

Workshop

The *Elemental Analysis of Forensic Evidence* Workshop will provide you with fundamentals in the elemental analysis of forensic samples, including hands on experience in hyphenated techniques such as ICP-MS, LA-ICP-MS and LIBS.

Students will conduct analysis of matrices of forensic interest such as glass, paint, hair, nails and bones.

Several tools for data analysis and statistical interpretation of the results will be covered.

Instrumentation

The following state of the art instrumentation will be available for the hands on laboratories:

- **ICP-MS:**
 1. HP 4500 quadrupole ICP-MS, 2. PE ELAN DRC II quadrupole ICP-MS with dynamic reaction cell capabilities
 3. Thermo Electron ELEMENT 2 High Resolution ICP-MS
- **Laser Ablation:** 1. CETAC LSX 500 266 nm and 2. New Wave UP213 nm
- **Laser Induced Breakdown Spectroscopy LIBS**
 1. Foster and Freeman ECCO single pulsed (1064 nm) and 2. Dual pulsed system (266 nm and 1064 nm)

Instructors

Instructors with unique expertise in the techniques and matrices of interest will be conducting the workshop.

Professor José R. Almirall

Ph.D., Department of Chemistry, Florida Intl. University.

Professor Robert S. Houk

Ph.D., AMES Laboratory, Iowa State University.

Professor Nicolo Omenetto

Ph.D., Dept. of Chemistry, University of Florida.

Tatiana Trejos

M.Sc., Department of Chemistry, Florida Intl. University.

Dr. Christopher Latkoczy

Ph.D., Department of Chemistry, ETH Hönggerberg, Zürich

Facilities

The workshop will be held at the facilities of the Chemistry Department at Florida Intl University, Miami, Florida

Registration

Deadline for registration is January 27th, 2006. Cost per student (\$850) includes registration and course materials. Lunch and coffee breaks fee is \$100.

For registration call Dr. José Almirall at 305 348 3917, fax 305 348 3772 or email at almirall@fiu.edu

A limited number of scholarships are available that cover the cost of tuition for scientists that work at governmental Forensic Science Laboratories.



PROGRAM

- 9.00 am – 9.15 am** Welcome and Introduction to the Workshop, *José Almirall, Ph.D.*
- 9.15 am – 9.45 am** Variation of trace elements in nature, *José Almirall, Ph.D.*
- 9.45 am -10.45 am** Introduction to Elemental Analysis by ICP-MS, *Robert S. Houk, Ph.D*
- 10.45 am -11.00 am** Coffee/Tea Break
- 11.00 am -12.00 pm** Introduction to Laser Ablation Sampling, *Tatiana Trejos, M.Sc*
- 12.00 pm -1.15 pm** Lunch Break
- 1.15 pm - 2.15 pm** Introduction to Laser Induced Breakdown Spectroscopy,
Nicolo Omenetto, Ph.D
- 2.15 pm -3.00 pm** Trace Elemental Analysis of Glass - A Model Matrix,
José R. Almirall, Ph.D.
- 3.00 pm -3.30 pm** Trace Elemental Analysis of Other Forensic Samples,
Tatiana Trejos, M.S.
- 3.30 pm -3:45 pm** Coffee/Tea Break
- 3.45 pm – 4:15 pm** Instrumentation Considerations in ICP-MS, LA-ICP-MS and LIBS,
Christopher Latkoczy Ph.D
- 4.15 pm – 5.00 pm** Data Analysis Tools
José R. Almirall, Ph.D.

MONDAY Feb 27, 2006

LABORATORY EXERCISES

The class will be divided into 4 groups of 3 students in each group (Group A, Group B and Group C, Group D) to conduct 4 hands-on exercises (each lasting 6 hours) during 3 days. Each group will participate in all four laboratory exercises and then all 4 groups will participate together on the last day in the data analysis and data presentation exercises.

Laboratory 1

1. Solution Digestion of Glass and Sample Preparation for Solution Analysis by ICP-MS (using ASTM 2154 Method). Analysis of Glass with the Agilent 4500 Plus ICP-MS.

Group A – Tuesday – (8 AM to 3 PM)

Group B - Tuesday (3 PM – 5 PM) and Wednesday (8 AM -12 PM)

Group C - Wednesday (1 PM – 5 PM) and Thursday (8 AM to 10 AM)

Group D - Thursday (10 AM – 5 PM)



Solution digestion and sample preparation of glass using ASTM 2154.

