

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

# Ultrafine Particles – Air Quality and Climate

Brussels, Belgium  
July 5 and 6, 2022

## Program



### **KIT | Karlsruhe Institute of Technology**

Karlsruhe Institute of Technology (KIT) pools its three core tasks of research, higher education, and innovation in a mission. The KIT Climate and Environment Center develops strategies and technologies to secure the natural bases of life.  
**[www.kit.edu](http://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](http://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](http://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.ccees.org](http://www.ccees.org)**

Ultrafine particles (UFP), the nano fraction of airborne particulate matter, are considered to be causing serious health problems and environmental effects. Combustion is a major source, also by producing volatile organic pollutants which are converted in the atmosphere through photochemical reactions.

Increasing applications of man-made nanomaterials add to the problem, e.g. after incineration at the end of their lifetime. A further interest in UFP's results from their specific role in atmospheric processes such as cloud formation and precipitation and, in fact, in climate.

The relation between UFP and human health and that of UFP and climate are both areas of active research and cross-links between these fields are found nowadays. The subtitle of the conference series: **“air quality and climate”** reflects this development.

Present policies to decrease exposure to particulate matter make use of the mass-based metrics PM10/PM2.5, which do not properly represent all risks for human health. EFCA is, therefore, in favour of the development of a fraction-by-fraction approach on particulate matter, both with respect to size and chemical composition. It already recommended European policymakers the introduction of Black Carbon Particles as additional metric in the Air Quality Directive. The organizers trust that EFCA's 8th Ultrafine Particles Symposium 2022 will again feature the most recent scientific progress in the field and so contribute to policy-relevant developments which improve the dialogue with policymakers in Europe. The Symposium has gained visibility by permanently moving to Brussels and attracts an effective mix of EU representatives and scientists. EFCA and KIT, together with GUS and CEEES are pleased to organize this event again. We cordially invite all experts to contribute actively and hope to see you again at the State representation of Baden-Württemberg in Brussels in July, 2022.

Thomas Leisner | Chairman

PROGRAM

TUESDAY, 5 JULY | EUROPASAAL

10:00 – 10:30

Opening

10:30 – 11:15

Keynote Session A

11:15 – 12:35

Session B – UFP Sources

Lunch  
FOYER/PATIO

13:35 – 14:20

Keynote Session C

14:20 – 15:40

Session D – Methods

Coffee Break  
FOYER

16:00 – 17:40

Session E – Urban Aerosols I

17:40 – 19:30  
Poster Session F & Buffet  
FOYER/PATIO

WEDNESDAY, 6 JULY | EUROPASAAL

09:00 – 09:45

Keynote Session G

09:45 – 10:30

Keynote Session H

Coffee Break  
FOYER

10:45 – 12:25

Session I – Urban Aerosols II

Lunch  
FOYER/PATIO

13:25 – 14:45

Session J – Health Effects

Coffee Break  
FOYER

15:00 – 16:30

Panel Discussion –  
From Monitoring to Measures

## Tuesday, 5 July

### Opening Plenary

10:00 Representative of the State of Baden-Württemberg / Bodo Lehmann  
EFCA President / Andrzej Jagusiewicz  
Symposium Chairman / Thomas Leisner

### Keynotes – Session A

10:30 – 11:15 | Europasaal  
Session Chair: Thomas Leisner

10:30 **Plastic air pollution – what do we know?**  
Stephanie Wright  
Imperial College London, United Kingdom

## Session B – UFP Sources

11:15 – 12:35 | Europasaal  
Session Chair: Andreas Meyer

- 11:15 B.1  
**UFP monitoring campaigns at London Heathrow Airport**  
Brian Stacey  
Ricardo Energy & Environment, Harwell, Oxon, United Kingdom
- 11:35 B.2  
**Shipping as an aggressive sector of Ultrafine Particles (UFP) emissions**  
Andrzej Jagusiewicz  
President of EFCA, Poland
- 11:55 B.3  
**Variability of Airborne Ultrafine Particles in Number and Size within the Urban Neighbourhoods Close to a Major European Airport**  
Julius Seidler  
University of Bayreuth, Germany
- 12:15 B.4  
**On-board measurement of ultrafine non-exhaust particulate emissions from a battery electric vehicle**  
Linda Bondorf  
German Aerospace Center (DLR), Stuttgart, Germany
- 12:35 Lunch

## Keynote Session C

13:35 – 14:20 | Europasaal  
Session Chair: Thomas Leisner

13:35 **Ultrafine aerosol particles in the atmosphere:  
instrumentation and results**

Tuukka Petäjä  
University of Helsinki, Finland

## Session D – Methods

14:20 – 15:40 | Europasaal  
Session Chair: Harald Saathoff

14:20 D.1  
**Physico-chemical characterization and source  
apportionment of UFP at airport, harbour,  
subway and road: the nPETS experimental  
set-up in Barcelona**

Sharon Ridolfo  
IDAEA, Barcelona, Spain

14:40 D.2  
**Nanofiltration must be combined with  
laminar vertical flow to minimize Virus  
infection risk**

