EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

CA16109 Chemical On-Line cOmpoSition and Source Apportionment of fine aerosoL

COST Action CA16109 COLOSSAL: objectives and activities

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Forum for air quality modelling in Europe

FARIMODE Technical meeting

Tallin, Estonia

June 26-28, 2018

What is COST

COST: European Cooperation in Science & Technology

- ✓ COST is the longest-running European **framework** supporting **trans-national cooperation** among researchers, engineers and scholars across Europe.
- ✓ COST Mission:

COST aims to enable breakthrough scientific developments leading to new concepts and products. It thereby contributes to strengthening Europe's research and innovation capacities.

What is COST

COST: European Cooperation in Science & Technology

- ✓ COST is an **EU-funded programme**.
- ✓ COST funds pan-European, bottom-up interdisciplinary **research networks** across all science and technology fields in Europe and beyond: **COST Actions**.
- ✓ COST Actions promote international coordination of **nationally-funded research**.
- ✓ COST provides funds for organising conferences, meetings, training schools, short scientific exchanges or other **networking activities** in a wide range of scientific topics.

COST Action COLOSSAL

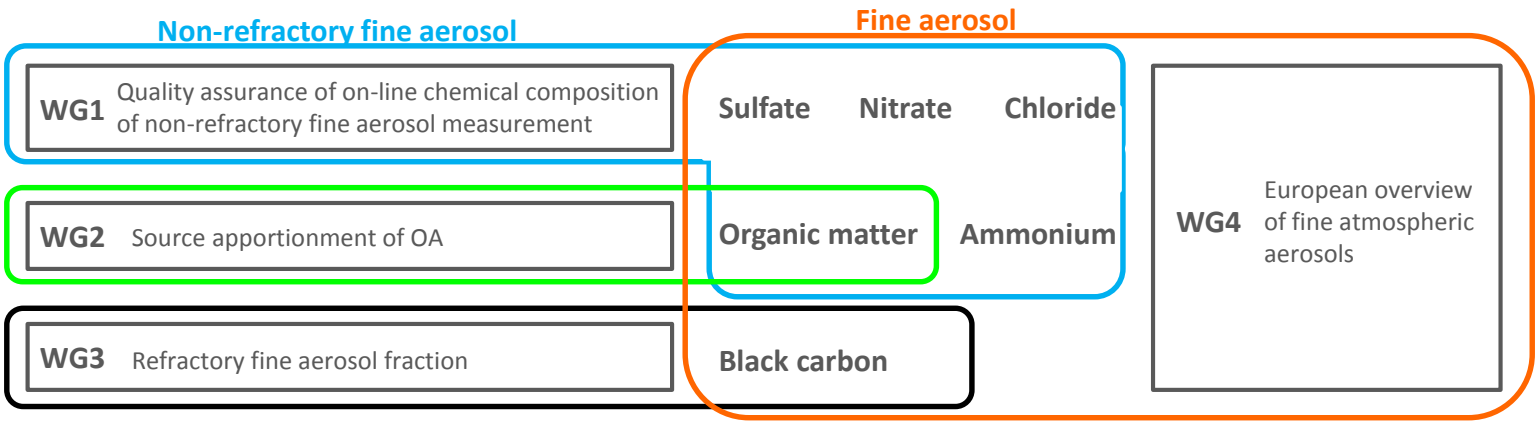
Chemical On-Line cOmpoSition and Source Apportionment of fine aerosoL, CA16109

Challenge:

