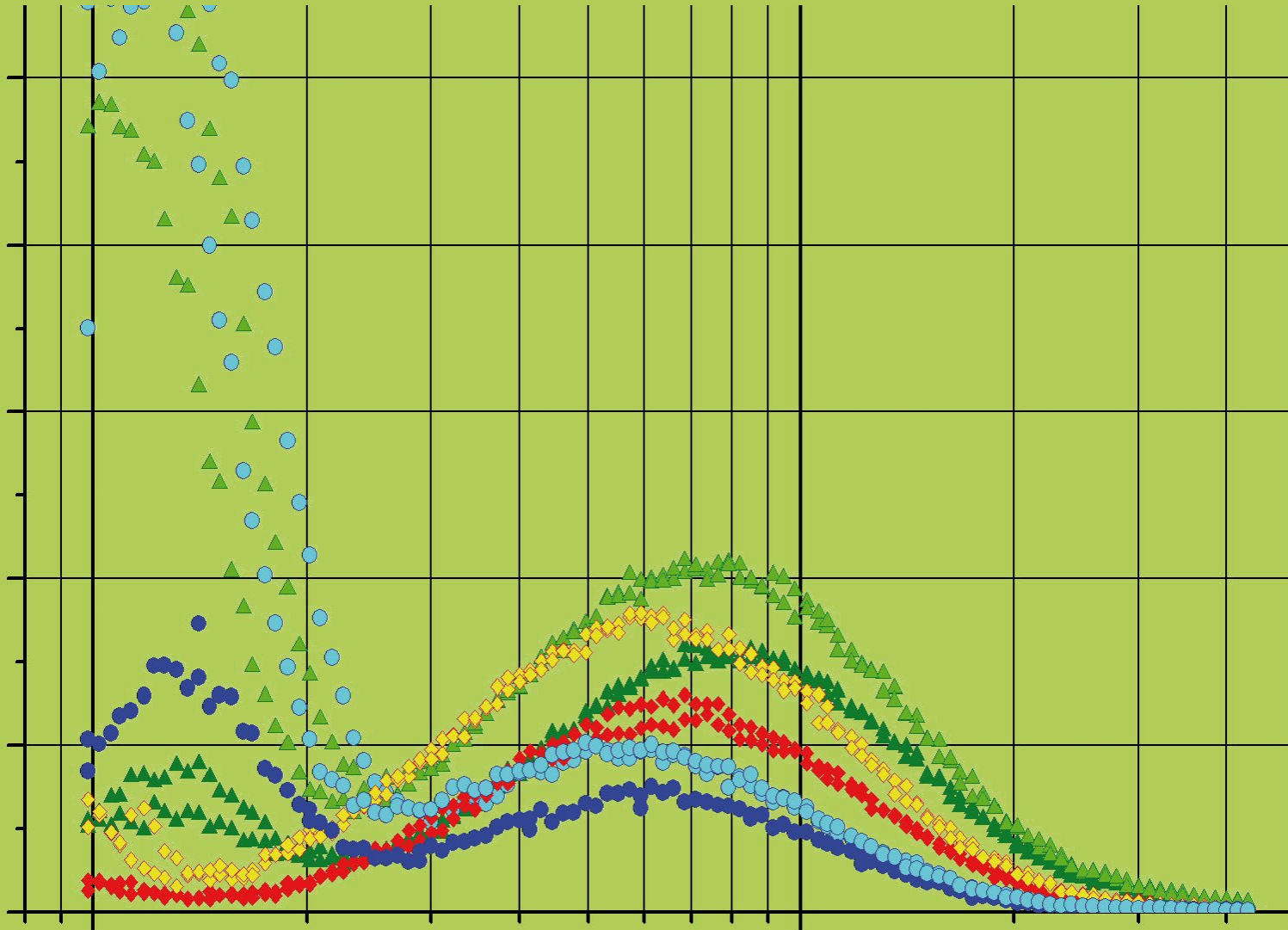


26th ETH-Nanoparticles Conference

June 20 - 22, 2023



**Norbert Heeb,
Empa**

**On behalf of the
Organizing
Committee**

26th ETH-Nanoparticles Conference

June 20 - 22, 2023

Scope

The conference serves as an interdisciplinary platform for expert discussions on all aspects of nanoparticles, freshly emitted from various sources, aged in ambient air, technical mitigation aspects, impact of particles on health, environment and climate, and particle legislation.

The international conference brings together representatives from research, industry and legislation.

All aspects of nanoparticles, from their birth to their death



The river Limmat divides the medieval city of Zürich. You can see Fraumünster, Saint Peter's church and Grossmünster.



You can also see linden trees now blooming at Lindenhof, releasing a pleasant odor but also pollen to the millions

Focus Event: Indoor air filtration of biogenic and combustion nanoparticles



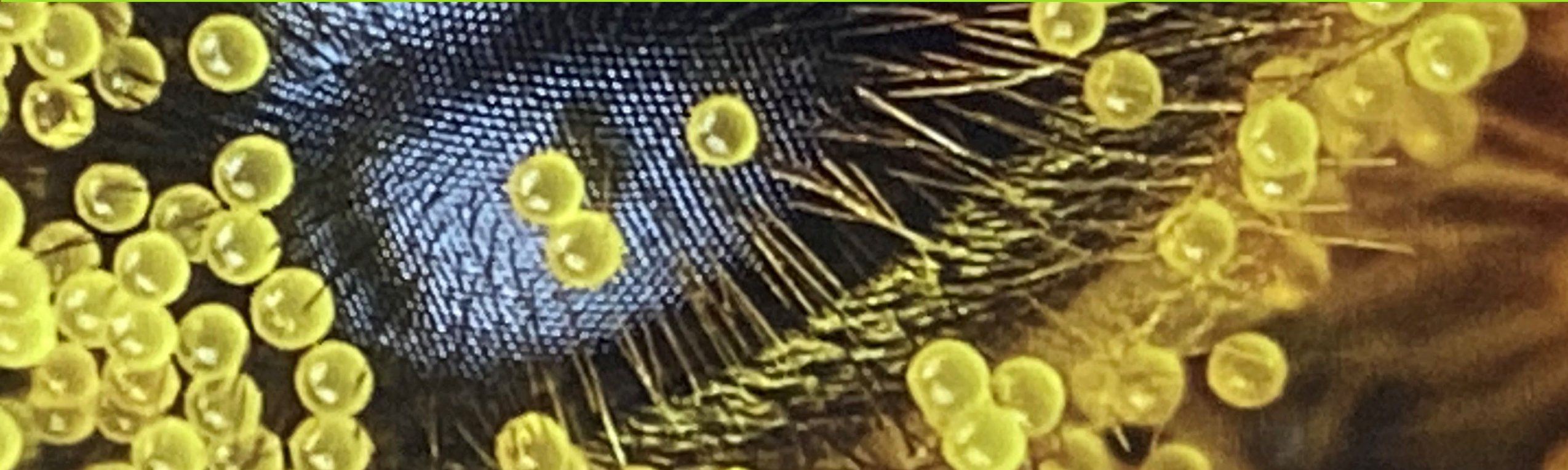
You can also see linden trees now blooming at Lindenhof, releasing a pleasant odor but also pollen to the millions

Focus Event:
Indoor air filtration of biogenic and combustion nanoparticles



Those with hay fever possibly will notice it.

