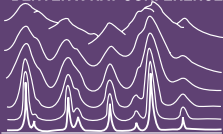


DENVER X-RAY CONFERENCE™



The 51st Annual
Denver X-ray Conference

Program

Plenary Session

Applications of X-ray Analysis to Forensic Materials

29 July–2 August 2002
Antlers Adam's Mark Hotel
Colorado Springs, Colorado, U.S.A.

Sponsored by

International Centre for Diffraction Data



51ST ANNUAL DENVER X-RAY CONFERENCE

Antlers Adam's Mark Hotel
Colorado Springs, Colorado U.S.A.
29 July–2 August 2002

2002 Denver X-ray Conference Organizing Committee

John A. Anzelmo, Bruker AXS, Inc., Madison, WI

Randolph Barton, Jr., Emeritus, DuPont Experimental Station, Wilmington, DE

Don Broton, Construction Technology Labs, Skokie, IL

Victor E. Buhrke, Chair, Consultant, Portola Valley, CA

John V. Gilfrich, Emeritus, SFA, Inc./NRL, Washington, DC

George J. Havrilla, Los Alamos National Laboratory, Los Alamos, NM

Ting C. Huang, Emeritus, IBM Almaden Research Center, San Jose, CA

Ron Jenkins, Past Chair, Emeritus, International Centre for Diffraction Data, Newtown Square, PA

James A. Kaduk, BP Chemicals, Naperville, IL

Terry Maguire, Conference Administrator, International Centre for Diffraction Data, Newtown Square, PA

Scott T. Misture, NYS College of Ceramics at Alfred University, Alfred, NY

I. Cev Noyan, IBM, Yorktown Heights, NY

Robert L. Snyder, The Ohio State University, Columbus, OH

Mary Ann Zaitz, IBM – EF Microelectronics, Hopewell Junction, NY

Future Conference Dates:

4–8 August 2003: Denver Marriott Tech Center Hotel
Denver, Colorado, U.S.A.

2–6 August 2004: Sheraton Steamboat Resort (Tentative)
Steamboat Springs, CO

Program:

This program is also available on the Denver X-ray Conference web page at <http://www.dxcicdd.com>. The information contained in this program is current as of the printing date. Changes will be communicated at the conference.

2002 DENVER X-RAY CONFERENCE PROGRAM

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ACCOMMODATIONS AND TRAVEL

Hotel Information

The 2002 Denver X-ray Conference (DXC) will be held 29 July–2 August at the Antlers Adam's Mark Hotel, 4 South Cascade Avenue, Colorado Springs, CO 80903, U.S.A., phone: 800.444.ADAM or dial direct: 719.473.5600, fax: 719.389.0259.

Reservations

Attendees are responsible for making their own reservations. Please identify yourself as a Denver X-ray Conference attendee when booking your reservation. Reservations should be made as soon as possible since there is a limited number of rooms available at the conference rate. The special conference rate of \$119 per day (plus 8% tax), single or double occupancy, will only be applicable before 3 July 2002, subject to availability. Please note the hotel's cancellation policy: Should an individual reservation need to be cancelled for any reason, there will be no charge for that individual reservation cancelled 24 hours or more prior to the scheduled day of arrival. If the individual reservation is not cancelled, a "no-show" fee of one night's room and tax will be charged.

Overflow Hotel

The Red Lion Hotel Colorado Springs, 314 West Bijou Street, Colorado Springs, CO 80905, phone: 800.477.8610 or dial direct: 719.471.8680, fax: 719.471.0894, has been selected as the overflow hotel. Please identify yourself as a Denver X-ray Conference attendee when booking your reservation. A group of rooms has been reserved at the special conference rate of \$89 per day (plus 8% tax) for single/double/triple/quad occupancy. The rate will only be applicable before 12 June 2002, subject to availability. Please note the hotel's cancellation policy: Individual rooms must be cancelled within 24 hours of arrival date to avoid any no show charges which will be debited to the individual's credit card. If enough rooms are reserved by conference attendees, a shuttle service will be provided by the Red Lion Hotel to the Antlers Adam's Mark Hotel. The Red Lion is located approximately 0.5 mile (3 blocks) from the Antlers Adam's Mark Hotel.

Need a roommate?

If you are unable to pay the full price of a hotel room, consider sharing the expenses with a roommate. Check out the Denver X-ray Conference web site, www.dxcicdd.com, for information on locating a roommate.

Travel Arrangements

The Denver X-ray Conference has selected Kitty Ward Travel, Inc. as the official travel agent for the conference. Kitty Ward Travel has negotiated special fares with United Airlines. A request for air travel is included on page 45 of this program. Please complete the form and fax to Kitty Ward Travel at fax: 610.543.0786 or call 610.543.0680 or 800.752.3718. If you prefer to arrange your own travel, you may still take advantage of the special airfares by referring to the Denver X-ray Conference numbers when making your reservations. The numbers are as follows:

United Airlines

Phone: 1.800.241.6522

DXC Reference Number: 502XR

REGISTRATION INFORMATION

Conference Registration Fees

All attendees must register for the conference, including organizers, chairs, invited speakers, and instructors.

Discounted fees will be applied to registrations received before 5 July 2002. The reduced registration fee will only be applied if registration form and payment are received on or before 5 July 2002. Attendees may pre-register by completing the form on page 47 of this program and sending it to: Denise Flaherty, ICDD, 12 Campus Blvd., Newtown Square, PA 19073-3273, U.S.A. ♦ E-mail: dxc@icdd.com ♦ phone: 610.325.9814 ♦ fax: 610.325.9823. Registration checks should be made payable to **ICDD/DXC** and enclosed with the registration forms.

	By July 5 th	After July 5 th
• Full week: exhibits, workshops, sessions [†]	\$325	\$400
• Monday & Tuesday: exhibits, workshops [†]	\$275	\$350
• Wednesday, Thursday & Friday: exhibits, sessions [†]	\$275	\$350
• Session organizers, invited speakers & workshop instructors [†]	\$100	\$100
• Students, unemployed X-ray people, and persons 65 and older: exhibits, workshops, sessions	\$75	\$75

[†]Includes a copy of Volume 46 of *Advances in X-ray Analysis* on CD-ROM

Take advantage of this opportunity to include the following orders with your conference registration fee:

- **Advances in X-ray Analysis**, Cumulative Volumes 1–39 on CD-ROM: \$350
- **Advances in X-ray Analysis**, Volume 40 on CD-ROM: \$150
- **Advances in X-ray Analysis**, Volume 41 on CD-ROM: \$150
- **Advances in X-ray Analysis**, Volume 42 on CD-ROM: \$150
- **Advances in X-ray Analysis**, Volume 43 on CD-ROM: \$150
- **Advances in X-ray Analysis**, Volume 44 on CD-ROM: \$150
- **Powder Diffraction** (Individual one year subscription for 2002 or 2003):

Domestic:	Online: \$60	Print: \$60	Print & online: \$80
Overseas:	Online: \$60	Print: \$85	Print & online: \$110
- **Powder Diffraction** (Institution one year subscription for the year 2002):

Worldwide:	Online: \$90	Print: \$105	Print & online: \$130
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Powder Diffraction is a quarterly journal that focuses on materials characterization employing X-ray powder diffraction techniques and procedures. For more information, please call 1.516.576.2200. Web site: ojps.aip.org/pdj.

