DEPARTMENT OF **CHEMICAL & ENVIRONMENTAL ENGINEERING**

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## THREE CASE STUDIES IN ATMOSPHERE-SURFACE EXCHANGE

***RESUSPENSION OF GASOLINE-DERIVED LEAD FROM YEARS PAST***
***SOILING OF LIMESTONE BUILDINGS***
***CHEMICAL CONSTITUENTS IN THE GREENLAND ICE SHEET***

Research on exchange processes between the atmosphere and surfaces are discussed in this seminar, focusing on three specific case studies. In the first, a mass balance for airborne lead in the South Coast Air Basin of California is presented, using emission inventory data and airborne concentration data on record at CARB. The mass balance results suggest that significant amounts of airborne lead measured currently in the SOCAB result from resuspension of soil originally contaminated by lead during the decades of leaded gasoline use. In the second case study, damage to limestone buildings by atmospheric pollutants is explored through modeling and measurement of a limestone building in Pittsburgh, PA. Results suggest that pollutants weaken the limestone surface which enables subsequent wind-driven rain to erode the surface. The erosion can continue over many years. In the third case study, chemicals in the Greenland Ice Sheet are examined to determine their origin; results suggest that long-range transport of both natural and anthropogenic pollutants are responsible for much of the chemical content in the ice sheet, and that some specific events can be traced back to their origins in the mid-latitudes.