European Federation of Clean Air and Environmental Protection Associations (EFCA)
International Symposium

**Ultrafine Particles**

Sources, Effects, Risks and Mitigation Strategies

in conjunction with AirMonTech

Brussels, Belgium
May 16 and 17, 2013
Ultrafine particles, briefly named UFP, are the smallest constituents of airborne particulate matter, and are considered to be an important factor in causing serious health problems and environment effects. They may nucleate as a result of combustion processes or form from volatile precursor gases via atmospheric photochemical reactions, thus showing a clear link to gaseous pollution. More recently, the direct emission of man-made nanoparticles in the various stages during their lifecycle has attracted considerable attention.

The effects of UFP on air quality, atmospheric processes such as cloud formation and precipitation, climate influence and human health are by far not finally investigated to proven evidence.

Targeting on the decrease of the exposure to particulate matter, European regulations have been set but focused on the larger fractions of particulate matter, certainly due to a lack of awareness, knowledge and measurement technology on UFP. Because of their relative small contribution to the mass of particulate matter gravimetric monitoring may not properly reflect its risk. Therefore, EFCA has recently recommended to include black carbon particles (BCP) as an additional indicator for public health protection in the European Air Quality Directive, also considering the contribution of Black Carbon to global warming.

The 4th EFCA Ultrafine Particles Symposium 2013 will reflect the most recent scientific progress in the field and aims to contribute to the dialogue with policymakers in Europe. Launched in 2007 in Karlsruhe, Germany, the EFCA-UFP Symposium has gained visibility by moving to Brussels. Now EFCA and KIT together with GUS and CEEES jointly feature this event again. We cordially invite all experts for active contributions. Meet your colleagues again and see you in Brussels in May 2013.

Thomas Leisner
Chairman
### 16 May 2013

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### Day one

**Thursday, 16 May**

09:45  **AirMonTech Workshop**  
Separate registration required,  
[www.airmontech.eu](http://www.airmontech.eu)  
Programme details see page 12

13:00  Lunch

### UFP Plenary Opening – Session A, 16 May, 13:45 – 15:00

**Session Chair: Thomas Leisner**

13:45  **Welcome and Greetings UFP Symposium**  
Representatives of the State of Baden-Württemberg,  
the Ministry for Environment Baden-Württemberg,  
EFCA and KIT

14:00  **Keynote:** Toxicology and biodistribution of ultrafines  
Flemming Cassee, RIVM, Bilthoven, Netherlands

14:30  **Keynote:** Aerosol mass spectrometry, source attribution and secondary aerosols  
André Prévôt, PSI, Villingen, Switzerland

15:00  Coffee Break
Day one, Thursday, 16 May

Monitoring of UFP – Session B, 15:30 – 16:50
Chairman: Karl-Friedrich Ziegahn

Dresden – An UFIREG project measurement station with an extensive quality assurance program
Susanne Bastian, Saxon State Office for Environment, Agriculture and Geology, Germany

Ultrafine particles at the regional background in 2005 – 2010 and down-wind of an airstrip and an industrial area in the Netherlands
Menno Keuken, TNO, Utrecht, The Netherlands

Seasonal and diurnal pattern of particle number concentration and size distribution at traffic exposed, urban background and rural sites in Po Valley, Italy.
Giovanni Lonati, Politecnico di Milano, Italy

Chemical characterization of ultrafine particles in a midsized city in the Po valley
Senem Ozgen, Politecnico di Milano, Italy

Health Effects – Session C, 15:30 – 16:50
Chairman: Flemming Cassee

Ultrafine particles are not major carriers of carcinogenic PAHs and their genotoxicity in size-segregated aerosols
Jan Topinka, Institute of Experimental Medicine, AS CR, Prague, Czech Republic

Air-liquid interface exposure system for in vitro toxicological studies of combustion aerosols in the HICE project
Hanns-Rudolf Paur, ITC, KIT, Germany

Chemical characterization and evaluation of toxicological effects on human bronchial epithelial cells BEAS-2B of fine and ultrafine airborne particles collected in Lebanon
Mireille Borgie, Université Lille Nord de France, Lille, France

Biokinetics of inhaled Ir-192 nanoparticles
Rachel Smith, Nanotoxicology Research Centre, PHE, Oxfordshire, UK

16:50 Coffee Break
Monitoring of UFP – Session D, 17:10 – 18:30
Chairman: John Murlis