On-site Registration:

All on-site registrations will be conducted at the Conference Registration Desk, located in the North Prefunction area, outside the Heritage Ballroom of the Antlers Adam's Mark Hotel. See the hotel layout on page 39 of this program for the exact location.

AVOID LONG LINES!
SAVE MONEY!
PRE-REGISTER!

Registration Times:

Sunday, 28 July	4:00 p.m. – 7:00 p.m.
Monday, 29 July	8:00 a.m. – 3:00 p.m.
Tuesday, 30 July	8:00 a.m. – 3:00 p.m.
Wednesday, 31 July	8:00 a.m. – 2:00 p.m.
Thursday, 1 August	8:00 a.m. – 2:00 p.m.

Please Note: Attendees (even those pre-registered) should check in at the Conference Registration Desk for conference materials (name tags, *Book of Abstracts*, late announcements, etc.).

Cancellation Policy: Cancellations must be submitted in writing to the Conference Coordinator. A full refund will be issued, less a \$25 processing fee, if the cancellation is received at least two weeks before the conference (Monday, 15 July 2002). No refunds will be issued for cancellations received after 15 July 2002.

EXHIBITOR INFORMATION

Exhibits will be located in the Heritage Ballroom. A diagram of the exhibit locations will be available in the *Book of Abstracts* and on the DXC web page at <http://www.dxcicdd.com>.

Exhibit Hours:

Monday	10:00 a.m. to 5:00 p.m.
Tuesday	10:00 a.m. to 5:00 p.m.
Wednesday	10:00 a.m. to 5:00 p.m.
Thursday	10:00 a.m. to 2:00 p.m.

Exhibitors as of 1 May 2002

AMPTEK, Inc.	Oxford Cryosystems
Bede Scientific Incorporated	Philips Analytical
Blake Industries, Inc.	Photoelectron Corporation
Bruker AXS, Inc.	Premier Lab Supply
Corporation Scientifique Claisse	Rigaku/MSK, Inc.
EDAX, Inc.	Rocklabs Ltd
Gresham Scientific Instruments Ltd	Sietronics Ltd
Handley Analytical Services	Soft Imaging System Corp.
Herzog Automation Corporation	Spectro Analytical Instruments, Inc.
Inel, Inc.	SPEX CertiPrep, Inc.
Initiative Scientific Products Ltd	Thales Components Corporation
International Centre for Diffraction Data (ICDD)	Thermo ARL
Kratos Analytical, Inc.	Thermo NORAN
LND, Inc.	X-ray & Specialty Instruments, Inc.
Materials Data, Inc. (MDI)	X-ray Flux Corporation
MOXTEK, Inc.	X-ray Instrumentation Associates
Osmic, Inc.	X-ray Optical Systems, Inc.

All exhibitors are invited to attend the
Exhibitors' General Meeting
Wednesday, 31 July 2002, 6:00 – 6:30 p.m.
in the Fremont room

EVENING TECHNICAL SESSIONS AND SOCIAL FUNCTIONS

*Spouses are welcome to attend all social functions
Evening Mixers and Poster Sessions will be held in the **Summit Ballroom** unless otherwise noted*

Sun., 28 July	5:30 – 7:30	Welcoming Reception Sponsored by Bede Scientific, SPEX CertiPrep and Claisse Scientifique
Mon., 29 July	6:30 – 8:30	Philips Analytical Reception & XRD Poster Session I Sponsored by Philips Analytical
Tues., 30 July	6:30 – 8:30	MDI and Rigaku/MSC, Inc. Reception & XRD Poster Session II Sponsored by Materials Data, Inc. and Rigaku/MSC, Inc.
Wed., 31 July	6:30 – 8:30	Bruker AXS, Inc. Reception & XRF Poster Session Sponsored by Bruker AXS, Inc.

Spouses' Coffee Hour

All spouses are invited to attend a complimentary coffee hour, sponsored by the Denver X-ray Conference. Coffee, tea and pastries will be served in the **Hayden** room from 9:30 to 10:30 a.m. on Monday and Tuesday. Information on local attractions and activities of interest will be provided.

General Information

Poster Boards

The poster boards used during the evening poster sessions will be 4' x 8' boards. Authors must bring their own thumbtacks or velcro.

Employment Clearinghouse

We will have a separate bulletin board to announce employment opportunities. Prospective employers and employees should bring announcements with them for posting.

Book of Abstracts

The DXC *Book of Abstracts* will be available at the Conference Registration Desk.

Parking

A parking garage is available at the Antlers for conference parking. Please use the entrance on the north side at Pikes Peak Place or the entrance on the west side at Antlers Plaza. Parking vouchers are available for sale at the hotel desk at a cost of \$6.00 per day self park, and \$10.00 per day valet. The daily vouchers allow unlimited access to the parking garage on the voucher date.

Workshops

Monday, 29 July–Tuesday, 30 July

a.m. workshops: 9:00 a.m.–12:00 noon • p.m. workshops: 2:00 p.m.–5:00 p.m.

Workshops, Monday a.m.

XRD

W-1 Texture Analysis I (Learning Center)

Organized by: **H. Schaeben**, Freiberg University of Mining and Technology, Freiberg, GermanyInstructors: **H. Schaeben**, Freiberg University of Mining and Technology, Freiberg, Germany
R.J. De Angelis, University of Florida, Shalimar, FL
F. Heidelbach, Universität Bayreuth, Bayreuth, Germany
J. Funderberger, Université de Metz, Metz CEDEX, France

Identifying experimental pole intensity data with the result of scanning the spherical X-ray transform of an orientation density function, a unifying view of mathematical texture analysis is presented in terms of spherical tomography. Material science application based on common X-ray radiation and very recent geoscience applications based on synchrotron radiation because of its penetration depth and angular resolution will be used to explain the rationale of texture analysis.

