

Abstract Submitted
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High Performance Tandem Perovskite/Polymer Solar Cells¹ YAO LIU, MONOJIT BAG, ZACHARIAH PAGE, LAWRENCE RENNA, PAUL KIM, JAEWON CHOI, TODD EMRICK, D. VENKATARAMAN, THOMAS RUSSELL², UMASS — Combining perovskites with other inorganic materials, such as copper indium gallium diselenide (CIGS) or silicon, is enabling significant improvement in solar cell device performance. Here, we demonstrate a highly efficient hybrid tandem solar cell fabricated through a facile solution deposition approach to give a perovskite front sub-cell and a polymer:fullerene blend back sub-cell. This methodology eliminates the adverse effects of thermal annealing during perovskite fabrication on polymer solar cells. The record tandem solar cell efficiency of 15.96% is 40% greater than the corresponding perovskite-based single junction device and 65% greater than the polymer-based single junction device, while mitigating deleterious hysteresis effects often associated with perovskite solar cells. The hybrid tandem devices demonstrate the synergistic effects arising from the combination of perovskite and polymer-based materials for solar cells.

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