

SCALE SEPARATION, SCALE DEPENDENCE, AND MULTISCALE MODELING IN THE PHYSICAL SCIENCES

a philosophy talk by

JULIA BURSTEN

(University of Kentucky)

The nanoscale poses challenges to scale separation, a common strategy of physical modeling. There, because the physics of the bulk occurs at the same length scale as the physics of the surface, common scale-separation techniques fail. Modeling the scale-dependent physics of nanoscale materials presents a new challenge whose solution requires conceptual engineering and new modeling infrastructure. These considerations suggest a view of physical modeling that decenters philosophical concerns around idealization and representation in favor of attention to interactions across length and time scales.

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