Ultrathin silicon solar cells are attractive in reducing cost but challenging in their optical and electrical optimization. In article number 1800858, Sihua Zhong, Fanying Meng, Wenzhong Shen, and co-workers propose all-solution-processed Si nanopyramids as surface texture for ultrathin solar cells. A 37-μm-thick Si solar cell, obtained by industrially compatible processes, achieves good performance and a quasi-omnidirectional characteristic.