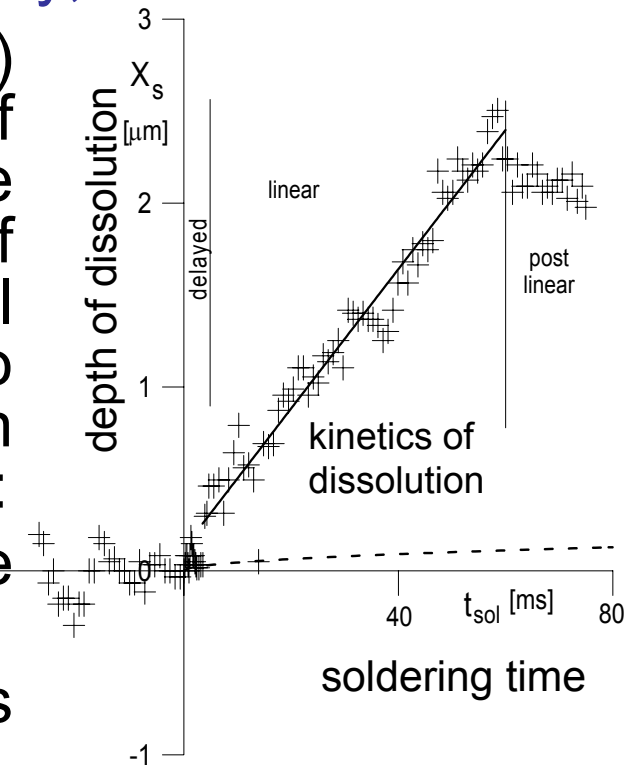
Modeling Formation of Microstructure of Intermetallic Compounds During Soldering.

Alex Umantsev, Fayetteville State University, DMR-0244398

Theoretical analysis of the intermetallic (IMC) phase growth highlighted the early stage of soldering as the critical step for the microstructure formation. On the basis of these theoretical ideas we introduced a novel experimental technique, which allowed us to study entire early-stage evolution process on one micrograph (panorama on the bottom). We found:

- The early stages are dominated by the kinetics of dissolution of the substrate (plot→).
- The dissolution of the grain boundaries is the cause of the roughness of the IMC layer.



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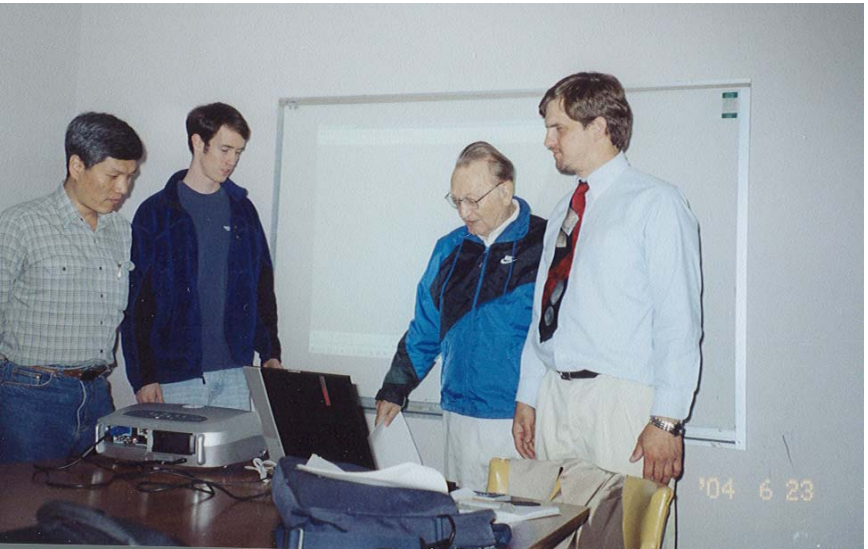
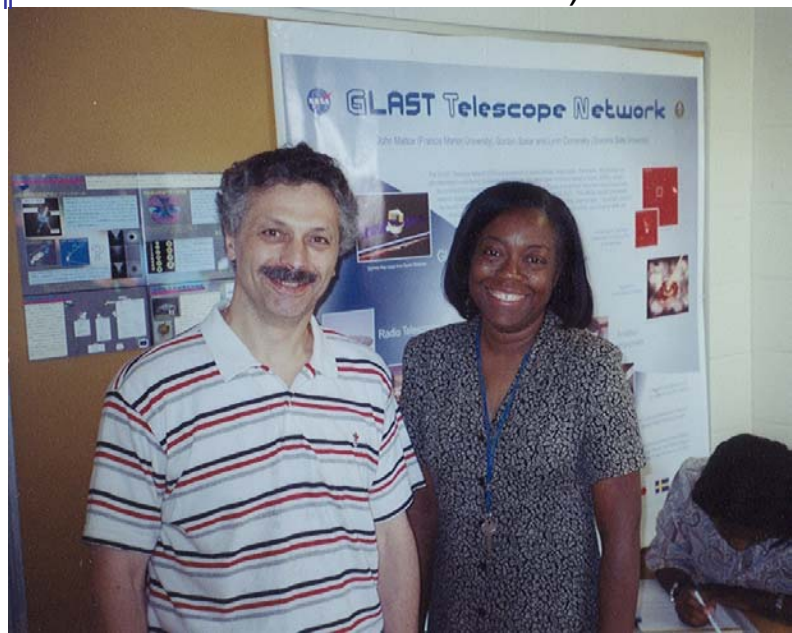
Education: Mr. Richard Lord is graduating in December of 2004 and planning to go to Grad School. In the past year he made:

1. Poster presentation at the Second Annual RISE (Research Initiative for Scientific Enhancement) Colloquium, FSU, April 1, 2004.
2. Poster presentation at the SOARS (Seizing Opportunities to Advance Research Scholars) Conference, FSU, March 26, 2004.
3. Oral presentation "Study if intermetallic growth between copper and tin" at the Department of Materials Science, NCSU, Raleigh, June 4, 2004. (←photo).



Outreach: Science/Math Summer Mentoring Program, sponsored jointly by NSF and Army Research Office. Participants except PI: two FSU professors (J. Mattox and J. Okeagu) and two E. E. Smith High school students (Lakeisha Williams and Christopher O'Donoghue). (photo ↓: PI and Mrs. Myles, EESHS Science Teacher.)