WG Member, CCMOSS Ltd, Cambridge, UK

12:40 - 13:00 Concepts for Mobile Sensing of Inorganic Nitrogenous Pollutants in Exhaust and the Atmosphere

Martin Kraft, CTR Carinthian Tech Research AG, Photonics Systems, Villach, Austria



13:00 - 14:30

Lunch Break

14:30 - 15:30

Session 7 - Poster Session

Chairperson: Marcel Bouvet, MC Member, Université de Bourgogne, Dijon, France

MATERIALS, SENSORS, SYSTEMS AND METHODS FOR AIR QUALITY MONITORING

Posters will be presented using exhibition panels, preferably by Early Stage Researchers.
Posters are listed as-received.

- P01** **Long-Term Trends in Concentration of SO₂ Near Copper Smelter Bor - Serbia**
V. Tasić¹, T. Apostolovski-Trujić¹, M. Jovašević-Stojanović², N. Milošević¹
¹Mining and Metallurgy Institute Bor, Zeleni bulevar 35, 19210 Bor, Serbia;
²University of Belgrade, VINCA Institute of Nuclear Sciences, Belgrade, Serbia
- P02** **Indoor Environment and Respiratory Health of Older People in Elderly Care Centers**
Ana Sofia Mendes, Cristiana Pereira, Livia Aguiar, João Paulo Teixeira, National Institute of Health, Porto, Portugal
- P03** **Perylene-based MSDI Heterojunctions for Ammonia Sensing in Genuine Atmosphere**
A. Wannebroucq, J.-M. Suisse, M. Bouvet, Université de Bourgogne, Institut de Chimie Moléculaire, MC Member, Dijon, France
- P04** **The Methodological Approach to a Health Impact Assessment (HIA) for Promoting Sustainable and Healthy Community in Val d'Agri (Basilicata - Italy)**
Annamaria Demarinis, Gianluigi De Gennaro, Stefania Petraccone, University of Bari, Department of Biology, Core-Group Member, Bari, Italy
- P05** **Comparison of Multivariate Linear Regression and Artificial Neural Networks for Calibration of Low Cost Electrochemical Sensors for CO and O₃**
Dusan Topalovic¹, Milos Davidovic¹, Zoran Ristovski², Milena Jovasevic-Stojanovic¹, 1) Action MC Member, Institute Vinca, Belgrade, Serbia; 2) QUT, Brisbane, Australia
- P06** **Some Practical Aspects of Predictor Variables Layer Creation for LUR Modeling of Air Pollution in Belgrade**
Milos Davidovic, Dusan Topalovic, Milena Jovasevic-Stojanovic, Action MC Member, Institute Vinca, Belgrade, Serbia
- P07** **CMOS Integrated Nanocrystalline SnO₂ Gas Sensors for Air Quality Control**
Eva Lackner, J. Krainer, R. Wimmer-Teubenbacher, C. Gspan, K. Rohrer, E. Wachmann, A. Köck, Materials Center Leoben Forschung GmbH, Leoben (Austria)
- P08** **CMOS Integrated Tungsten Oxide Nanowire Networks for ppb-Level H₂S Sensing**
Johanna Krainer, E. Lackner, R. Wimmer-Teubenbacher, C. Gspan, K. Rohrer, E. Wachmann, A. Köck, Materials Center Leoben Forschung GmbH, Leoben (Austria)
- P09** **Opto-Chemical Sensor Systems based on Electrospun Nanofibers for Ultra-Fast Oxygen Detection and Their Application in Exhaled Breath Gas Analysis**
C. Wolf, Stefan Köstler, Joanneum Research, Materials, Graz (Austria)
- P10** **A Nanosecond Luminescence Lifetime Measurement System for Optical Sensing**
A. Tschepp, H. Wang, C. Wolf, G. Mohr, C. Salthouse, Stefan Köstler, Joanneum Research, Materials, Graz (Austria)
- P11** **The Influence of Nb on Surface Chemistry and Morphology of TiO₂ Nanotubular Arrays**
M.Kwoka¹, V. Galstyan², E. Comini², A. Kuliś¹, J.Szuber¹
¹Institute of Electronics, Silesian University of Technology, Gliwice, Poland
²SENSOR Lab, Department of Information Engineering, Brescia University, and CNR-IDASC, Brescia, Italy



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15:30 - 17:00

Session 8 - Keynote Presentations: Case-Studies on Air Quality Sensors

Chairperson: Michele Penza, Action Chair - ENEA, Brindisi, Italy

15:30 - 16:00

AirSenseEUR: An Open-source Multi-Sensor Platform for Air Quality Monitoring

Michel Gerboles, L. Spinelle, A. Kotsev, M. Signorini, JRC, EC DG ENV, Institute for Environment and Sustainability, Ispra, Italy

16:00 - 16:20

FLAMENCO: Air Quality Sensing in Flanders Mobile Enacted Citizen Observatories

Jan Peters and Jan Theunis, VITO, Mol, Belgium

16:20 - 16:50

FP7 Project MSP - Multi Sensor Platform for Smart Building Management: Status and Progress

