MRS SHORT COURSES

A short course on liquid phase epitaxy techniques proved so popular at last year's annual meeting it will be repeated at this year's. Two other short courses will be offered, as well.

The course program was organized by L.C. Feldman of Bell Laboratories, chairman of the Society's Education Committee. He noted the topics selected are those in which the most interest has been shown.

Liquid Phase Epitaxy

The short course in liquid phase epitaxy techniques is designed to present the practical aspects of epitaxial crystal growth using the LPE technique, with emphasis on application to III-V compound semiconductors. The course is designed primarily for those who wish to be involved with LPE in the laboratory, but have little experience with the problems involved. It should be useful for those in research and industrial environments.

Areas to be covered include the basic relevant thermodynamics, materials for which the technique is applicable, various system designs and growth procedures, growth kinetics, and some approaches to elementary characterization. Some discussion of the limitations of LPE and a brief comparison with competing techniques, such as CVD and MBE, will be made. If there is sufficient interest, an evening session will be arranged to discuss individual attendees' specific growth needs and problems. Notes will be provided.

The instructor is L.R. Dawson of Sandia National Laboratories, who taught it at the 1982 annual meeting. He has been actively engaged in LPE growth of compound semiconductor materials for 17 years. He obtained his B.S. from the California Institute of Technology and his M.S. and Ph.D. degrees from the University of Southern California. He spent eight years at Bell Laboratories and is now involved in materials research at Sandia. He has used the LPE technique for the growth of a wide range of III-V compounds, including GaAs, AlGaAs, GaP, InP and GaSb, and for a broad range of device applications including Gunn devices, light emitting diodes, field effect and bipolar transistors, lasers and optical detectors.

Surface Analysis

The course on surface analysis techniques will present the conceptual and practical aspects of modern surface and thin-film analysis techniques. The main purpose is to present the principles underlying the various materials-analysis techniques and their practical capabilities. The course will cover sputter-Auger analysis, X-ray photoelectron spectroscopy (X.P.S.), secondary ion mass spectroscopy (SIMS), Rutherford backscattering and channeling (RBS), electron-microprobe and other analysis techniques. The course is designed for all people concerned with modern materials analysis. At its completion, a student should be able to make an informed decision on the analytical technique applicable to a given problem.

The instructors are James W. Mayer of Cornell University and Feldman of Bell Labs. Each has had extensive experience in a range of problems concerned with surface analysis. Each also has had extensive experience in course development and instruction on this subject.

Mayer is a leader in the fields of thin-film science and technology. He has been employed at Hughes Research Labs, California Institute of Technology, and Cornell, which he joined in 1980, and where he holds the Bard chair in Materials Science. In 1981 Mayer was chosen by the Materials Research Society to receive its highest honor, the Von Hippel Award. ti 0.125i Feldman has been a member of the technical staff at Bell Labs since 1967. He has played a leading role in the development of ion scattering/surface science techniques and their comparison to other surface science probes.

Ion Implantation

The course entitled Ion Implantation: Principles and Practice is designed for scientists, engineers and technicians who are or will be involved in ion implantation. The curriculum will cover the fundamental techniques of ion implantation, the application of this technique to materials and the practical aspects of ion implantation equipment. The basic concepts of ion ranges and ion bombardment damage will be covered. Students will learn of the underlying concepts as well as sources of implantation information, such as range tables and damage profile compilations. There will be extensive discussion of ion implantation equipment. This will include discussion of various types of implantation machines, questions concerned with beam integration and implantation uniformity, vacuum requirements and so on. Applications will center on the fields of semiconductor doping and modification of the near surface properties of metals. The discussion of semiconductors will include annealing techniques. Metals applications will be concerned with the modification of the wear and corrosion properties of metal components.

The instructor is J. Hirvonen, vice president and technical director of Zymet Inc. He was formerly employed at the Naval Research Laboratories, where he formed one of the most active and successful implantation programs in the United States. He is a leader in the field of ion implantation equipment and its unique applications to materials science and current materials problems.

Each of the three short course is planned for two days. Registration materials are being developed, and will be forwarded to members by the Secretariat. Non-members should request information at the following address:

MRS Secretariat
Ernest M. Hawk
110 Materials Research Laboratory
University Park, PA 16802