W-2 Methods of Phase Identification (Carson)

Organized by: **R. Jenkins**, Emeritus, International Centre for Diffraction Data, Newtown Square, PAInstructors: **R. Jenkins**, Emeritus, International Centre for Diffraction Data, Newtown Square, PA
J. Faber, T. Fawcett, International Centre for Diffraction Data, Newtown Square, PA

This workshop is intended for those new to the field of phase identification by X-ray powder diffraction. The program is based on the use of many worked examples and utilizes each of the standard search/match methods currently supported by the ICDD.

XRF

W-3 Fundamentals of XRF (Summit I & II)

Organizers & Instructors: **J. Gilfrich**, Emeritus, SFA, Inc./NRL, Washington, DC
J. Croke, Emeritus, Philips Analytical, Inc., Natick, MA

This workshop is intended to explain briefly the basics of X-ray emission and how that information is applied in the practice of X-ray Fluorescence Analysis. While aimed at new workers in the field, the level of detail should have some interest for the more experienced analyst.

W-4 Analysis of Layered Materials by XRF (Fremont)

Organized by: **M.W. Dirken**, Philips Analytical, Almelo, The NetherlandsInstructors: **M.W. Dirken**, Philips Analytical, Almelo, The Netherlands
M. Mantler, Vienna University of Technology, Vienna, Austria
A. Wittkopp, NeXray L.L.C., Ronkonkoma, NY

This workshop provides an introduction to the analysis of layered materials and is intended for the X-ray spectroscopist who encounters this analysis for the first time. Therefore, the physics and various analysis models are presented. This is followed by contributions of ED-XRF and WD-XRF examples, focusing on practical issues including problems of finite thickness and line selection.

XRD

W-5 Texture Analysis II (Learning Center)

Organized by: **H. Schaeben**, Freiberg University of Mining and Technology, Freiberg, Germany

Instructors: **H. Schaeben**, Freiberg University of Mining and Technology, Freiberg, Germany
R.J. De Angelis, University of Florida, Shalimar, FL
F. Heidelbach, Universität Bayreuth, Bayreuth, Germany
J. Fundenberger, Université de Metz, Metz CEDEX, France

Continuation of W-1.

W-6 Advances in Database Technology (Carson)

Organized by: **J. Faber**, International Centre for Diffraction Data, Newtown Square, PA

Instructors: **J. Faber**, **S. Kabekkodu**, International Centre for Diffraction Data, Newtown Square, PA

The International Centre for Diffraction Data (ICDD) is responding to the changing needs in powder diffraction and materials analysis by developing completely new Powder Diffraction Files (PDF-4) in relational database (RDB) format. In this workshop, an overview of RDB technology will be presented, and how this technology helps to set the stage for total pattern analyses. The PDF-4/Full File 2002 contains 136,895 powder diffraction patterns, mainly from inorganic phases. The PDF-4/Organics 2002 will contain approximately 150,000 entries nearly all of which are organic phases. On-the-fly fully digitized patterns have been developed to facilitate direct comparisons between experiment and reference data in the PDF-4. A number of specific data mining exercises that demonstrate the power of a relational database format over the traditional (flat file) database structures will be presented. More importantly, it will be illustrated how these data mining techniques can be exploited in real problem-solving environments.

XRF

W-7 Specimen Preparation I (Summit I & II)

Organized by: **D. Broton**, Construction Technology Labs, Skokie, IL

Instructors: **D. Broton**, **S. Nettles**, Construction Technology Labs, Skokie, IL
J. Anzelmo, Bruker AXS, Inc., Madison, WI
V. Kocman, A.S.O. Design, Quebec, Canada

The sampling and specimen preparation workshop at the DXC continues to be a fundamental aspect of the Conference. This workshop covers the basics of sampling and specimen preparation for a wide variety of materials. Novel approaches to preparing specimens for analysis come from instructors with many years of experience applying those techniques to real-world industrial samples. Tricks-of-the-trade and useful tips for both novices and experienced X-ray analysts will be presented. The audience is encouraged to participate by providing input about their own experiences, sample types and solutions. Topics in 2002 will include sampling, pressed powders, borate fusions, and loose packed powders. Sample preparation methods for pitch and treated wood as well as using reference materials and pure compounds for standardization of XRF instruments will also be included.

Workshops, Monday p.m.

W-8 Polarized X-ray Optics (Summit III)

Organized by: **B. Chappell**, Macquarie University, Sydney, Australia

Instructors: **B. Chappell**, Macquarie University, Sydney, Australia
R.W. Ryon, Emeritus, Lawrence Livermore National Laboratories, Livermore, CA
J. Heckel, Spectro Analytical Instruments, Kleve, Germany
D. Wissmann, Spectro Analytical Instruments, Kleve, Germany
M. van Driessche, Texaco Technology, Ghent, Belgium

This workshop will discuss features of XRF analysis that are specific to the polarized technique. More specifically, it will look at the practical problems of preparing samples of liquids and powders for analysis by polarized XRF spectrometry. With an operating spectrometer, it will examine the procedures for the analysis of low levels of sulfur in gasoline and for high precision analysis of samples in fused glass beads. The use of the Compton method for matrix corrections will be discussed, and also the Turboquant method of semiquantitative analysis. This workshop also seeks contributions from other participants.

XRD & XRF

W-9 Optics (Carson)

Organized by: **G.J. Havrilla**, Los Alamos National Laboratory, Los Alamos, NM
Z. Al-Mosheky, Osmic, Inc., Troy, MI

Instructors: **S. Formica**, SUNY at Albany, Albany, NY
D.K. Bowen, Bede Scientific, Inc., Englewood, CO
L. Jiang, Osmic, Inc., Troy, MI
D. Gibson, Z. Chen, X-ray Optical Systems, Inc., Albany, NY

This workshop provides the basic knowledge about some selected X-ray optics including total reflection-based ellipsoidal optics, polycapillary optics, crystal optics and multilayer optics. One objective is to help users understand the basic working principles and performance characteristics of these optics. The other objective is to further help users understand the function of an optical system in an X-ray instrument.

