

# 17<sup>th</sup> ETH Conference on Combustion Generated Nanoparticles

The Swiss Federal Office for the Environment is Patron of this Conference  
Zurich, June 23<sup>rd</sup> – 26<sup>th</sup>, 2013

Conference Venue: Zürich ETH Zentrum, Main Building, HG E7  
Welcome-Party 23<sup>rd</sup> June, 7.00 pm Alumni Pavillon invited by VERT-Association  
Conference Registration Monday 24<sup>th</sup> June 7.30 am  
see [www.nanoparticles.ethz.ch](http://www.nanoparticles.ethz.ch)



## Agenda of Presentations

### Monday June 24<sup>th</sup> 2013

<b>Welcome</b>	<b>09.00-09.20</b>
Burtscher H. / University of Applied Sciences Northwestern Switzerland <i>Welcome</i>	
N. Heeb / EMPA Switzerland <i>In memoriam Dr. Andrea Ulrich</i>	
Kasper, M. / VERT-Association, Switzerland <i>Housekeeping</i>	
<b>Opening Address</b>	<b>09.20-09.30</b>
Christine Egerszegi-Obrist, Member of the Council of States in Switzerland	
<b>Key-Lectures</b>	<b>09.30-10.20</b>
Steininger N. / EU-Commission Brussels <i>2013 – The Year of Air</i>	
Konstandopoulos A. / CERTH/CPERI Greece <i>Functionalized, Structured Reactors for Sustainable Mobility and Clean Energy</i>	
<b>COFFEE BREAK</b>	<b>10.20 – 10.50</b>
<b>Session 1: Fundamentals</b>	<b>10.50 – 12.10</b>
Chair: U.Baltensperger	
Gröhn A.J. / ETHZ Switzerland <i>On-line Diagnostics for Growth and Monitoring of Combustion Aerosols</i>	
Cozzolino G. / Istituto di Ricerche sulla Combustione, Italy <i>Droplet Nucleation and Growth of Nanoparticles in the Flue Gas Cleaning Process</i>	
Kureti S. / University of Freiberg, Germany <i>Effect of Physical-Chemical Soot Properties on the Kinetics of Catalytic Soot Oxidation</i>	
Rossi M.J. / PSI, Switzerland <i>Functional Groups on the Surface of Carbonaceous Nanomaterials and Human Health</i>	
<b>LUNCH</b>	<b>12.10 – 13.10</b>

<b>Session 2a: Combustion Engine Emissions</b>	<b>13.10 – 14.50</b>
Chair: Th. Lutz	
Barro Chr. / ETHZ, Switzerland <i>Potential of PM Reduction through Post Injection Application</i>	
Brem B. / EMPA, Switzerland <i>Non-Volatile PM Mass and Number Emissions of Aircraft Gas Turbine Sources</i>	
Czerwinski J. / AFHB Switzerland <i>NO<sub>2</sub> Formation in Diesel Particle Filter Systems</i>	
Friedrich A. / Consultant, Germany <i>Particles from Gasoline Direct Injection Engines: Abatement Options</i>	
Thiruvengatam A. / West Virginia University, USA <i>Particulate Matter Emissions from a Current Technology Natural Gas Engine</i>	

<b>Session 2b: Combustion Engine Emissions</b>	<b>14.50 – 16.10</b>
Chair: Ch. Barro	
Kittelson D. / University of Minnesota, USA <i>Real-Time Measurements of Metallic Ash Emissions from Engines</i>	
Favre C. / AECC Brussels <i>Particles Emissions of Commercially Available Small Handheld Equipments</i>	
Matousek Th. / MOT Karlsruhe, Germany <i>Influence of Injection Pressures up to 300 bar on Particle Emissions in a GDI-Engine</i>	
Woodburn J. / BOSMAL, Poland <i>Particulate Emissions from LDVs used for Short Trips – the Impact of the Cold Start Effect</i>	

