

Rocky Mountain Conference on Magnetic Resonance


Volume 31 *31st Rocky Mountain Conference*

Article 1

7-30-1989

31st Rocky Mountain Conference

Follow this and additional works at: <https://digitalcommons.du.edu/rockychem>

 Part of the [Chemistry Commons](#), [Materials Science and Engineering Commons](#), and the [Physics Commons](#)

Recommended Citation

(1989) "31st Rocky Mountain Conference," *Rocky Mountain Conference on Magnetic Resonance*: Vol. 31, Article 1.

DOI

<https://doi.org/10.56902/RMCMR.1989.31.1>

Available at: <https://digitalcommons.du.edu/rockychem/vol31/iss1/1>



This work is licensed under a [Creative Commons Attribution 4.0 International License](#).

This Conference Proceeding is brought to you for free and open access by Digital Commons @ DU. It has been accepted for inclusion in Rocky Mountain Conference on Magnetic Resonance by an authorized editor of Digital Commons @ DU. For more information, please contact jennifer.cox@du.edu, dig-commons@du.edu.

31st Rocky Mountain Conference

Abstract

Program and registration information for the 31st annual meeting of the Rocky Mountain Conference, co-sponsored by the Rocky Mountain Section of the Society for Applied Spectroscopy and the Rocky Mountain Chromatography Discussion Group. Held in Denver, Colorado, July 30 - August 4, 1989.

Copyright Statement / License for Reuse



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

Publication Statement

Copyright is held by the Rocky Mountain Conference on Magnetic Resonance. User is responsible for all copyright compliance.

PROGRAM
AND
REGISTRATION INFORMATION

JULY 30 - AUGUST 4, 1989

RADISSON HOTEL DENVER
1550 COURT PLACE
DENVER, COLORADO

SPONSORED BY

ROCKY MOUNTAIN SECTION
SOCIETY FOR
APPLIED SPECTROGRAPHY

ROCKY MOUNTAIN
CHROMATOGRAPHY
DISCUSSION GROUP

TABLE OF CONTENTS

Registration Information	1
Exhibition	2
Social Program	3
Travel	4
Housing	5
visitor Information	5
Film Festival	5
Employment Clearing House	6
Message Center	6
Restaurant Service	6
Workshop/Seminar Notices	6
Short Courses	7
Conference Personnel	14
Technical Program	26
Map of Downtown Denver	IBC

SYMPOSIA SCHEDULE

(Page Number in Program)

	Monday July 31		Tuesday August 1		Wednesday August 2		Thursday August 3
	AM	PM	AM	PM	AM	PM	AM
Atmospheric Science	16	16					
Atomic Spectroscopy - General			17	17	18	18	
Atomic Spectroscopy - ICP/MS	19	19					
Chemometrics						19	
Chlorinated Hydrocarbons					20		
Chromatography -General	20	21					
Chromatography -Ion				21			
Chromatography -SCF			22				
Computer Applications				22			
Electrochemistry	23	24	24				
Environmental Chemistry	31	32	32	33	33	34	
EPR	25	25	25	26	28	29	30
IR - iR/FTIR	34	35					
IR- Near IR			36	37			
Luminescence			35	36			
NMR	37	38	38	39	39	40	40
Posters	43						
Quality Assurance					41	41	
Robotics		42	42				

CONFERENCE LOCATION

Technical sessions and the exhibition for the 31st Rocky Mountain Conference will be **held** in the **RadiSSOn** Hotel Denver, 1550 Court Place, Denver, Colorado.

REGISTRATION

Admission to **all** technical sessions and the exhibition is by the name badge for the 31st Rocky Mountain Conference. Preregistration, using the form in the center of this booklet, is encouraged. The deadline for the receipt of the preregistration form and full remittance of conference fees is **July 21, 1989**. Conference fees are payable by check (denominated in **\$US**, only) made **payable** to the Rocky Mountain Conference.

Registration Fees - 1989	
Preregistration (received by July 21, 1989)	\$40.00
Preregistration -one specified day	25.00
Registration - on site	50.00
Registration - one specified day	30.00
Student registration	10.00
Additional Vendor registration	35.00
Unemployed or retired registration	No charge
Film Festival only	No charge
Exhibition only (non-vendor)	No charge

Refunds

Requests for refunds of conference fees must be received by **July 21, 1989**.

Times

On-site registration for the 31st Rocky Mountain Conference will be held in the Convention Lobby of the Radisson Hotel Denver during these times:

Sunday, July 30	5:00 p.m. - 9:00 p.m.
Monday, July 31	7:30 a.m. - 3:30 p.m.
Tuesday, August 1	7:30 a.m. - 3:30 p.m.
Wednesday, August 2	7:30 a.m. - 3:30 p.m.
Thursday, August 3	8:00 a.m. - 10:00 a.m.

Future Conferences

32nd Conference, July 29-August 3, 1990

33rd Conference, July 28-August 2, 1991

34th Conference, August 2-August 7, 1992

EXHIBITION

The Rocky Mountain Conference exhibition provides an opportunity to see and discuss the latest in analytical instrumentation, apparatus, supplies, and services. The exhibitors support the Rocky Mountain Conference - please support them! Beverages will be served in the Exhibit area during the breaks between papers.

Hours

Monday, July 31	9:30 a.m. - 5:00 p.m.
Tuesday, August 1	9:30 a.m. - 5:00 p.m.
Wednesday, August 2	9:30 a.m. - 2:00 p.m.

For space or information about the exhibition, contact:

Glenda Brown
127 South Washington Ave.
Louisville, CO 80027
(303) 236-53*5 (7:30 a.m.-4:00p.m.)
OR
Laura Hubbard
(303)966-2920

The following exhibitors have reserved space as of April 12, 1989.

Affiliated Scientific, Inc.	Lee Scientific
Bio-Rad, Digilab Div.	Oxford Instruments
CEM Corp.	Perkin-Elmer Co.
Dionex	Sadtler Research Labs
Extrel Corp.	Tekmar Co.
Finnegan MAT	Thermo Jarrell Ash Corp.
Instruments SA, Inc.	Wilmad Glass Co.
Lab Support Inc.	

Time and space are also available for exhibitors interested in sponsoring short workshops. Please contact Glenda Brown or Laura Hubbard for more information.

SOCIAL PROGRAM

Registration Night Mixer

A cash bar will be open in the conference registration area of the Radisson Hotel Denver on Sunday evening, **July 30**, from 7:00 to 9:00 p.m. Plan to meet other conference attendees and beat the Monday rush to pick-up your **conference** badge and abstract book.

Conference Mixer

All conferees and spouses are invited to attend this lively affair on Monday, **July 31**. This year's mixer will be held in the Exhibition area from 5:00 to 7:00 **p.m.** Refreshments will be served.

Conference Banquet

The conference banquet will be on Tuesday, August 1, at 7:00 p.m. in the Majestic **Ballroom** of the Radisson. Tickets are \$22 each. There will be a cash bar in the Majestic Lounge at 6:00 p.m.

Carol E. Lyons, our banquet speaker, is the Manager of Urban Air Quality Studies at the **Atmospheric** Sciences Center of the University of Denver (DU). Ms. Lyons conducts scientific research directed at finding effective solutions to existing air pollution problems. The Atmospheric Sciences Center was established at DU in 1987 to address scientific, sociological, legal and business aspects of air quality issues. Ms. Lyons received her M.S. degree in Chemical Engineering in 1976 from the California Institute of Technology. She also holds a **B.S.**, degree in chemistry and physics.