XRD

W-10 Rietveld Applications I (Summit III)

Organized by: **J.A. Kaduk**, BP Chemicals, Naperville IL

Instructors: **J.A. Kaduk**, BP Chemicals, Naperville, IL, kadukJA@BP.com
R.W. Morton, D.E. Simon, Phillips Petroleum Company, Bartlesville, OK,
rwmorton@ppco.com, desimon@ppco.com
M.A. Rodriguez, Sandia National Laboratory, Albuquerque, NM,
marodri@sandia.gov

This workshop is an introduction to using the Rietveld method to solve practical problems, with emphasis on the approaches, thought processes, and potential pitfalls. The emphasis will be on concepts, not details of the programs (though GSAS, Fullprof, and RIQAS will be illustrated). Topics covered will include data collection, quantitative analysis, the accuracy and precision of structural and analytical quantities, and application of the method in high-throughput production applications. The main instruction will be through working examples in real time (not hands on), and discussing how the analyst decides "what to do next". The intention is to distribute a CD-ROM containing (some) programs and the raw data for the examples. **Attendees are invited to submit their own data (in advance!) to one of the instructors for possible discussion.**

XRF

W-11 Specimen Preparation II (Summit I & II)

Organized by: **D. Broton**, Construction Technology Labs, Skokie, IL

Instructors: **D. Broton, S. Nettles**, Construction Technology Labs, Skokie, IL
J. Anzelmo, Bruker AXS, Inc., Madison, WI
V. Kocman, A.S.O. Design, Quebec, Canada

Continuation of W-7.

Workshops, Tuesday a.m.

W-12 Mathematical Methods of Quantitative XRF (Fremont)

Organized by: **M. Mantler**, Vienna University of Technology, Vienna, Austria

Instructors: **M. Mantler**, Vienna University of Technology, Vienna, Austria
B. Vrebos, Philips Analytical, Almelo, The Netherlands
W.T. Elam, University of Washington, Seattle, WA

This workshop will cover:

1. Empirical and theoretical methods of quantitative XRF
2. Basic interactions and atomic (“fundamental”) parameters
3. Sources and accuracy of atomic parameters and tube spectra
4. Classical fundamental parameter methods
5. Computed (theoretical) influence coefficients
6. Software issues
7. Special cases and methods (Thin films, inhomogeneous specimens, light elements)

XRD

W-13 Rietveld Applications II (Summit III)

Organized by: **J.A. Kaduk**, BP Chemicals, Naperville IL

Instructors: **J.A. Kaduk**, BP Chemicals, Naperville, IL
R.W. Morton, D.E. Simon, Phillips Petroleum Company, Bartlesville, OK
M.A. Rodriguez, Sandia National Laboratory, Albuquerque, NM

Continuation of W-10.

W-14 Line Broadening (Carson)

Organized by: **J.D. Makinson**, RSI Materials Engineering, Omaha, NE

Instructors: **J.D. Makinson**, RSI Materials Engineering, Omaha, NE
R.J. De Angelis, University of Florida, Shalimar, FL

This workshop covers the theory and application of line broadening as well as some of the pitfalls and difficulties encountered. Techniques of line broadening measurements will be discussed along with the limitations of each method. Applications will include line broadening of two-phase steels with regard to processing, thermal history, carbon content, and service history.

XRF

W-15 Quantitative Analysis – Standardless Methods (Summit I & II)

Organized by: **J.A. Anzelmo**, Bruker AXS, Inc., Madison, WI

Instructors: **J.A. Anzelmo**, Bruker AXS, Inc., Madison, WI
K.-E. Mauser, Bruker AXS GmbH, Karlsruhe, Germany
D. Bonvin, Applied Research Laboratories, Ecublens, Switzerland

Two approaches have emerged as the methods for performing so-called Standardless Analysis. The two approaches are 1) scanning, and 2) counting directly on peaks and backgrounds. This workshop will discuss various aspects of the two approaches such as the theory, data collection, data manipulation, calibration, sample preparation, and practical examples.

W-16 TXRF (Learning Center)

Organized by: **M.A. Zaitz**, IBM – EF Microelectronics, Hopewell Junction, NY

Instructors: **M.A. Zaitz**, IBM – EF Microelectronics, Hopewell Junction, NY
P. Wobrauschek, Atominstitut der Österreichischen Universitäten, Vienna, Austria

This workshop will cover the basics of total reflection X-ray fluorescence, as well as instrumentation, calibration, and applications.

Sessions

Poster Sessions: Monday, 29 July–Wednesday, 31 July

Oral Sessions: Wednesday, 31 July–Friday, 2 August

XRD Poster Session I, Monday, 29 July

(Summit)

6:30 p.m.–8:30 p.m., authors present

*The XRD Poster Session I will be held in conjunction with the
Philips Analytical mixer.*Chairs: **I.C. Noyan**, IBM, Yorktown Heights, NY**D.F. Rendle**, The Forensic Science Service, Metropolitan Laboratory, London, UK*Session chairs will select the two best papers for awards.*Software & Theory

- D-113 MANAGING THE BACKGROUND PROFILE USING THE NEW X'CELERATOR DETECTOR
R.W. Morton, D.E. Simon, J.J. Gislason, Phillips Petroleum Company, Bartlesville, OK
- D-087 CALIBRATION OF DIFFRACTOMETERS II: INTERNAL CONSISTENCY AND THE BALANCE
G. Berti, U. Bartoli, M. D'Acunto, F. De Marco, University of Pisa, Pisa, Italy
- D-005 THEORY OF X-RAYS BACKSCATTERING BY WEAKLY AND STRONGLY BENT CRYSTALS
T. Tchen, Moscow State Academy of Fine Chemical Technology, Moscow, Russia
- D-015 SIMULATION OF X-RAY REFLECTIVITY FROM PERIODICAL SURFACE GRATINGS
A. Ulyanekov, Bruker AXS, Inc., Karlsruhe, Germany
I. Feranchuk, S. Feranchuk, Belorussian State University, Minsk, Belarus
- D-045 ANALYSIS OF THE FACTORS, INFLUENCING THE PRECISION OF SIMULATED X-RAY
DIFFRACTION (REFLECTION) CURVES
A. Ulyanekov, Bruker AXS, Inc., Karlsruhe, Germany
- D-031 MULTI-STEP REFINEMENT OF DIFFRACTION PATTERN WITH OVERLAPPING BRAGG
REFLECTIONS
B.N. Kodess, ICS & E, Denver, CO
I.P. Jouravlev, VNIIMS, Moscow, Russia
- D-059 MINIMIZATION OF MICROABSORPTION EFFECTS ON A COMPLEX SYSTEM
B.M. Pederson, R.S. Winburn, Minot State University, Minot, ND
- D-010 RENDERING OF CRYSTALLOGRAPHIC ORIENTATIONS, ORIENTATION AND POLE
PROBABILITY DENSITY FUNCTIONS
H. Schaeben, K.G. van den Boogaart, Freiberg University of Mining and Technology,
Freiberg/Saxony, Germany