**Focus Event:
Indoor air filtration of biogenic and combustion nanoparticles**



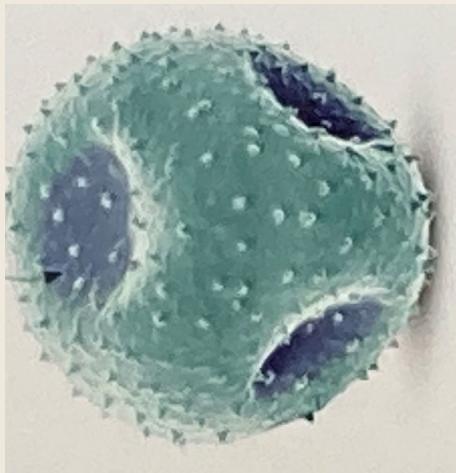
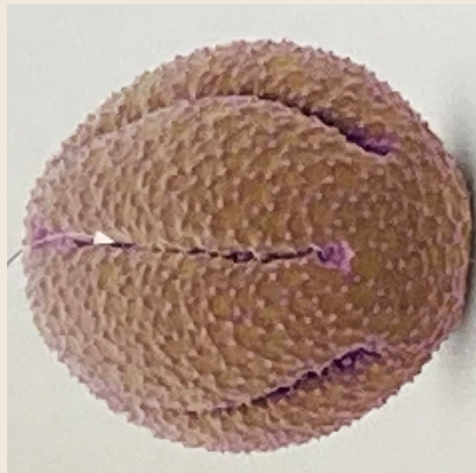
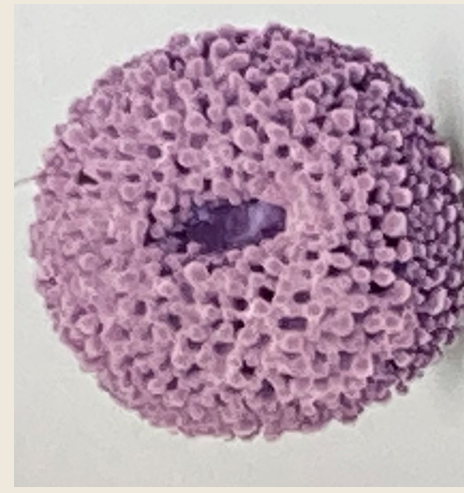
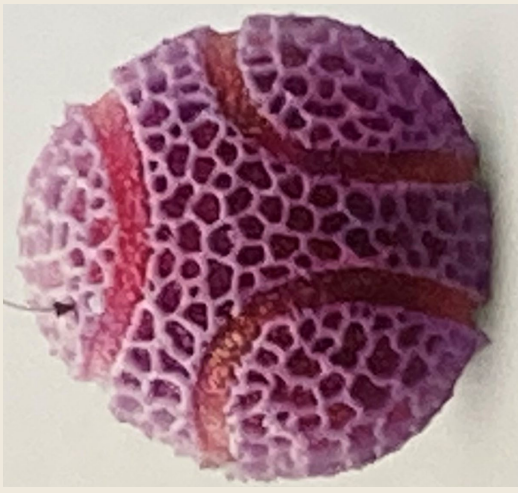
Even in bees eyes (2 mm), pollen can be disturbing

A microscopic image showing a blue, woven mesh filter. Numerous yellow, spherical pollen grains are trapped on the mesh. The grains are of varying sizes and are clustered in some areas, particularly on the left and right sides of the frame. The mesh itself is a fine, grid-like structure.

Focus Event:
Indoor air filtration of biogenic and combustion nanoparticles

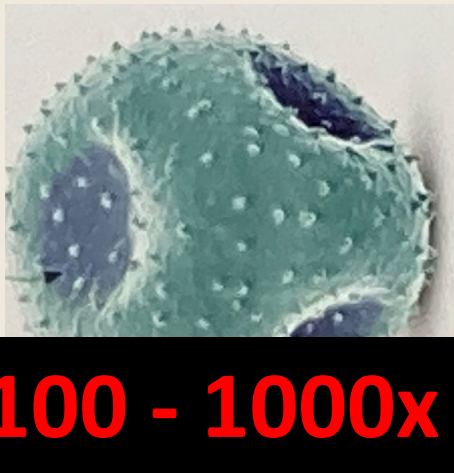
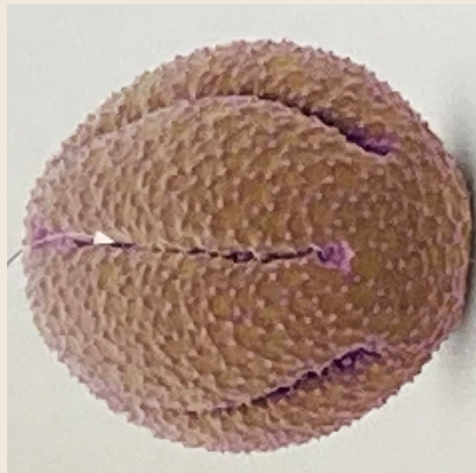
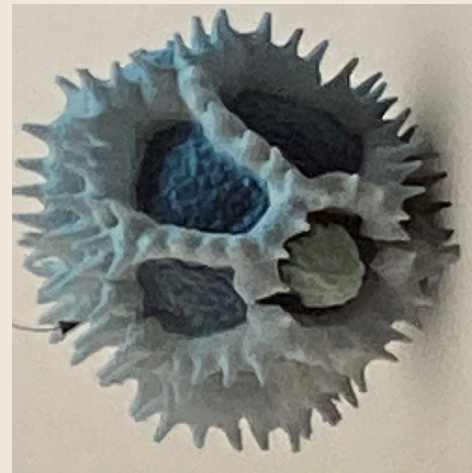
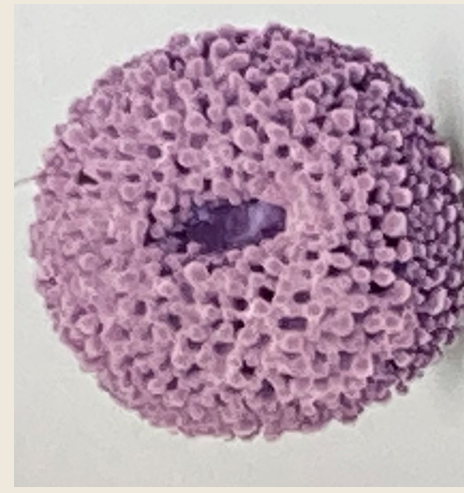
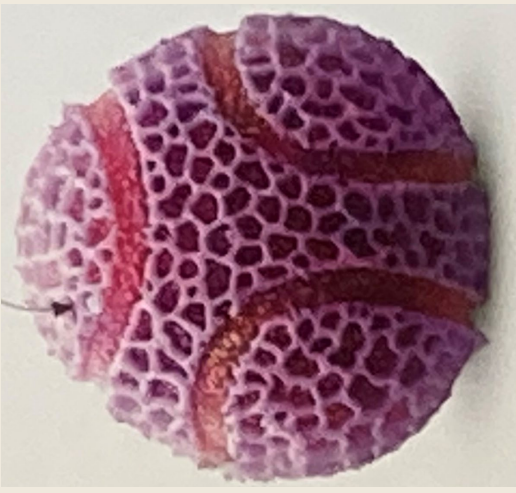
Zoom 10 - 100x

