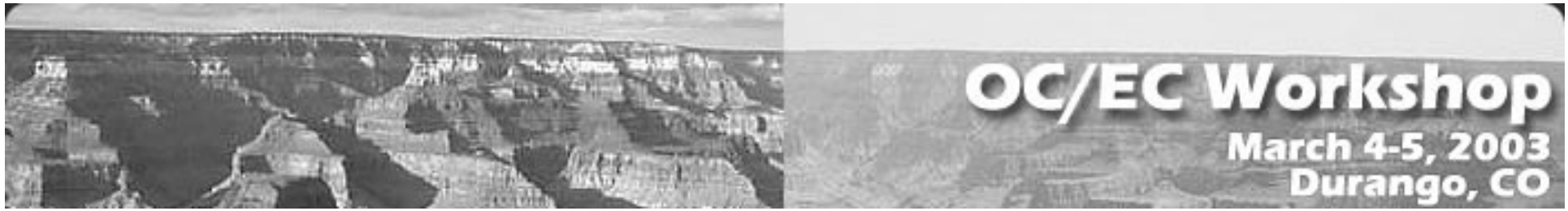

TOPIC #8

What New and Innovative Sampling, Analytical, and Interpretive Techniques are Needed to Determine the Properties and Sources of Carbonaceous Aerosol in the Atmosphere?

Two Focus Groups

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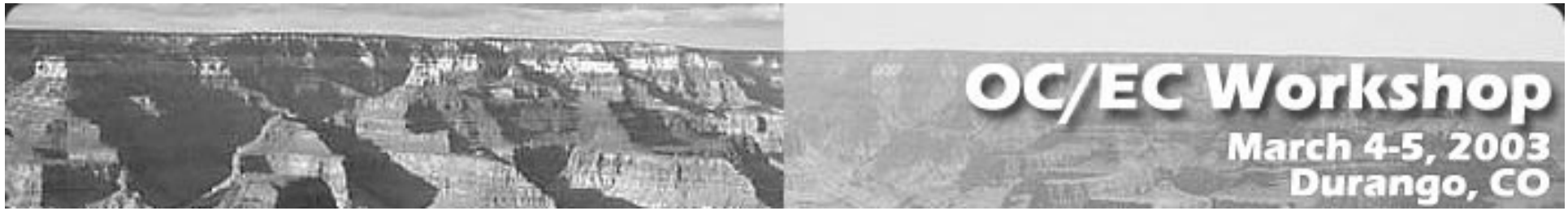

Relevance of OC/EC

1. Radiative Transfer and Visibility (Scattering and Absorption and Indirect Effects)
2. Source Apportionment
3. Health Effects (small, toxic particles)
4. Biosphere (agriculture, ocean, etc.)
5. Degradation of Buildings, Art, etc.

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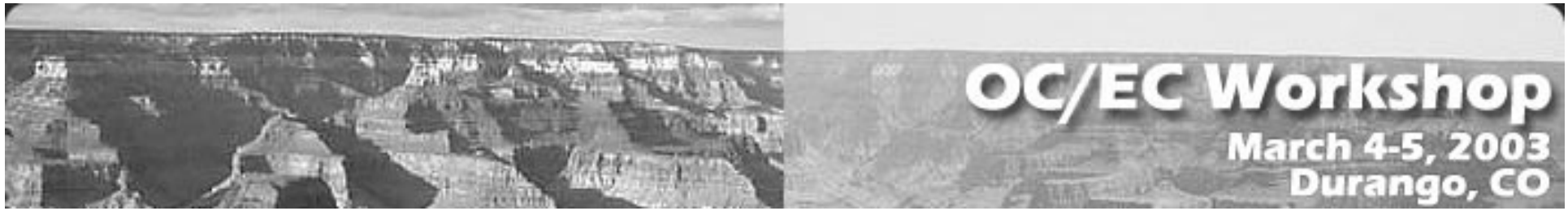

Appropriate Measurements: EC/OC?

1. **<u>Radiative Transfer and Visibility:</u>**
   Absorption, Scattering, asymmetry parameter g, phase function (measure directly and/or derive from species concentrations)
2. **<u>Source Apportionment:</u>**
   Any conservative properties
   Is light absorption conservative? Experiment!
3. **<u>Health Effects:</u>**
   We don't know.