Comprehensive chemical characterisation of UFPs within the German Ultrafine Aerosol Network
Sebastian Scheinhardt, TROPOS, Leipzig, Germany

Aerosol size distribution clustering and comparison with other air quality parameters in two Spanish cities
Mariola Brines, IDAEA-CSIC, Barcelona, Spain

Analysis of atmospheric pollution level during the wintertime
Fabian Lenartz, ISSeP, Liège, Belgium

The use of mobile air quality measurements to assess the spatial and temporal variability of urban UFP and BC concentrations
Jan Peters, VITO, Mol, Belgium

Methods and Instruments – Session E, 17:10 – 18:30
Chairman: Sander Teeuwisse

Particle Number PN complementing Particle Mass PM for vehicle engine emission measurement
Andreas Mayer, TTM Technik Thermische Maschinen, Niederrohrdorf, Switzerland

Comparison of UFP concentration and size distribution instruments at an urban site
Jeroen Staelens, VMM, Belgium

Chemical characterization of PM in a residential area in Beijing, China.
K. Schäfer et al, IMK-IFU, KIT, Germany

Micro SOA chamber: a tool for the evaluation of the secondary organic aerosol production potential from wood burning appliances
Alejandro Keller, University of Applied Sciences North-western Switzerland, Windisch, Switzerland
Poster Session and Buffet  
18:30 – 20:00

Size fraction determination of tree crown deposited particles in an urban street canyon.
Jelle Hofman et al, Univ. of Antwerp, Belgium

Nanometer particles in the air of Raciborz and Zabrze in Poland during smog episodes in 2010.
L. Osródka et al, IMWM–NRC, Katowice, Poland

Catalytic stripper technology enables measurement of solid particle size and concentration.
H.-J. Schulz et al, Catalytic Instruments GmbH & Co. KG, Rosenheim, Germany

Change of morphology of soot particles by UNECE Reg. 83 treatment.
Tristan Reinisch et al, AVL List GmbH, TU Graz, Austria

Ultraschwarz – Ultrafine particles and health in the Ore Mountains: Annaberg-Buchholz (Germany) and Ústí nad Labem (Czech Republic).
Alexander Schladitz et al, Saxon State Office for Environment, Agriculture and Geology, Dresden, Germany

Effects of traffic congestion and extended idling on heavy duty diesel truck fine particle emissions.
Michal Vojtisek-Lom et al, Techn. Univ. Liberec, Czech Republic

UFIREG project: Ultrafine particles – an evidence-based contribution to the development of regional and European environmental and health policy.
Josef Cyrys et al, Helmholtz Zentrum München, Germany

Monitoring and modelling ambient PM2.5-10 in the city of Nijmegen.
Keesjan Valk et al, Witteveen+Bos, Netherlands

On the correlation of black carbon, filter smoke number and particulate matter related elemental carbon measured at large medium-speed 4-stroke diesel engines engaged in international shipping.
Peter Lauer, MAN Diesel & Turbo SE, Augsburg, Germany
New measurement system for PM and ultrafine particles.  
Jürgen Spielvogel et al, Palas® GmbH, Karlsruhe, Germany

Modelling the dynamics of ultrafine particles.  
R. Guichard et al, INRS, Vandoeuvre-lès-Nancy, France

A new device for unattended long-term measurement of UFP.  
B. Pirenne et al, Grimm Aerosol Technik GmbH & Co KG,  
Ainring, Germany

Monitoring of major acidic species in PM10 particle fraction in Zagreb air, Croatia.  
Mirjana Cackovic et al, IMI, Zagreb, Croatia

Development towards a German national aerosol standard for number concentrations of soot particles in PTB.  
Andreas Nowak et al, PTB, Braunschweig, Germany

End of first day

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Day two  
Friday, 17 May

**Keynotes, Session F, 17 May, 09:00 – 10:10**  
Chairman: Thomas Leisner

09:00  **Keynote:** Sources, formation mechanisms and physicochemical properties of UF  
Constantinos Sioutas, USC, Los Angeles, USA

09:35  **Keynote:** Ultrafine particles and neurodegenerative diseases  
Roel Schins, IUF Düsseldorf, Germany

10:10  Coffee Break
Methods and Instruments/Emission Sources – Session G, 10:40 – 12:00
Chairman: Giuseppe Fumarola

Miniature electrical aerosol sensors for the measurement of lung-deposited surface area
Martin Fierz, naneos particle solutions GmbH, Windisch, Switzerland

UFP measurements at indoor and outdoor microenvironments
Giovanni Lonati, Politecnico di Milano, Italy