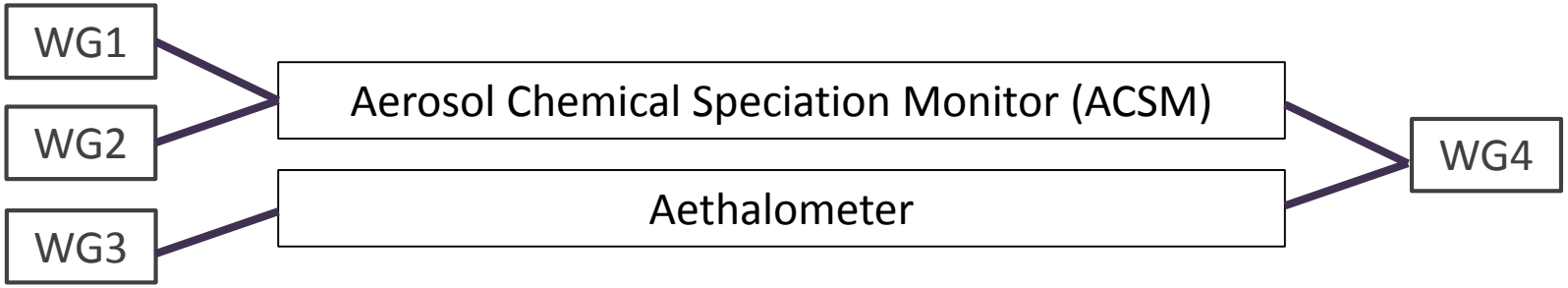
To optimize and harmonize **fine atmospheric aerosols online measurements**, guaranteeing the transfer of knowledge. To coordinate overarching analyses to assess the spatial variability (across Europe), temporal variability (at a one hour time resolution or better), seasonality (using long term datasets), phenomenology (chemical composition) and sources of fine atmospheric aerosol.

Structure

Chemical On-Line cOmpoSition and Source Apportionment of fine aerosoL



Main instrumentation:



Objectives

Research Coordination Objectives (1-5)

1) To provide clear, evidence-based guidelines for real-time chemical characterization of fine atmospheric aerosols, in terms of measurement protocols and data treatment, which ensures consistent, reproducible and comparable results across Europe.

2) To provide a homogenized protocol to determine the source apportionment of fine organic aerosol and black carbon, based on real-time measurements of organic mass spectra and light absorption at different wavelengths, respectively.

3) To coordinate and reinforce exchanges of scientific research necessary to understand factors influencing the concentrations and chemical composition of fine atmospheric aerosols.

4) To ensure the good performance of the instrumentation used by undertaking intercomparison exercises.

5) To develop quality control and assurance criteria and methodologies for the above-mentioned activities and promote their use Europe-wide and globally.

Objectives

Research Coordination Objectives (6-10)

6) To promote the joint interpretation of results at different European sites.

7) To maintain and further build a network of experts, researchers, Early Career Investigators (ECI), and PhD students that allows the achievement of the previous objectives. This will also contribute to the overall skills base.

8) To provide data for air quality model evaluation and model development which are the basis of air quality related policies.

9) To bring together the communities dealing with black and brown carbon with the ones dealing with chemical composition and source apportionment.

10) To recommend to manufacturers desirable features of instrumentation for the determination of real-time chemical characterization and source apportionment of fine atmospheric aerosols.

Objectives

Capacity Building Objectives (11-12)