Andreas Mayer  
NanoCleanAir GmbH CEO, Niederrohrdorf,  
Switzerland

15:00 D.3  
**Method Optimization and Physico-chemical  
characterisation of UFPs**

Deeksha Shukla  
Helmholtz Zentrum München (HMGU), Germany

15:20 D.4  
**Method, equipment and exemplary results for  
harmonized UFP number and size distribution  
measurements following CEN/TS 16976 and  
CEN/TS 17434**

Torsten Tritscher  
TSI GmbH, Aachen, Germany

15:40 Coffee Break

## Session E – Urban Aerosols I

16:00 – 17:40 | Europasaal  
Session Chair: Ranka Godec

- 16:00 E.1  
**Equivalent BC properties during the COVID-19 spring 2020 lockdown period in Brussels, Belgium compared to non-lockdown periods**  
Alexander Mangold  
Royal Meteorological Institute of Belgium, Brussels, Belgium
- 16:20 E.2  
**Research Infrastructure's to evaluate advanced air quality parameters, including ultrafine particles, in urban Europe (RI-URBANS)**  
Xavier Querol  
Institute of Environmental Assessment and Water Research (IDÆA), Barcelona, Spain
- 16:40 E.3  
**Source apportionment of Black carbon (BC) particles in urban background in European cities in the frame of the RI-URBANS project**  
Marjan Savadkoobi  
Institute of Environmental Assessment and Water Research (IDÆA), Spain
- 17:00 E.4  
**Chemical characterization and source apportionment of PM<sub>2.5</sub> in two East-Mediterranean sites**  
Marc Fadel  
Université du Littoral Cote d'Opale, Dunkirk, France
- 17:20 E.5  
**Representing UFP urban background concentrations with the chemistry-transport model LOTOS-EUROS**  
Astrid Manders  
TNO, Utrecht, The Netherlands

## Poster Session F & Buffet

17:40 – 19:30 | Foyer/Patio

- F.1  
**Comparison of carbon mass concentrations in PM<sub>2.5</sub> and PM<sub>1.0</sub>**  
Ranka Godec  
Institute for medical research and occupational health, Zagreb, Croatia
- F.2  
**Relationship between chemical composition, source apportionment and oxidative potential of PM<sub>2.5</sub> in an East-Mediterranean site**  
Dominique Courcot  
University of Littoral Cote d'Opale, Dunkirk (ULCO), France
- F.3  
**Evaluation of air quality changes in a Chinese megacity over 2006 – 2021 using PM<sub>2.5</sub> receptor modelling**  
Anna Canals Angerri  
Institute of Environmental Assessment and Water Research (IDAEA-CSIC), Barcelona, Spain
- F.4  
**Mass concentration of water-soluble ions in PM<sub>2.5</sub> at a coastal urban background site in Croatia**  
Valentina Gluščić  
Institute for Medical Research and Occupational Health, Zagreb, Croatia
- F.5  
**Determining the influence of material structure and sizing on the comminution behaviour of carbon fibres**  
Jonathan Mahl  
Karlsruhe Institute of Technology, Karlsruhe, Germany
- F.6  
**The Investigated of Relative Variable Importance (RVI) and Strength of Interaction Effects (SIE) of fine-Particles and variables during Movement Control Order condition by using the Stochastic Boosted Regression Treestechinque.**  
Noor Yahaya  
Universiti Malaysia Teerengganu, Malaysia

- F.7 **Accounting PM Emissions in Life Cycle Assessment LCA**  
Peter Brantsch, Thomas Reichert,  
Fraunhofer ICT, Pfingst, Germany
- F.8 **A closer look at the invisible – unprecedented levels of ultrafine particles (UFP) and the hydrological cycle**  
Wolfgang Junkermann  
Karlsruhe Institute of Technology, Germany
- F.9 **Laboratory and on-road tests assessment of fine and ultrafine particle emission factors for Euro 6LPG passenger cars**  
Giovanni Lonati  
Politecnico di Milano, Italy
- F.10 **Impact of Ultrafine Particle Emissions from In-land Ferries**  
Sina Acksen  
Helmholtz-Zentrum Geesthacht, Germany

## EXHIBITORS

Envicontrol –  
environmental technologies



TSI GmbH



Grimm Aerosol Technik



[www.clean-aviation.eu](http://www.clean-aviation.eu)



AAVOS Environmental  
& Process Analysers



## Wednesday, 6 July

### Keynotes – Session G

09:00 – 09:45 | Europasaal  
Session Chair: Thomas Leisner

09:00 **Spatial Distribution of Combustion Related Ultrafine Particles in Innsbruck, Austria**  
Armin Hansel  
University of Innsbruck, Austria

### Keynotes – Session H

09:45 – 10:30 | Europasaal  
Session Chair: Thomas Leisner

09:45 **Exposure to iron-rich pollution nanoparticles: a specific risk to human brains and hearts?**  
Barbara Maher  
University of Lancaster, United Kingdom

