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Amorphous Silicon-Carbon Nanostructure Solar Cells MARIA SCHRIVER, UC Berkeley, WILL REGAN, MATTHIAS LOSTER, ALEX ZETTL — Taking advantage of the ability to fabricate large area graphene and carbon nanotube networks (buckypaper), we produce Schottky junction solar cells using undoped hydrogenated amorphous silicon thin films and nanostructured carbon films. These films are useful as solar cell materials due their combination of optical transparency and conductance. In our cells, they behave both as a transparent conductor and as an active charge separating layer. We demonstrate a reliable photovoltaic effect in these devices with a high open circuit voltage of 390mV in buckypaper devices. We investigate the unique interface properties which result in an unusual J-V curve shape and optimize fabrication processes for improved solar conversion efficiency. These devices hold promise as a scalable solar cell made from earth abundant materials and without toxic and expensive doping processes.

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