Beating the Limit for Solar Cell Efficiency

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The detailed balance limit furnishes an upper bound for solar cell efficiency. Yet, by considering the assumptions made in this theory, one can find ways of improvement. Concentrators, multiple cells, and multiple pair generation are useful approaches, but often at the expense of higher production cost.

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Hans J. Queisser was born in Berlin, Germany in 1931. He studied physics in Berlin; Lawrence, Kansas; and in Goettingen, Germany, where he obtained his doctorate in 1958. He was Senior Scientist with William Shockley in Mountain View, California; there he published the paper on “Detailed Balance Efficiency of Solar Cells.” Later he worked at Bell Laboratories and the University of Frankfurt, Germany. In 1970 he became one of the Founding Directors of the Max-Planck-Institute for Solid-State Research in Stuttgart, Germany. He is a member of several academies and was president of the German Physical Society.