cells providing over 10 kW of power. The 1970s also saw the first use of shallow junction silicon cells for increased blue response and current output, the use of the back surface field, the low–high junction theory for increased silicon cell voltage output, and the development of wraparound contacts for high efficiency silicon (HES) cells to enable automated array assembly and to reduce costs.

In the 1980s, the gap between theoretical efficiencies and experimental efficiencies for silicon, gallium arsenide, and indium phosphide became almost nonexistent (see Figure 10.1) [12]. New thin-film cells of amorphous silicon and $CuInGaSe_2$ brought the possibility of higher thin-film efficiencies and flexible, lightweight substrates that excited the space community. However, silicon still provided the majority of the power for space and eventually the solar arrays for the International Space Station (ISS) (see Figure 10.2).

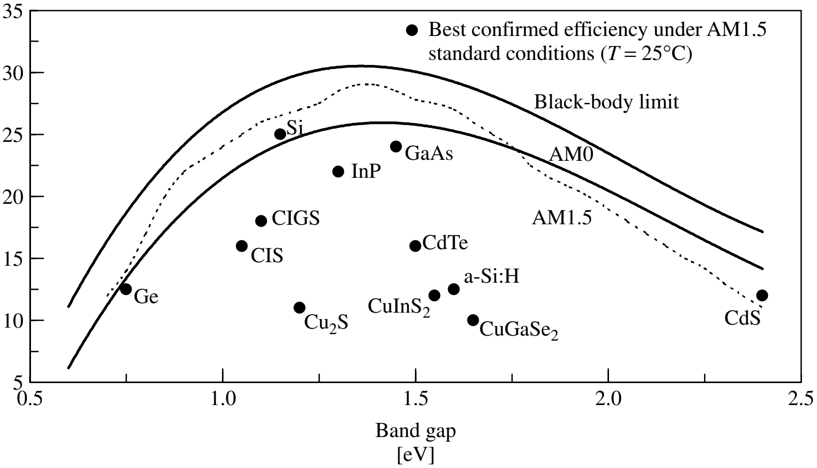

Figure 10.1 Comparison of measured cell efficiencies to the theoretical limits as a function of band gap [12]

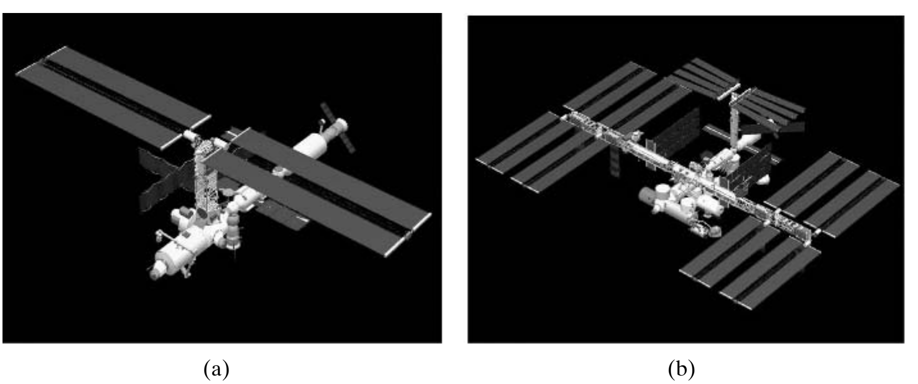

Figure 10.2 (a) Current status of International Space Station (ISS) and (b) planned configuration of ISS by 2004. (Pictures courtesy of NASA)