Even in bees eyes (2 mm), pollen can be disturbing



The beauty of pollen at the micrometer scale (20 – 200 μm)

Photos from "Micro Life", Harvey et al. Dorling Kindersley, London



Zoom 100 - 1000x

The beauty of pollen at the micrometer scale (20 – 200 μm)

Photos from "Micro Life", Harvey et al. Dorling Kindersley, London



The beauty of bacteria at the micrometer scale (0.2 – 2 μm)

Photos from "Micro Life", Harvey et al. Dorling Kindersley, London



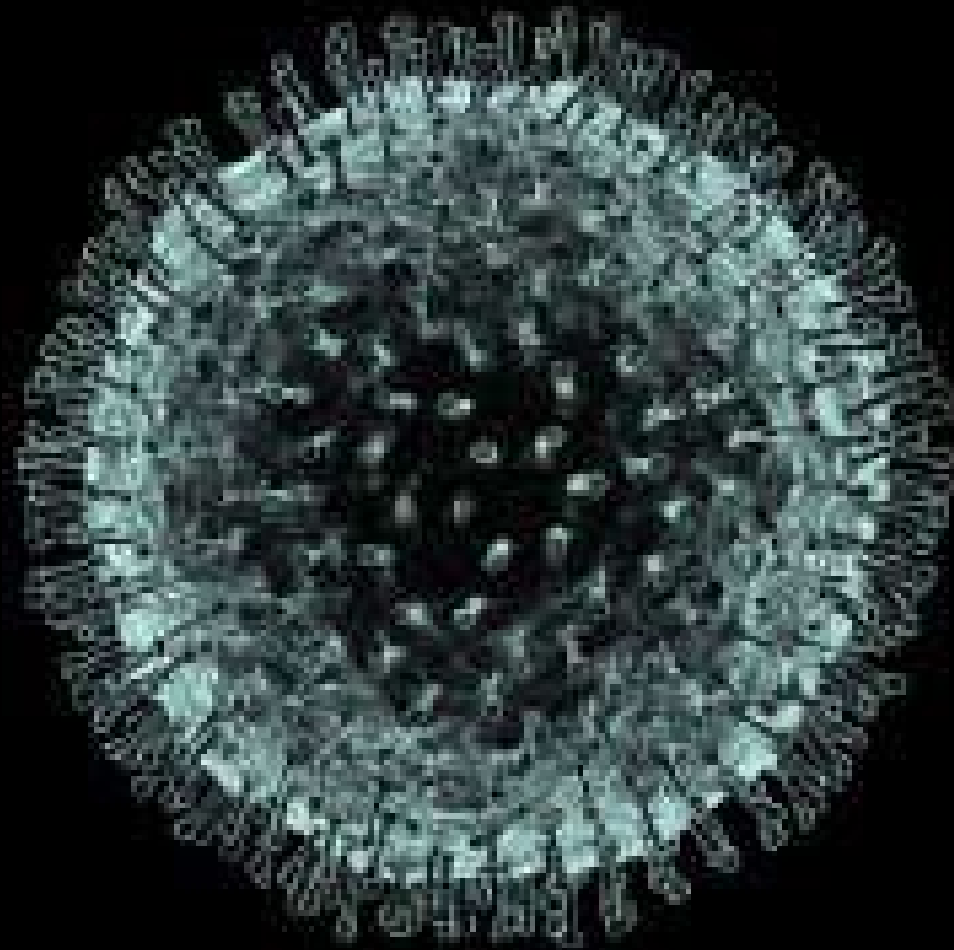
Zoom 2 - 20x

The beauty of bacteria at the micrometer scale (0.2 – 2 μm)

Photos from "Micro Life", Harvey et al. Dorling Kindersley, London



Corona virus - infected cells at the nanometer scale (100 nm)



The beauty of viruses at the nanometer scale (80-120 nm)



Do not inhale it!

The beauty of viruses at the nanometer scale (80-120 nm)



NEAT, the first large-scale application of diesel particle filters for combustion-generated nanoparticles (15-80 nm)



The beauty of the alveolar system of a human lung at the micrometer scale (200-500 μm)



The beauty of the alveolar system of a human lung at the micrometer scale (200-500 μm)



The beauty of red blood cells at micrometer scale (6 - 8 μm)



Focus Event:

Indoor air filtration of biogenic and combustion nanoparticles

We will take you to an inspiring 3-day journey to the fascinating world of nanoparticles

A scanning electron micrograph (SEM) showing a complex, porous, and fibrous structure. The material consists of interconnected fibers and larger, irregularly shaped clusters, creating a highly textured and porous appearance. The color palette is primarily brown and grey, with some red highlights. A bright green banner is overlaid at the top of the image.

Focus Event:

Indoor air filtration of biogenic and combustion nanoparticles

You need your imagination to see the invisible.

You need your creativity to foresee the unforeseeable.

