

N85-32397

HIGH-EFFICIENCY MODULE AND ARRAY RESEARCH

JET PROPULSION LABORATORY

R.G. Ross, Jr.

Module High-Efficiency Research Thrusts

- **Development of module technologies contributing to high efficiency**
 - **High cell packing factors**
 - **Low optical losses**
 - **Low electrical mismatch losses**
 - **Low operating temperatures**
- **Development of reliability technologies required to maintain high efficiency of:**
 - **Cells**
 - **Optical coatings**
 - **Encapsulants**

Module Technologies Contributing to High Efficiency

- **High cell-packing factors**
 - **Narrow borders, close cell spacing**
 - **Large modules**
- **Low optical losses**
 - **Antireflection coatings**
 - **Antisoiling coatings**
 - **High-transmittance encapsulants**
- **Low electrical-mismatch losses**
 - **Series-paralleling**
 - **Cell sorting**
- **Low operating temperatures**
 - **Good convective cooling of module rear surface**
 - **High-emittance, high-reflectance rear surface**
 - **Low IR-absorptance front surface**

PLENARY SESSIONS

Unique Issues Associated With Reliability of High-Efficiency Modules

- **Reliability of:**
 - **High-efficiency cells**
 - **Narrow module borders**
 - **Antisoiling coatings**
 - **Antireflection coatings on glass-air interfaces**

FY85 Research Related to High-Efficiency Modules

- **Module temperature reduction with IR-reflecting cells (Spire)**
- **Reliability of antisoiling coatings (Springborn)**
- **Reliability of modules with narrow borders (JPL, Wyle)**
- **Reliability of high-efficiency cells (Clemson)**
- **Verification of overall module performance (JPL, Spire, Westinghouse)**