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FINNISH METEOROLOGICAL INSTITUTE



Aerosol research





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Aerosol research

- ✓ The physical and chemical properties of tropospheric aerosols
- ✓ The composition, chemical transformation and physical properties of fine particulate matter in urban air
- ✓ Aerosol technology





Aerosol research

Research laboratory and facilities

- **Aerosol laboratory**
- **The crucial chemical analyses performed in-house**
- **Several field measurement campaigns per year; e.g., in 2004:**
 - Helsinki (4 campaigns)
 - Hyytiälä (1)
 - Pallas (1)
 - Rome (1)
 - Crete (1)

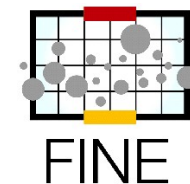




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The station of Kumpula - Part of the urban intensive measurement network (PARNET)

- Evaluate measurement methods
 - aerosols and gases
 - meteorology
 - ground-based and mast measurements
- Characterise urban air particles in Helsinki
- Source apportionment
- Support exposure analysis
- Combine measurements and dispersion modelling



Ref: R. Hillamo

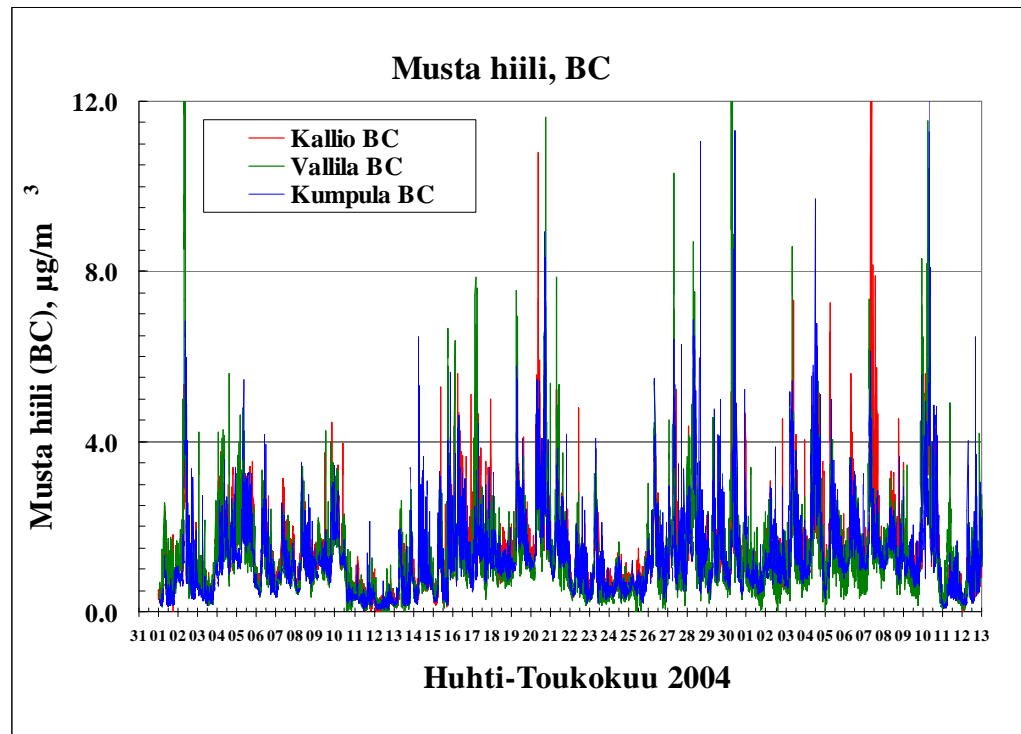


Aerosol measurements at the Kumpula station

- **total number concentration**
- **number size distribution (5 nm - 20 μm)**
- **black carbon (absorption)**
- **PM_{2.5} and PM₁₀**
- **EC and OC, RP5400**
- **Online chemistry: Particle into Liquid Sampler (PILS: anions, cations), high time resolution**
- **nephelometer(scattering), Particle Soot Absorption Photometer (Absorption) , ELPI (size distribution)**
- **raman Lidar, AOD**



Measurements of black carbon at Kumpula



Facility for measuring
the size distribution of
black carbon in real time

Measured temporal evolution of black carbon
at three stations in April – May, 2004



