

## **6.014 Insight into the Global Distribution of Ground-level Fine Particulate Matter from Satellite Remote Sensing and from the SPARTAN Aerosol Network.**

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Abstract:

Fine particulate matter (PM<sub>2.5</sub>) is believed to be the leading environmentally-related risk factor for premature mortality worldwide. However, ground-level monitoring remains sparse in many regions of the world. Satellite remote sensing from multiple platforms (e.g. MODIS, MISR, SeaWiFS, CALIOP) and algorithms (e.g. Dark Target, Deep Blue, MAIAC) offers a global data source to address this issue. Global numerical modeling plays a critical role in relating these observations to ground-level concentrations. The resultant satellite-based estimates of PM<sub>2.5</sub> indicate dramatic variation around the world, with implications for global public health. A new ground-based aerosol network (SPARTAN) offers valuable measurements about PM<sub>2.5</sub> in globally dispersed urban areas across more than 10 countries to evaluate and improve satellite-based PM<sub>2.5</sub> estimates, and to provide near-surface chemical and microphysical detail unobtainable from space. These SPARTAN measurements offer insight into the global mass, optical properties, chemical composition, and trace metals in PM<sub>2.5</sub>. This presentation will highlight recent advances in combining satellite remote sensing, global modeling, and ground-based measurements of atmospheric aerosols to improve understanding of global population exposure to PM<sub>2.5</sub>.