Hasok Chang

22 January, 2:00 p.m. - 3:30 p.m., Refugee Scholar's Room

"Physical Constitution vs. Mereology"

Abstract:

I propose a practice-based perspective on physical ontology, with particular attention to what happens in the actual practices of synthesis and disassembly in chemistry and physics. Such a focus exposes significant difficulties with the common mereological framework, which presumes the existence of units combining with each other without suffering any alterations in the process. In the experimental physical sciences, ranging from early modern chemical analysis to contemporary elementary particle physics, atomistic assumptions have co-existed with worries about fundamental units being changeable. Phenomena such as nuclear reactions, proton–proton collisions and the pair-creation and pair-annihilation of matter and anti-matter have given ample demonstrations that physical composition does not fit the standard part–whole relations in mereology. 'Compositionism' in chemistry and physics, founded on the notion that things are made up of immutable units simply getting rearranged through reactions, is a habit of our thinking, not a dictate of nature. We do apply compositionist thinking successfully in many areas of mathematics and some areas of science and everyday life, but not in the most fundamental parts of physical science. It would be a mistake to base our metaphysics on compositionism uncritically.