Hardware/Instruments

- C-03 THE DEVELOPMENT OF THE PORTABLE XRF & XRD
S. Maeo, S. Nomura, K. Taniguchi, Osaka Electro-Communication University, Osaka, Japan
- C-04 PORTABLE SIMULTANEOUS XRF/XRD PROTOTYPE INSTRUMENT
S. Cornaby, A. Reyes-Mena, P.W. Moody, M. Moras, MOXTEK, Inc., Orem, UT
T. Hughes, Brigham Young University, Provo, UT
L.V. Knight, MOXTEK, Inc., Orem, UT and Brigham Young University, Provo, UT
- D-003 X-RAY FOCUSING OPTICS OF DOUBLE-CRYSTAL SYSTEMS
T. Tchen, Moscow State Academy of Fine Chemical Technology, Moscow, Russia
- D-004 DIFFRACTIONAL TRAP FOR THERMAL NEUTRONS
T. Tchen, Moscow State Academy of Fine Chemical Technology, Moscow, Russia
- D-006 SPECTROMETERS FOR HARD X-RAYS ON THE BASIS OF CURVED CRYSTALS
T. Tchen, Moscow State Academy of Fine Chemical Technology, Moscow, Russia
- D-009 THE PERFORMANCE OF YB₆₆ DOUBLE CRYSTAL MONOCHROMATOR FOR DISPERSING SYNCHROTRON RADIATION AT SPRING-8
M. Kitamura, H. Yoshikawa, V.A. Mihai, A. Nisawa, N. Yagi, M. Okui, M. Kimura, T. Tanaka, S. Fukushima, National Institute for Materials Science, Hyogo, Japan
T. Mochizuki, Japan Synchrotron Radiation Research Institute, Hyogo, Japan
- D-017 FRESNEL COMPOSITE ZONE PLATES FOR HARD X-RAY FOCUSING
V.V. Aristov, A.V. Kuyumchyan, A.A. Isoyan, E.V. Shulakov, M.V. Grigorev, IMT of the Russian Academy of Science, Moscow District, Russia
S. Kuznetsov, I. Snigireva, A. Snigirev, ESRF, Grenoble, France
K.G. Trouny, Yerevan State University, Yerevan, Armenia
- D-056 HIGH STABILITY MICROFOCUS X-RAY SOURCE FOR ANALYTICAL APPLICATION
M. Ito, T. Inazuru, M. Iguchi, Hamamatsu Photonics K.K., Shizuoka, Japan
- D-063 A SIMPLE GLANCING ANGLE ATTACHMENT FOR A POWDER DIFFRACTOMETER
J.A. Carsello, Northwestern University, Evanston, IL

Structure

- D-007 X-RAY INVESTIGATION OF THE SINTERED NIOBIUM POWDER STRUCTURAL INHOMOGENEITIES
L. Skatkov, PCB "Argo", Beer-Sheva, Israel
- D-021 THE EFFECTS OF SINTERING TIME AND ATMOSPHERE ON SURFACE FILM FORMATION IN THREE CERAMIC WASTE FORMS USING X-RAY DIFFRACTION
D.M. Missimer, A.R. Jurgensen, R.L. Rutherford, Westinghouse Savannah River Site, Aiken, SC
- D-027 STABILITY, STRUCTURE, AND IONIC CONDUCTION IN MODIFIED AURIVILLIUS CERAMICS
S. Speakman, S.T. Mixture, New York State College of Ceramics at Alfred University, Alfred, NY
- D-091 NEUTRON POWDER DIFFRACTION STUDIES OF HEXACELSIAN WITH AND WITHOUT MgO AND TiO₂ ADDITIONS
C.J. Rawn, B.C. Chakoumakos, Oak Ridge National Laboratory, Oak Ridge, TN
H.J. Holland, J.T. Kohli, Corning, Inc., Corning, NY
- D-019 CRYSTAL STRUCTURE OF OXYGEN/NITROGEN-DOPED GeSbTe PHASE-CHANGE MEDIA: INVESTIGATION USING GRAZING INCIDENCE X-RAY DIFFRACTION
A. Takase, G. Fujinawa, Rigaku Corporation, Tokyo, Japan
A. Ebina, Teijin Limited, Hiroshima, Japan

6:30 p.m.–8:30 p.m., authors present

The XRD Poster Session II will be held in conjunction with the MDI and Rigaku/MSK, Inc. mixer.

Chairs: **T.C. Huang**, Emeritus, IBM Almaden Research Center, San Jose, CA
R. Barton, Jr., Emeritus, DuPont Experimental Station, Wilmington, DE

Session chairs will select the two best papers for awards.

Quantitative Analysis

- D-060 MINERALOGY OF VOLCANIC ROCKS BY RIETVELD ANALYSIS
R.M. Gonzalez, T.D. Lorbiecke, T. Edwards, J.R. Webster, R.S. Winburn, Minot State University, Minot, ND
- D-058 HEAVY MINERAL ANALYSIS OF SANDSTONES BY RIETVELD ANALYSIS
J.R. Webster, R.P. Kight, R.S. Winburn, C.A. Cool, Minot State University, Minot, ND

Non-Ambient

- D-075 XRD STUDY OF THE DEHYDRATION REACTION OF THEOPHYLLINE MONOHYDRATE: EFFECT OF POLYVINYLPIRROLIDONE
C. Nunes, R. Suryanarayanan, University of Minnesota, Minneapolis, MN
A. Mahendrasingam, Keele University, Staffordshire, UK
- D-039 HIGH-TEMPERATURE X-RAY DIFFRACTION STUDY OF REACTION RATES IN CERAMICS
M.S. Peterson, II, C.A. Say, S.A. Speakman, S.T. Misture, New York State College of Ceramics at Alfred University, Alfred, NY
- D-030 STUDIES OF THE TRANSITION STATE FOR KDP-DKDP SOLID SOLUTION
B.N. Kodess, ICS & E, Denver, CO
A.I. Beskrovny, VNIIMS, Moscow, Russia
- D-044 HIGH TEMPERATURE X-RAY DIFFRACTION STUDIES USING A TWO-DIMENSIONAL DETECTOR
J. Brechbühl, H.-G. Krane, F. Stowasser, L. Brügemann, Bruker AXS GmbH, Karlsruhe, Germany
- D-081 IN SITU, IN AIR, HIGH-TEMPERATURE STUDIES OF OXIDE SYSTEMS USING THE THERMAL-IMAGING TECHNIQUE
L. Siah, W.M. Kriven, University of Illinois at Urbana-Champaign, Urbana, IL

