Technical Program
Format: Presentation/discussion/demonstration
Understanding the Accuracy Barrier of Quantitative Electron Beam X-ray Microanalysis and the Role of Standards
April 8-11, 2002

Monday, April 8

8:00-9:00 am — Registration

9:00-9:10 — Welcome and Introduction: Dale Newbury

I. Defining the Problem

9:10-9:45 Kurt F.J. Heinrich (NIST, ret.) — *Errors in Quantitative Microanalysis*

9:55-10:35 Peter Rez (Arizona St. U.) — *Accurate Cross Sections For Microanalysis*

10:45 --11:00 Break

11:00-11:40 Eric Lifshin (SUNY Albany) — *How detectability limits and spatial resolution for chemical analysis relate to precision*

II. Measuring the x-ray intensity: Instrumentation limitations

11:45-12:25 John Armstrong (NIST) — *EPMA Measurement Limitations*

12:30-1:30 — Lunch: NIST Cafeteria

1:30-2:05 Terry Williams (Nat. Hist. Mus., London) for Stephen Reed (U. Cambridge) — *Optimization of WD analysis conditions*

2:10-2:45 Chuck Herrington (Geller Microanaly. Lab.) — *Advanced Electronics for Pulse Processing*

2:50-3:10 Break

III. Spectral Processing

3:10-3:45 Robert Myklebust (NIST, ret.) — *WDS Spectral Fitting*

3:50-4:25 Peter Statham (LINK) — *Extracting EDS Intensities*

4:30-5:30 Panel Discussion — What Industry Needs

Tuesday, April 9

IV. Processing the data: matrix corrections

Time / Speaker	Title
8:30-9:05 John Armstrong (NIST)	*Matrix corrections: comparison of methods*
9:10-9:45 John Donovan (U. Oregon)	*Backscatter averaging in compounds- how should backscatter loss be calculated in the atomic number correction*
9:45-10:00	Discussion
10:00-10:15	Break

V. Quantitative X-ray Microanalysis Under Extreme Conditions: the Lunatic Fringe

Time / Speaker	Title
10:15-10:50 John Small (NIST)	*Particles and Rough Surfaces*
10:55-11:30 Dale Newbury (NIST)	*X-ray Microanalysis in the Variable Pressure (VPSEM) and Environmental Scanning Electron Microscopes (ESEM)*
11:35–12:10 Robert Carlton (Lehigh U.)	*Accuracy and Precision of Quantitative X-ray Analysis using the Environmental Scanning Electron Microscope*
12:10-12:30 Discussion	
12:30-1:30	Lunch
1:30-2:05 Dale Newbury (NIST)	*X-ray Microanalysis in Extreme Conditions: Low Voltage SEM*

VI. Future Directions: Advanced x-ray spectroscopy

Time / Speaker	Title
2:10-2:45 Jan Iwanczyk (Photon Imaging)	*Silicon Drift Detectors*
2:50-3:25 Kent Irwin (NIST)	*The NIST Microcalorimeter*
3:30-4:05 Del Redfern (EDAX)	*The Microcalorimeter for Industrial Applications*
4:05-4:30	Discussion
4:30-5:45	Laboratory Tours: NIST Microcalorimeter and Photon Imaging Silicon Drift Detector

Wednesday, April 10

Standards Needs

8:20	Introduction: Ryna B. Marinenko

I. Sample Preparation of Standard Materials

8:30-9:00 Joseph D. Geller (Geller Microanal.)	*Sample Preparation Techniques for Electron Probe Microanalysis*
9:00-9:40 Guy Remond, (U. Tech. Sidney, Visiting Prof.)	*Polishing Techniques and Implications in Quantitative Microanalysis*
9:40-10:00 Eric Windsor (NIST)	*SRM 482: The Effect of Sample Preparation Artifacts on the Micro-Homogeneity of a Standard Reference Material*
10:00-10:20	Discussion on Preparation Techniques
10:20-10:35	Break
10:35-11:45 George Vander Voort (Buehler)	*Specimen Preparation for Electron Microprobe Analysis*
11:45-12:05	Discussion on Preparation Techniques
12:05-1:15	Lunch

II. Standard Materials – Availability and Use

1:15-1:40 Gene Jarosewich (Smith. Inst.)	*Mineral Microanalysis Standards from the Museum of Natural History, Smithsonian Institution.*
1:40-2:05 Greg Meeker (U.S. Geolog. Surv.)	*Standards for the Analysis of Geological and Ceramic Materials.*
2:05-2:30 Ryna Marinenko (NIST)	*NIST Standards for Microanalysis and the Certification Process*
2:30-2:50	Reference Material Needs Discussion
2:50-3:05	Break

III. Characterization of Reference Materials

3:05-3:25 John Donovan (U. Oregon)	*A Re-Examination Of The Rare-Earth Element Reference Standards For The Electron Microprobe*
3:25-3:55 Paul Carpenter	*Characterization of Corning EPMA Standard Glasses 95IRV, 95IRW,*

(NASA) *and 95IRX*

3:55-4:25 E. P. Vicenzi, (Smith. Inst.) — *Characterization of Corning Archeological Reference Glasses using Microbeam Techniques.*

4:25-5:00 — Discussion Of Standards Characterization Needs

Thursday, April 11

IV. Specialty Application Standards

8:30-9:00 John Fournelle (U. Wisc.) — *Trials and Tribulations in an EPMA lab: the Good, the Bad and the Ugly (Standards)*

9:00-9:30 Eric Steel (NIST) — *Reference Materials For Specialty Applications: Thin Films, Coatings, Particles, Powders, And More*

9:30-10:00 John Hanchar (Geo.Wash. U.) — *Preparation And Characterization Of Single-Crystal Oxide Standards, Zircon, Hafnon, Thorite, Uraninite, And Coffinite For Use as Microanalysis Standards.*

10:00-10:15 — Break

10:15-10:45 Rollin Lakis (Los Alamos NL) — *Microanalysis Standards for the Actinide Elements with Special Emphasis on Ga-Pu alloys.*

10:45-11:15 — Discussion of Specialty Standards

11:15-12:30 — Microanalysis Laboratory Tours