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Quantum heat engines, Fano Interference, Quantum Coherence and the Limits to photocell efficiency PHILIP VETTER, Princeton University, Texas A&M University — In quantum heat engines, incident light excites electrons, which can then deliver useful work to a load. Radiatively induced quantum coherence can break detailed balance and yield lasing without inversion. It is claimed that it is possible to break detailed balance via quantum coherence, as in the case of lasing without inversion and the photo-Carnot quantum heat engine. Although in complete accord with the laws of thermodynamics, in principle, a quantum limit to photovoltaic operation can exceed the classical one, so that noise-induced quantum coherence, such as Fano coherence, enables us to break detailed balance and get more power out of a laser or photocell.

Philip Vetter
Princeton University, Texas A&M University

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