CLASSIFICATION
OF SINGLE PARTICLE
OPTICAL SCATTERING PATTERNS
BY THE
SPECTRUM ENHANCEMENT ALGORITHM

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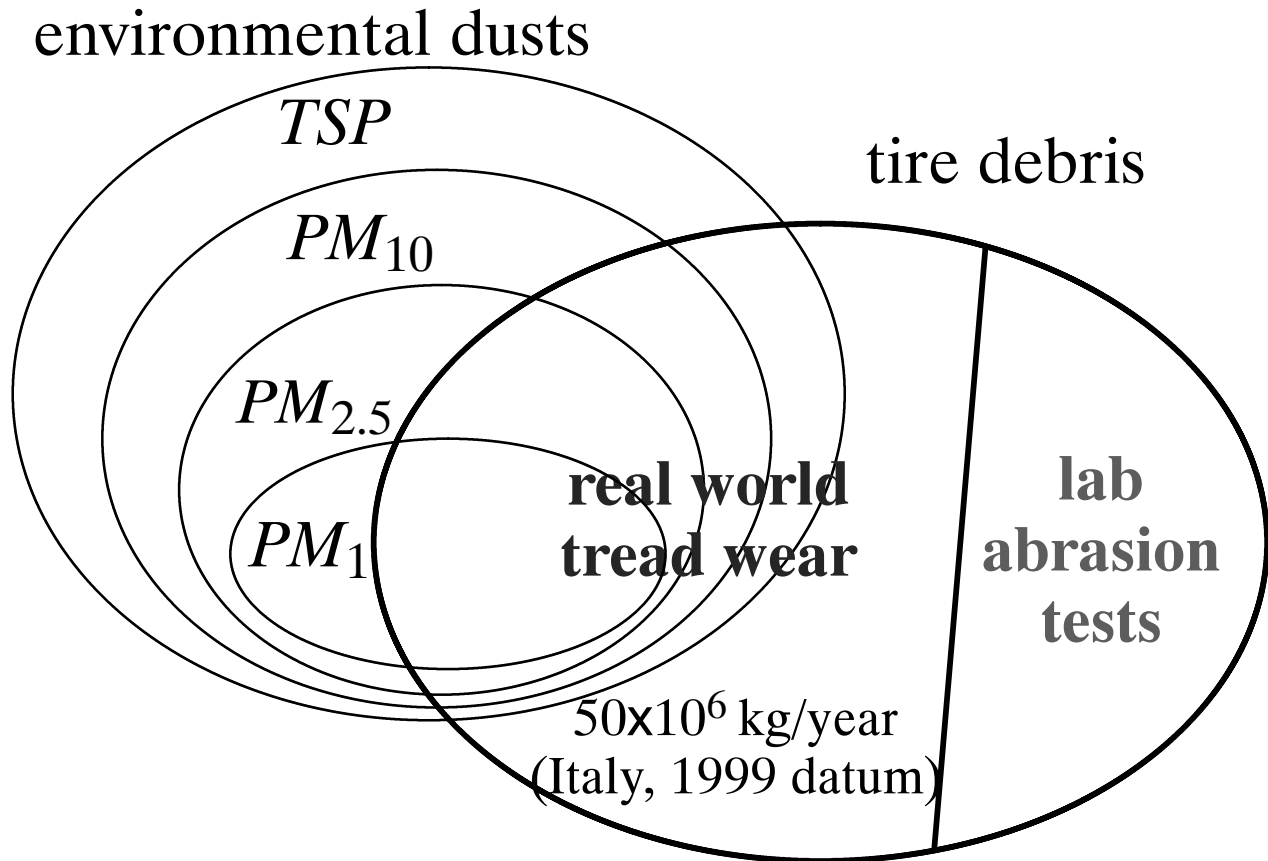University of Milan−Bicocca (MI−B), MILAN, IT 20126
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PLAN

- **Motivation**

- **Experimental**

- **Spectrum enhancement for feature extraction**

- **Classifier training**

- **Applications**

- **Confidence and stability of classification**

MOTIVATION
TIRE DUST: WHAT, HOW, WHY ?

environmental dusts

TSP

PM_{10}

$PM_{2.5}$

PM_1

tire debris

real world tread wear

lab abrasion tests

50×10^6 kg/year (Italy, 1999 datum)