**COFFEE BREAK and  
POSTER SESSION**

**16.10 – 17.10**

<b>Session 3: Particle Filter Systems – Aftertreatment</b>	<b>17.10 – 18.50</b>
Chair: A. Mayer	
Yamamoto K. / Nagoya University, Japan <i>Simulation on Soot Oxidation in Catalyzed DPF</i>	
Heeb N. / EMPA, Switzerland <i>PCDD/F Formation in Catalytic Diesel Particle Filters: New Risks with Biofuels</i>	
Køcks M. / Danish Technological Institute, Denmark <i>Shipboard Characterization of a Wet Scrubber System during Operation</i>	
Zinola St. / IFP Energies Nouvelles, France <i>Particle Number Characterization from a Spark Ignition Direct Injection Engine with GPF</i>	
Ehlers Chr. / Forschungszentrum Jülich, Germany <i>Formation of „White Soot“ by Diesel Cars Equipped with Particle Filters</i>	

**APERITIF offered by EXHIBITORS**

**19.00**

**Tuesday June 25<sup>th</sup>, 2013**

<b>Session 4: Legislation</b>	<b>08.00 – 10.00</b>
Chair: J. Lemaire	
Cackette T. / retired from California Air Resources Board, USA <i>Successes and Challenges Reducing Urban Air Pollution and Climate Change</i>	
Hallauer Ph. / BAFU, Switzerland <i>UNECE Regulation Concerning the Approval of Retrofit Emission Control Devices (REC)</i>	
Riccobono F. / European Commission, Ispra, Italy <i>The Future of the Particulate Measurement Programme</i>	
Rindlisbacher Th. / BAZL, Switzerland <i>Non-volatile Particle Mass and Number Standard for Aircraft Gas Turbines</i>	
Van Ham J. / EFCA, The Netherlands <i>Ultrafine Particles: Some Views on Preferred Metric</i>	
Kasper M. / VERT Association, Switzerland <i>10<sup>th</sup> Anniversary of the PMP Golden Instrument</i>	

**COFFEE BREAK and  
POSTER SESSION****10.00 – 11.00**

<b>Session 5a: Instrumentation</b>	<b>11.00 – 13.00</b>
Chair: O. Bischof	
Andersson J. / Ricardo, UK <i>The Future of Particulate Mass Measurements</i>	
Alozie N. / Brunel University, UK <i>Influence of Dilution Conditions on Diesel Engine Particulate Emission</i>	
Kirchner U. / Ford, Germany <i>Particle Number Emission of Light-Duty Vehicles during Real-World Driving</i>	
Dierks U. / HORIBA, Germany <i>Accuracy of PN Counting Systems with Different 23nm Cutpoint Calibration Methods</i>	
Yamada H. / NTSEL Japon <i>Emission of sub 23 nm Particles from DPF Diesel and GDI</i>	
Sioutas C. / University of Southern California, USA <i>Emission Factors of PM Pollutants for LDVs based on Urban Street Driving Conditions</i>	

**LUNCH****13.00 – 14.00**

<b>Session 5b: Instrumentation</b>	<b>14.00 – 15.40</b>
Chair: H. Burtscher	
Samaras Z. / Aristotle University, Thessaloniki, Greece <i>Testing of Soot Sensors for DPF Failure Monitoring</i>	
Migliorini F. / Consiglio Nazionale delle Ricerche, Italy <i>Laser-Induced Incandescence Instrument for Carbonaceous Particles Detection</i>	
Nowak A. / Physikalisch-Technische Bundesanstalt, Germany <i>Validation of Novel Light Scattering Devices for Measuring of Opacity and Soot Mass</i>	
Tikkanen J. / Pegasor Finland <i>Dilution Artifacts, a Significant Source of Error; PMP vs. Raw Exhaust</i>	
Khalek I. / SWRI, San Antonio, USA <i>Particle Generator for Engine Exhaust Simulation</i>	

**COFFEE BREAK****POSTER SESSION and POSTER VOTING****15.40 – 16.40**

<b>Session 6a: Health Effects</b>	<b>16.40 – 18.30</b>
Chair: B. Rothen-Rutishauser	
Rothen-Rutishauser B./ University of Fribourg, Switzerland <i>Introduction</i>	
Tsai M. / Swiss TPH, Basel, Switzerland <i>Bridging the Gap: Bringing Measurements Closer to Health Effects</i>	
Ducret-Stich R. / Swiss TPH, Basel, Switzerland <i>Modeling of Short-Term Ultrafine Particle Number Concentrations in a Swiss City</i>	
Moshhammer H. / Medical University of Vienna, Austria <i>How Health-Predictive are Routine Air Monitoring Data?</i>	
Gerlofs-Nijland M.E. / RIVM Bilthoven, The Netherlands <i>Influence of NO<sub>2</sub> on Pulmonary Toxicity in Mice Exposed to Diluted Diesel Engine Exhaust</i>	
Paulson, S. / University of California, L.A. <i>Factors controlling Spatial Variations of Combustion related Pollutants in Urban Areas</i>	