10:30 Coffee Break

Session I – Urban Aerosols II

10:45 – 12:25 | Europasaal  
Session Chair: Xavier Querol

- 10:45 I.1  
**Carcinogenic organic compounds in PM1 particle fraction at an urban location with “canyon” effect**  
Ivana Jakovljević,  
Institute for Medical Research and Occupational Health, Zagreb, Croatia
- 11:05 I.2  
**Levels of carbohydrates in PM1 particulate matter emitted during wintertime**  
Suzana Sopčić  
Institute for Medical Research and Occupational Health, Zagreb, Croatia
- 11:25 I.3  
**Tuning sampling and analysis strategies for UFP: Laboratory and field tests with selected PAH-marker components**  
Elisabeth Eckenberger  
University of Bayreuth, Germany
- 11:45 I.4  
**Spatial and temporal variation of ultrafine particles in the Bavarian centres of the NAKO health study: Augsburg and Regensburg**  
Josef Cyrys  
Helmholtz Zentrum München (HMGU), Germany
- 12:05 I.5  
**Characterisation of inhalable aerosols from carbon fibres**  
Sonja Mülhopt  
Karlsruhe Institute of Technology,  
Karlsruhe, Germany
- 12:25 Lunch

Session J – Health Effects

13:25 – 14:45 | Europasaal  
Session Chair: Flemming Cassee

- 13:25 J.1  
**Relationships between oxidative potential of PM size, composition & source apportionment in urban & regional background in Barcelona, NE Spain**  
Marten in-t Veld  
Institute of Environmental Assessment and Water Research (IDÆA), Barcelona, Spain
- 13:45 J.2  
**Validation of an Aerosol Exposure Air-Liquid-Interface (AE-ALI) system to facilitate more realistic hazard identification of nano-sized aerosol exposure in human relevant culture models**  
Chang Guo  
CRCE, UK Health Security Agency (UKHSA, previously called PHE), Oxfordshire, United Kingdom
- 14:05 J.3  
**Functional Effects of Carbon Black Nanoparticles on Primary Airway Epithelial Cells in vitro**  
Totta Ehret Kasemo  
University Clinic Würzburg, Germany
- 14:25 J.4  
**Short term and long term exposure to UFP of Schiphol Amsterdam airport**  
Flemming R. Cassee  
RIVM, The Netherlands
- 14:45 Coffee Break



## **Panel Discussion**

### **From monitoring to measures – How to transfer science into societal and administrative action**

15:00 – 16:30

Session Chair: Karl-Friedrich Ziegahn

#### **Armin Hansel**

University of Innsbruck, Austria

#### **Barbara Maher**

University of Lancaster, United Kingdom

#### **Tuukka Petäjä**

University of Helsinki, Finland

#### **Stephanie Wright**

Imperial College London, United Kingdom

## **Statement**

“Air pollution is one of the greatest environmental risks to public health.”

“In recent years, ultrafine particles have been recognized as crucial because of their ability to reach the most distal lung regions and greatly impact the cardiovascular system.”

“A reduction of coal combustion, and other policy actions, can account for a noticeable decrease of gaseous and PM levels, and for a drastic reduction of metals in ambient air.”

“The identification of emission sources is of utmost importance to policymakers in order to implement policies to protect health and improve the air quality in the region.”

“The determination of health effects directly related to UFP as well as determination of emission sources and standardized emission monitoring is essential for successful air quality measures incorporating airborne UFP.”

## **Symposium Chairman**

#### **Thomas Leisner**

Institute for Meteorology and Climate Research,  
Karlsruhe Institute of Technology, KIT, Germany

## **Organizing Committee**

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Gesellschaft für Umweltsimulation (GUS)

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KIT Climate and Environment Center

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Fraunhofer ICT, EFCA and CEEES

#### **Angela Richter**

Helmholtz Gemeinschaft, Brussels Office

#### **Harald Saathoff**

Karlsruhe Institute of Technology (KIT)

## **Proceedings**

Presentations and Posters will be published electronically after the Symposium.

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## Venue

Representation of the State of  
Baden-Württemberg to the EU  
Rue Belliard 60-62  
B-1040 Brussels, Belgium



## Registration and Fee

Please register online via **ufp.efca.net**  
Participant fee: € 520,–  
Reduced fee for authors: € 350,–  
(one author per contribution)  
Including book of abstracts, conference proceedings,  
conference buffets and refreshments

## Information

### Karlsruhe Institute of Technology (KIT)

Institute of Meteorology and Climate Research

Susanne Bolz  
Kaiserstraße 12  
76133 Karlsruhe, Germany  
Email: [ufp@imk-aaf.kit.edu](mailto:ufp@imk-aaf.kit.edu)  
[ufp.efca.net](http://ufp.efca.net)

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Karlsruhe Institute of Technology (KIT)  
President Professor Dr.-Ing. Holger Hanselka  
Kaiserstraße 12  
76131 Karlsruhe, Germany  
[www.kit.edu](http://www.kit.edu)

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