ABSTRACT: Solving Denver's Brown Cloud Problem: Science, Politics and Money

Visible air pollution in Denver is ugly and distressing, but it is not a controlled substance. Federal and state environmental regulations do not address urban visibility. **In** the spring of 1987, local, state and national businesses joined in an unprecedented display of cooperation to fund a thorough, intensive analysis of the sources of Denver's brown cloud. The **1987-SS** Metro Denver Brown Cloud Study was privately funded and operated, under the auspices of Governor Roy **Romer**, with the cooperation of the Colorado Department of Health and the U.S. Environmental Protection Agency. Carol Lyons served as the Project Manager for this 18-month, \$1.5 million study. This presentation will describe the complex scientific analyses implemented to solve the brown cloud puzzle. The equally complex and challenging political problems associated with a major air pollution study will also be presented.

Georgetown Scenic Tour

On Wednesday, August 2, a **scenic** tour to Georgetown, Colorado is planned. Georgetown was the core of the greatest silver producing area the world had ever seen and the Georgetown citizens have worked together to preserve their town in the traditions of that era. The **Georgetown-Silver** Plume Mining District has been designated as a National Historical Landmark by the Secretary of **Interior**, National Park Service.

A Gray Line tour bus **will** depart from the Radisson at 4:30 p.m. We **will** travel the scenic route over Squaw Pass, at the base of Mt. Evans, past Echo Lake. The arrival in Georgetown will be about 6:30 p.m. allowing time to roam through the many quaint shops, relax, explore, dine in one of the many restaurants, etc. Scheduled departure from Georgetown is **9:30** p.m. and we anticipate arriving at the Radisson by 10:30 p.m. Tickets are \$12 each.

Conferees are encouraged to look for messages posted in the registration area regarding additional events planned by individual symposia.

TRAVEL

Special Rocky Mountain Conference Fares on **United** Airlines

United Airlines has joined with the Rocky Mountain Conference to offer special airfares that are not available to the general public when you attend the conference and travel between July 26 thru August **Z, 1989**, inclusive.

In addition, the Rocky Mountain Conference attendees and their families will be eligible for a special drawing. The prize is one complimentary Continental U.S. round-trip ticket for travel prior to September 1, **1990**.

You may choose one of two special discount schedules:

A) A **5Z** discount from any applicable/available United fare. Virtually all fares are eligible for this discount (including Ultra Savers which are commonly priced as low as **70%** off Coach).

B) Or, an unrestricted fare priced **ft** below United's standard coarh (Y class) fare.

To obtain these **Special** fares, follow these easy steps:

1. Either you, your employer's travel department, or your preferred travel agent phone **United's** toll-free number at 800-521-4041. Call daily between 8:30 a.m. and **11:00 p.m, E.D.T.**

2. **Immediately** reference the special Rocky Mountain Conference account number 400TS.

3. United specialists will provide information and make reservations for **all** flights and fares, including the special conference fare. The special Rocky Mountain Conference fare is available on United flights within the United States (in Canada, ask for the special meeting **fare**).

M* You may purchase your tickets from your local travel agent or United will mail them to your home or **office***

Whichever means of ticketing you choose, the special conference fare can only be obtained when the reservation is initiated by phone through the special United 800 number listed above.

Seats are limited, so call early for best availability. Fares are guaranteed at time of ticket purchase.

HOUSING

Hotel Accommodations

Hotel rooms at the **Radisson Hotel Denver**, 1550 Court **Pi.**, Denver, CO 80202, (303) 893-3333 or **800-654-1550**, are available at the guaranteed conference rate of \$70 per night (single), \$80 per night (double), plus applicable tax. Suites available upon request at the conference discount. The reservation form in the center of this booklet must be returned **directly** to the hotel.

Additional hotels, within easy walking distance or a short ride on a 16th Street **Mall** shuttle bus (free), are listed below. Locations are given on the map inside the back cover. For rates and reservations, contact the hotel directly.

The Brown Palace Hotel, 321 17th St., Denver, CO 80202, (303) **297-3111** or 800-321-2599 (800-228-2917 in Colorado).

Comfort Inn, 401 17th St., Denver, CO 80202. 800-631-2090 (Colo), 800-237-7431 (outside Colo). Inquire about group rates available for reservations made prior to June 30.

Executive Tower Inn, **1405** Curtis St., Denver, CO 80202, (303) **571-0300** or 800-525-**6651**.

Hyatt Hotel, **1750 Welton** St., Denver, CO 80202, (303) **295-1200** or 800-527-*727.

Holiday Inn-Downtown, 1*50 **Glenarm Pl.** Denver, CO 80202, (303) 573-1*50 or 800-*65-*329.

Marriott City Center, **1701** California St., Denver, CO 80202, (303) **297-1300** or 800-228-9290.

Warwick, 1776 Grant St., Denver, CO 80203, (303) 861-2000 or **(800) 525-2888**.

Low cost student housing is also available at local universities. Commute time to the conference site ranges from 20 to **45** minutes via regional bus transportation. For rates and reservation information, contact **John** Garbarino at (303) **236-361**

ADDITIONAL ACTIVITIES

Visitor Information

Denver and the surrounding area boast a large number of activities that are enjoyable for both young and old. For additional information contact the Denver Metro Convention and Visitors Bureau, 225 W. Colfax **Ave.**, Denver, CO 80202, (303) **892-1112**. For information about statewide attractions contact **the** Colorado Tourism Board, 1625 Broadway, Suite 1700, Denver, CO 80202. (303) 592-5510.

Film Festival

Several films of scientific interest Will be shown throughout the Rocky Mountain **Conference**. Admission to the **film festival** is by a paid or complimentary conference badge. Titles and a schedule will be posted in the registration area.

Employment Clearing House

Space will be provided for employees to post job announcements and for conferees to file resumes. The Rocky Mountain Conference assumes no obligation for the confidentiality of information filed with the employment clearing house, the qualification of job candidates, or the descriptions of job offered.

Message Center

Incoming telephone messages for conferees will be posted at the message center in the registration area. The telephone number is (303) 893-3333, ext. 337. Ask for the Rocky Mountain Conference message center. This **Service** will be available from 8:00 a.m. to 3:30 p.m. **Monday-Wednesday** and from 8:00 a.m. to 10:00 a.m. Thursday.

Restaurant Service

The Communications Department of the Denver Metro Convention and Visitors Bureau will provide a **FREE** restaurant reservation service designed to let out-of-town delegates know about Denver's world-class dining opportunities, from casual to elegant. The Dining Desk will have a header that reads "Free Restaurant Reservations", and will also have an experienced reservation person, a phone and a cart featuring poster-size menus that delegates can browse through. This service has been in operation for five years and has been extremely successful in providing delegates with convenient, courteous, and efficient service.

FREE SEMINAR

YOUR RESUME AND INTERVIEW - ARE THEY GOOD ENOUGH TO GET THE 30B YOU REALLY WANT?

In today's competitive employment environment, education and experience alone seldom provide sufficient credentials to secure a new job. Marketing and selling yourself through proper resume preparation and interviewing can give you the competitive edge you need to get the job **offer**. Lab Support, Inc. will present specific guidelines on building an **effective** resume, including format, objectives, accomplishments and resume cover letters. Next, we will discuss the right approach to interviewing, covering key points such as preparation, presentation of strengths, and salary negotiation. Lab Support is the nation's largest scientific personnel service, specializing in placement of chemists and scientists in laboratories throughout the U.S.

Sponsored by Lab Support, Inc.

SHORT COURSES

The Education Committee of the Colorado Section of ACS is offering short courses in conjunction with the 31st Rocky Mountain Conference as described below. Registration **forms** are included in the *center* of this booklet. The Radisson Hotel Denver has agreed to provide lodging for short course participants at the special conference rate. Please mention the 31st Rocky Mountain Conference when making reservations. All courses will be taught at the Radisson Hotel Denver. Tuition will be refunded if course registration is cancelled before July 14, 1989.