**DINNER PARTY invited by Sponsors****19.00****Dinner Speaker: Claus-Detlef Schegk**

**Wednesday, June 26<sup>th</sup>, 2013**

<b>Session 6b: Health Effects</b>	<b>08.00 – 09.30</b>
Chair: P. Gehr	
Gehr P. / University of Bern, Switzerland <i>Introduction</i>	
Müller L. / University of Bern, Switzerland <i>Diesel Exhaust Particles Modify Natural Killer Cell Function and Cytokine Release</i>	
Vojtisek-Lom M. / University of Liberec, Czech Republik <i>PM and PAH-Emissions of Trucks under Severe Congestion Conditions: Part 1</i>	
Topinka J. / IEM Prague, Czech Republik <i>Relative Toxicity of Particulate Matter Organic Extracts under Severe Congest.Cond.: Part 2</i>	
Pinkerton K. / CHE UC Davis, USA <i>Cardiopulmonary Toxicity of Urban Source-Oriented Ultrafine and Submicron Fine PM</i>	

<b>Poster Award Ceremony</b>	<b>09.30</b>
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**COFFEE BREAK** **10.00 – 10.30**

<b>Session 7: Ambient Particles</b>	<b>10.30 – 12.50</b>
Chair: N. Heeb	
Bruns E.A. / Paul Scherrer Institut, Switzerland <i>Smog Chamber Studies of Primary and Secondary Wood Burning Products at Low Temp.</i>	
Platt S.M. / Paul Scherrer Institut, Switzerland <i>Secondary Aerosol Production from Modern Diesel and Gasoline Cars</i>	
Keller A. / Fachhochschule Nordwestschweiz, Switzerland <i>On-site Estimation of Secondary Organic Aerosol Production Potential from Wood Burning</i>	
Löschau G. / Saxon State Office for Environment, Germany <i>Saxony – A Pioneer in Monitoring Ultrafine Particles in Germany</i>	
Moroni S. / AMAT, Italy – im memoriam Dr.Giovanni Invernizzi <i>Airborne Black Carbon and Traffic Patterns during the First Year of “Area C” LEZ in Milan</i>	
Phuleria H. / SwissTPH Basel, Switzerland <i>Spatiotemporal Variation of PN in four Swiss Areas and its Relationship with PM</i>	
Zardini A. / European Commission, Ispra, Italy <i>Primary Emissions and Secondary Aerosol Formation from Two Heavy-Duty Trucks</i>	

**Lunch** **13.00 – 14.00**

## FOCUS-Event

### *How to Regulate Solid Nanoparticles in Ambient Air*

<b>Presentations</b>	<b>14.00 – 15.30</b>
Chair: P. Gehr	
Gehr P. / University of Bern, Switzerland <i>Welcome Address</i>	
Künzli N. / Swiss Tropical and Public Health Institute, Basel, Switzerland <i>Introduction: Setting the Stage - Linking Policy with Science</i>	
Dockery D. / Harvard School of Public Health, Boston, USA <i>Lessons from Epidemiologic Studies of Ambient Fine and Ultrafine Particles</i>	
Frey U. / Childrens Hospital, University of Basel, Switzerland <i>Effect of Air Pollution on Newborns</i>	
Hüglin Ch./ EMPA, Dübendorf, Switzerland <i>Real Time Mapping of Air Quality in Cities for Improved Exposure Estimation</i>	
Baldauf R./ US Environmental Protection Agency, Durham NC, USA <i>Ambient Air Mitigation Strategies for Red. Expos. to Mobile Source Nanoparticle Emissions</i>	