Characterization of tire dusts
  morphology
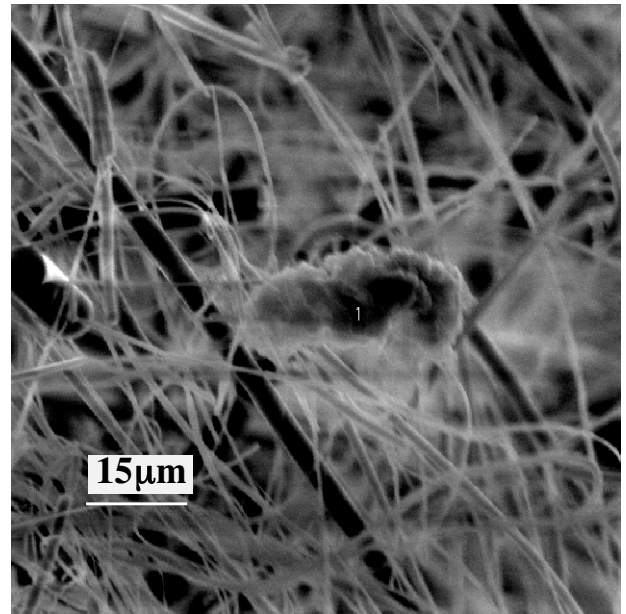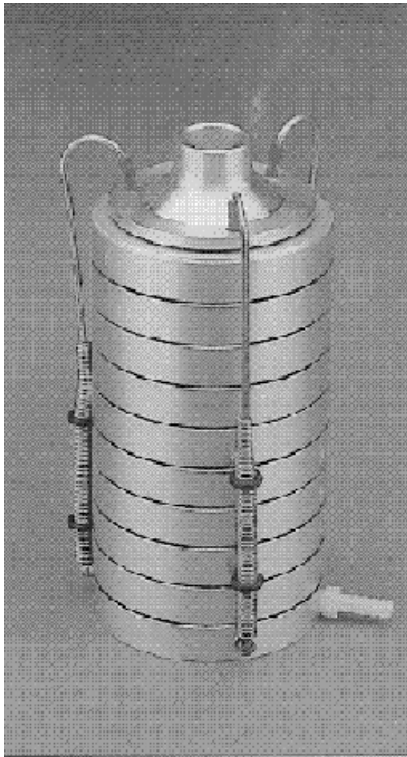 *physics*
  chemistry.

Identification in heterogeneous materials
  laboratory specimens
  environmental specimens.

Evaluation of impact
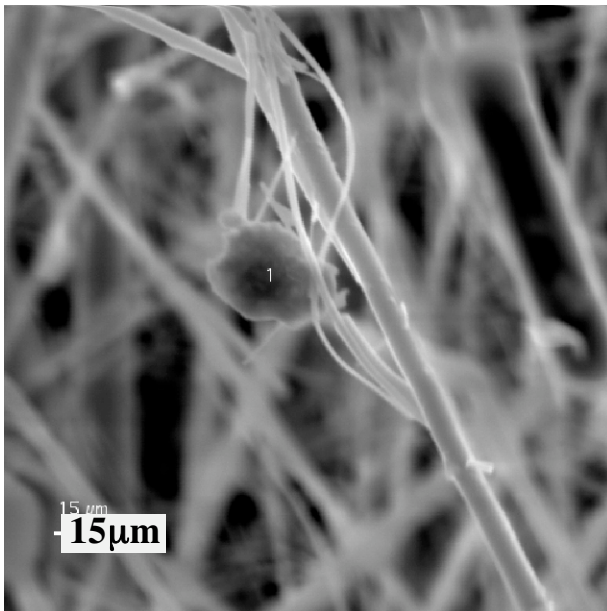 *on human health*
  on environmental compartments.

ENVIRONMENTAL PM_{10} SAMPLING

ANDERSEN INSTRUMENTS $20-800$
$1-ACFM$
Non Viable Sampler (1999)

Background PM_{10}
impacted on glass fiber disc

Tire debris particle in
skid braking PM_{10}

High sulfur hydrocarbons
in skid braking PM_{10}