THE LABORATORY PERSONAL COMPUTER

3. B. Calvert, Ph.D., PE
2 days: August 3-4, 1989
Tuition: members \$350, non-members \$400

ANALYTICAL CHEMISTRY OF CONTAMINANTS IN SURFACE AND GROUNDWATER

Dr. E. Michael **Thurman** and Dr. Michael Reddy
3 days: July 27-29, 1989
Tuition: members \$400, non-members \$450

LABORATORY INFORMATION MANAGEMENT SYSTEMS: FROM PROBLEM DEFINITION TO SYSTEM EVALUATION

Dr. Gerst Gibbon, Dr. Joseph Golden, Ann Cibus
2 days: August 3-4, 1989
Tuition: members \$675, non-members \$725

EFFECTIVE MANAGEMENT OF CHEMICAL ANALYSIS LABORATORIES

John H. Taylor, Jr. and Dr. Mary M. Routson
2 days: August 3-4, **1989**
Tuition: members \$600, non-members \$650

PRACTICAL ANALYTICAL ATOMIC SPECTROSCOPY: AAS, ICP-AES, ICP/MS

Dr. Theodore C. Rains and Dr. Howard E. Taylor
2 days: July 27-28, 1989
Tuition: members \$350, **non-members** \$400

BASIC PRINCIPLES OF MASS SPECTROMETRY AND INTERPRETATION OF ORGANIC MASS SPECTRA

Dr. Z. A. Zirrolli
3 **days-** July 26-28, **1989**
Tuition: **members** \$350, non-members \$400

Registration deadline for all courses is July 14, 1989. For more information contact:

Carlos Arozarena
USGS-Water Lab
5293 Ward Road
Arvada, CO 80002
Tel. 303/236-5345

OR

Sonia Atwood
Marathon Oil **Company**
P.O. Box 269
Littleton, CO 80160
Tel. 303/794-2601

THE LABORATORY PERSONAL COMPUTER

Instructor: J. B. Calvert, Ph.D., PE

August 3-4, 1989

Tuition: \$350 member; \$400 non-member

This course will help you make the best use of **computer-Controlled** instrumentation in the laboratory. The **IBM** PC and compatibles are capable of managing sophisticated and individualized data acquisition and processing systems. In order to make full and intelligent use of these capabilities, it is necessary to understand how to control the computer and to interface it to external devices. This course will show you how to go beyond the limitations of commercially-available programs and interface hardware, and to tailor data systems to your particular needs.

You will learn how to use the ubiquitous programming language BASIC, and how its capabilities can be expanded by using assembly language routines in conjunction with it. Then you will see how a high-level language such as Turbo C can extend the speed and adaptability of a data acquisition system. You will learn how to use these programming capabilities to acquire external data through serial, **GPIB**, and current-loop links that can be adapted to any equipment capable of digital output, such as balances, spectrometers, and digital multimeters. You will be able to input and output data directly to program variables, facilitating data analysis.

Methods of directly interfacing to the PC bus will be demonstrated. These methods offer significant increases in speed and accuracy over commonly available commercial hardware. The principles of digital-to-analog and analog-to-digital conversion will be presented, including the use of voltage-to-frequency methods. The control of 120 V ac equipment, including heaters, magnet valves and other actuators, will be explained. This will include the use of **optoisolators** to solve problems of safety, ground loops, and **differences** in levels.

The course will be taught in a hands-on manner with IBM computers in an instrumentation laboratory. You will construct and test circuits on a solderless breadboard, using standard components. Detailed notes, with **full** explanations, data, and sources of further information, will be supplied to each participant in a 3-ring binder. A diskette containing useful programs will be included with the binder.

Faculty: J. B. Calvert Ph.D., PE, Associate Professor of Engineering, University of Denver, Denver, Colorado 80208

For more information contact:

Carlos **Arozarena**
U.S.G.S. - Water Lab
5293 Ward Road
Arvada, CO 80002
Tel. **303/236-5345**

or

Sonia Atwood
Marathon Oil Company
P.O. Box 269
Littleton, CO 80160
Tel. **303/794-2601**

ANALYTICAL CHEMISTRY OF CONTAMINANTS
IN SURFACE AND GROUND WATER
Instructors: Dr. E. Michael Thurman and Dr. Michael Reddy
July 27-29, 1989
Tuition: \$400 **member**; \$450 non-member

The course is intended for **environmental** chemists, water quality specialists, technicians, or others involved in the environmental chemistry of water. Participants will gain an overall knowledge of instrument function, use, and application to water samples; learn about general concepts and approaches to water analysis through lectures, slides, and practical **examples**; expand their knowledge of acid rain and groundwater contamination; and understand how natural variability in water quality and geology influence the interpretation of contaminant samples.

Major topics covered include methods of sampling and analysis of water for organic and inorganic contaminants; representative sampling, sampling preservation and analytical methodology; sampling and measurement of major ions, trace elements, and organic constituents in natural and contaminated ground and surface waters; modern chemical methods for water analysis, such as **ICP**, graphite furnace AA, **IC**, GC, LC GC-MS, and various methods of sample preparation; current commercial equipment, instrument function and application to water samples of low to high ionic strength; and quality assurance and quality control techniques for **field** and lab operation.

Faculty: Dr. E. Michael Thurman and Dr. Michael Reddy of the U.S. Geological Survey

For more information contact:

Carlos Arozarena
U.S.G.S. - Water Lab
5293 Ward Road
Arvada, CO **80002**
Tel. 303/236-5345

or

Sonla Atwood
Marathon Oil Company
P.O. Box 269
Littleton, CO 80160
Tel. 303/794-2601

LABORATORY INFORMATION MANAGEMENT SYSTEMS:
FROM PROBLEM DEFINITION TO SYSTEM EVALUATION
Instructors: Dr. Gerst Gibbon, Dr. **Joseph** Golden, and Miss. Ann Cibulas
August 3-4, 1989
Tuition: \$675 member; \$725 non-member

This new course is aimed at managers and supervisors who want to assess the impact LIMS has or would have on their laboratory, laboratory scientists who are considering the purchase or building of a laboratory management system, and scientists from analytical service and physical testing laboratories, both industrial and government, who have limited knowledge of the subject.

As a participant, you will learn what hardware and software tools are available for implementing a **LIMS**, how to prepare a functional requirement specification for a **LIMS**, and how to execute the procurement of a LIMS. Important topics covered include laboratory audits, LIMS functional specification, economic justification and budgeting, system implementation alternatives, the make/buy decision, proposals and their alternatives, training and support, and post-installation evaluation.

Faculty: Dr. Gerst Gibbon, Chief of the Processing Monitoring and Analysis Branch, U.S. Department of Energy's Pittsburgh Energy Technology Center; Dr. **Joseph** Golden, President, Laboratory Management Systems, Inc.; and Miss. Ann Cibulas, Product Manager, Calgon Corporation.

For more information contact:

Carlos **Arozarena**
U.S.G.S.- Water Lab
5293 Ward Road
Arvada, CO 80002
Tel. 303/236-5345

or

Sonia Atwood
Marathon Oil Company
P.O. Box 269
Littleton, CO 80160
Tel. **303/794-2^01**

EFFECTIVE MANAGEMENT OF CHEMICAL ANALYSIS LABORATORIES

Instructors: John H. Taylor and Dr. Mary M. Routson

August 3-4, 1989

Tuition: \$600 member; \$650 non-member

Due to its complex technical nature, the chemical analysis laboratory has traditionally been managed by a professional analytical chemist. Today this manager must know how to determine the cost and value of analytical services, the productivity of the laboratory, the return on capital employed, as well as how to motivate personnel, ensure quality, and operate with technical proficiency. During the course you will learn what is expected of you, what you should expect of your employees, and how to assess **performance** within the laboratory environment.