### **COFFEE BREAK**

**15.30 – 16.00**

<b>Pannel Discussion</b>	<b>16.00 – 17.00</b>
Chair: P. Gehr	
<u>Panellists:</u>	
N. Künzli / Swiss TPH, Basel, Switzerland	
D. Dockery / Harvard-University, Boston / University	
U. Frey / Childrens Hospital University of Basel, Switzerland	
Ch. Hüglin / EMPA, Switzerland	
R. Baldauf / US-EPA , USA	
T. Reichert / EFCA, The Netherlands	
K. Pinkerton / University of California / USA	
M. Berger / University of Amsterdam / The Netherlands	

*Concluding Remarks: K.Boulouchos*

**End of the 17<sup>th</sup> ETH-NPC**

**17.00**

## POSTERS

### Poster Session 1: Fundamentals

1.	Buesser B.	ETH Zürich	<i>The Coalescence of Aerosol Nanoparticles by Molecular Dynamics</i>
2.	Eggersdorfer M.L.	ETH Zürich	<i>Restructuring of Aggregates and their Primary Particle Size Distribution during Sintering</i>
3.	Goudeli E.	ETH Zürich	<i>Accounting for the Variable Fractal Dimension during Coagulation &amp; Sintering of Fractal-Like Particles</i>
4.	Kadau D.	Wärtsilä	<i>Aggregate Morphology Evolution by Sintering: Number and Diameter of Primary Particles</i>
5.	Konstandopoulos A.	CERTH/CPERI	<i>Study of Diesel Soot Structure and Reactivity upon Oxidation by Raman Microspectroscopy</i>
6.	La Rocca A.	University of Nottingham	<i>Nanoparticle Characteristics of Exhaust and Soot-in-oil from a light duty Diesel Engine</i>
7.	Melas A..	CERTH/CPERI	<i>On the Relation between Aerodynamic and Mobility Diameter Distributions for Aggregates Consisting of few Monomers</i>
8.	Stein M.	University of Duisburg	<i>Mass-mobility Exponent and Primary Particle Diameter of Zirconia and Copper Nanoparticles</i>
9.	Tuch Th.	Leibniz Institut	<i>Effect of Silver Particle Shape on Cut-off Diameter of TSI 3790 CPCs.</i>
10.	Zhou Lei	Eindhoven University of Technology	<i>Laser Diagnostics on Sooting Tendency in Laminar Diffusion Flame of Liquid Fuels at Elevated Pressure</i>
11.	Corbin J.C.	ETH Zürich	<i>Mass Spectrometry of Soot From Six Different Sources: Carbon Fragmentation Patterns and Refractory CO<sub>2</sub></i>

### Poster Session 2: Combustion Engine Emissions

12.	Bielaczyc P.	BOSMAL	<i>A Quantitative Comparison of the Particulate Matter Emissions from two Euro 5 Vehicles (Direct Injection Petrol &amp; Diesel)</i>
13.	Casadei S..	INNOVHUB-SSI	<i>Nanoparticle Size Distribution, Soot and Ammonia Emissions from a NGVs Fleet</i>
14.	Czerwinski J.	AFHB Biel	<i>Emissions on HD Diesel Engines – some new Results of AFHB</i>
15.	Czerwinski J.	AFHB Biel	<i>Experiences with Cleaning of CVS Dilution Tunnel</i>

