A hot-carrier relaxation process has been discovered that may eventually be used to increase the electrical output voltage from a solar cell based primarily on nano-composite films of silicon. Using a technique called electron spin resonance, Center members Taylor and Collins of the Colorado School of Mines and Madan from MVSystems, Inc. have found that electrons and holes generated in amorphous silicon regions can transfer to the nanocrystalline regions before losing their excess energy to heat.