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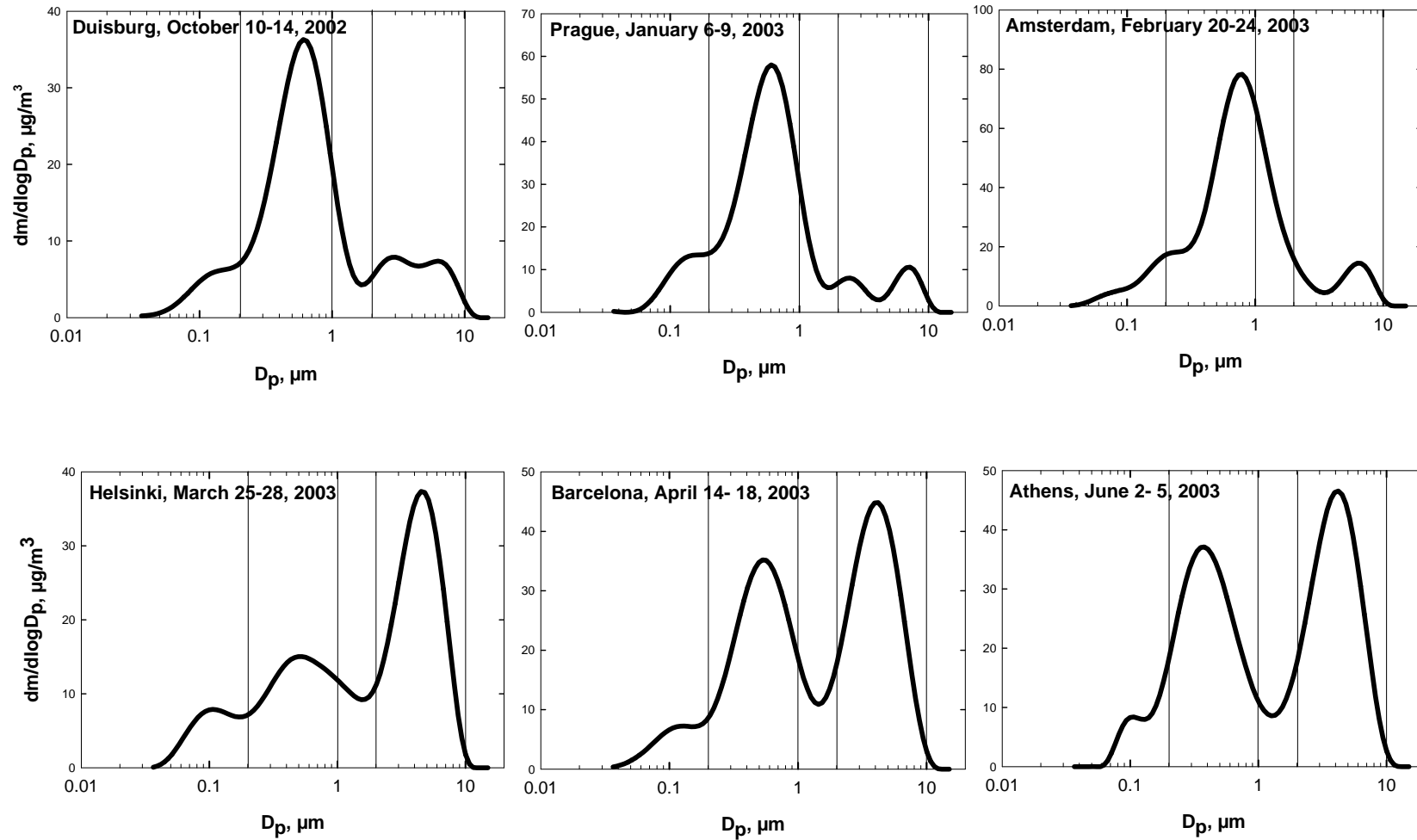


Measuring the health effects of fine particulate matter (EU-PAMCHAR) Measurement cabin in Prague





Toxicology of particles - PAMCHAR





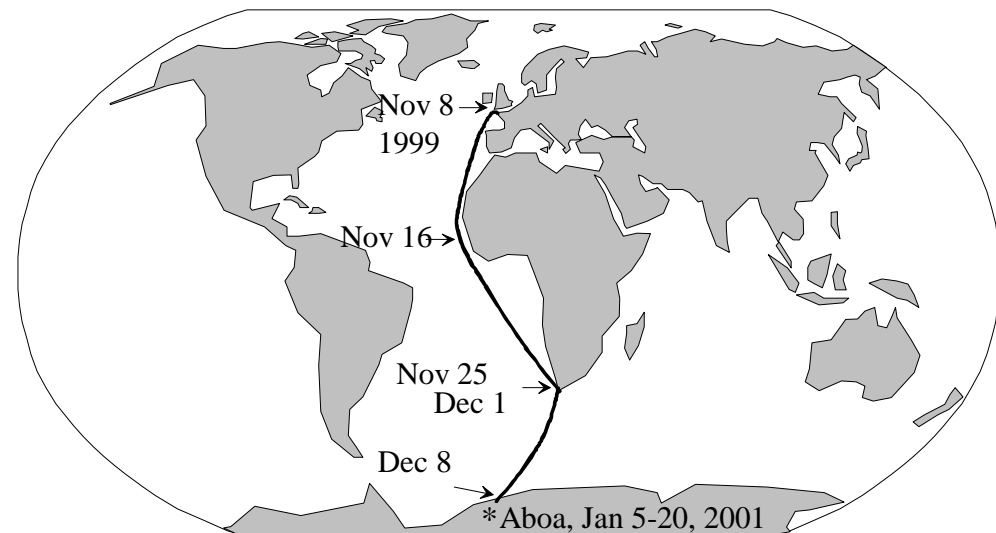
The second scientific expedition to Antarctica