TUESDAY Feb 28 – THURSDAY MARCH 2, 2006



Analysis of acid digested solution using the Agilent 4500 plus ICP-MS.

Laboratory 2

2. Laser Ablation Sample Preparation for Glass Analysis, Laser Ablation of Glass using the NITECRIME protocol with the New Wave Research 213 nm LA system and a Perkin Elmer SCIEX DRCII ICP-MS.

Group A - Tuesday (3 PM – 5 PM) and Wednesday (8 AM -12 PM)

Group B - Wednesday (1 PM – 5 PM) and Thursday (8 AM to 10 AM)

Group C - Thursday (10 AM – 5 PM)

Group D – Tuesday – (8 AM to 3 PM)



Sample Preparation for Laser Ablation Analysis of Glass.



Laser Ablation Analysis of Glass using the NITECRIME protocol and the New Wave Research 213 nm LA system and the PE SCIEX DRC II ICP-MS including experiments with the Dynamic Reaction Cell.

Laboratory 3

3. Laser Ablation of other matrices of Forensic Interest (Bone, Hair, Nail and other biological matrices) using the CETAC LSX 500 laser Ablation system and the Thermo Electron Element 2 High Resolution ICP-MS.

Group A - Wednesday (1 PM – 5 PM) and Thursday (8 AM to 10 AM)

Group B - Thursday (10 AM – 5 PM)

Group C - Tuesday – (8 AM to 3 PM)

Group D - Tuesday (3 PM – 5 PM) and Wednesday (8 AM -12 PM)



Elemental Analysis of bone samples using a CETAC LSX500 and a Thermo Electron Element 2 High Resolution ICP-MS.

Laboratory 4

4. Laser Induced Breakdown Spectroscopy analysis of glass and other matrices, including data analysis for comparison purposes.

Group A - Thursday (10 AM – 5 PM)

Group B – Tuesday – (8 AM to 3 PM)

Group C - Tuesday (3 PM – 5 PM) and Wednesday (8 AM -12 PM)

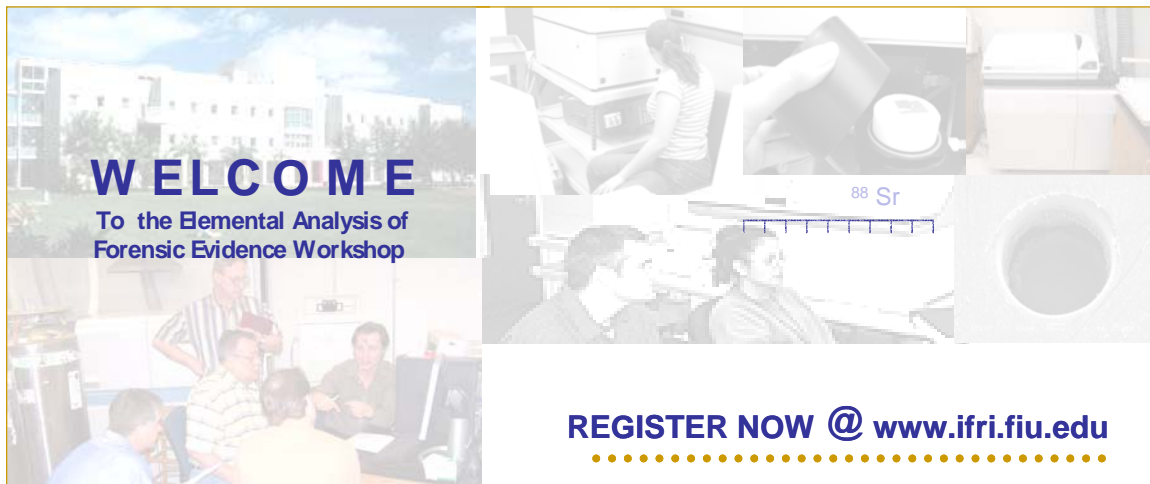
Group D - Wednesday (1 PM – 5 PM) and Thursday (8 AM to 10 AM)

Data analysis and final presentations

8:30 A.M. Data analysis exercises and data presentation by all groups.

Report writing and testimony on elemental analysis of forensic samples.

12:30 Class ends



WELCOME
To the Elemental Analysis of
Forensic Evidence Workshop

REGISTER NOW @ www.ifri.fiu.edu

FRIDAY MARCH 3, 2006