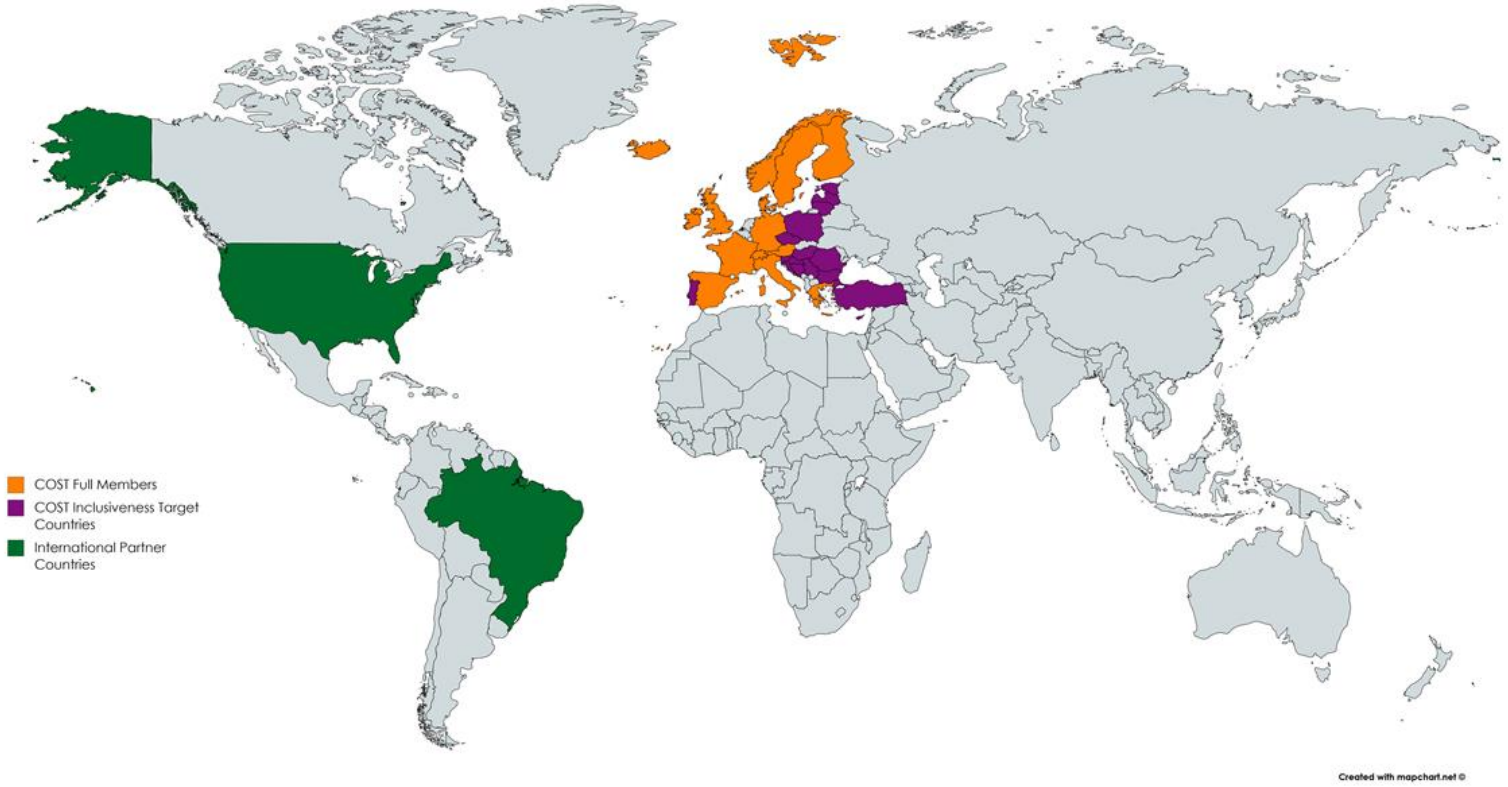
11) To train less-experienced researchers (mainly PhD students and ECI) on the use of techniques for real-time chemical characterization and source apportionment of fine atmospheric aerosols and interpretation of results and data treatment.

12) To support and training of researchers (including PhD students and ECI) from Participating Countries and Inclusiveness Target Countries who might have a need for such knowledge and might lack other means to achieve such experience.