The ship: Academic Fedorov

Route 1999-2000

Expedition 2004-2005:
- new particle formation
- ion-induced nucleation

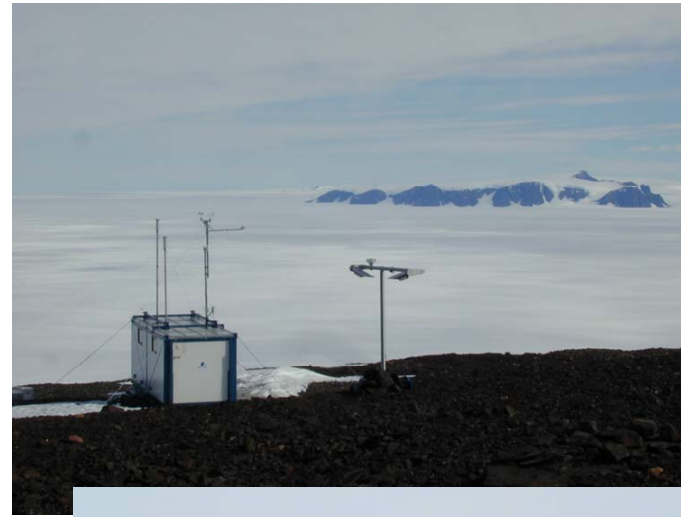




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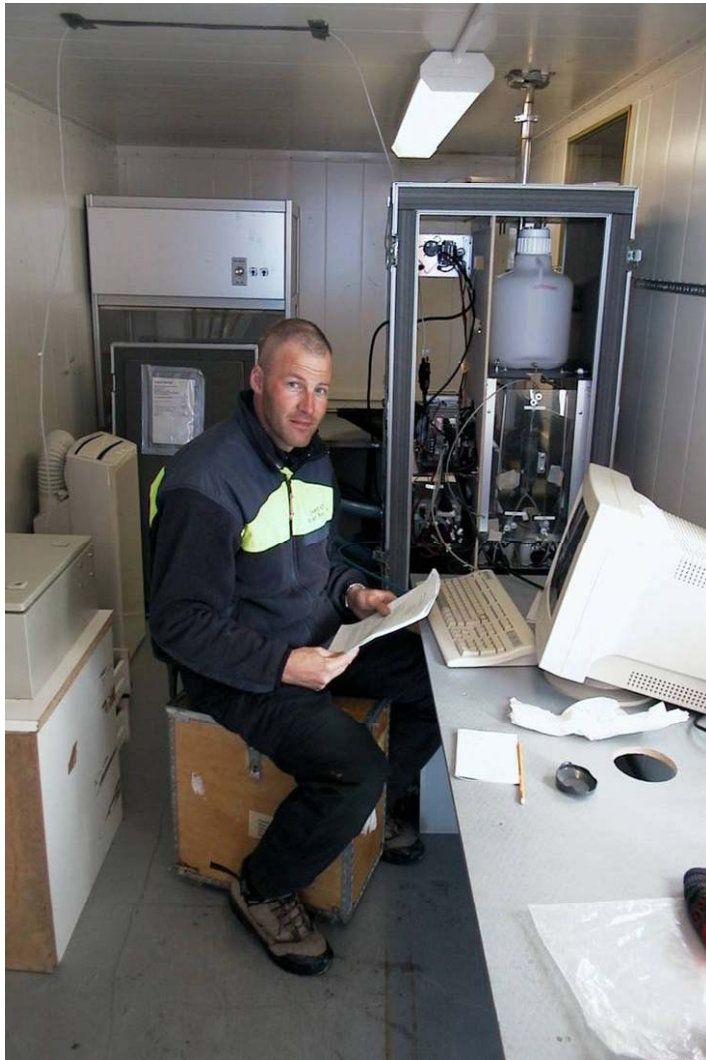


Aboa, Antarctica 1997-2001



Aboa, 2003





Sven Lidström
Swedish Polar Research Secretariat



Automatic particle
counter system