This course is designed for laboratory managers and upper level supervisors and covers the problems peculiar to analytical chemistry laboratories. **Specific** approaches to handling interdisciplinary activity, workload balancing and meeting commitments will be discussed.

Faculty: John H. Taylor, Jr., Vice President-General Manager, Analytical Technologies, **InC**, has responsibility for a multimillion dollar chemical services laboratory, servicing private industry, government, and **in-house** engineering departments. Dr. Mary M. Routson, Director, San Francisco Operations, ICF Technology, Inc., has directed analytical laboratories in contract research institutes.

For more information contact:

Carlos Arozarena
U.S.G.S. - Water Lab
5293 Ward Road
Arvada, CO 80002
Tel. 303/236-5345

or

Sonia Atwood
Marathon **OH** Company
P.O. Box 269
Littleton, CO 80160
Tel. 303/794-2601

PRACTICAL ANALYTICAL ATOMIC SPECTROSCOPY:
AAS, ICP-AES, ICP/MS

Instructors: Dr. Theodore C. Rains and Dr. Howard E. Taylor
July 27-28, 1989

Tuition: \$350 member; \$400 non-member

This highly rated, recently revised course is designed for chemists, biochemists, chemical engineers, analysts, clinicians, and quality assurance managers who are interested in research and analytical applications of atomic absorption spectrometry (AAS), inductively coupled plasma-atomic emission spectrometry (ICP-AES), and inductively coupled plasma/mass spectrometry (ICP/MS).

Participants are taught the fundamental theory of atomic spectrometry with a minimum of mathematical treatment, followed by state-of-the-art in instrumentation, data processing/computer, and sample treatment. Practical tips are presented on ways to improve precision and accuracy of analytical measurements. The areas of applications covered include biological/clinical, environmental, geological, and metallurgy. New analytical techniques for subtrace analyses and how to apply them are also discussed.

Faculty: Dr. Theodore C. Rains, National Bureau of Standards, and Dr. Howard E. Taylor, U.S. Geological Survey.

For more information contact:

Carlos Arozarena
U.S.G.S. - Water Lab
5293 Ward Road
Arvada, CO 80002
Tel. 303/236-53*5

or

Sonia Atwood
Marathon Oil Company
P.O. Box 269
Littleton, CO 80160
Tel. 303/794-2601

**BASIC PRINCIPLES OF MASS SPECTROMETRY AND
INTERPRETATION OF ORGANIC MASS SPECTRA**

Instructors: 3. A. Zirrolli, Ph.D.

July 26, 27, and 28, **1989**

Tuition: \$350 member; \$400 **non-member**

This course will describe the principles of modern mass spectrometry and apply **them** to the identification of organic compounds. Sample introduction methods (GC, vapor, direct probe), ionization processes (positive, negative, FAB, chemical, electronic), mass analysis and detection will be discussed with emphasis on molecular ion analysis and simple fragmentation processes. The course **will** develop an approach to the determination of elemental composition and diagnostic **fragmentation** patterns, and the student **will** become familiar with the mass spectra characteristic of common organic compound classes, drugs, pesticides and pollutants. The course is based upon and uses as a **reference** the text, Interpretation of Organic Mass Spectra. Third Edition by F. W. McLafferty, University Science Books, 1980.

For more information contact:

Carlos Arozarena
U.S.G.S. - Water Lab
5293 Ward Road
Arvada, CO 80002
Tel. 303/236-5345

or

Sonia **AtWOOD**
Marathon Oil Company
P.O. Box 269
Littleton, CO 80160
Tel. 303/794-2601

ORGANIZERS OF THE 31ST ROCKY MOUNTAIN CONFERENCE

Conference Chairman - Greg W. Johnson, **Adolph Coors Company**, Coors Analytical Lab, Mail No. VR737, Golden, CO **80*01**, (303) **277-6701**.

Conference Program Chairwoman - Pat **Sulik**, Rocky Mountain Instrumental Labs, *56 South Link Lane, Fort **Collins**.CO **\$052***, (303) **530-1169**.

Exhibits - Glenda Brown, U.S. Geological Survey, 5293 Ward Road, Arvada, CO 80002, (303) **236-53*5**, and Laura Hubbard, 1*91 Stonehaven **Ave.**, **Broomfield**, CO 80020, (303) **966-*106** at work or (303) 469-9408 at home.

Registration - John Garbarino, U.S. Geological Survey, MS *08, 5293 Ward Road, Arvada, CO **80002**, (303) **236-361**

Treasurer - David **Ordemann**, Adolph Coors Co., Mail No. BC600, Golden, CO 80*01, (303) 277-2590.

Social Events - Sandy Grande, **Manville Services Corp.**, R and D Center, P.O. Box 5108, Denver, CO 80217, (303) 978-5386, and Wendy Sticka, CPSD **Bldg.** 881, Rockwell International, P.O. Box 464, Golden, CO 80*02. (303) 966-70*9.

Stall - John Fowler, **USEPA-NEIC**, Building 53, Box 25227, DFC, Lakewood, CO 80226, (303) 236-5132.

Publicity - Jan Gurnsey, 5531 Bitterbush Way, Loveland, CO 80537, (303) 669-9216.

Short Courses/Film Festival - Carlos Arozarena, U.S. Geological Survey, 5293 Ward Road, Arvada, CO **80002**, (303) **536-53*5**.

Audio-Visual - Tom Leiker, U.S. Geological Survey, 5293 Ward Road, Arvada, CO 80002, (303) 236-3616.

Mailing List - Carol Gies, Rockwell International, General Lab. Bldg. **881**, P.O. Box , Golden, CO **80*01**, (303) **966-7380**.

Preliminary and Final Program Typist - Debbie Taylor, U.S. Geological Survey, MS *08, 5293 Ward Road, Arvada, CO 80002, (303) 236-3600.

SYMPOSIA CHAIRMEN AND CHAIRWOMEN

Atmospheric Sciences - D. **Stedman**, Department of Chemistry, University of Denver, University Park, Denver, CO 80208-0179, (303) **871-3530**.

Atomic Spectroscopy - Thomas **Niemczyk**, Department of Chemistry, University of New Mexico, Albuquerque, NM 87131, (505) 277-5319.

Chemometrics - Vanessa Bush, **InfometricS, Inc.**, 2200 6th **Avenue.**, Suite 833, Seattle, WA **98121**, (206) ***1-*696** at work or *036 33rd West, Seattle, WA **98199**, (206) 282-8586 at home.

Chlorinated Hydrocarbons - Brian Bush, New York State Department of Health, Wadsworth Laboratories, Albany, New York 12201-0509, (518) *73-7582.

Chromatography - Steve Nyarady, Adolph Coors Co., Coors Analytical Lab, Mail No. BC600, Golden, CO **80*01**, (303) 277-5917.

Computer Applications - John Lanning, Associate Dean, College of Liberal Arts and Sciences, University of Colorado at Denver, Box **144**, 1200 Larimer Street, Denver, CO 80204, (303) 556-2557.