26th ETH-Nanoparticles Conference

June 20 - 22, 2023



Schweizerische Eidgenossenschaft
Confédération suisse
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Confederaziun svizra

Bundesamt für Umwelt BAFU
Office fédéral de l'environnement OFEV
Ufficio federale dell'ambiente UFAM
Uffizi federal d'ambient UFAM

ETH zürich



SCS
Swiss Chemical
Society

**Non-profit society
to organize this conference**

Organized by the NPC-association
Under the auspices of the FOEN, SCS and ETH

26th ETH-Nanoparticles Conference

June 20 - 22, 2023

Scientific and Organizing Committee

Anita Anselmi, Lunge Zürich

Claudia Auinger, Empa

Dr. Oliver Bischof, TSI

Peter Bonsack, FOEN

Prof. em. Dr. Heinz Burtscher, FHNW/ISE

Prof. em. Dr. Jan Czerwinski, BFH/AFHB, Biel

Prof. Danilo Engelmann, BFH/AFHB, Biel

Prof. em. Dr. Peter Gehr, University of Bern

Dr. Martin Gysel, PSI

Dr. Norbert Heeb, Empa

Dr. Christoph Hügli, Empa

Ron Kappeler, Swiss TPH

Dr. h.c. Andreas Mayer, TTM

Prof. Dr. Claudia Mohr, ETH, PSI

PD. Dr. Loretta Müller,
DBMR University of Bern, Inselspital Bern

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AMI, University of Fribourg

Dr. Laretta Rubino, VERT

Dr. Claus-Detlef Schegk, VerAn

David Spichiger, Swiss Chemical Society

Dr. Martin Stöckli, inspire AG

Dr. Konstantina Vasilatou, METAS

Céline Wittwer, Swiss Chemical Society

Yan Zimmerli, BFH/AFHB, Biel

A few words to our society:

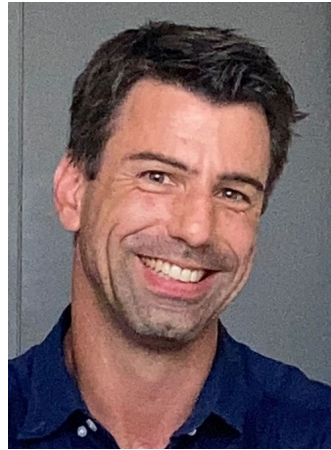
- Universities of
Bern, Basel, Fribourg
- UAS of Bern/Biel, NWS,
- ETHZ, Inspire
- Swiss Federal Institutes
Empa, PSI, METAS
- Swiss TPH
- Industry:
TSE, TTM, TSI, VerAn,
- Swiss Chemical Society

Support (We wear red dotted name tags)

Céline Wittwer, SCS



David Spichiger, SCS



Martin Stockli, Inspire



Jan Zimmerli, BFH Biel



Claudia Auinger, Empa



Claudia Masucci, Empa



Fabienne Jäckle, Empa



Oscar Mendo Diaz, Empa



Jules Hutter, Empa



Christoph Schürch, ETH



Norbert Heeb, Empa

Please contact us if problems appear

Program Overview

Central European
Summer Time, CEST

CEST: UTC+02:00

Tue, June 20

- 09:00 Welcome, Instructions
- 09:10 Keynote Lecture by Claudia Mohr, Aerosol Chemistry, ETH and Head of Laboratory for Atmospheric Chemistry, PSI
- 09:40 Session 1: Aircraft, marine and other non-road sources
Chair: Norbert Heeb
- 10:40 Coffee Break
- 11:00 Session 2: Biomass, biofuel- and synfuel combustion
Chair: Martin Gysel-Beer
- 12:30 Lunch Break
- 13:30 Poster Session (even numbers)
- 15:00 Coffee Break
- 15:30 Session 3: Brake and tyre wear, on-combustion emissions
Chair: Christoph Hüglin

17:00 Exhibitors Apéro

Wed, June 21

- 09:00 Session 4: Particle emissions control of combustion engines (Part A)
Chair: Danilo Engelmann
- 10:30 Coffee Break
- 11:00 Session 5: Particle emissions control of combustion engines (Part B)
Chair: Laretta Rubino
- 12:30 Lunch Break
- 13:30 Poster Session (odd numbers)
- 15:00 Coffee Break
- 15:30 Session 6: Nanoparticle metrology and chemical characterization
Chair: Konstantina Vasilatou
- 17:00 End of Conference Day 2

18:00 Alphorn Concert

19:00 Conference Dinner
(sign up at the reception)

Thu, June 22

- 09:00 Session 7: Health effects
Chair: Barbara Rothen-Rutishauss
- 10:30 Coffee Break
- 11:00 Session 8: Nanoparticle Formation and transformation
Chair: Oliver Bischof
- 12:00 Award Ceremony**
- 12:30 Lunch break
- Focus Event: Indoor air filtration of biogenic and combustion nanoparticles
Chair: Loretta Müller
- 13:30 Part 1
- 15:00 Coffee Break
- 15:30 Panel Discussion**
- 16:50 Goodbye

17:00 End of conference

3x from 9:00 to 17:00

8 Sessions
(20 and 10 min talks
incl. discussions)

**2 Poster sessions (90 min,
odd/even numbers)**

**Focus Event (6 x 20 min
50 min panel discussion)**

Program Overview

Central European
Summer Time, CEST

CEST: UTC+02:00

Tue, June 20

09:00 Welcome, Instructions
09:10 Keynote Lecture by Claudia Mohr,
Aerosol Chemistry, ETH and Head of
Laboratory for Atmospheric Chemistry,

QR-code program Tuesday



13:30 Poster Session (even numbers)
15:00 Coffee Break
15:30 Session 3: Brake and tyre wear,
on-combustion emissions
Chair: Christoph Hüglin

17:00 Exhibitors Apéro

Wed, June 21

09:00 Session 4: Particle emissions control of
combustion engines (Part A)
Chair: Danilo Engelmann

10:30 Coffee Break

QR-code program Wednesday



17:00 End of Conference Day 2

18:00 Alphorn Concert

19:00 Conference Dinner

(sign up at the reception)