Participants

31 countries	69 institutions	203 participants

Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Norway, Poland, Portugal, Romania, Serbia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, Brazil, United States of America



Action timeline

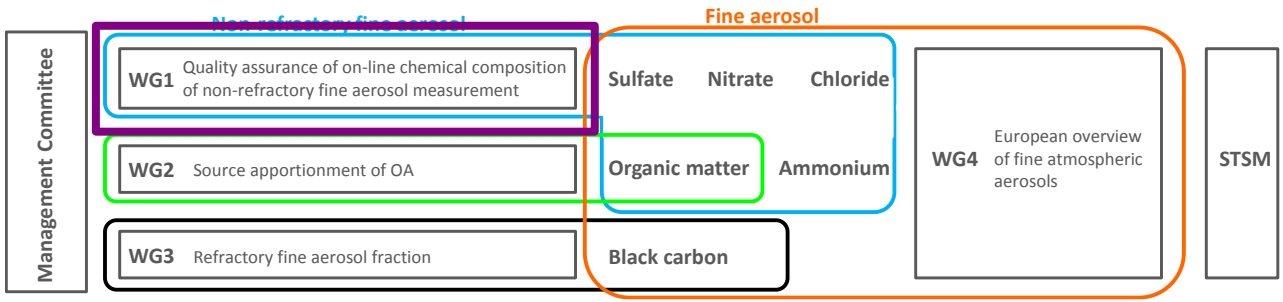
- Action started 3 March 2017

4 years duration

2 March 2021

We are at Month 16

Activities



WG1
Quality assurance of on-line chemical composition of non-refractory fine aerosol measurments

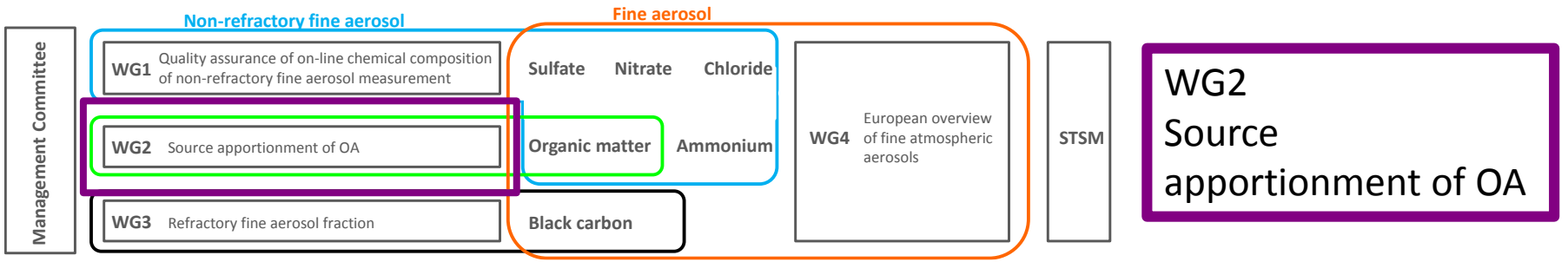
- Training Schools
  - ✓ ToF-ACSM, Prague, 12-14 Feb 2018

Sessions:

- Measurement principles of ToF-ACSM
- ToF-ACSM settings and tuning
- Data acquisition
- Data processing

- Intercomparison exercise ACSM and co-located instruments
  - ➢ Nov 2018, coordinated with ACTRIS2
- Workshops (data treatment and discussion of intercomp output + best practices)
- Wikipage with Best Practices

Activities



- Training Schools
  - ✓ Source apportionment OA high time resolution, Prague, 15-17 Feb 2018
- Workshops (advanced OA SA)
- Working group meetings
  - ➢ WG2 meeting, Bucharest 24-28 September 2018
- Contribution to SPECIEUROPE

Sessions:

- Overview PMF-ME-2
- Overview SoFi
- How to prepare your input datasets
- SoFi tool
- Result interpretation

