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ABSTRACT DEADLINE: NOVEMBER 1, 2005

REMINDER: *In fairness to all potential authors, late abstracts will not be accepted.*

MRS Symposium A: Amorphous and Polycrystalline Thin-Film Silicon Science and Technology

Thin films of amorphous, nano-, micro-, and polycrystalline silicon, and related alloys, are used in active matrix displays, imaging arrays, and solar panels. These products make large-area electronics the fastest growing semiconductor technology today and encourage further research on materials and devices. In this symposium, scientists and engineers discuss thin-film silicon issues ranging from deposition to electronic and optical properties, to design, fabrication, and analysis of devices and their integration into products. Materials of interest include amorphous, nano-, micro-, and polycrystalline silicon, and their alloys with Ge, C, and other elements. Current challenges include the understanding of growth processes; producing high-quality films at high growth rates or low temperatures; applying *in-situ* characterization techniques for monitoring growth; understanding amorphous, mixed-phase, and crystalline structures and the principles for augmenting crystallinity; developing post-deposition processes, such as thermal or laser annealing; identifying fundamental issues in electronic structure and carrier transport in 3, 2, and 1 dimensions; understanding metastability and the role of hydrogen; integrating thin film silicon into systems on glass; and designing, fabricating, and testing of new or improved devices and circuits. Of special interest will be the interfacing of thin-film silicon with organic and polymer optoelectronics, with polymer substrates and encapsulation, and with biological materials.

Session Topics

Applications

- Silicon nanowires
- Thin-film transistors and circuits
- Solar cells and modules
- Sensors and imaging arrays
- Systems on glass
- Flexible electronic surfaces
- Organic or biological interfaces
- Novel devices

Growth and Crystallization

- New growth methods
- Gas phase and plasma chemistry
- Surface reactions
- High-deposition rates and film uniformity
- Low-temperature growth
- Micro- and nanocrystalline films
- Thermal and laser crystallization

Bonding, Electronic Properties, Characterization, and Modeling

- Amorphous, crystalline, and mixed-phase structure
- Electron density of states and carrier transport in 3D, 2D, and 1D
- Optical properties
- Roles of hydrogen
- Metastabilities and defects
- Granularity, heterogeneity, and surface roughness

A one-day tutorial complementing this symposium is tentatively planned. Further information will be included in the program that will be available in January.

Invited speakers will cover timely subjects in growth, properties, and applications.

Symposium Organizers

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