Thu, June 22

09:00 Session 7: Health effects
Chair: Barbara Rothen-Rutishauss

10:30 Coffee Break

QR-code program Thursday



13:30 Part 1

15:00 Coffee Break

16:50 Goodbye

15:30 Panel Discussion

17:00 end of conference

3x from 9:00 to 17:00

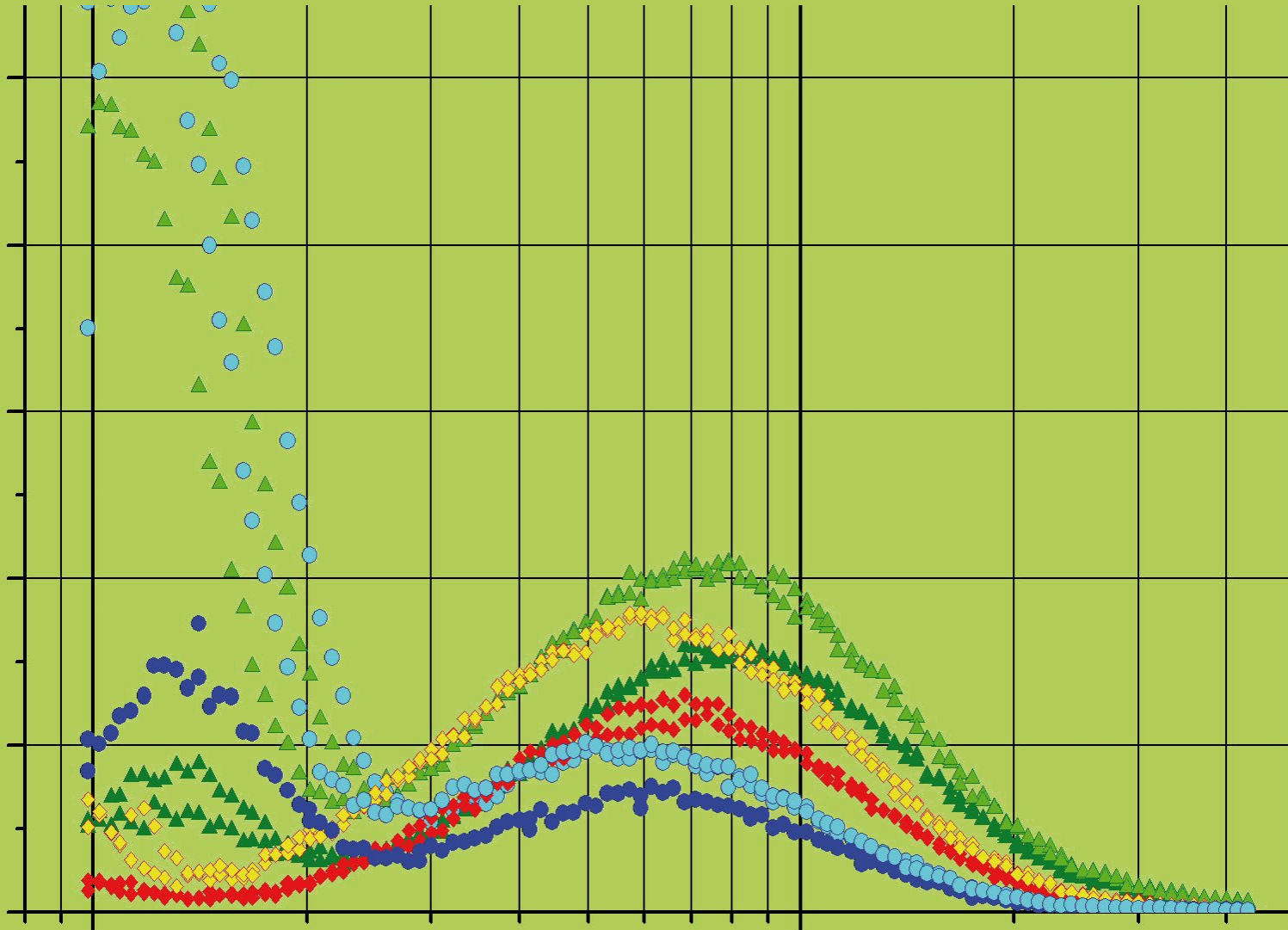
**8 Sessions
(20 and 10 min talks
incl. discussions)**

**2 Poster sessions (90 min,
odd/even numbers)**

**Focus Event (6 x 20 min
50 min panel discussion)**

26th ETH-Nanoparticles Conference

June 20 - 22, 2023



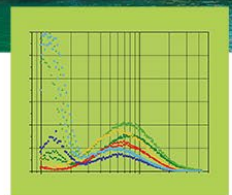
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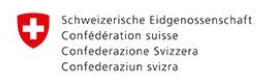
26th ETH-Nanoparticles Conference

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Visit them on:
Floors D and E

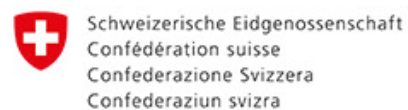


June 20 – 22, 2023, ETH Zürich, Switzerland
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Federal Office of Civil Aviation FOCA
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26th ETH-Nanoparticles Conference

June 20 - 22, 2023

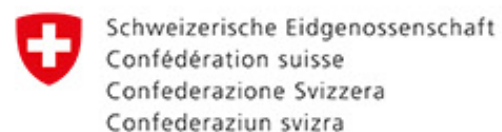


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ETH zürich



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Meet the exhibitors at their booth in floors D and E

Visit the exhibitions throughout the conference
Read short company CVs in the printable program

<https://npc23.scg.ch/program1/program-overview>

 Printable Program




Location	Exhibitors Floor D, Particle Filter Technology
Floor D, Booth 1	HJS
Floor D, Booth 2	Corning
Floor D, Booth 3	Mann+Hummel
Floor D, Booth 4	NanoCleanAir
Floor D, Booth 5	VERT Association
Location	Exhibitors Floor E, Instrumentation
Floor E, Booth 1	TSI
Floor E, Booth 2	DEKATI
Floor E, Booth 3	BARTEC AUTO ID
Floor E, Booth 4	naneos
Floor E, Booth 5	Catalytic Instruments
Floor E, Booth 6	AEROSOL MAGEE SCIENTIFIC
Floor E, Booth 7	Emissions Analytics
Floor E, Booth 8	JING
Floor E, Booth 9	AETHLABS
Floor E, Booth 10	Cambustion

Search for abstracts

Permanent access throughout the conference for registered participants

Search

Event Topic Type

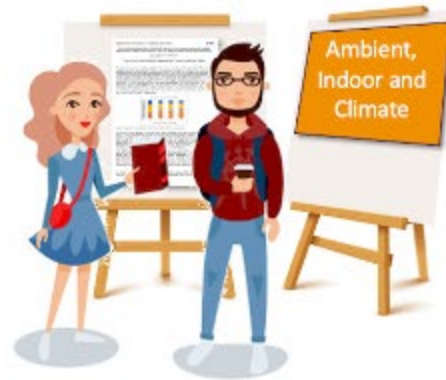
Title	Main Author	University	Topic	Type	
An interactive and playful air quality sensor as an alternative approach to foster students' awareness of bad air quality exposure	Felix M. Walcher	ETH Zurich	Indoor particles	Poster Presentation	<input type="button" value="Download as pdf"/> <input type="button" value="Send on Email"/>
Algorithm for Determining Abnormal Signs of Ship Propulsion Engines Using Machine Learning	Ryubin Kwon	Mokpo National Maritime University	Aircraft, marine and other non-road sources	Poster Presentation	<input type="button" value="Download as pdf"/> <input type="button" value="Send on Email"/> 
A Study on Predicting CO₂ Emissions Based on Calculated ECU Data and Deep Learning Model on Real-Driving Conditions for LDVs	Youngjae Jeon	Korea National University of Transportation	Emission control of combustion engines	Poster Presentation	<input type="button" value="Download as pdf"/> <input type="button" value="Send on Email"/>
Comparison of charging mechanism, the efficiency of particle matter capture and generation of byproducts from different ionization based indoor pollution control technologies	Aiwarya A. Kumar	IIT Bombay, India	Filtration of combustion and biogenic nanoparticles	Poster Presentation	<input type="button" value="Download as pdf"/> <input type="button" value="Send on Email"/>