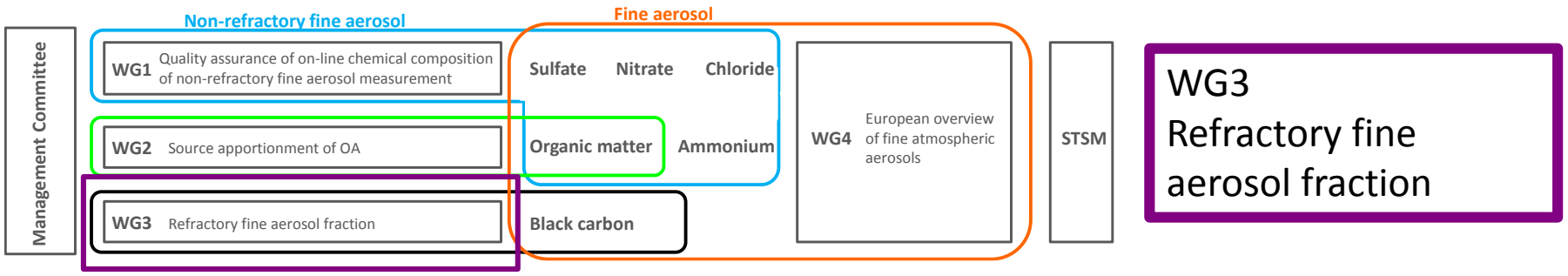
Activities

Advanced organic SA using SoFi Pro 6.4

- Inspection / Selection of thousands-millions of PMF runs based on user-defined proxies/tracers (dynamic criteria-based feature)
- Inspection of **averaged PMF runs**
- **Bootstrap analysis** for the assessment of the statistical error in PMF results
- **Rolling approach** allowing for time-dependent factor profiles, especially relevant for long-term SA studies
- **C-value** (manual and automated) when combining data from two and more instruments
- Many more useful tools, such as **classifying** variables/timepoints for an efficient result inspection, **hourly/daily resolutions** in addition to default, **averaging package** for the input data, etc.

Contact person: Francesco Canonaco / Andre Prevot (PSI) (andre.prevot@psi.ch)

Activities

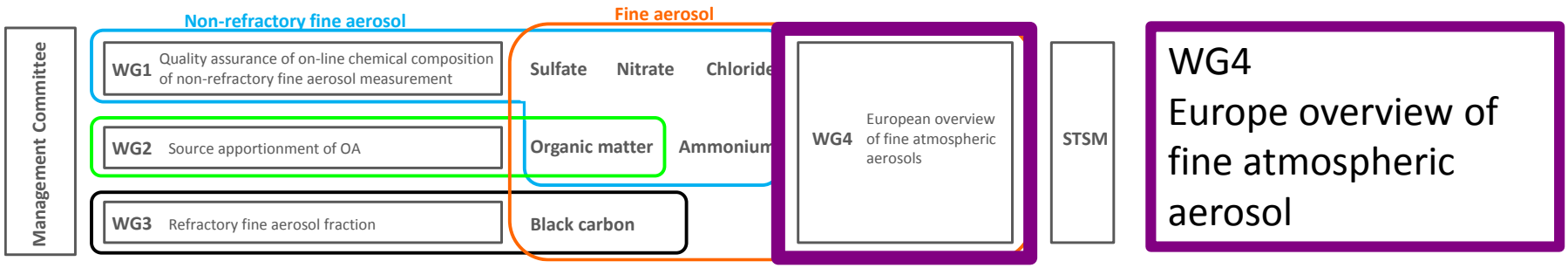


- Training Schools
  - ✓ Black and brown carbon, Ljubljana, 15-17 Jan 2018
- Intercomparison exercises
  - ➢ Tentatively Oct 2018 or Jan 2019
- Workshops
- Wikipage

Sessions:

- Black and Brown Carbon
- BC On-road and ambient measurements
- Measuring BC and BrC with Aethalometers
- Black Carbon source
- Aethalometer AE33 training and quality control/assurance
- ….and more

Activities



- Workshops (to gather existing datasets in Europe, discuss the results, and possibly decide on the additional datasets)
  - ➢ WG4 meeting, Bucharest 24-28 September 2018
- Common activities
  - ✓ Participation to the EMEP/ACTRIS/COST winter experiment (2017-2018)
- Contribution to EBAS

Activities

EMEP/ACTRIS/COLOSSAL:

GOAL

- To quantify EBC_{ff} and EBC_{bb} by multi wavelength aethalometer measurement, and to validate this approach using concurrent off-line measurements of the wood burning tracer levoglucosan

- To provide a harmonized data set for model validation

- To initiate regular monitoring of EBC_{ff} and EBC_{bb}, and reporting of such data to EBAS.

