CALIFORNIA STATE UNIVERSITY, LONG BEACH

THE MATHEMATICS COLLOQUIUM

Presents

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Speaking on

Muddy Children, Other Logic Puzzles, and Temporal Dynamic Epistemic Logic

Friday November 9, 2007 12:00noon - 1:00PM

FO3-200A

Abstract: Dynamic epistemic logic describes how knowledge is updated upon new information. Consider this puzzle: Five very intelligent young siblings went out one day to play in the park. After an hour, their father came down to the park and noticed that some of his children had mud on their foreheads. He then announced that at least one of them was muddy, and he then asked if they knew if they themselves were. After they simultaneously shook their heads "no" (and had no other form of communication), he asked again, and then again, until all of the muddy children simultaneously answered "I am", while those not muddy still shook their heads. How the muddy children came to know that they were muddy is a puzzle of both mathematical induction and dynamic epistemic logic. This talk will address this puzzle as well as other puzzles of dynamic epistemic logic, and will discuss various languages related to dynamic epistemic logic, including temporal dynamic epistemic logic that allows us to express past events.