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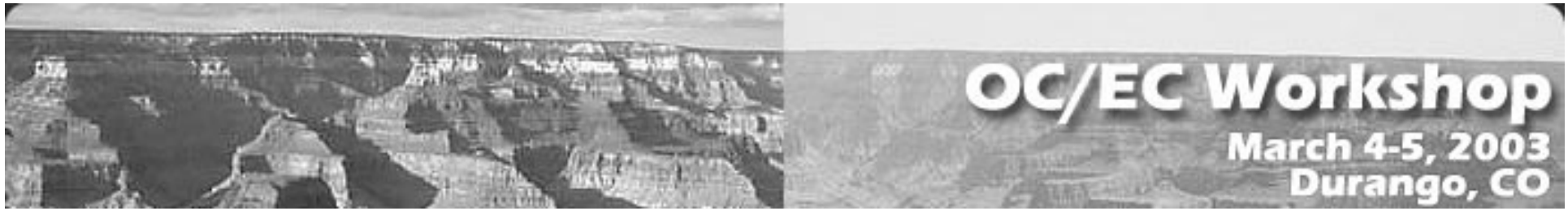

Sampling

1. **<u>What is a particle (semi-volatile?):</u>**
   denude & freeze
2. **<u>Large particles:</u>**
   Inlet design
3. **<u>Problems with quartz filters:</u>**
   friability, sorption of VOCs
   alternative: gold filters?

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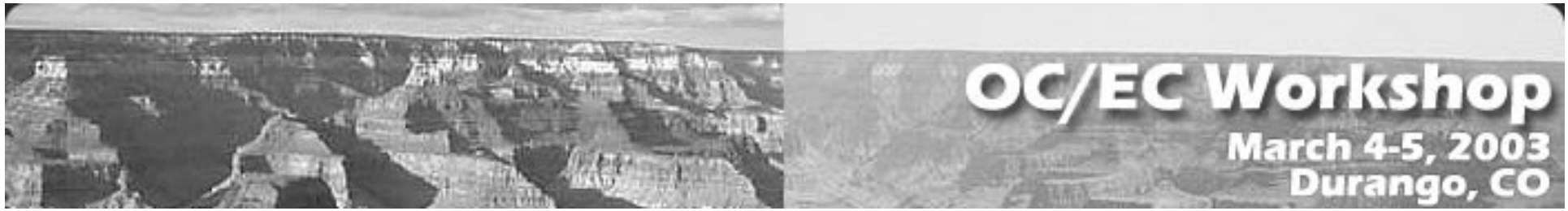

Light Absorption (priority for RT, visibility)

1. **Spectrally resolved:**
   through solar spectrum, 300 nm - 1000 nm
2. **Correlation with GC from Raman Spectroscopy**
3. **Phase functions?**

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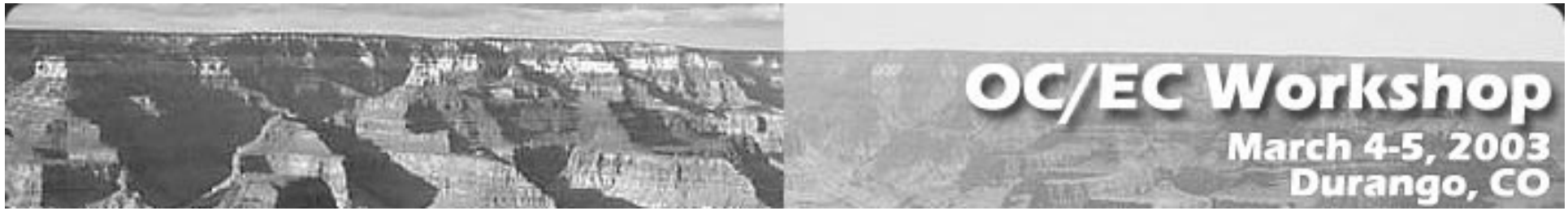

Importance of Continuous Measurements

1. **Ambient:**
   At least 1 h, better 10 min time resolution
2. **Source:**
   1 s
3. **What can we measure continuously:**
   Absorption, Scattering, TC, etc ?