Contact person: Wenche Aas

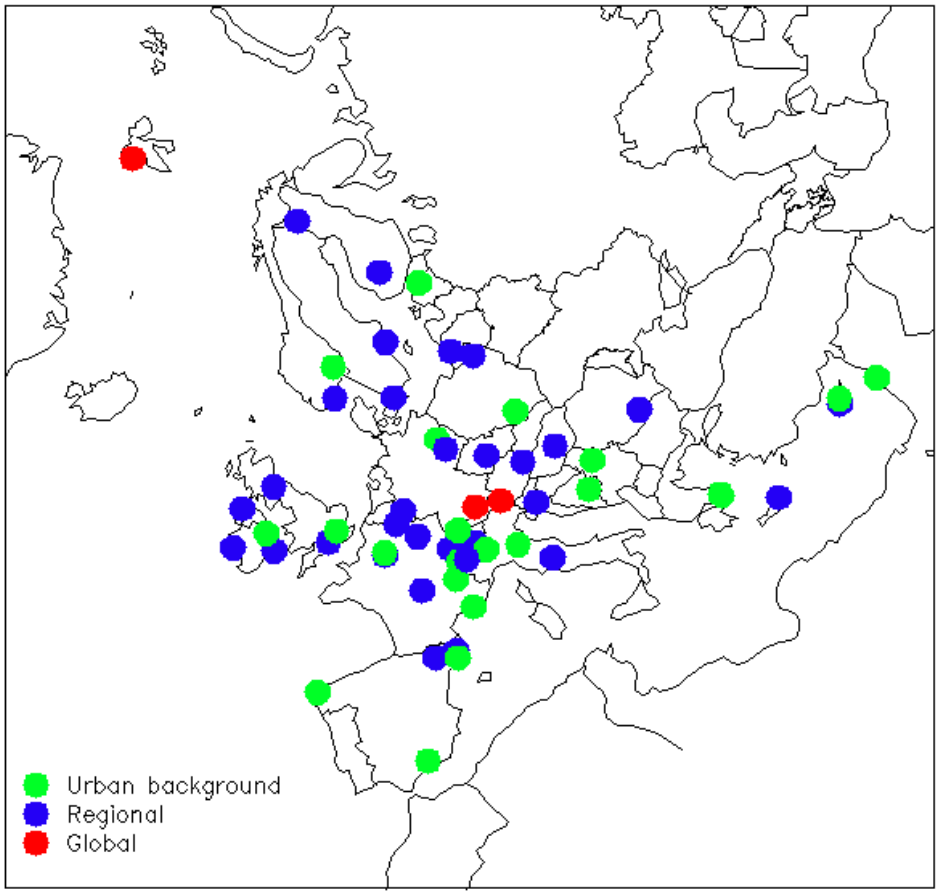
Activities

EMEP/ACTRIS/COLOSSAL:

