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Dr. Kee's research efforts are primarily in the modeling and simulation of thermal and chemically reacting flow processes, with applications to combustion, electrochemistry, and materials manufacturing. A major ongoing focus is in the chemistry and electrochemistry of solid-oxide fuel cells. His combustion research emphasizes the use of elementary chemical kinetics to understand fundamental flame structure. Current research includes efforts on catalytic partial oxidation, catalytic combustion and water-mist flame suppression. The materials-processing efforts emphasize the design, optimization, and control of chemical-vapor-deposition processes, with applications ranging from thin-film photovoltaics to CMOS semiconductor devices. Dr. Kee is the principal architect and developer of the CHEMKIN software, which is a leading software package used worldwide for simulating chemically reacting flow.