- Electrochemistry - **Joseph H. Christie**, U.S. Geological Survey, MS 973, Box 25046, **DFC**, Denver, CO 80225, (303) 236-2464 and **Larry L. Jackson**, U.S. Geological Survey, MS 973, Box 25046, **DFC**, Denver, CO 80225, (303) 236-2473.
- EPR** - Gareth Eaton, Vice Provost for Research, Be 224, University of Denver, Denver, CO 80208-0091, (303) 871-2980 and Sandra Eaton, Department of Chemistry, University of Denver, Denver, CO 80208, (303) **871-2980**.
- Environmental Chemistry - Lynda Faires, U.S. Geological Survey, Box 25046, MS 407, Denver Federal Center, Denver, CO 80225, (303) 236-9362.
- General Posters - Carlos Arozarena, U.S. Geological Survey, 5293 Ward Road, Arvada, CO 80002, (303) 236-5345.
- ICP/MS - Howard Taylor, U.S. Geological Survey, MS 408, 5293 Ward Road, Arvada, CO 80002, (303) 236-1928 or 3614.
- IR/FTIR** - **A.R. Chughtai**, Department of Chemistry (Mudd Building), University of Denver, Denver, CO 80208, (303) 871-4404.
- Ion Chromatography - Bill Williams, **Manville** Service Corporation, Manville Tech Center, P.O. Box **5108**, Denver, CO **80217**, (303) 978-5595.
- Luminescence - Marvin Goldberg, U.S. Geological Survey, P.O. Box 25046, MS 424, Lakewood, CO 80225, (303) 236-4728.
- NEAR-IR** Spectroscopy - Donald Burns, **NIR** Resources, 54 Canopus Hollow Road, Putnam Valley, NY 10579, (914) 526-3223 and **Joseph Montalvo**, USDA, ARS, SRRC, P.O. Box 19687, New Orleans, LA 70179, (504) 286-4249.
- NMR - Bernie Gerstein, Iowa State University, 229 Spedding, Ames, IA **50011**, (515) 294-6342.
- Quality Assurance - Bill **Shampine**, U.S. Geological Survey, MS 401, Box 25046, Denver Federal Center, Lakewood, CO 80225, (303) 236-1940.
- Robotics - Rob **MarUyama**, Adolph Coors Co., Coors Analytical Lab, Mail No. BC600, Golden, CO **80401**, (303) 277-6499.
- Supercritical Fluid Chromatography - Bernd Wenclawiak, Physikalisches Institut, **Wilhelm Klemm** Str. 10, D-4400 Munster, West Germany, **01149251833610**.

SYMPOSIUM ON ATMOSPHERIC SCIENCE

Organized by Donald H. Stedman

Monday Morning and **Afternoon, July 31**

KEYNOTE. WILLIAM L. CHAMEIDES

THE ROLE OF BIOGENIC HYDROCARBONS IN URBAN PHOTOCHEMICAL SMOG: ATLANTA AS A CASE STUDY. William L. Chameides, R. W. Lindsay, J. Richardson, and C. S. Kiang, Georgia Institute of Technology.

KEYNOTE: DONALD H. STEDMAN

MODELLING OXYGENATED FUEL S. Donald H. Stedman, University of Denver.

NO_x MEASUREMENTS AT PAWNEE. K. F. Zeller, W. J. Massman, B. G. Fox, D. W. Stocker, and D. H. Stedman, U.S. Forest Service and University of Denver.

DEVELOPMENT AND TESTING OF THE UNIVERSAL SULFUR DETECTOR FOR THE MEASUREMENT OF SULFUR COMPOUNDS IN THE ATMOSPHERE. Richard L. Benner and Donald H. Stedman, University of Denver.

SEASONAL VARIATIONS OF GAS-PHASE HYDROGEN PEROXIDE OVER THE CENTRAL U.S. John D. Ray, University of Colorado.

INVESTIGATIONS INTO THE CHEMISTRY AND KINETICS OF ClO AND BrO AND THEIR CHEMICAL SOURCE REACTIONS. Andrew A. Turnipseed, John W. Birks, and Jack G. Calvert, University of Colorado.

EXHAUSTING THE "RECEIVING CAPACITY" OF THE URBAN AIR ENVIRONMENT. Wendall P. Greek and Vernon P. Dorweiler, Michigan Technological University.

MEASUREMENTS OF ATMOSPHERIC ORGANIC NITRATES AND THEIR CONTRIBUTION TO TOTAL REACTIVE NITROGEN. Martin P. Buhr, David D. Parrish, Frederick C. Fehsenfeld, and Robert E. Sievers, R/E/AL7.

TRENDS IN ATMOSPHERIC CONCENTRATIONS OF FORMALDEHYDE AND ACETALDEHYDE BEFORE, DURING, AND AFTER THE FIRST AND SECOND SEASONS OF COLORADO'S OXY-FUELS PROGRAM. Larry G. Anderson, Charles M. Machovec, and John A. Lanning, University of Colorado at Denver.

APPROACHES FOR ASSESSING THE IMPACT OF COLORADO'S HIGH OXYGEN FUELS PROGRAM ON ATMOSPHERIC CO CONCENTRATIONS. Larry G. Anderson, Philip N. Anderson, Charles M. Machovec, and Robert Meglen, University of Colorado at Denver.

ON THE RELATIONSHIP BETWEEN TROPOSPHERIC OZONE AND TEMPERATURE. Perry J. Samson and Sanford Sillman, University of Michigan.

MEASUREMENT OF SOLUBILIZED ALUMINUM IN AIRBORNE MINERAL DUST. Gregory L. Kok and John L. Winchester, National Center for Atmospheric Research.

AMBIENT HYDROGEN PEROXIDE MEASUREMENTS BY PEROXYOXYLATE CHEMILUMINESCENCE. Karen K. Francis and Donald H. Stedman, University of Denver.

SYMPOSIUM ON ATOMIC SPECTROSCOPY

Organized by Tom Niemczyk

Tuesday Morning, August 1

- 8:45 Welcome
- 8:50 INVITED SPEAKER. JOHN W. **OLESIK**
EFFECTS OF MATRIX AND SOLVENT IN ICP-AES: INHERENTLY SMALL OR CONVENIENTLY FORTUNATE? John W. Olesik, University of North Carolina.
- 9:30 LASER SAMPLING INTO AN INDUCTIVELY COUPLED PLASMA OPTICAL EMISSION SPECTROMETER. Robert J. Thomas, The **Perkin-Elmer** Corporation.
- 9:50 DETERMINATION OF RARE EARTH ELEMENTS IN RARE EARTH MATRICES BY ICP-AES - **LINE** SELECTION. I. B. Brenner, Geological Survey of Israel and P. Grosdailon, Jobin Yvon **OSA**), France.
- 10:10 BREAK
- 10:40 **OPTIMIZATION** OF PLASMA CONDITIONS USING A SINGLE ICAP METHOD FOR ELEMENT LINES FROM 160 TO 800 NM. J. E. Shmelzel, A. E. Grindle, and J. J. Sotera, Thermo Jarrell Ash Corporation.
- 11:00 DETERMINATION OF ARSENIC, LEAD, SELENIUM AND THALLIUM IN WATER BY ICP EMISSION AT CLP REQUIRED LEVELS USING AN ULTRASONIC NEBULIZER. Danton Nygaard, Frank **Bulman**, and Timothy Alavosus, **Baird** Corporation.
- 11:20 A NEW CONCEPT IN ICP-AES - A MULTICHANNEL **POLYSCAN** SPECTROANALYZER. R. R. Myers, Instruments SA, **Inc/JY** Division; A. LeMarchand, P. Grosdailon, Jobin Yvon, France; and I. B. Brenner, Geological Survey of Israel.
- 11:40 AUTOMATED ELEMENT **PRECONCENTRATION** FOR AAS AND ICP. Angeto C. Grillo, et al., **Qestran** Corp.
- 12:00 LUNCH

Tuesday **Afternoon**, August 1

- 1:30 KEYNOTE SPEAKER. **RICHARD D. SACKS**
DIRECT CURRENT MAGNETICALLY TAILORED PLASMA DEVICES FOR ANALYTICAL ATOMIC SPECTROSCOPY. Richard D. Sacks, University of Michigan.
- 2:10 DETERMINATION OF TRANSITION METALS IN SEAWATER AND BRINES USING COUPLED ION CHROMATOGRAPHY/SIMULTANEOUS INDUCTIVELY COUPLED ARGON PLASMA. J. M. Riviello, R. M. Manabe, H. M. Kingston, and A. Siriraks, Dionex Corporation, Thermo Jarrell Ash, and **NIST**.
- 2:30 EXCITATION OF METAL ATOMS BY ENERGY TRANSFER FROM VIBRATIONALLY SELECTED $N_2(A^2\pi_g, V)$. Jill E. Angus, Byron A. Palmer, Lawrence A. Layman, Doug E. Hof, Los Alamos National Laboratory, and Thomas **M. Niemczyk**, University of New Mexico.
- 2:50 HOLLOW ANODE DISCHARGE - GRAPHITE FURNACE EMISSION SPECTROMETRY. James M. Harnly, David L. **Styris**, and Nathan E. Ballou, **USDA** and **Battelle**, Pacific Northwest Labs.