Fugitive fine and ultrafine particle emissions from steelworks: source characterization and ambient air mapping with a mobile laboratory
Frank Drewnick, Max Planck Institute for Chemistry, Mainz, Germany

Evolution of morphology and chemical composition of fine particles emitted by a Fe-Mn metallurgy plant during the NANO-INDUS campaign
Alodie Blondel, Université du Littoral Côte d’Opale, Dunkerque, France

Modelling and Dynamics of UFP – Session H
10:40 – 12:00
Chairman: Manfred Neuberger

On the Spatial Distribution and Evolution of Ultrafine Aerosols in Urban Air in Barcelona, Spain
Manuel Dall’Osto, IDÆA-CSIC, Barcelona, Spain

Modelling of particle number size distribution over Europe with chemistry transport model LOTOS-EUROS
Astrid Manders, TNO, Utrecht, the Netherlands

Short-term urban and residential monitoring of UFP concentration and size distribution
Patrick Berghmans, VITO, Mol, Belgium

Number concentrations and dynamics of airborne nanoparticles in cities
Prashant Kumar, FEPS, University of Surrey, Guildford, United Kingdom

Emission Sources – Session I, 13:00 – 14:20
Chairman: Harald Saathoff

Size-resolved particle emission factors for individual ships
Asa Hallquist, IVL, Gothenburg, Sweden

Influence of diesel engine operating parameters on the physicochemical properties of emitted soot particles
Wolfgang Mühlbauer, LTTT- BERC, University of Bayreuth, Germany

Ultrafine particle emissions from residential combustion in Europe and their dependence on fuel quality and appliance type
Hugo Denier van der Gon, TNO, Utrecht, The Netherlands

Release of engineered nanoparticles during waste incineration – stability of nanoparticle agglomeration in flames
Inge-Maria Liesen, ITC-KIT, Germany

Epidemiology and Indoor Air – Session J
13:00 – 14:20
Chairperson: Vladimira Vadjic

Exposure of schoolchildren to UFP and other traffic-related air pollution: the HEAPS study
Martine Van Poppel, VITO, Mol, Belgium

Selection of key ambient particulate variables for epidemiological studies - applying cluster and heatmap analysis as tools for data reduction
Josef Cyrys, Helmholtz Zentrum München, Neuherberg, Germany

Indoor and outdoor ultrafine particles levels in primary schools in Barcelona
Ioar Rivas, CREAL and IDÆA-CSIC, Barcelona, Spain

Dangerous contamination in inns, even in designated non-smoking rooms
Manfred Neuberger, Austrian Academy of Sciences, Medical University of Vienna
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Manfred Neuberger, Austrian Academy of Sciences, Medical University of Vienna
Closing Session – Session K, 14:40 – 16:00
Chairman: Thomas Leisner

14:40  **Keynote:** EU air policy review
Andre Zuber, DG ENV, European Commission, Brussels

Particulate emissions and their control at modern small-scale wood combustion boilers
Hanns-Rudolf Paur, ITC, KIT, Eggenstein-Leopoldshafen, Germany

Particle number (N) and black carbon (BC) in current urban air quality networks in Europe
Mar Viana et al, IDÆA-CSIC, Barcelona, Spain

15:40  Closing Remarks

16:00  Closure
Venue
Representation of the State of Baden-Württemberg to the EU
Rue Belliard 60-62
B-1040 Brussels

Conference Chairman
Thomas Leisner
Karlsruhe Institute of Technology (KIT)

Social Programme
Conference buffet on 16th May at 18.30.

Conference Secretariat
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Registration and Accommodation
Registration details available at ufp.efca.net
AirMonTech Workshop, May 16, 9:45 – 13:00

9:45  Welcome and Introduction  
Thomas Kuhlbusch, IUTA, GER and Thomas Reichert, EFCA

10:15  European Commission perspectives  
José Jiménez-Mingo, DG Research & Innovation, EU

10:40  Health effects of air pollution – implications for AQ monitoring  
Michal Krzyzanowski, formerly WHO

11:10  AQ monitoring technologies: current state and future options  
Robert Gehrig, EMPA, Switzerland / Ulrich Quass, IUTA, Germany

11:55  The AirMonTech database  
Annette Borowiak, JRC Ispra, EU

12:10  AirMonTech recommendations and research roadmap  
Paul Quincey, NPL, United Kingdom

