

Chemical Physics of the Environment

Chemical physics processes play important roles in many environmentally relevant processes including the sequestration, migration, transformation and removal of contaminants in soil, the atmosphere and ground water; water purification; green manufacturing; the migration and transformation of nanoparticles in the environment. For example, the chemical physics of transition metal oxides (and other oxides and minerals) impact contaminant migration in ground water, contaminant sequestration (including carbon storage), and the catalytic and photo-catalytic reduction of atmospheric contaminants. The production, transformation and radiation impacts of atmospheric aerosols (often involving many reactive chemicals) have important impacts on pollution and atmospheric radiation. Processes in fluids including water and scCO_2 are also of wide importance. Focus topic sessions will include:

- **Transition metal and other oxides** - The chemical physics of transition metal oxides and other oxides and minerals with relevance to contaminant oxidation/reduction and transport, emission sequestration (including CO_2), and other environmentally important processes such as nucleation and growth, dissolution, catalysis and photocatalysis.
- **Green processes** - Chemical physics relevant to environmentally friendly processes (green processing, green solvents, catalysis for contaminant removal etc.)
- **Atmospheric Aerosols** - Understanding formation, transformation, and transport processes of atmospheric aerosols and their implications for radiation balance and other important environmental processes.
- **Nanoparticles in the environment** – Chemical physical processes related to transformations, migration and physicochemical properties of nanoparticles in the environment.
- **Water (and other fluids)** – Chemical physics of water which impacts contaminant transport, water purification, transport and reactions in nano-pores, multi-phase fluid flow, and a variety of processes relevant to clouds and aerosols.
- **Sensors** – Chemical physics of detection processes important for the development of highly sensitive environmental sensors

An objective of this symposium is to examine the current understanding (and limitations) of environmentally relevant processes and to point towards areas where additional theoretical and/or experimental advances and tools can enable scientific advances. Many environmental reactions couple processes across materials phase or size and presentations that deal with these added complexities are particularly encouraged.

Symposium Organizers:

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