During the past funding year, we have extended our research to (1) developing binder-free porous core-shell structured Ni/AlSnO_3 configuration and porous NiO/AlSnO_3 core-shell structured anodes; (2) developing mesoporous silicon anodes; (3) developing mesoporous silicon-based NiSnO_3 anodes for electrochemical micro-capacitors; (4) developing mesoporous silicon anodes; (5) developing NiSnO_3 films fabricated by sol–gel method; (6) developing Sn@carbon composites and Sn@carbon-based micro-capacitors; (7) developing novel mesoporous NiSnO_3 anodes for lithium ion batteries. All these research efforts have significantly advanced our understanding of fundamental issues regarding intrinsic properties of conversion mechanism and alloying mechanism-based porous materials as anodes for Li-ion batteries.