Stress/Strain

- D-029 NANOSTRUCTURE ANALYSIS USING 2D SMALL ANGLE X-RAY SCATTERING OPTIMIZED FOR Fe-BASED ALLOYS
K. Erlacher, R. Görgl, Material Center Leoben GmbH, Austria and Austrian Academy of Sciences and University of Leoben, Austria
H. Jakob, Bruker AXS GmbH, Germany
P. Fratzl, Austrian Academy of Sciences and University of Leoben, Austria
- D-034 MEASUREMENT OF STRESS IN SURFACE ACOUSTIC WAVE FILTERS USING BRAGG ANGLE CONTOUR MAPPING
P.M. Adams, The Aerospace Corporation, Los Angeles, CA

- D-047 AN EXPERIMENTAL STUDY ON X-RAY RESIDUAL STRESSES INDUCED BY SHOT PEENING PROCESS OF AUSTENITE STAINLESS STEEL
S. Takahashi, T. Murotani, Y. Hirose, Kanazawa University, Kanazawa, Japan
K. Hiratsuka, Polytechnic University, Sagamihara, Japan
- D-050 PLASTIC STRAIN OF ROLLED DUPLEX α/γ STAINLESS
H. Hirose, Kinjo University, Ishikawa, Japan
S. Takago, Industrial Research Institute of Ishikawa, Ishikawa, Japan
M. Tone, T. Sasaki, Kanazawa University, Kanazawa, Japan
M. Saka, Tohoku University, Miyagi, Japan
- D-051 DEVELOPMENT OF MEASURING SYSTEM FOR STRESS BY MEANS OF IMAGE PLATE FOR SYNCHROTRON RADIATION EXPERIMENT AT PHOTON FACTORY (KEK)
T. Sasaki, Y. Hirose, Kanazawa University, Kanazawa, Japan
K. Hiratsuka, Polytechnic University, Sagamihara, Japan
Y. Yoshioka, Musashi Institute of Technology
- D-052 DEVELOPMENT OF MEASURING SYSTEM FOR STRESS BY MEANS OF NEUTRON IMAGE PLATE AT JAPAN ATOMIC ENERGY RESEARCH INSTITUTE (JAERI)
T. Sasaki, Y. Hirose, Kanazawa University, Kanazawa, Japan
K. Hiratsuka, Polytechnic University, Sagamihara, Japan
N. Minakawa, Y. Morii, N. Niimura, Japan Atomic Energy Research Institute
- D-053 DEVELOPMENT OF MEASURING SYSTEM FOR STRESS BY MEANS OF IMAGE PLATE FOR LABORATORY X-RAY EQUIPMENT
K. Hiratsuka, Polytechnic University, Sagamihara, Japan
T. Sasaki, K. Seki, Y. Hirose, Kanazawa University, Kanazawa, Japan
- D-054 THERMAL FATIGUE PROPERTIES OF LASER PEENED HOT WORK DIE STEEL (H13)
K. Yatsushiro, M. Sano, Yamanashi Industrial Technology Center, Yamanashi, Japan
M. Kuramoto, Polytechnic University, Kanagawa, Japan
- D-118 MICROSTRUCTURE ANALYSIS OF STRAIN-FREE Y_2O_3 NANOPOWDERS FROM PATTERN DECOMPOSITION AND WHOLE PATTERN FITTING APPROACHES
D. Louër, T. Bataille, T. Roisnel, Université de Rennes I, Rennes Cedex, France

Thin Films

- D-084 USING X-RAY MAPPING TECHNIQUES TO CORRELATE SUBSTRATE AND FILM PROPERTIES WITH DEVICE PERFORMANCE
K.W. Kirchner, K.A. Jones, Army Research Lab, Adelphi, MD
- D-002 BACKSCATTERING OF X-RADIATION BY CURVED BICRYSTALS AND CRYSTALS WITH THIN EPITAXIAL FILMS
T. Tchen, Moscow State Academy of Fine Chemical Technology, Moscow, Russia

- D-046 EFFECT OF THE RESIDUAL STRESS ON THE MECHANICAL STRENGTH OF THE THIN FILMS
M. Gotoh, T. Sasaki, Y. Hirose, Kanazawa University, Ishikawa, Japan
S. Takago, Industrial Research Institute of Ishikawa, Ishikawa, Japan
- D-048 PREPARATION OF INTERMETALLIC COMPOUNDS COATING BY Ni-AI MIXED POWDER SPLAYING AND LATER HEAT TREATMENT
T. Murotani, T. Taguchi, Y. Hirose, Kanazawa University, Kanazawa, Japan
A. Ikenaga, Osaka Prefecture University, Sakai, Japan
- D-049 EFFECT OF PULSE TIMING ON RESIDUAL STRESS OF CRACK FREE CHROMIUM LAYER DEPOSITED BY PULSE PLATING
Y. Kobayashi, J. Nagasawa, Tokico Ltd., Kawasaki, Japan
K. Watanabe, Atotech Japan K.K., Yokohama, Japan
T. Sasaki, Y. Hirose, Kanazawa University, Kanazawa, Japan
- D-089 A COMPARISON OF ANALYTICAL TECHNIQUES FOR HYDROGEN CONTENTS IN DLC FILMS FORMED BY PBII METHOD
H. Yasui, Y. Hirose, T. Sasaki, Kanazawa University, Kanazawa, Japan
K. Awazu, Industrial Research Institute of Ishikaway, Kanazawa, Japan
H. Naramoto, Japan Atomic Energy Research Institute, Takasaki, Japan

6:30 p.m.–8:30 p.m., authors present

The XRF Poster Session will be held in conjunction with the Bruker AXS, Inc. mixer.

Chairs: **M.A. Zaitz**, IBM–EF Microelectronics, Hopewell Junction, NY
K. Taniguchi, Osaka Electro-Communication University, Osaka, Japan

Session chairs will select the three best papers for awards.