12:40  Discussion and closing words  
Thomas Kuhlbusch, IUTA, Germany

Please register additionally online at www.airmontech.eu  
The participation in the AirMonTech Workshop only is free.
Giuseppe Fumarola, University of L’Aquila, Italy
Hans Gygax, Cerc’Air, Switzerland
Marie Haeger-Eugensson, SCAS, Sweden
Jean-Marie Haguenoer, APPA, France
Walter Kofler, ASASPP, Austria
Richard Mills, IUAPPA, United Kingdom
Abdurrahman Bayram, TUNCAP, Turkey
John Murlis, EP-UK, United Kingdom
Rudolf Neuroth, KRdL in VDI and DIN, Germany
Gordana Pehnec, CAPPA, Croatia
Tinus Pulles, VVM-CLAN, The Netherlands
Bjarne Sivertsen, NILU, Norway
Sanni Turunen, FAPPS, Finland
Krzysztof Zareba, PIGEKO, Poland
Giuseppe Zerbo, CSIA / ATI, Italy
Karl-Friedrich Ziegahn, KIT and GUS, Germany
Peter Bruckmann, Landesamt für Natur, Umwelt und Verbraucherschutz Nordrhein Westfalen (LANUV), Recklinghausen, Germany

Urs Baltensperger, Paul Scherrer Institut, Villigen PSI, Switzerland

Flemming Cassee, Dutch National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands

Wolfgang Kreyling, Helmholtz Center for Environment and Health, München, Germany

Markku Kulmala, University of Helsinki, Department of Physical Sciences, Finland

Manfred Neuberger, Institute for Environmental Hygiene, Medical University of Vienna, Austria

Xavier Querol, Consejo Superior de Investigaciones Científicas (CSIC), Barcelona, Spain

Rachel Smith, Nanotoxicology Research Centre, PHE, Oxfordshire, United Kingdom

Claire Segala, SEPIA, Paris, France

Ulrich Teipel, University of Applied Sciences, Nürnberg, Germany

Vladimira Vadjic, Institute for Medical Research and Occupational Health, Zagreb, Croatia

Bernhard Vogel, Institute for Meteorology and Climate Research, Karlsruhe Institute of Technology, KIT, Germany
HOST ORGANIZATIONS

KIT | Karlsruhe Institute of Technology
KIT bundles the missions of both precursory institutions: A university of the state of Baden-Württemberg with teaching and research tasks and a large-scale research institution of the Helmholtz Association conducting program-oriented provident research on behalf of the Federal Republic of Germany. Within these missions, KIT is operating along the three strategic fields of action of research, teaching, and innovation. www.kit.edu

EFCA | The European Federation of Clean Air and Environmental Protection Associations aims at encouraging professional activity in Europe while working at the interface between science and (European) policy on environmental problems. www.efca.net

GUS | Gesellschaft für Umweltsimulation e.V (Society for Environmental Engineering). It is the organization of people, institutions and companies who work in environmental engineering and testing. Since 1969, GUS supports the development of environmental engineering on a non-profit basis. www.gus-ev.de

CEEES | The Confederation of European Environmental Engineering Societies is the umbrella organisation of national technical societies for environmental engineering and testing. CEEES promotes technical advisory boards, seminars and conferences with the support of national member societies. www.cee.es.org

AirMonTech | Air Pollution Monitoring Technologies for Urban Areas is a European research project with the aim to identify trends and new monitoring devices, to set-up a dedicated database for all stakeholders on monitoring metrics and techniques, and to develop a research roadmap for future urban air quality monitoring. The consortium comprises 9 partners from leading European research organisations. www.airmontech.eu
Symposium Chairman
Thomas Leisner, Institute for Meteorology and Climate Research, Karlsruhe Institute of Technology, KIT, Germany

Organizing Committee
Thomas Reichert
Fraunhofer ICT and GUS, President of EFCA, Germany
Joop van Ham
EFCA, The Netherlands
Klara Langer
Karlsruhe Institute of Technology (KIT), Germany
Sabine Aref
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Angela Richter
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Biserka Mathes
Karlsruhe Institute of Technology (KIT), Germany
Harald Saathoff
Karlsruhe Institute of Technology (KIT), Germany
Thomas A.J. Kuhlbusch
IUTA, Germany

Proceedings
Presentations and Posters will be published electronically after the Symposium.

Website
Updates on the symposium are to be found at: ufp.efca.net

Accomodation
Please book your rooms directly. Participants have booked mainly at Hotel First Euroflat and Argus Hotel Brussels.

Information
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