Anton Köck, Materials Center Leoben Forschung GmbH, MC Member, Leoben, Austria

16:50

Conclusions

Michele Penza, ENEA, Brindisi, Italy

17:00

Closure of COST Action TD1105 *EuNetAir* WORKSHOP



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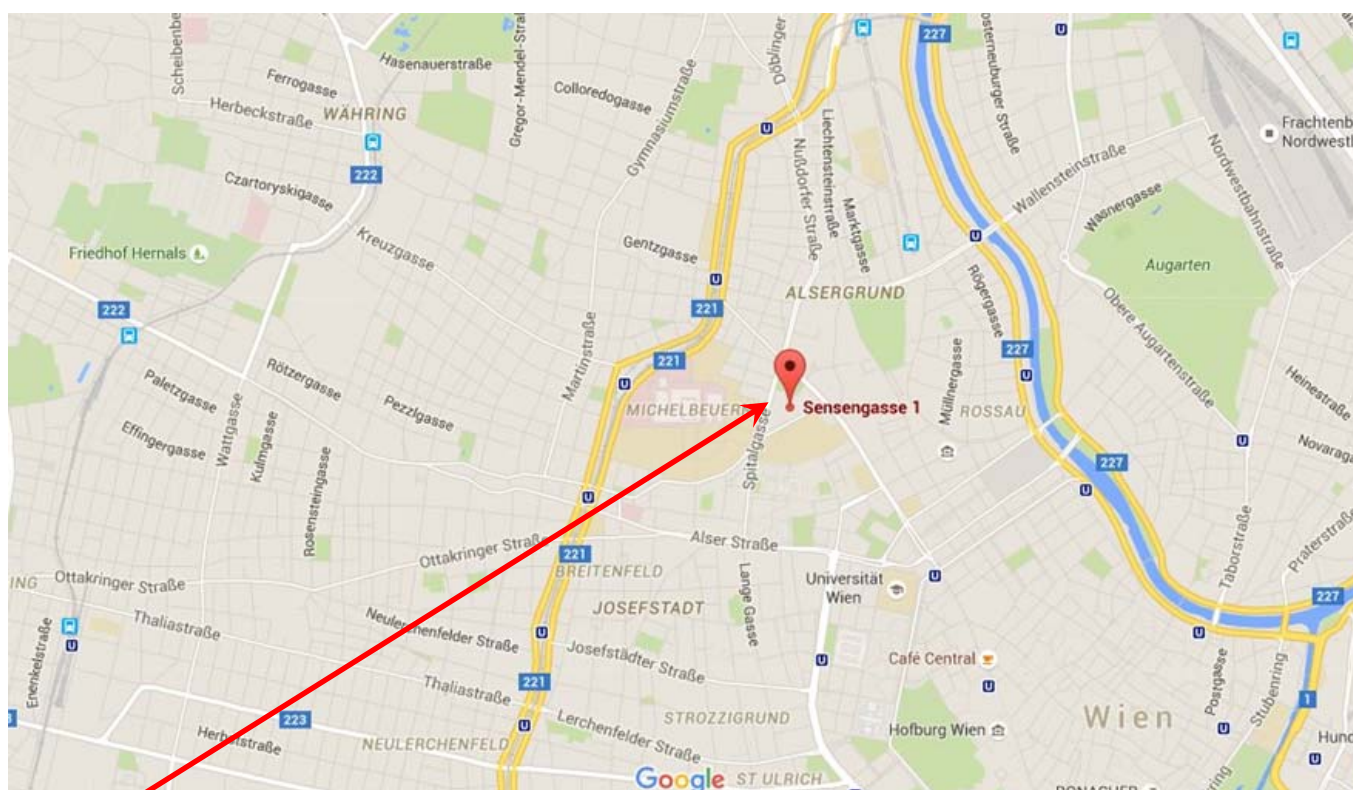


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4th Action Workshop Venue/Location of COST Action TD1105 EuNetAir
FOURTH INTERNATIONAL ACTION WORKSHOP on
Innovations and Challenges for Air Quality Control Sensors
Vienna (Austria), 25 - 26 February 2016

hosted at FFG - Austrian Research Promotion Agency - AT COST Association
Sensengasse 1, 1090 Vienna, Austria (Room "Franziska Seidl", Ground Floor)



Venue: FFG - Austrian Research Promotion Agency - AT COST Association, Sensengasse 1, 1090 Vienna, Austria

The House of Research is located in the ninth District of Vienna near the General Hospital (AKH) and the University campus.
GPS Coordinates (WGS-84): N 48°13'11" - E 16°21'11"

How to reach us by public transport

The No. 5 and 33 trams stop right in front of the House of Research ("Lazarettgasse" stop).

... from Hauptbahnhof railway station:

No. 13A bus bound for Skodagasse, get off at the "Laudongasse" stop and change to No. 5 tram bound for Praterstern or No. 33 bound for Friedrich-Engels-Platz; get off at "Lazarettgasse".

... from the airport:

Take the S-Bahn or the City-Airport Train to Wien-Mitte, change to U4 metro bound for Heiligenstadt; get off at "Friedensbrücke" and change to No. 5 tram bound for Westbahnhof; get off at "Lazarettgasse".