3:10 BREAK

3:10 **IN SITU** HYDRIDE GENERATION PRECONCENTRATION OF ARSENIC IN A GRAPHITE FURNACE WITH SAMPLE VAPORIZATION INTO A MICROWAVE INDUCED PLASMA FOR EMISSION SPECTROMETRY. Henryk Matusiewicz, Ralph E. Sturgeon, and Shier S. **Berman**, National Research Council of Canada.

4:00 ANALYSIS OF ENVIRONMENTAL WATER SAMPLES UTILIZING FULLY AUTOMATED ATOMIC ABSORPTION SPECTROPHOTOMETRY. Maria W. Tikkanen, Roger Starek, and Sue Peters, Applied Research Laboratories.

4:20 CONTINUUM SOURCE AAS WITH A PULSED SOURCE AND A PHOTODIODE ARRAY DETECTOR. James M. Harnly, USDA; Gary P. Moulton and Thomas C. O'Haver, University of Maryland.

Wednesday Morning, August 2

8:40 PRESENTATION OF NEW MICROWAVE DIGESTION TECHNIQUES: CLOSED VESSEL VERSUS OPEN VESSEL. Angelo C. Grillo, et al., Questron corp.

9:00 SIMULTANEOUS DETERMINATION OF As, Se, TI AND Pb IN WATER AND SOIL SAMPLES. Dean A. Bass and Ken Seace, Hitachi Instruments, Inc.

9:20 EVALUATION OF INTERNAL STANDARDIZATION IN ICP-AES: POST MEASUREMENT AND REAL TIME. M. L. Salit, E. Pruszkowski, D. A. Yates, J. B. Collins, and R. L. Hergenreder, Perkin-Elmer Corporation.

9:40 GEOPLASMAS - RECENT DEVELOPMENTS IN AUTOMATED SAMPLE PREPARATION, ANALYSIS OF GEOLOGICAL AND ENVIRONMENTAL MATERIALS AND CHEMOMETRIC DATA INTERPRETATION. M. Bosier, Bureau Recherches Geologiques Et **Minieres (BRGM)**; Y. Lang, **Jobin Yvon (JY-ISA)**; and I. B. Brenner, Geological Survey of Israel.

10:00 BREAK

10:30 SELECTIVE DETERMINATION OF SELENIUM (IV) AND SELENIUM (VI) IN TAP WATER BY HGAAS-FLA -AND A STUDY OF THE TRANSPORTATION LAW BETWEEN THEM. Zhi Liu and Hong Chen, Testing Center of **Gansu**, China.

10:50 A NEW AUTOMATED DUAL ELEMENT FURNACE AA OPTIMIZED FOR CLP ANALYSIS. 3. E. Schmelzel, J. Dulude, and 3. Sotera, Thermo **Jarrell Ash** Corporation.

11:10 A NEW ELEMENT SPECIFIC GC DETECTOR BY AA SPECTROSCOPY. Angelo C. Grillo, et al., Questron Corp.

11:30 Lunch

Wednesday Afternoon, August 2

1:30 EXPERIMENTAL ANALYSIS OF LIQUID AND SOLID SAMPLES USING A FAST SEQUENTIAL MULTI-ELEMENT ATOMIC ABSORPTION SPECTROPHOTOMETER. William C. Batie and A. E. **Bernhard**, **ANALYTE** Corporation.

1:50 FLOW INJECTION IN ATOMIC ABSORPTION ANALYSIS: MORE THAN JUST A NEW WAY OF SAMPLE INTRODUCTION. G. Schlemmer, Z. Fang, and W. **Erler**, **Bodenseewerk Perkin-Elmer** and Co.

2:10 ROUTINE ANALYSES OF MERCURY AT PPT LEVELS. Angela C. Grillo, et al., Questron Corp.

SYMPOSIUM ON INDUCTIVELY COUPLED PLASMA-MASS SPECTROMETRY

Organized by Howard E. Taylor

Monday Morning, July 31

- 9:00 OPENING REMARKS. H. E. Taylor.
- 9:10 KEYNOTE ADDRESS. R. M. BARNES
- CHALLENGES AND DIRECTIONS WITH INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY. R. M. Barnes, E. **Bakowska**, and C. **Amarasiriwardena**, University of Massachusetts.
- 9:50 MULTIVARIATE CALIBRATION IN INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY. M. E. Ketterer, C. A. Ramsey, 3. 3. **Reschl**, and M. J. Peters, U.S. Environmental Protection Agency.
- 10:15 BREAK
- 10:30 ISOTOPIC ANALYSIS - USE IN ENVIRONMENTAL CHEMISTRY, GEOCHEMISTRY, AND **HYDROLOGY**. H. E. Taylor and J. R. Garbarino, U.S. Geological Survey.
- 10:55 LASER SOLID SAMPLING **ICP-MS** ANALYSIS OF PRECIOUS METALS. E. R. Denover, **Perkin-Elmer** Corp.
- 11:20 LASER ABLATION ICP-MS - TOWARDS IMPROVED PRECISION. C. T. Tye, P. D. Blair, R. Henry, I. **Abell**, VG Elemental Ltd.
- 11:45 LUNCH

Monday Afternoon, July 31

- 1:00 KEYNOTE ADDRESS. F. E. LICHTE
- THE ROLE OF **ICPMS** IN THE ANALYTICAL LABORATORY. F. E. Lichte, U. S. Geological Survey.
- 1:45 IN SITU PRECONCENTRATION OF SELECTED TRACE METALS FROM NATURAL WATERS. 3. R. Garbarino, T. I. Brinton, and H. E. Taylor, U. S. Geological Survey.
- 2:10 BREAK
- 2:30 PRACTICAL USES OF TIME RESOLVED ANALYSIS IN ICP-MS. P. **Hulmston**, R. C. Hutton, R. Henry, P. D. Blair, and A. Kinsella, VG Elemental Ltd.
- 2:55 DEVELOPING INDUCTIVELY COUPLED PLASMA-MASS SPECTROMETRIC METHODS FOR ROUTINE ANALYSIS IN A WATER QUALITY LABORATORY. L. M. Faires, U.S. Geological Survey.

SYMPOSIUM ON CHEMOMETRICS

Chairperson, Vanessa Bush

Deanna Peterson, Presiding

Wednesday Afternoon, August 3

- 1:00 INTRODUCTORY REMARKS. Deanna Peterson
- 1:10 PATTERN RECOGNITION AND EXPLORATORY DATA ANALYSIS: AN OVERVIEW. R. E. Meglen, University of Colorado at Denver.

