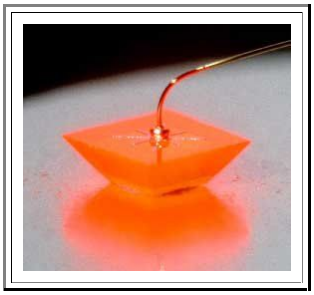
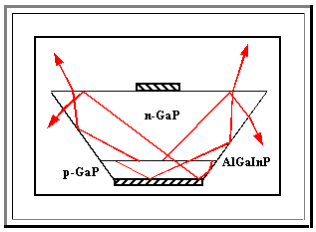
Recent Developments in LEDs

Advanced

- Here is some more information about the inverted Pyramid **LED**.
  - It was described quite recently (*M.R. **Krames** et. al., "High-Power truncated-inverted-pyramid (AlxGa1-x)0.5In0.5P/GaP light-emitting diodes exhibiting >50% external quantum efficiency," Applied Physics Letters, 75[16], pp. 2365, (1999)*) and has a large optical efficiency leading to a "external quantum efficiency" which is simply the what we called total external efficiency of **55%** (as compared to about **30 %** of the former champion).
  - The cross section below shows why: There are few reflection losses. Otherwise the device is not quite as simple as looks like. It is based on an epitaxially-grown aluminum gallium indium phosphide/gallium phosphide (**AlGaInP/GaP**) multiwell active region sandwiched between an **n**-type gallium phosphide (**GaP**) layer and a **p**-type **GaP** layer.





  - More information can be found in a recent article from the internet or in the *Scientific American* from February **2001**.