Enjoy posters in Floors D and Eo

Permanent access throughout the conference for registered participants


Poster session 1: Tuesday June 20, 13.30-15.00, even-numbered posters

Poster session 2: Wednesday June 21, 13.30-15.00, odd-numbered posters



Poster program (incl. poster #)

Get a printable poster program as registered participant



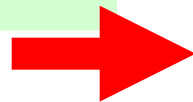
Session 1: Aircraft, marine and other non-road sources

Chair: Oscar Mendo Diaz, Jules Hutter, Empa

- P-01 **Dr. Kåre Press-Kristensen**, Green Transition Denmark
«Ultrafine particles from cruise ships and ferries in ports»
- P-02 **Dalho Shin**, Konkuk University
«Exhaust Emission Characteristics according to Load Factor of Construction Machinery in Real-work Mode»
- P-03 **Ryubin Kwon**, University of Mokpo, Korea
«Algorithm for Determining Abnormal Signs of Ship Propulsion Engines Using Machine Learning»

Session 2: Ambient air particles, secondary pollutants

Chair: Oscar Mendo Diaz, Jules Hutter, Empa

- P-04 **Päivi Aakko-Saksa**, VTT Technical Research Centre of Finland
«Semivolatile fraction's characteristics from engine and car exhaust»
- P-05 **Vikas Goel**, Indian Institute of Technology Delhi
«Sources and Light Absorption Properties of Black Carbon over Delhi»
- 

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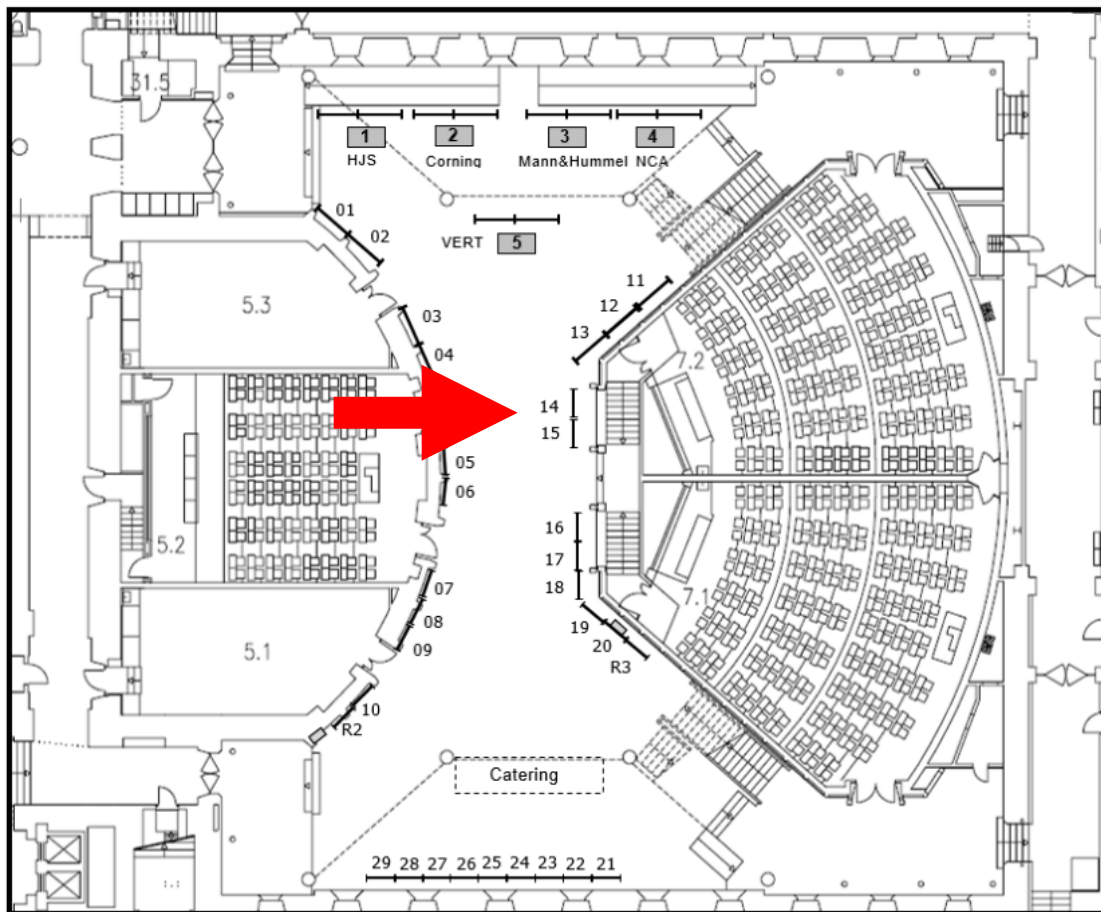
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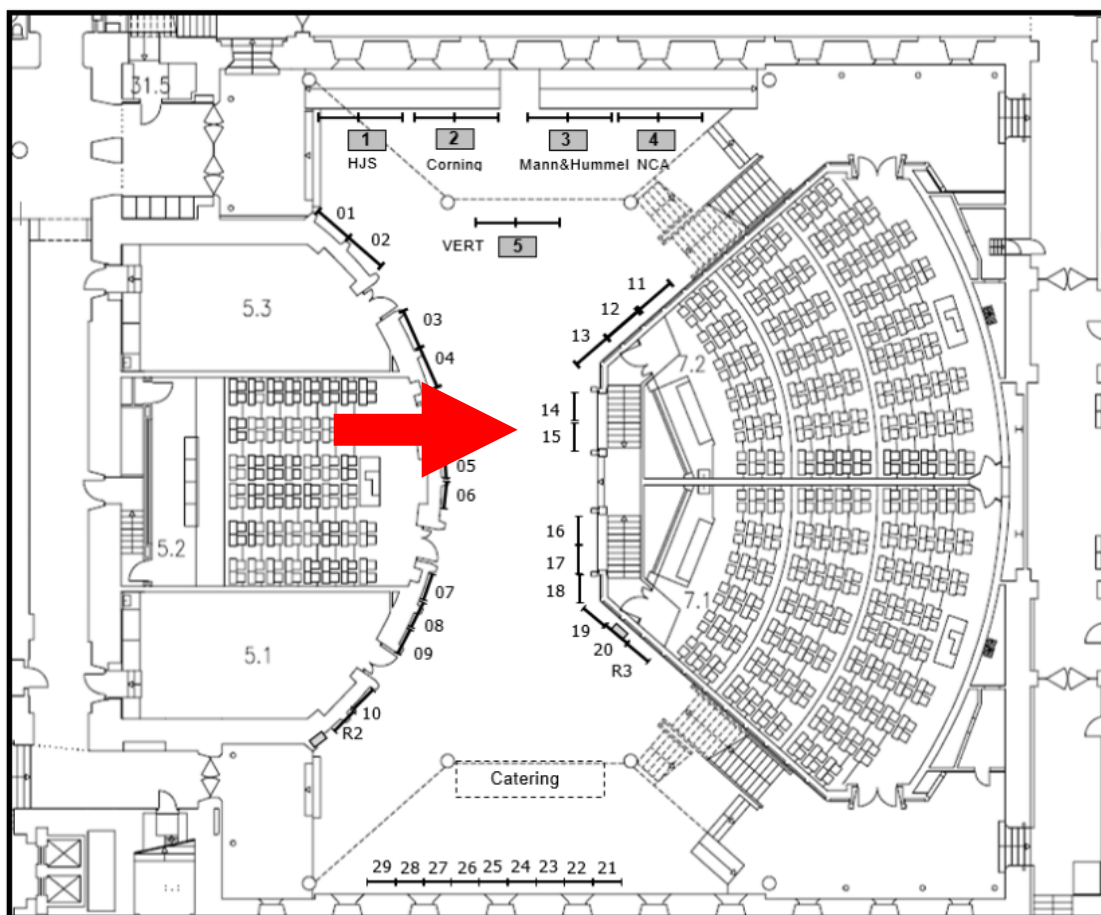
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Organisational remarks