EDXRF

- F-25 IDENTIFICATION OF FORGED WORKS OF ART BY PORTABLE EDXRF SPECTROMETRY
J.L. Ferrero, C. Roldán, D. Juanes, J. Carballo, J. Pereira, J.L. Lluch, Universitat de València (ICMUV), València, Spain
M.E. Pernet, M. Crespo, Museo Nacional de Bellas Artes, Habana, Cuba
- F-18 EDXRF AS AN IMPORTANT TOOL IN THE SELECTIVE LEACHING OF URANIUM AND THORIUM FROM CONTAMINATED ZIRCON
M. Yusoff, Malaysian Institute for Nuclear Technology Research, Selangor, Malaysia

TXRF

- F-17 NEW IN-LINE WAFER ANALYZER, VPD INTEGRATED TXRF
M. Yamagami, A. Ikeshita, Y. Onizuka, T. Yamada, Rigaku Corporation, Osaka, Japan
- F-39 SYNCHROTRON RADIATION INDUCED TXRF OF LOW Z ELEMENTS: ANALYSIS OF Si WAFER SURFACES AT THE PTB UNDULATOR PGM BEAMLINE AT BESSYII
C. Strel, G. Pepponi, P. Wobrauschek, Atominstitut der Österreichischen Universitäten, Wien, Austria
B. Beckhoff, G. Ulm, Physikalisch-Technische Bundesanstalt, Berlin, Germany
S. Pahlke, L. Fabry, Th. Ehmman, Wacker Siltronic, Burghausen, Germany
B. Kanngießner, W. Malzer, Technische Universitäten Berlin, Berlin, Germany
- F-44 NEXAFS SPECTROSCOPY OF ORGANIC CONTAMINATION ON Si WAFERS BY TXRF
G. Pepponi, C. Strel, P. Wobrauschek, Atominstitut der Österreichischen Universitäten, Wien, Austria
B. Beckhoff, G. Ulm, Physikalisch-Technische Bundesanstalt, Berlin, Germany
T. Ehmman, S. Pahlke, L. Fabry, Wacker Siltronic, Burghausen, Germany
- F-45 COMPARISON OF SR-TXRF EXCITATION-DETECTION GEOMETRIES FOR SAMPLES WITH DIFFERING MATRICES
G. Pepponi, C. Strel, P. Wobrauschek, S. Zamini, N. Zöger, Atominstitut der Österreichischen Universitäten, Wien, Austria
G. Falkenberg, HASYLAB at DESY, Hamburg, Germany
- F-16 NEW MULTILAYER MONOCHROMATOR FOR HEAVY ELEMENTS ANALYSIS IN TXRF
T. Yamada, M. Doi, Rigaku Corporation, Osaka, Japan
Y. Platonov, Osmic, Inc., Auburn Hills, MI

- F-40 SYNCHROTRON RADIATION INDUCED TOTAL REFLECTION X-RAY SPECTROMETRY OF LOW Z ELEMENTS ON Si WAFER SURFACES AT SSRL, BEAMLIN 3-3: COMPARISON OF DROPLETS WITH SPIN COATED WAFERS
C. Strel, **G. Pepponi**, **P. Wobrauschek**, **N. Zoeger**, Atominstitut der Österreichischen Universitäten, Wien, Austria
P. Pianetta, **K. Baur**, Stanford Synchrotron Radiation Laboratory (SSRL), Stanford, CA
S. Pahlke, **L. Fabry**, **C. Mantler**, Wacker Siltronic, Burghausen, Germany
B. Kanngieß, **W. Malzer**, Technische Universitäten Berlin, Berlin, Germany
- F-38 Si DRIFT DETECTOR VERSUS Si(Li) DETECTOR FOR TXRF APPLICATIONS
P. Wobrauschek, **F. Osmic**, **C. Strel**, Atominstitut der Österreichischen Universitäten, Wien, Austria

Miscellaneous

- F-11 FUNDAMENTAL PARAMETER METHOD FOR LOW ENERGY REGION
N. Kawahara, **T. Yamada**, Rigaku Corporation, Osaka, Japan
B. Beckhoff, **G. Ulm**, Physikalisch-Technische Bundesanstalt, Berlin, Germany
R. Herbst, **M. Mantler**, Technische Universität Wien, Wien, Austria
- F-14 THE ANALYSIS OF GLASS FRIT BY WAVELENGTH-DISPERSIVE X-RAY SPECTROMETRY
A.R. Jurgensen, **D.M. Missimer**, **R.L. Rutherford**, Westinghouse Savannah River Site, Aiken, SC
- F-04 BACKGROUND REDUCTION IN PROPORTIONAL COUNTER
H. Sipilä, Metorex International, Espoo, Finland
- F-52 STUDY ON CAPILLARY DISCHARGE SOFT X-RAY LASER IN Ne-LIKE Ar
Q. Wang, **Y. Cheng**, **Y. Zhao**, Harbin Institute of Technology, Harbin, China
- F-02 STUDIES OF SPECTROMETER WITH X-RAY POLYCAPILLARY LENS
A.P. Morovov, **M.G. Vasin**, **A.E. Lakhtikov**, **V.V. Nazarov**, Russian Federal Nuclear Center, Sarov, Russia
- F-32 TECHNIQUES FOR SAMPLE PREPARATION OF FERRO-ALLOY AND SULFIDES FOR XRF ANALYSIS WITH FUSED BEADS ON AN AUTOMATIC GAS FUSION MACHINE
M. Davidts, I.C.P.H. Chemical International, Philadelphia, PA
- F-24 EXPERIMENTAL EVIDENCE FOR SECONDARY EXCITATION IN X-RAY PHOTOELECTRON SPECTROMETRY
M.F. Ebel, **R. Svagera**, **R. Ashury**, **H. Ebel**, Vienna University of Technology, Vienna, Austria
- F-03 SELECTIVE SORBENTS FOR XRF BASED ON CROWN-ETHERS
L.I. Trakhtenberg, **G.N. Gerasimov**, **V.F. Gromov**, State Scientific Center, Moscow, Russia
A.P. Morovov, **M.G. Vasin**, **A.E. Lakhtikov**, **Yu.V. Ignatiev**, **V.V. Nazarov**, **V.N. Funin**, Russian Federal Nuclear Center, Sarov, Russia

**Plenary Session
Wednesday, 31 July
(Summit III)**

APPLICATIONS OF X-RAY ANALYSIS TO FORENSIC MATERIALS

8:30 a.m.–12:30 p.m.

Organized by: **D.F. Rendle**, The Forensic Science Service, Metropolitan Laboratory, London, UK
R. Jenkins, Emeritus, International Centre for Diffraction Data, Newtown Square, PA

8:30 Welcoming Remarks

T. Fawcett, Executive Director, International Centre for Diffraction Data, Newtown Square, PA

V. Buhrke, Chairman, Denver X-ray Conference, Consultant, Portola Valley, CA

Presentation of Awards

◆ 2002 Birks Award to **Michael Mantler**, Vienna University of Technology, Vienna, Austria
presented by: Y. Gohshi, National Institute for Environmental Studies, Tsukuba, Japan

◆ Announcement of the 2002 Jerome B. Cohen Student Award
presented by: I. Cev Noyan, IBM, Yorktown Heights, NY

◆ Announcement of the 2002 McMurdie Award
presented by: R.L. Snyder, The Ohio State University, Columbus, OH

