How Students Can Learn Science on the Basis of “Misconceptions”

I will present two “high resolution” studies of learning. The first is an extraordinary case of high school students learning good science on the basis of what are generally regarded as “misconceptions.” These students produced a correct model of thermal equilibration in about an hour, and with essentially no instruction. In the second case, another class chose a different set of elements to build on, and wound up with a non-normative model. Because most of the “naïve” knowledge elements that were used by the students have been previously well-researched, we are in an excellent position to identify the particular ways in which they are changed and combined during learning. These patterns of change and composition constitute good candidates for general learning mechanisms. I conclude with implications for the field of conceptual change, showing that what happened in these case studies is fully consistent with the “knowledge in pieces” perspective on conceptual change, but inconsistent with what competing views presume.

Please join us for a more informal discussion with Dr. Andrea diSessa during our “Coffee and Chat” session from 2:30 pm – 4:00 pm in the Natural Sciences Building (Room 3203).