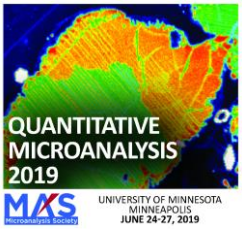

Quantitative Microanalysis 2019
QMA2019, June 24-27, 2019

Call for papers

Welcome to Quantitative Microanalysis 2019. This Call for Papers (C4P) document lists the topics included in the topical conference. The conference will include tutorials, technical platform and poster presentations, vendor demonstrations, and group discussions.

We will organize the tutorials and core presentations, including sponsor technical demonstrations. We solicit from the community both contributed platform and poster presentations with reference to the topics below.

Please note that the conference theme of *quantitative microanalysis* is emphasized in all presentations. All presentations require the submission of an abstract in the Microscopy & Microanalysis format. All details will be available on the QMA 2019 web page on the MAS web site:

QMA 2019 web page: http://www.microprobe.org/topical-conferences/qma-2019/qma-2019

Part 1 – Contributed Platform and Poster Presentation Topics

Sample Preparation for Microanalysis Applications

- Practical aspects sample preparation and polishing methods
- Sample holders and mounting strategies
- Conductive coating materials and methods

Microanalysis Education

- User forums, web sites, short courses
- Teaching young scientists about microanalysis

Achieving the Best Quantitative Analysis

- Instrumentation and analytical quality control
- Qualitative analysis
- Procedural anatomy of quantitative analysis run
- WDS and EDS spectrometer alignment, WDS deadtime and pulse processing calibration
- Use of standards-based monitoring of accuracy

- Analytical report methods

Microanalysis Reference Materials

- Obtaining, preparing, and evaluating available microanalysis standards, community needs, synthesizing and preparing new standards
- Selection of standards for EPMA vs. SEM microanalysis, primary vs. secondary standards, standard maintenance
- Standardless vs. standards-based microanalysis

Wavelength-dispersive Spectrometry

- WDS scan databases
- Mean atomic number background method and applications
- WDS background methods and issues for trace element analysis
- Combined WDS-EDS analysis
- State analysis and spectroscopic measurement

Energy-dispersive Spectrometry

- Spectrum and pulse-pileup processing methods
- High precision and accuracy microanalysis by SDD-EDS
- Intelligent approach to standardless EDS analysis
- Improvements in overlapped and light element EDS analysis

FEG Instruments and Microanalysis

- Microanalysis at high spatial resolution and at low voltage / low overvoltage
- FEG vs. Tungsten instrument methods
- Beam-sensitive materials, characterization of behavior, correction methods
- Plasma cleaning, cold finger, and surface contamination reduction methods

Quantitative Compositional Mapping

- EDS and WDS mapping methods
- Precision and detection limit considerations
- Quantification of map data
- Processing of compositional map data, spectrum data cubes, cluster methods

Advanced Microanalysis

- Rare-earth element and trace element analysis, EPMA age dating
- Light element and low-voltage analysis, analysis using L-family lines
- Multilayer and thin-film samples
- Non-ideal samples, rough surfaces, and particles
- Virtual microanalysis standards and calibration methods

Current and Future Trends in Microanalysis

- Hyperspectral cathodoluminescence and EPMA combined methods
- WDS spectroscopy and soft X-ray spectrometer technology
- Micro X-ray fluorescence spectrometry
- Correlative methods, EBSD and microanalysis methods

Quantitative Microanalysis Applications

- Earth science materials, mineralogy and petrology, meteorites

- Technology materials, ceramics and alloys
- Quantitative microanalysis in the biological, archeological, and life sciences
- Cultural heritage applications of microanalysis

Vendor Demonstrations

- Microanalysis problem solving using commercially available systems
- Perspectives from applications specialists

Part 2 -- MAS Early Career Scholar Presentations

- Presentations by ECS awardees (platform and poster presentations available)
- Summary of ECS awardee research and microanalysis methods used
- Topics may emphasize applications-based microanalysis studies
- Data and image processing methods, visualization, use of software tools
  Need not be cutting edge, but if novel quantitative analysis methods are developed should be presented
- See Early Career Scholar information on QMA 2019 website for full details

Part 3 – Conference Presentations Organized by QMA 2019

Tutorials

Introduction to Electron-probe Microanalysis and Wavelength-dispersive Spectrometry

- Overview of the electron microprobe, wavelength-dispersive spectrometers
- Measurement procedures for quantitative analysis, analytical setup, background determination, precision
- Correction algorithms, mass absorption coefficients, accuracy
- Modern trends in microanalysis, compositional mapping, diverse sample types

Introduction to SEM-EDS Microanalysis

- Overview of SEM and energy-dispersive spectrometry
- EDS instrumentation including calibration and pulse-processing, pulse-pileup and other artifacts
- Measurement procedures, including analytical geometry
- Standards-based vs. standardless analysis
- Modern trends including spectrum image mapping

Software Tools and Applications (core presentations and contributed applications)

- **Casino Monte Carlo software**
  The Casino program is used for electron scattering and X-ray production simulation for bulk, thin-film, and grain-boundary geometries. This tool is best for rapid visualization of samples and discussion of spatial considerations in microanalysis.
- **DTSA-II software**
  The DTSA-II program simulates a variety of sample geometry types (bulk, particle, inclusion, thin-film) using both Monte Carlo and $\Phi(\rho z)$ algorithms, and produces an EDS spectrum and scattering diagram as output. It also has important capabilities such as spectrum simulation and quantitative analysis of EDS spectra. Script files can be used to automate processing.
- **CalcZAF software**
  The CalcZAF software is used to calculate either concentration or k-ratio for bulk samples and is the best public domain software for ZAF / $\Phi(\rho z)$ calculations. It includes a standard database, X-ray and mass absorption coefficient datasets, and other useful capabilities.
- **GMR Thin Film software**

The GMR Thin Film program is used to calculate either concentration or k-ratio for thin film and multilayer samples for quantitative analysis, and calculates both layer composition and thickness based on proposed models. It can be used to compare primary, characteristic, and secondary X-ray fluorescence distributions.

- **Penelope Monte Carlo software**

  The Penelope software is an advanced simulation tool that uses Monte Carlo simulation for arbitrarily complex sample geometries. The primary use of the software is to generate X-ray intensity data with emphasis on the evaluation of secondary fluorescence.