

EFFECT OF SUNLIGHT INTENSITY ON THE EFFICIENCY OF SOLAR CELLS: FROM III-V MULTIJUNCTION CONCENTRATOR CELLS TO ORGANIC PHOTOVOLTAICS

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I will start with detailed introductions into two seemingly discontinuous areas of photovoltaic (PV) research and technology: PV conversion of concentrated sunlight and organic photovoltaics (OPV) based conjugated polymer / fullerene bulk hetero-junction (BHJ) solar cells. After reviewing state-of-the-art and some most important challenges in both technologies I will report about:

- (1) our experimental results on ultra-high-flux ($> 1,000$ suns) characterization of concentrator III-V multijunction solar cells [1-4];
- (2) recent findings on the effects of concentrated sunlight on key PV parameters [5-6] and stability of organic photovoltaics [5,7].

References

1. J.M. Gordon, E.A. Katz, D. Feuermann, M. Huleihil, *Appl. Phys. Lett.* **84**, 3642 (2004).
2. J.M. Gordon, E.A. Katz, W. Tassew, D. Feuermann, *Appl. Phys. Lett.* **86**, 073508 (2005).
3. E.A. Katz, J.M.Gordon, W.Tassew, D. Feuermann, *J. Appl. Phys.* **100**, 044514 (2006).
4. O. Korech, B.Hirsch, E.A. Katz, J.M. Gordon, *Appl. Phys. Lett.* **91**, 064101 (2007).
5. T. Tromholt, E. A. Katz, B. Hirsch, A. Vossier and F. C. Krebs. *Appl. Phys. Lett.* **96**, 073501 (2010).
6. A. Manor, E. A. Katz, T. Tromholt, B. Hirsch and F. C. Krebs. *J. Appl. Phys.*, **109**, (2011), in press.
7. T. Tromholt, A. Manor, E. A. Katz and F. C. Krebs. *Nanotechnology*, **22**, 225401(2011).