- 2:10 PREDICTION OF WASTE TOXICITY THROUGH CLASSIFICATION OF INDIRECT MEASUREMENTS. M. E. Ketterer, C. A. Ramsey, and J. H. Lowry, U.S. Environmental Protection Agency.
- 2:20 BREAK
- 3:00 ROBUST DETECTION OF CHEMICAL SIGNALS IN NOISE. K. A. Duell, K. L. Rowlen, J. P. Avery, K. Kelly, and J. W. Birks, University of Colorado.
- 3:20 A CHEMOMETRIC APPROACH TO AN ANALYTICAL TECHNIQUE: INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY. M. E. Ketterer, C. A. Ramsey, J. J. Reschl, and M. J. Peters, U.S. Environmental Protection Agency.
- 3:40 TENSORIAL PERSPECTIVES ON CALIBRATION. S. L. Neal, University of Washington.
- 4:40 WINE AND CHEESE RECEPTION

SYMPOSIUM ON CHLORINATED HYDROCARBONS

Chairman: Brian Bush Co-chairman: Robert M. Smith

Wednesday Morning, August 2

- 8:40 INTRODUCTORY REMARKS. Brian Bush
- 8:45 LC AND GC DETERMINATION OF A NEUROTOXIC PCB CONGENER: 2,4,6-TRICHLOROBIPHENYL. CORRELATION OF IN VIVO AND IN VITRO NEUROTOXICITY. R. F. Seegal, K. Brosch, K. Priester, B. Bush, and W. Shain, New York State Health Department.
- 9:10 PCB SCREENING WITH ITNA, D. M. Seitz, C. R. Sutcliffe, E. S. Gladney, and G. H. Brooks, Los Alamos Laboratory.
- 9:35 CHLORINATED DIOXIN AND DIBENZOFURAN STUDIES IN NEW YORK STATE. R. M. Smith, P. W. O'Keefe, and K. M. Aldous, New York State Health Department
- 10:15 BREAK
- 10:35 DETERMINATION OF COPLANAR PCB IN HUDSON RIVER AND LAKE ONTARIO FISH, B. Bush, and C. S. Hong, New York State Health Department.
- 11:00 FEATURED SPEAKER. DAVID R. HILKER.
- MASS SPECTROMETRY OF CHLORINATED HYDROCARBONS. David R. Hilker and K. M. Aldous, New York State Health Department.

SYMPOSIUM ON CHROMATOGRAPHY

Organized by Stefan A. Nyarady

Monday Morning, July 31

- 8:30 OPENING REMARKS. Stefan A. Nyarady.
- 8:40 NEW SULFUR SELECTIVE DETECTOR FOR GAS CHROMATOGRAPHY. Neil Johansen and Marianne Legier, Sievers Research.
- 9:05 DEVELOPMENT OF A GAS CHROMATOGRAPHIC DETECTOR FOR MEASUREMENT OF SULFUR-, NITROGEN-, PHOSPHOROUS-, AND ARSENIC-CONTAINING COMPOUNDS. Kelley M. Wells, John W. Birks, University of Colorado.

- 9:30 APPLICATIONS OF ELECTROCHEMICAL DETECTION TO THE DETERMINATION OF NONCHROMOPHORIC SPECIES BY **LIQUID** CHROMATOGRAPHY. A. Henshall, R. Rocklin, R. Kiser, and P. Newton, **Dionex** Corporation.
- 10:00 BREAK
- 10:30 PLENARY LECTURE/KEYNOTE. PROF. TERRY ACREE
- CHARM ANALYSIS OF AROMAS, Prof. Terry Acree, Cornell University, Geneva, New York.
- 11:20 MASS SPECTRAL STUDIES OF ALKALINE EARTH (5-DIKETONATE COMPLEXES USED AS PRECURSORS FOR SUPERCONDUCTING THIN FILMS. Sherri Banning Turnipseed, Robert M. Barkley, Robert E. Sievers, University of Colorado.
- 11:45 LUNCH
- Monday Afternoon, July 31
- 2:00 HIGH SPEED THERMAL MODULATION FOR SAMPLE INTRODUCTION INTO A GAS CHROMATOGRAPHIC COLUMN FOR PROCESS STREAM ANALYSIS. Zaiyou Liu, Minquan Zhang, and John B. Phillips, Southern Illinois University.
- 2:25 RANDOM DISTRIBUTION THEORY AND OLIVE OIL TRIGLYCERIDE DISTRIBUTION. Brian D. Martin and Richard V. Flor, U.S. Customs Service.
- 2:50 STUDIES ON THE OXIDATION RATES OF LINOELAIDIC AND **LINOLEIC** ACIDS USING **HPLC-CHEMILUMINESCENCE** DETECTION. G C Yang, Y. Ku, and P. Yurawecz, Food and Drug Administration.
- 3:25 DETERMINATION OF VOLATILE ORGANICS IN METHANOL SOLUTION USING A FID, EDC AND **PID** WITH AN ON-COLUMN INJECTION METHOD. N. S. Sung, Phillips Petroleum Company.

SYMPOSIUM ON ION CHROMATOGRAPHY

Organized by F. W. Williams

F. W. Williams, presiding

Tuesday **Afternoon**, August 1

- 2:00 INTRODUCTION
- 2:10 UV DETECTION APPLICATIONS IN CATION CHROMATOGRAPHY. D. W. Togami, Interaction Chemicals.
- 2:35 EXPANDED PROBLEM-SOLVING CAPABILITY OF ION EXCHANGE PACKINGS WITH A PELLICULAR LAYER OF ELECTROSTATICALLY, OR COVALENTLY-BONDED **SUBMICRON** LATEX PARTICLES. A. Henshall, R. Rocklin, M. Doyle, and S. **Stillman**, Dionex Corp.
- 3:15 BREAK
- 4:00 THE USE OF ION CHROMATOGRAPHY IN CONTROLLING MANUFACTURE OF MULTILAYER CIRCUIT BOARDS. R. E. Smith, Allied **Signal**.
- 4:25 COMPARISON OF MEMBRANE VERSUS RESIN BASED SAMPLE PREPARATION DEVICES FOR ANION ANALYSIS. W. R. Jones, Waters, Division of Millipore.

SYMPOSIUM ON SUPERCRITICAL FLUIDS

Organized by B. Wenclawiak

B. Wenclawiak presiding

Tuesday Morning, August 1

- 9:00 INTRODUCTIONARY REMARKS. Bernd Wenclawiak.
- 9:05 INVITED SPEAKER. JOSEPH M. LEVY
MULTIDIMENSIONAL SUPERCRITICAL FLUID CHROMATOGRAPHY. Joseph M. Levy. BP America Research and Development.
- 9:50 RETENTION OF ACIDIC AND BASIC COMPOUNDS IN PACKED COLUMN SUPERCRITICAL FLUID CHROMATOGRAPHY. Dirk Upmnoor and Gerd Brunner, Technische Universität Hamburg-Harburg.
- 10:10 DESORPTION OF TRACE ORGANIC AQUATIC POLLUTANTS PRECONCENTRATED ON SOLID SORBENT USING SUPERCRITICAL FLUID EXTRACTION. William T. Foreman, U. S. Geological Survey.
- 10:30 BREAK
- 11:00 SUPERCRITICAL CHROMATOGRAPHY IN THE RETROGRADE REGION OF A MOBILE PHASE. F. D. Kelley and E. H. Chimowitz. University of Rochester.
- 11:20 SUPERCRITICAL FLUID EXTRACTION AND SUPERCRITICAL FLUID CHROMATOGRAPHY WITH SECONDARY ION MASS SPECTROMETRY DETECTION. Bernd Wenclawiak, Willy Sichtermann, and Jorg Schipke. Westfälische Wilhelmsuniversität Münster.
- 11:40 PESTICIDE RESIDUE ANALYSIS WITH SUPERCRITICAL FLUIDS. Jorg Schipke and Bernd Wenclawiak, Westfälische Wilhelmsuniversität Münster.
- 12:00 SUPERCRITICAL FLUID APPLICATION FOR THE ANALYSES OF LEWISITE (L) AND III-QUINUCLIDENYL BENZILATE (BZ). Michael W. Ellzy, Paul C. Bossle, and Foy E. Ferguson, U.S. Army Chemical Research Division and Engineering Center.
- 12:20 SEPARATION OF m-XYLENE AND ETHYLBENZENE ON SILICATE IN SUPERCRITICAL AND GASEOUS CARBON DIOXIDE. Chung-Sung Tan, National Tsing Hua University.
- POSTER:
HIGH PRESSURE EXTRACTION OF MONTAN WAX. Gero Braun and Rudolf steiner. Universität Erlangen-Nürnberg.

