successfully developed even without the terrestrial market addressed above. On the other hand, the parallel (but partly deferred) evolution of space and terrestrial photovoltaics has led to many fruitful and essential cross-stimulations.

Solar modules for space applications (Figure 2.14) have to meet other and mostly more stringent requirements than terrestrial devices such as lowest weight and highest efficiency, extremely high reliability, high resistivity against extraterrestrial particle radiation (high lifetime) and spectral sensitivity that is well matched to the extraterrestrial solar spectrum.

Photovoltaic modules meeting corresponding standards have been realised in a relatively short time span. This success was based on many ingenious inventions and on the fact that cost reduction has not been the most important issue in the first decade of satellite technology. Thus, space photovoltaics became, at least initially, the technological breeder for today's silicon-wafer-based terrestrial solar cell technology.

A similar technology fertilisation might occur again: About one-half of today's space solar cells are already made from GaAs and related compound semiconductors (Figure 2.14). Such solar cells exhibit considerable higher efficiencies and lifetimes than Silicon cells. There is a realistic chance that these space-proven technologies become the basis for a new class of solar cells having light conversion efficiencies in the range of 40 or even 50%. Besides advanced flat-plate solar modules such solar cells, in conjunction with optical concentrators, constitute a strong technological option for future terrestrial large-scale electricity generation.

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