16.	Durdina L.	EMPA	<i>Effective Density Characterization of Soot Particles Emitted from Aircraft Gas Turbine Engine Sources</i>
17.	Karjalainen Panu	Tampere University	<i>Use of Hydrotreated Vegetable Oil Reduces Particle Number Emissions of a Heavy Duty Diesel Engine</i>
18.	Lappi M.	VTT Finland	<i>Effect of Speed Reduciton on Particle Emissions of Ships</i>
19.	Leach F.	University of Oxford	<i>Evaluation of a PN Index on SGDI Engines at Steady State and over the NEDC</i>
20.	Littera D.	CAFEE WVU	<i>Investigation Of Particle Size Distributions In A Exhaust Plume Emitted By Heavy-Duty Diesel Trucks At Cruise And Idling Operations: Wind Tunnel Results</i>
21.	Mühlbauer W.	University of Bayreuth	<i>Influence of Engine Parameters on Physical Properties of Emitted Diesel Soot Particles</i>
22.	Noël L.	IFP Energies nouvelles	<i>Detailed Characterization of Nanoparticles Emitted by Spark Ignition Direct Injection Engines</i>
23.	Pielecha J.	University of Poznan	<i>Particulate Matter Emission from Bi-fueled Vehicles Powered by Compressed Natural Gas and Gasoline</i>
24.	Rahman Mostafizur	Queensland University	<i>Variation in Particle Emissions and Morphology among Biodiesels with Controlled Physicochemical Properties</i>
25.	Rosenoern Th.	FORCE	<i>Factors Controlling Condensed Phase Emissions from Gas Engine Fired Combined Heat and Power Plant (CHP) – a Field Study</i>
26.	Suarez-Bertoa R. a	European Commission	<i>Effect of Temperature on Ammonia Emissions from Gasoline and Ethanol Flexi Fuel Cars</i>
27.	Wahl C.	DLR	<i>Nanoparticle Emissions of a Flight Gas Turbine Running Jet A-1 and GTL Mixtures</i>

### Poster Session 3: Particle Filter Systems

28.	Besch M.C.	West Virginia University	<i>Real-Time DPF-Filtration Efficiencies Using In-Line Particle Matter Sensors</i>
29.	Iwasaki K.	Sumika Ceramics	<i>Thermal Shock Investigation of Aluminum Titanate-based Ceramic Filters under Robustness Testing</i>
30.	Kattouah Ph.	NGK Europe	<i>Latest Particulate Filter Technology to Reduce Particle Emissions from Gasoline Engines</i>



31.	Ruzal-Mendelevich M.	Ben-Gurion University	<i>Agglomeration Inducing Exhaust Pipe / Impact on Particle Number and Morphology</i>
32.	Sjöblom J.	Chalmers, Gothenburg	<i>Capture of Automotive Particulate Matter in open Substrates</i>
33.	Yan Keping	Zhejiang University	<i>Electrostatic Precipitation of Fine Particles from Coal-Fired Power Plants</i>
34.	Stachulak J.	Vale	<i>Development and Optimization of DPF System for Underground Mining Operation</i>

#### Poster Session 4: Legislation

#### Poster Session 5: Instrumentation

35.	Arndt M.	AVL List	<i>A Particle Generator for On-site Checks of PN and PM Measurement Devices</i>
36.	Cachón, L	Matter Aerosol	<i>NanoMet3: Portable Solid Nanoparticle Counter for Vehicle Exhaust Emissions</i>
37.	Dirscherl Kai	DFM Denmark	<i>Calibration Service for Mobility Measurements Based on Reference Material for Monodisperse Spherical Particles in Aerosols</i>
38.	Dirscherl Kai	DFM Denmark	<i>Pre-normative Study of Size Distributions of Combustion Particles from Fossil and Non-fossil Fuels</i>
39.	Hess A.	Empa	<i>Size Distribution and Elemental Composition of Airborne Nanoparticles Measured On-Line by SMPS-ICPMS Coupling Technique</i>
40.	Hildebrandt M.	Physikalisch Technische Bundesanstalt	<i>A Standard Soot Aerosol Generator System for the Validation and Calibration of Particle Measurement Instruments</i>
41.	Högström R.	MIKES Finland	<i>Comparison of Aerosol Electrometers Using Soot Particles</i>
42.	Jordan-Gerkens A.	Physikalisch-technische Bundesanstalt	<i>Evaluation of Measuring Methods for Particle Emission from Modern Diesel Vehicles in Periodic Emissions Control</i>
43.	Jurányi Z.	FHNW Windisch	<i>Combination of Optical and Mobility based Number Size Distribution Measurements of Combustion Generated Particles</i>
44.	Lüönd F.	METAS	<i>A New Method to Improve Performance of a Tandem-DMA Setup for Size Selection of Airborne Nanoparticles</i>
45.	Moore R.H.	NASA	<i>Mapping the Operation of the Miniature Combustion Aerosol Standard (mini-CAST) Soot Generator</i>