- **22 Countries**. **57 sites** (not all confirmed)
- AE + OC/EC +levo

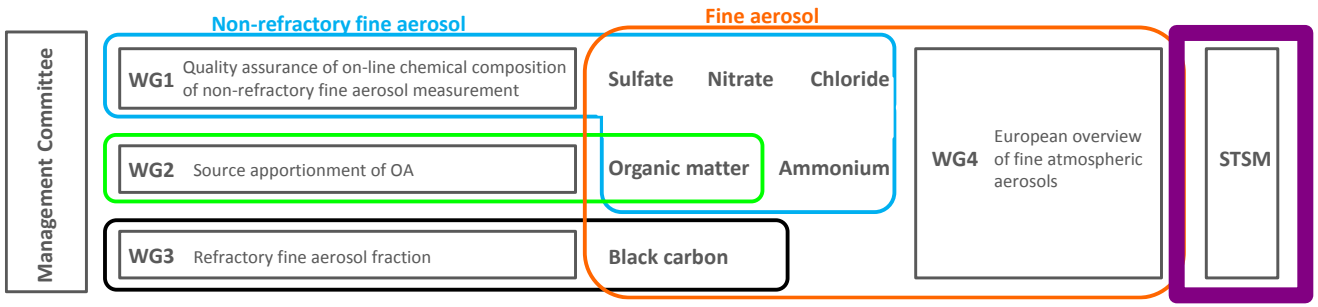
•Additional measurements

- 18 sites with ACSM
- 12 with MAAP



Contact person: Wenche Aas (wenche.aas@nilu.no)

Activities



Strengthening existing networks and fostering collaborations within COST partners. A STSM should specifically contribute to the scientific objectives of the COST Action

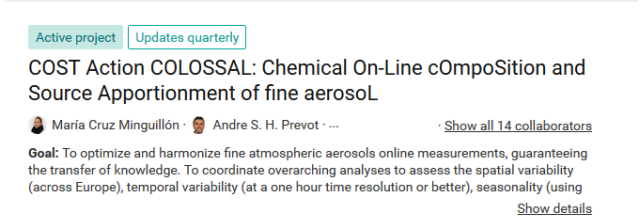
- ✓ 1st Call: 12 September 2017, 6 grants
- ✓ 2nd Call: 8 February 2018, 2 grants
- ➢ 3rd Call: 8 June 2018, 10 grants

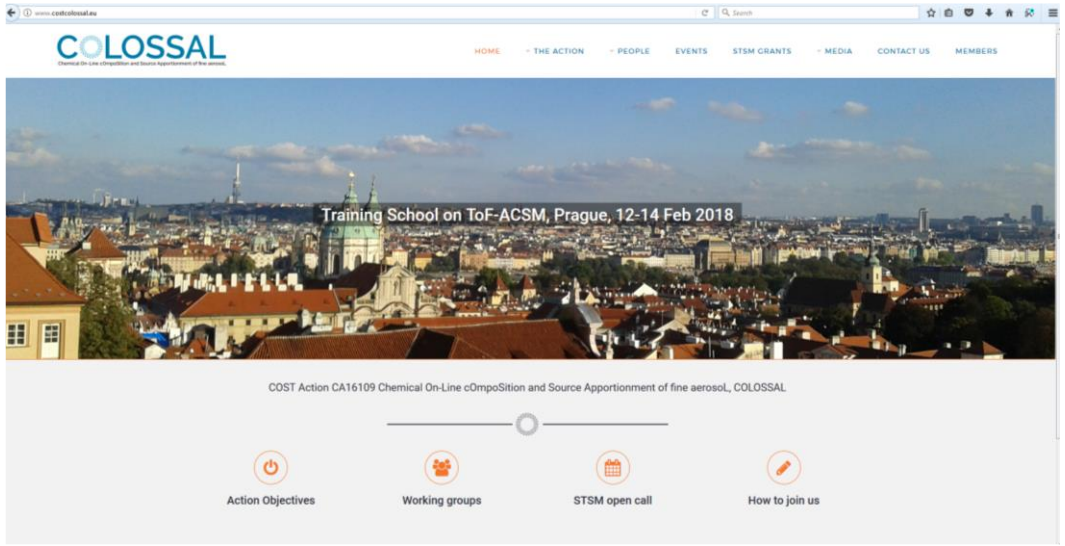
How to follow

- Twitter @cost_colossal

- http://www.costcolossal.eu/

- Research Gate





How to join

- http://www.costcolossal.eu/contact-us/
- http://www.cost.eu/participate/join_action

  - Email: mariacruz.minguillon@idaea.csic.es
  - contact your COST National Coordinator (CNC)

Thank you for your attention