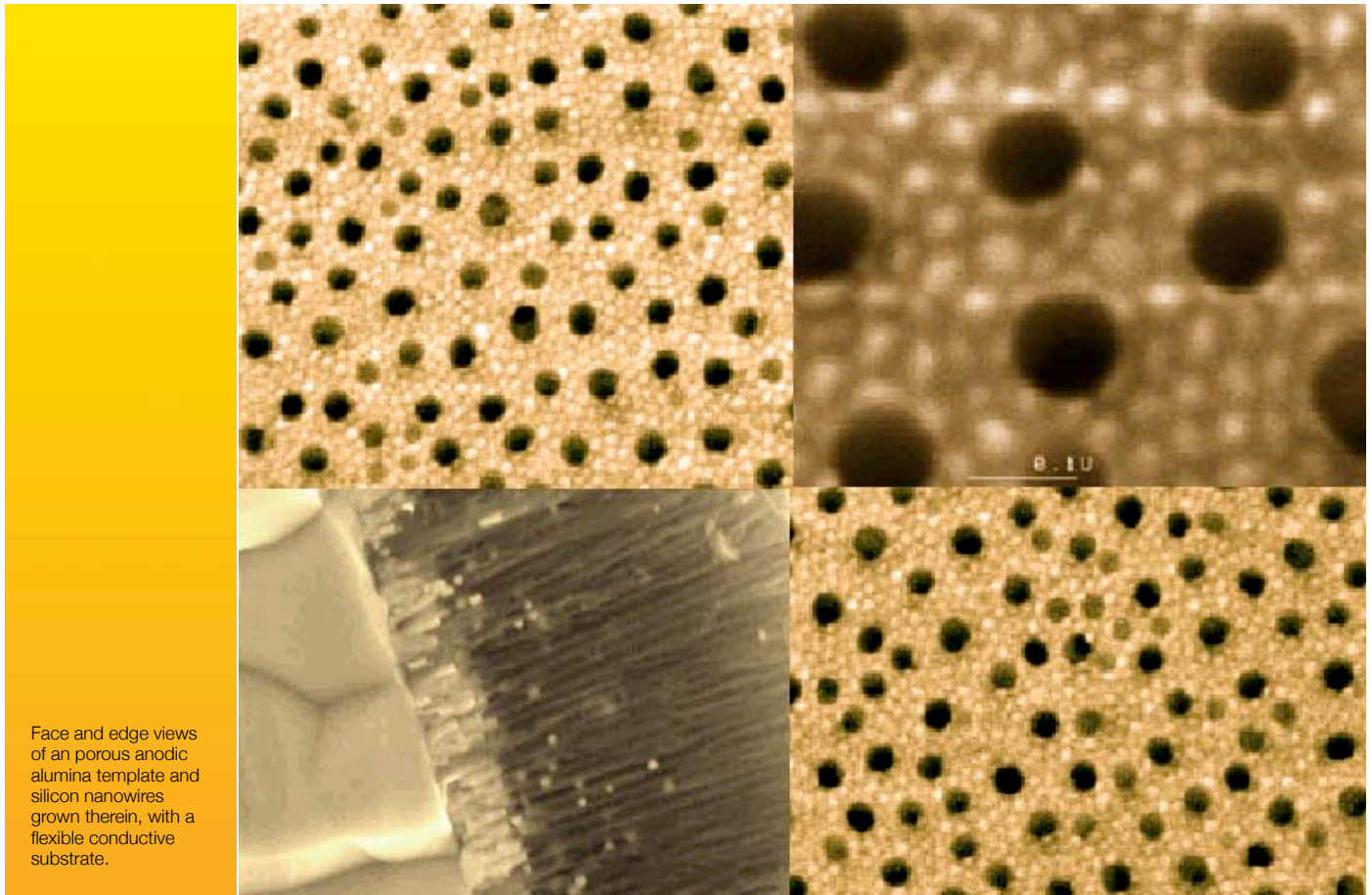


PHOTOVOLTAICS

Penn State MRSEC



Face and edge views of an porous anodic alumina template and silicon nanowires grown therein, with a flexible conductive substrate.



New architectures for photovoltaics flexible nanowire solar cells

IRG3



Sarah Dilts and Joan Redwing at the Penn State MRSEC, in collaboration with Joe Habib at Illuminex corporation, are fabricating arrays of silicon nanowires within nanoporous alumina membranes formed on flexible conductive substrate as next-generation photovoltaic devices. This innovative device geometry will make possible large two and three-dimensional photovoltaic panels that are light weight, efficient and can be stored in a small enclosure. Increased conversion efficiencies are anticipated as a result of the high broadband absorption of the nanowire array

structure. Since the silicon matrix is naturally subdivided into individual nanowires, the array as a whole can be flexible, unlike a monolithic panel. These photovoltaic panels can then be directly integrated into clothing and instrumentation, providing low cost and portable power. This project is supported by the Penn State MRSEC and SBIR funding from NSF and NASA.