



Photovoltaics – Heading towards Thin Films

Date: **Tuesday, March 27, 2001**

Time: **5:30pm**

Location: **The College of New Jersey, 128 Armstrong Hall (the Engineering Building)**

Abstract:

Photovoltaics is the conversion of sunlight (or light in general) to electricity. Around the world, solar modules are finding their way onto the roofs of houses or commercial buildings, and supplying electricity to displace some of the power drawn from the grid. The energy conversion is accomplished using solar cells. Traditionally, solar cells are made using expensive wafers of crystalline silicon, but now, cells and modules based on thin film semiconductors are becoming available.

This talk will examine the relative merits of thin film and wafer-based photovoltaics from a variety of standpoints – production technology, history, cost, stability, ratings, longevity, and energy payback time. The discussion ranges from general features to specific examples of the differences between these technologies, enabling a valuable perspective of the PV field to be gained.

Bio:

Dr. Alan Delahoy, Vice President of Research and Development and a corporate officer at Energy Photovoltaics, Inc. has 21 years of National Laboratory and industrial research experience. He received his B.A. degree in Physics from the University of Oxford in 1971, and his Ph.D. in Electrical Engineering from Rutgers University in 1979. Joining Brookhaven National Laboratory in 1979, he worked as an Associate Scientist on R.F. glow discharge amorphous silicon until 1981. He left Brookhaven to join Chronar Corporation, becoming Director of Research and Development in 1983, and continued in that capacity at Advanced Photovoltaic Systems in 1990. In 1991, Dr. Delahoy became VP R&D for EPV, Inc. He is an internationally respected researcher in photovoltaics, and with Dr. Z. Kiss, was responsible for the invention of the pre-heated box carrier concept using vertical close-packed substrates for large batch processing of amorphous silicon. At Chronar he investigated a-Si:H materials and devices prepared by static CVD, LPCVD, APCVD, photo-CVD, and plasma techniques, and introduced buffer layers, tandem cells, and ZnO back reflectors. At APS, he achieved, on April 6 1990, a then world record power output of 74.4 W for a monolithic thin film module. At EPV, Dr. Delahoy has led tandem junction a-Si development, and contributed to large-scale deposition processes for Cu(In,Ga)Se₂ using novel linear evaporative sources, and for Mo and ZnO:Al using pulsed magnetron sputtering. He has pioneered several diagnostic schemes for devices and modules, performed module energy delivery calculations, invented new processes for ZnO and ZnIn₂Se₄ film formation, and has secured and managed Government contracts. He has 79 publications and 9 patents.