SYMPOSIUM ON COMPUTER APPLICATIONS

Organized by John A. Lanning

Tuesday Afternoon, August 1

- 1:30 OPENING REMARKS. John A. Lanning
- 1:35 RECYCLING A/D CONVERTERS FROM MINICOMPUTERS TO PC-BASED AUTOMATION SYSTEMS. Mike McGinnis, Sievers Research Inc.

SHORT COURSE REGISTRATION

Courses Sponsored by Colorado Section
American **Chemical** Society
at the
31st Rocky Mountain Conference
Denver, Colorado

	Member	Non- Member
The Laboratory Personal Computer	/7\$350	Z7\$400
Analytical Chemistry of Contaminants in Surface and Groundwater	Z7\$40G	U\$U5Q
Laboratory Information Management Systems: From Problem Definition to System Evaluation	Z7S675	[J%715
Effective Management of Chemical Analysis Laboratories	/7\$600	Z7S650
Practical Analytical Atomic Spectroscopy: A A S , ICP-AES, ICP/MS	Z73350	Z7\$400
Basic Principles of Mass Spectrometry and Interpretation of Organic Mass Spectra	^7\$350	/7\$^00

Name:_____

Organization:_____

Address:_____

Phone:_____

Refund Policy: Full refunds will be made if requests are received on or before **July** 14, 1989.

Make checks payable to **The American Chemical Society** and send payment with this form to Carlos Arozarena, **USGS-Water** Lab, 5293 Ward Road, Arvada, CO 80002

31ST ROCKY MOUNTAIN CONFERENCE PREREGISTRATION FORM

PLEASE CHECK HERE IF **THIS IS A NEW ADDRESS**Please type or **print** clearly for your badge.

Name_____

Company_____

Mailing **Address**_____PREREGISTRATION FEES (.PER PERSON)

City_____Regular \$40.00_____

State/Country/Zip_____Student (full time) \$10.00_____

Phone_____Retired/Unemployed No charge _____

Please circle letters for areas of interest: Registration (1 day) \$25.00_____

A **Atmospheric** Science H Environmental N Near **IR**, Georgetown Tour **\$12.00** ^ ^ ^ _ ^ ^ ^ , —

B Atomic Spectroscopy I EPR O NMR Banquet \$22.00_____

c **Chemometrics** J **Ion Chromatography** P Quality Assurance

D Chlorinated Hydrocarbons K ICP-MS Q Robotics

E Chromatography L IR/FT-IR R Supercritical Fluid Chromatography

F Computer Applications M Luminescence

G Electrochemistry

Preregistration forms must be accompanied with the preregistration fee paid in full (\$ U.S. only) and be received by July **21, 1989**. Make check payable to ROCKY MOUNTAIN CONFERENCE and return to:

CO John Garbarino
U.S. Geological Survey
5293 Ward Road, MS **40S**
Arvada, CO 80002

HOTEL RESERVATION FORM

Radisson Hotel Denver
1550 Court Place, Denver, Colorado
(303) 893-3333 or **(S00)** 654-1550

31st Rocky Mountain Conference
July 30-August 4, 1989

Arrival Date:_____Departure Date:_____

Time:_____Checkout **12100** noon

Guest 1 (Last name, first name):_____

Guest 2 (Last name, first name):_____

Address:_____

City, State, Country, ZIP:_____*

Telephone:_____

Type of Room Single **\$70.00/night** plus applicable tax

 Double \$80.00/night plus applicable tax

 Suites available upon request at the conference discount.

Reservations will be held until 6:00 p.m. on the arrival date unless a later time is specified above.

The Radisson Hotel Denver has agreed to hold the block of rooms for the 31st Rocky Mountain Conference until July 14, 1989. We urge you to make reservations promptly.

Send this form only to the Radisson Hotel Denver at the address above. Attention Reservations.

- 2:00 IMPROVING LAB PRODUCTIVITY THROUGH LOCAL AREA NETWORKS: IMPLEMENTATION OF A LAN FOR MICROSOFT **WINDOWS-BASED** CHROMATOGRAPHY WORK STATIONS. Alan Henshall, 3. Adams, and 3. Schibler, Dionex Corporation.
- 2:25 USING LOTUS 1-2-3 IN AUTOMATED LABORATORY DATA REPORTING. Steven E. Bonde and 3ohn G. Huntington, Phoenix Analytical Laboratories.
- 2:50 BREAK
- 3:10 INTEGRATION OF A SPREADSHEET TO A DATA BASE MANAGER FOR ENHANCED DATA MANIPULATION ON A PC-BASED LIMS. Richard D. Beaty and Paul C. Difierding, Telecation Associates.
- 3:35 EVALUATION OF ICP DATA ACCURACY USING DIGITAL EQUIPMENT CORPORATION USER FRIENDLY SOFTWARE. Greg Johnson, Charles Lawhead, and Terry Burbank, Coors Analytical.
- 4:00 AUTOMATION OF DATA TRANSFER FROM LABORATORY INSTRUMENTS USING AN INTEGRATED DATABASE SOFTWARE PACKAGE. Merle Shockey, Thomas Bushly, Linda Pratt, and Stephen **Glodt**, U.S. Geological Survey.
- 4:20 A STATE-OF-THE-ART DATA PROCESSING, QUALITY ASSESSMENT, AND REPORTING SYSTEM FOR CHEMICAL ANALYSES DATA. Oren V. Hester, David H. van **Haften**, **Judy** A. Steverson, EG and G Idaho.

SYMPOSIUM ON ELECTROCHEMISTRY

Organized by **Joseph H. Christie** and Larry L. Jackson

Monday Morning, July 31

- 8:30 KEYNOTE SPEAKER. JANET G. **OSTERYOUNG**.
VOLTAMMETRY AT **MICROELECTRODES**, Janet G. Osteryoung.
- 9:10 VOLTAMMETRIC-AMPEROMETRIC DETECTION FOR LIQUID CHROMATOGRAPHY. Craig E. Lunte.
- 9:30 VOLTAMMETRIC-AMPEROMETRIC DETECTION FOR LIQUID CHROMATOGRAPHY USING MICROELECTRODE ARRAYS. Rita K. Palsmeier, David S. Maxwell, and Craig E. Lunte.
- 9:50 SPATIAL ELECTROCHEMICAL DETECTION FOR THIN-LAYER AND LIQUID CHROMATOGRAPHY AT SEMICONDUCTING TITANIUM DIOXIDE THIN FILMS. Garrett N. Brown, **John W. Birks**, and Carl A. **Koval**.
- 10:10 BREAK
- 10:40 MODULATED REFLECTANCE SPECTROSCOPY. John A. Turner.
- 11:00 A **MICRO-ELECTROCHEMICAL** CELL FOR INVESTIGATING ELECTRON TRANSFER AT TUNGSTEN DISLENIDE SEMICONDUCTOR/SOLUTION INTERFACES, Jason N. Howard, Carl A. Koval, and Bruce A. Parkinson.
- 11:20 QUARTZ MASS BALANCE STUDIES OF MASS TRANSPORT PROCESSES IN THIN **FILM SENSORS**. H. Meyer and Daniel A. Buttry.
- 11:40 LUNCH