



Samueli
School of Engineering

Electrical and Computer Engineering
66-147H Engineering IV,
420 Westwood Plaza
Los Angeles, CA 90095-1594

Phone: 310.825.6913
s.s.iver@ucla.edu
www.chips.ucla.edu



What really is Heterogeneous Integration ?

Subramanian S. Iyer

UCLA Center for Heterogenous Integration and Performance Scaling (CHIPS)

Samueli Engineering, UCLA

s.s.iver@ucla.edu

chips.ucla.edu



Abstract

Packaging is undergoing a major paradigm shift and promises to take up the lag caused by the slowing down of CMOS scaling. In this paper, we examine these shifts that have been driven by the scaling of key packaging metrics such as bump pitch, trace pitch, inter-die spacing and alignment. The goal of advanced packaging is to enable the same benefits that Moore/Dennard scaling has accomplished for CMOS viz. density, performance, power, and cost and can make packaged chip assemblies comparable to monolithic SoCs using these metrics with the additional advantage of heterogeneity. The vehicles that advanced packaging employs are somewhat different: dielets/chiplets, advanced assembly techniques, simplified inter-chip communication protocols and cost optimization via the use of optimized heterogeneous technologies. Another important aspect of advanced packaging is the adoption and adaptation of silicon technology methods to packaging. In this talk we will discuss what characterizes heterogeneous integration and what defines a chiplet and dielet.

(Keywords: Packaging, chiplets, dielets, Si IF, FOWLP, interposers, 3DIC)