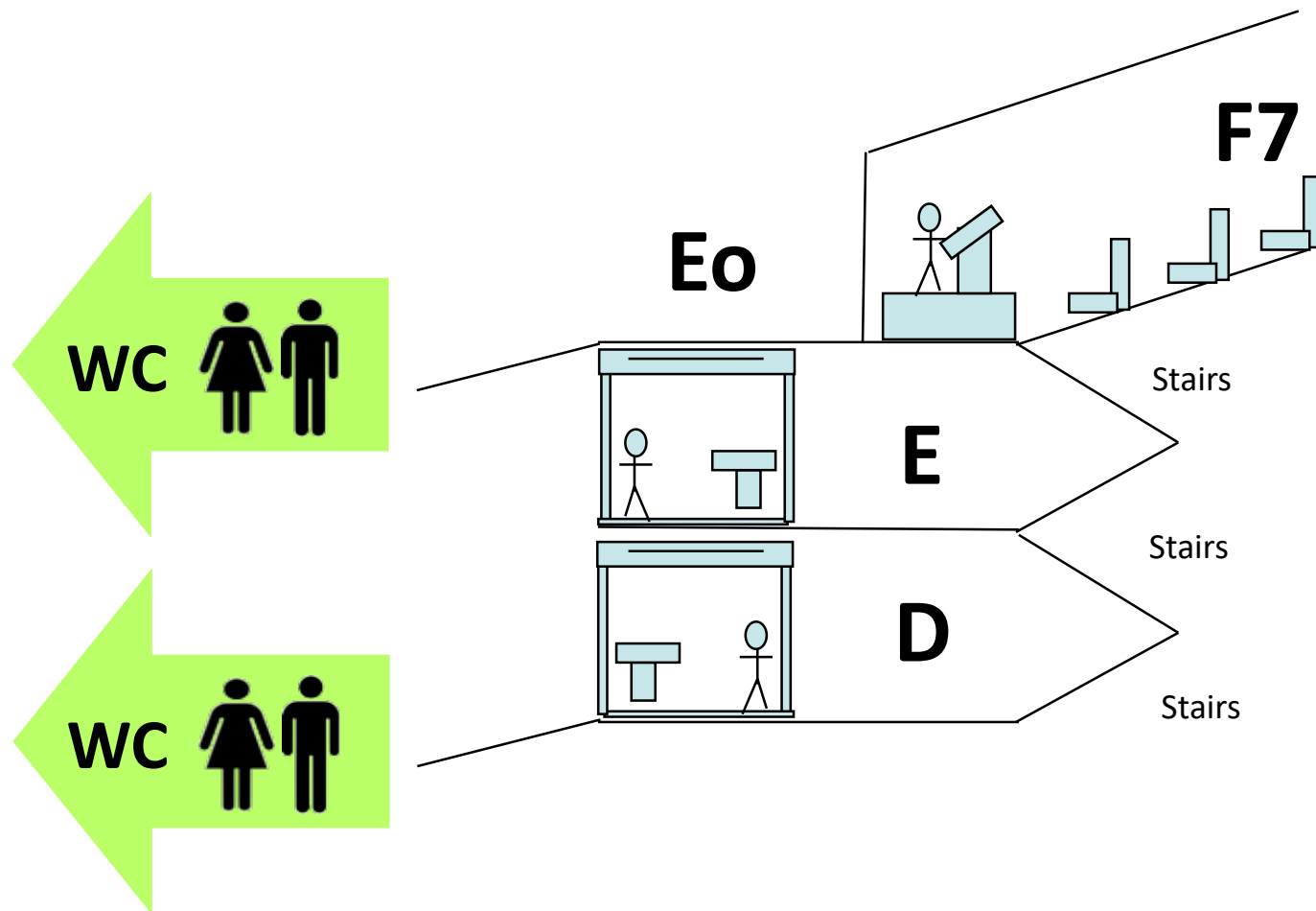


Floor E:

**Reception,
Help desk**

Open 08.00-17.30

Essential locations



Auditorium F7

Floor Eo:

Posters 1
Coffee & Lunch
Apéro today

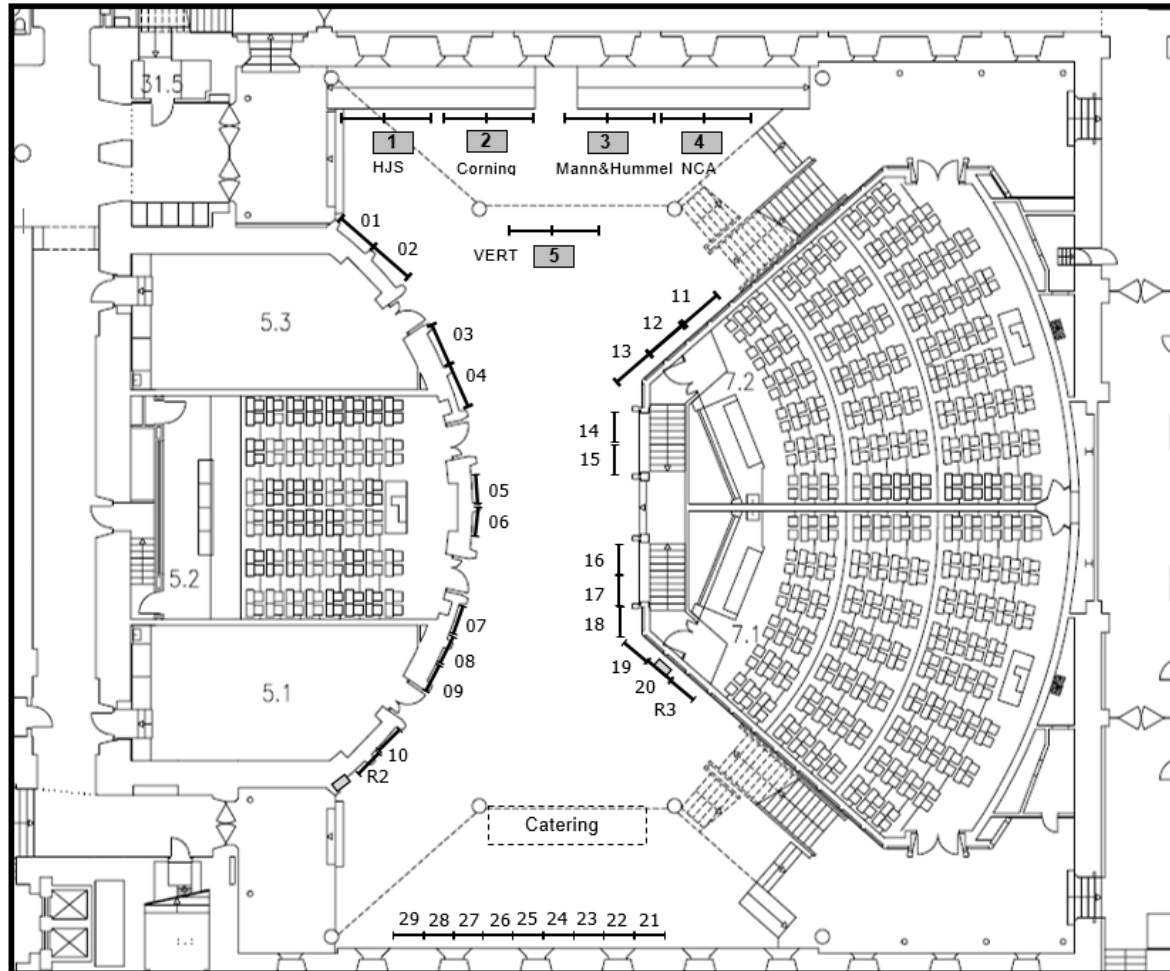
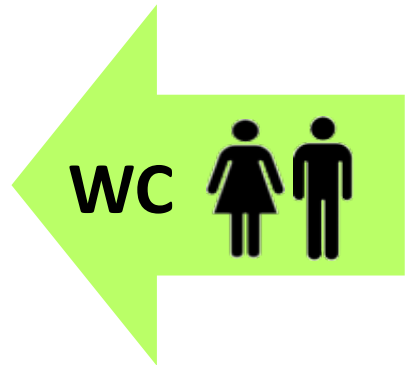
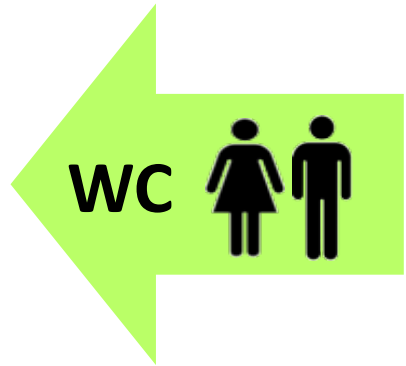
Floor E:

Registration, Help desk
Exhibition 1

Floor D:

Exhibition 2, Posters 2
Coffee & Lunch
Apéro today

Essential locations



Floor D:
Exhibition 2 & Posters 2
Coffee & Lunch
Apéro today

Easy access to WC

Social events

**Mon June 19,
19:00**

Welcome Apéro, Rooftop

**Tue June 20,
17:00**

Exhibitor Apéro, Floors D & Eo

**Wed June 21,
18:00**

**Alphorntrio Concert
Polyterasse (outdoor)
(Mensa in case of bad weather)
19:00
Conference Dinner (Mensa)**

**Thu June 22,
12:00**

**Trojan Horse Award/
Best Poster Awards**



Internet access

Login (every day)

Choose WLAN net: **public or public-5**

Call external page: <https://nanoparticles.ch>

Landing page ETH: **share your mobile phone number**

Get SMS with code: **apply your code**



Floor E:
Reception,
Help desk

Open 08.00-17.30

Weather forecast

today

Wed

Thu

Fri



17/31°

18/30°

17/26°

16/23°

**Expect some
thunderstorms on
Thursday evening**

Program, Tuesday June 20, 2023, morning

Session 1: Aircraft, marine and other non-road sources

Chair: Norbert Heeb, Empa

Program Tuesday 20th, June 2023

All indicated times are in CEST (GMT +2). Convert CEST into any time zone.



09:00 **Norbert Heeb**, Empa

«Welcome, Introduction and Conference Opening»

09:10 **Claudia Mohr**, ETH, Laboratory for Atmospheric Chemistry, PSI

«Keynote Lecture: Nanoparticles, climate and health: From observation to impact»

25+5 min

Session 1: Aircraft, marine and other non-road sources

Chair: Norbert Heeb, Empa Dübendorf

09:40 **Zachary Decker**, Paul Scherrer Institute PSI

«Connecting size-resolved aerosol composition and gas-phase volatile emissions from aircraft engines at the Zürich airport»

15+5 min

10:00 **Tobias Schripp**, German Aerospace Center (DLR)

«Field Study on the Impact of Sustainable Aviation Fuels on Helicopter Engine Emissions»

15+5 min

10:20 **Lukas Durdina**, ZHAW Zurich

«Swiss research of particle emissions reduction with sustainable aviation fuels»

15+5 min

10:40 Coffee Break

Keynote: Nanoparticles, climate and health: From observation to impact

Best paper 2021 in Environ. Sci.: Atmos., 2021, 1, 161

“Molecular composition of semi-volatile aerosols in the summertime central Arctic Ocean”



Claudia Mohr,

ETH,

PSI,

Laboratory for

Atmospheric

Chemistry