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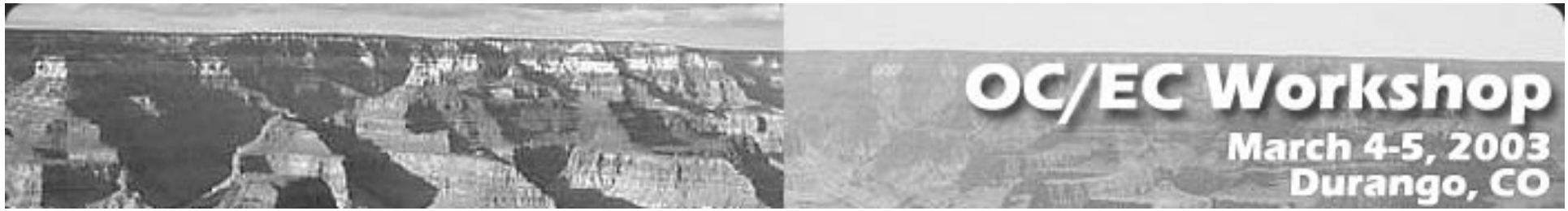

OC Functional Groups?

1. **Extremes:** OC and individual compounds
2. **Medium Ground:** Functional groups by FTIR

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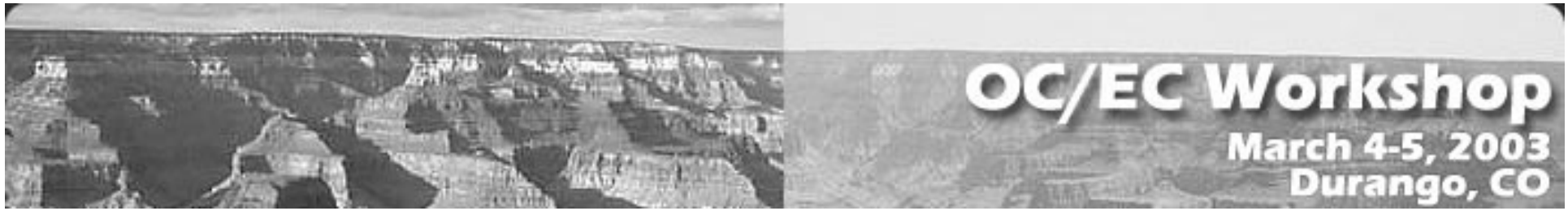

We will have to live with Thermal Optical Analysis ? Oh No!!!

Research Topics:

1. Use a better measure of filter blackness (Absorption through radiative transfer approach).
2. Multi-wavelength measurement of absorption.
3. Real time determination of filter mass during TOA.
4. Use Raman spectroscopy to characterize pyrolized OC in comparison to EC.

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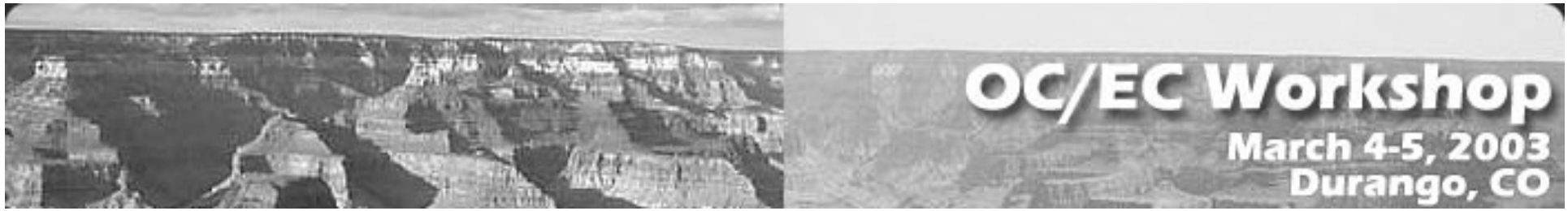

We will have to live with Thermal Optical Analysis ? Oh No!!!

Standardization (over 3 years):

1. Use standard protocol in addition to individual protocols
2. Generate standard materials or standard facility.
3. Obtain traceability to standards.

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