46.	Scheckman J.H.	TSI	<i>Pulse Height Monitor to Improve Data Reliability of Condensation Particle Counter for Engine Exhaust Emission Applications</i>
47.	Spielvogel J	Palas	<i>New Measurement System for the Combined Measurement of PM-Fractions and Ultrafine/Nanoparticles</i>
48.	Vojtisek-Lom M.	University Liberec	<i>High-Volume Combustion Aerosol Sampling using Tandem Atmospheric Samplers</i>
49.	Rongchai Kanchit	University Cambridge	<i>High Temperature Condensation Particle Counter; a Novel Device for Nanoparticle Emission Measurement</i>
50.	Payne S.	Cambustion	<i>The CPMA-Electrometer System as a Traceable Mass Concentration Standard</i>

### Poster Session 6: Health Effects

51.	Jeannet N.	University of Bern	<i>Effects of Inhaled Nanoparticles in Health and Disease by in vitro Technology</i>
52.	Steiner S.	Adolphe Merkle-Institut	<i>Genotoxicity of Diesel Exhaust – what is the most Reliable in Vitro Test?</i>

### Poster Session 7: Ambient Particle

53.	Norman M.	SLB-analys	<i>Exposure of Air Pollutants linside Vehicles while Driving in Road Tunnels</i>
54.	Phuleria H.	SwissTPH	<i>Seasonal and Spatial Variation of Indoor and Outdoor Particulate Mass and Nitrogen Dioxide Concentration in eight Swiss Areas</i>
55.	Pieber S. M.,	PSI	<i>Flow Reactor Measurements of Submicron Secondary Organic Aerosol from Vehicle Emissions</i>
56.	Shokouhmand Milad	University Teheran	<i>Transport Properties Effects on the Combustion of Lycopodium Particles</i>
57.	Jaiswal N.K.	University of Raipur	<i>Indoor Carbonaceous Particulate Pollution</i>
58.	Zanatta M.	PSI	<i>Absorbing Properties of Black Carbon over Europe</i>



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- BAUMOT Baumot AG, Fehraltorf, Schweiz
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- TSI TSI GmbH, Particle Instruments, Aachen, Deutschland
- UGZ Umwelt- und Gesundheitsschutz der Stadt Zürich
- VERT VERT Association for Verification of Emission Reduction Technologies
- ZUG Kanton Zug mit Innerschweizer Kantonen



## Organization Committee

Name	Mail	Telefon
Anselmi A.	Anita.Anselmi@lunge-zuerich.ch;.	+41 44 268 20 71
Baltensperger U. Prof. Dr.	Urs.baltensperger@psi.ch;	+41 56 310 24 08
Barro, Chr. Dr.	barro@lav.mavt.ethz.ch;	+41 44 632 66 32
Boulouchos K. Prof. Dr.	boulouchos@Lav.mavt.ethz.ch;	+41 44 632 56 48
Burtscher H. Prof. Dr.	heinz.burtscher@fhnw.ch;	+41 56 202 74 73
Cachon Luis	lcachon@matter-aerosol.ch;;	+41 77 466 25 60
Czerwinski J. Prof. Dr..	csj1@bfh.ch;	+41 32 321 66 80
Gehr P. Prof. Dr. em.	gehr@ana.unibe.ch;	+41 31 631 84 32
Heeb N. Dr.	Norbert.heeb@empa.ch;	+41 58 765 42 57
Kasper M. Dr.	Markus.m.kasper@me.com;	+41 79 466 00 81
Künzli N., Prof. Dr.	Nino.kuenzli@unibas.ch;	+41 61 284 83 99
Leuenberger Chr. Dr.	Christian.leuenberger@leupro.ch;	+41 43 205 24 01
Lutz Th. W.	Thomas.lutz@alumni.ethz.ch;	+41 44 632 24 82
Mayer A. Dr. h.c.	TTM.a.mayer@bluewin.ch;	+41 56 496 64 14
Rothen Rutishauser B. Prof. Dr.	barbara.rothen@dkf.unibe.ch;	+41 31 641 84 41
Schegk C.-D. Dr.	c-d.schegk@veran.ch;	+41 56 245 58 05
Weingartner E. Dr.	Ernest.weingartner@psi.ch;	+41 56 310 24 05
Zimmerli Y.	Yan.zimmerli@bfh.ch;	+41 31 321 66 80

