Title: Structures and reactivity of clays and nanoparticles in soils and water

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Session description: The clay sized (<2-micron) particles, including clay minerals and recently more emphasized the finer (<100 nm) nanoparticles in soils, sediments, and water are the major players in regulating the chemistry of inorganic and organic compounds in the environment. The type, structure (ordering and defects), quantity, and morphology of the clays and the nanoparticles are also the indicators of the genesis of the soils and the diagenesis of the minerals in the sediments. The reactions of the clays and nanoparticles with nutrients, heavy metals, pesticides, emerging contaminants determined the fates of these inorganic and organic compounds in the soil-water environment. With recent advances in instrumentation, experimental and computational methodologies for clay and nanoparticle characterization and quantification, our understanding about the natural clays and nanoparticles in soils and water are improving. This session seeks presentations on 1) the characterization, computation, simulation work on the clays and nanoparticles in soils and water, and 2) their reactions with inorganic and organic compounds concerned to agriculture, health, and environment.