*Continued from previous page*

devoted to scholarly exposition on electron scattering and spectroscopic techniques. Included are extensive treatments of low-energy electron diffraction (by M. G. Lagally), valence-band photoemission, including synchrotron-radiation techniques (by G. Margaritando and J. H. Weaver), core-level techniques, including x-ray photoelectron and Auger spectroscopies (by R. L. Park), and surface vibrational spectroscopic techniques (by W. H. Weinberg).

While the surface physics field is well known for its abundance of acronyms, even the most avid players of "Trivial Pursuit" amongst the readership might be stumped by "SLEEP" and "FERP." However, the reader of the opening chapter on work-function measurements (by L. W. Swanson and P. R. Davis) will discover that these identify a new wave of measurement techniques.

A limitation of the volume is that largely only the well-established techniques are presented, as opposed to the most cutting-edge, recent developments that will shape much of the future activity in the field. Certainly inclusion of such material might have easily doubled the size of the volume, and warranted a separate treatise unto itself. But, in all fairness, the present volume is also not totally devoid of such material. In particular, the last chapter on electron- and photon-stimulated desorption (by T. E. Madey and R. Stockbauer) provides the reader with such a glimpse, after the groundwork is prepared in the preceding chapter on conventional desorption techniques (by J. T. Yates, Jr.).

The volume is highly recommended to students and active researchers alike who want a solid reference to the mainstream of experimental surface physics. While the most up-to-date findings tend to be missing, the clarity and completeness of the presentations, and the successful integration of the material ensures the volume of a long useful lifetime.

*About the reviewer: S. D. Bader is a surface physicist in the Advanced Materials Section of the Materials Science and Technology Division of Argonne National Laboratory. His current research interests are in the magnetic properties of epitaxial films and monolayers, as studied by electron-spectroscopic, magneto-optic, and insertion-device synchrotron-radiation techniques.*

## Rapid Solidification Technology for Reduced Consumption of Strategic Materials

### J. E. Flynn

(*Noyes Publications, 1985*)

A prospective reader would be well advised to avoid this photo-offset repackaging of a report, originally prepared for the U. S. Bureau of Mines, that bore a different and more appropriate title. The original document undoubtedly served its sponsor fairly well, providing a relatively compact description of the technology of rapid solidification, and a fair assessment of the technical issues. Unfortunately, there doesn't seem to be a legitimate wider audience for a publication that should have been more carefully edited, and which contains a number of technical inaccuracies, one of which is fatal. The hope for a new, strategic element-free family of nickel-base superalloys, processed by rapid solidification, was proven to be futile at least four years ago. Chromium was found to be indispensable for adequate corrosion and oxidation resistance. It is not useful to continue holding up the prospect of reduced strategic element consumption as a potential benefit of rapidly solidifying nickel-base alloys when more recent, contradictory information exists.

There may be a legitimate need for hard-bound reproductions of documents that were originally prepared as government reports, particularly in order that a wider audience might be reached. However, such a need ought not to be automatically assumed; rather, it should be very selectively applied, and books such as this one might not be printed.

*About the reviewer: Loren A. Jacobson is staff member at Lawrence Livermore National Laboratory and former program manager, Defense Advanced Research Projects Agency.*

## Current Topics in Photovoltaics

### Edited by T. J. Coutts and J. D. Meakin

(*Academic Press, 1985*)

Solar cells are sure to play a significant role in the provision of the future electricity supplies. This volume addresses currently important topics in the photovoltaics in Chapters 1-5.

Chapter 1 deals with theoretical aspects of heterojunctions. The authors pay attention to the advantages and disadvantages of heterojunctions and present a detailed analysis of the individual contributions to the reverse saturation current. Chapter 2 deals with solar cells based on the Cu-ternary compounds and, in particular, with $CuInSe_2$. There is interest in this material because it is one of three systems which in thin film form have yielded device efficiencies greater than 10%.

Chapter 3 deals with a-Si:H-based solar cells. The author indicates the advantages of this material system which are a very high optical absorption coefficient, controllable type conductivity, low-cost and low-energy-intensity material, a very simple growth technique and the potential for economies of scale. Chapter 4 reviews the recent work on advanced high-efficiency concentrator solar cells. Chapter 5 concerns the extensively investigated $CdS/Cu_2S$ cell. The Chapter begins with an historical review of the device from its early relevance to space applications. Useful studies have been made of the copper-sulfur phase diagram and of the diffusion coefficient of copper in CdS.

Each of the chapters intends to represent an up-to-date assessment of the particular topic and be self-contained. This volume is very useful to any engineer and scientist who is interested in the solar cells.

*About the reviewer: Kazuro Murayama is a research associate of the University of Tokyo. He was a technical staff member of Bell Laboratories in 1980 and a visiting scientist at MIT in 1981.*





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