Plenary Session Remarks

D.F. Rendle, The Forensic Science Service, Metropolitan Laboratory, London, UK
R. Jenkins, Emeritus, International Centre for Diffraction Data, Newtown Square, PA

The following are the invited papers to be presented during the plenary session:

- 9:00 P-5 X-RAY ANALYSIS IN THE U.S. CUSTOMS LABORATORIES
M.H. Liberman, US Customs Laboratory, San Francisco, CA
- 9:30 P-6 UNDERKARAT JEWELRY: THE PERFECT CRIME? INVESTIGATIONS AND ANALYSIS OF JEWELRY USING XRF
D. Kloos, Industry Consultant, Westminster, CA
- 10:00 P-1 X-RAY DIFFRACTION ANALYSIS IN THE FORENSIC SCIENCE LABORATORY OF STUTTGART, GERMANY—THE LAST RESORT IN MANY CRIMINAL CASES
W. Kugler, Forensic Science Laboratory, Landeskriminalamt Baden-Wuerttemberg, Stuttgart, Germany
- 10:30 Break
- 11:00 P-2 PORTABLE XRF FOR FORENSIC INVESTIGATIONS
D.C. Ward, Federal Bureau of Investigation, Microanalysis Laboratory, Washington, DC
- 11:30 P-3 USE OF X-RAYS IN THE UNITED KINGDOM FORENSIC SCIENCE SERVICE
D.F. Rendle, The Forensic Science Service, Metropolitan Laboratory, London, UK
- 12:00 P-4 XRD AT THE FBI: THE THREE C'S OF FORENSIC SCIENCE
M.C. Bottrell, Federal Bureau of Investigation, Geologist/Forensic Examiner, Washington, DC

Session C-1 NEW DEVELOPMENTS IN XRD & XRF INSTRUMENTATION (Commercial)

Organized by: V.E. Buhrke, Consultant, Portola Valley, CA

- 1:40 F-19 THE ATTEMPT OF ULTRA SENSITIVE X-RAY FLUORESCENCE SPECTROMETRY USING THE MULTI EXCITATION X-RAY TUBE
K. Taniguchi, S. Maeo, C. Uno, H. Nagai, Osaka Electro-Communication University, Osaka, Japan
- 2:00 D-094 DEVELOPMENT OF A TUNABLE, MONO-ENERGETIC X-RAY SOURCE USING LASER—COMPTON SCATTERING (LCS) FROM A 20 MeV ELECTRON BEAM
K. Choufanni, D. Wells, F. Harmon, Idaho State University, Pocatello, ID
J.L. Jones, G. Lancaster, Idaho National Engineering & Environmental Laboratory, Idaho Falls, ID
- 2:20 F-27 APPLICATIONS OF MINIATURE X-RAY TUBES FOR PORTABLE X-RAY FLUORESCENCE ANALYSIS
D. Clark Turner, A. Reyes-Mena, C. Jensen, MOXTEK, Inc., Orem, UT
- 2:40 D-025 VORTEX—A HIGH PERFORMANCE SILICON DRIFT DETECTOR FOR X-RAY DIFFRACTION
S. Barkan, J.S. Iwanczyk, B.E. Patt, L. Feng, C.R. Tull, G. Vilkelis, Photon Imaging, Inc., Northridge, CA
- 3:00 Break
- 3:20 D-088 A NOVEL DIGITAL X-RAY TOPOGRAPHY SYSTEM
D.K. Bowen, M. Wormington, P. Feichtinger, C.H. Russell, S. Bates, Bede Scientific Incorporated, Englewood, CO
- 3:40 D-033 A HIGH-TEMPERATURE POWDER DIFFRACTION FURNACE
M.D. Dolan, S.I. Zdieszynski, S.T. Misture, New York State College of Ceramics at Alfred University, Alfred, NY
- 4:00 F-06 ANALYTICAL PERFORMANCE OF A NEW GENERATION OF HANDHELD EDXRF SPECTROMETERS
V. Thomsen, D. Schatzlein, Niton Corporation, Billerica, MA
- 4:20 F-31 OPTIMIZATION STRATEGIES FOR BENCHTOP EDXRF SYSTEMS
A.T. Ellis, Oxford Instruments Analytical Ltd., High Wycombe, UK
- 4:40 F-47 USE OF COMPACT, OPTIMIZED WD-XRF INSTRUMENT IN SPECIFIC APPLICATION AREAS
D. Bonvin, R. Yellepeddi, K. Juchli, Thermo ARL, Ecublens, Switzerland
- 5:00 F-50 S2 RANGER: THE TOTAL SOLUTION FOR EDXRF ANALYSIS
J. Anzelmo, B. Burton, A. Seyfarth, L. Arias, Bruker AXS, Inc., Madison, WI

SESSION C-2 SYNCHROTRON APPLICATIONS I

Organized by: **C. Lavoie**, IBM, Yorktown Heights, NY
 Co-chair: **K. Ludwig**, Boston University, Boston, MA

- 2:00 C-06 REAL-TIME SYNCHROTRON STUDIES OF PHASE TRANSITIONS — Invited
K.F. Ludwig, **A.S. Özcan**, **X. Wang**, Boston University, Boston, MA
X. Flament, **R. Caudron**, ONERA, Chatillon, France
C. Lavoie, **C. Cabral, Jr.**, **J.M.E. Harper**, IBM Research Division, Yorktown Heights, NY
- 2:30 D-090 COMBINED SMALL AND WIDE ANGLE SCATTERING MEASUREMENTS
 USING HIGH-ENERGY X-RAYS
J.D. Almer, **U. Lienert**, **D.R. Haeffner**, **P. Thiyagarajan**, Argonne National
 Laboratory, Argonne, IL
J. Ilavsky, University of Maryland at College Park, College Park, MD and National
 Institute of Standards & Technology, Gaithersburg, MD
- 2:50 D-042 THREE DIMENSIONALLY RESOLVED STUDIES OF PLASTIC DEFORMATION
 IN METALS
L. Margulies, Risø National Laboratory, Roskilde, Denmark and ESRF, Grenoble
 Cedex, France
H.F. Poulsen, **G. Winter**, **S. Schmidt**, Risø National Laboratory, Roskilde, Denmark
- 3:10 Break
- 3:30 C-07 THE THREE-DIMENSIONAL MAPPING OF FATIGUE CRACK POSITION VIA
 A NOVEL X-RAY PHASE CONTRAST APPROACH
K. Ignatiev, Georgia Institute of Technology, Atlanta, GA
W.-K. Lee, **K. Fezzaa**, Argonne National Laboratory, Argonne, IL
G.R. Davis, **J.C. Elliott**, Queen Mary and Westfield College, London, UK
S.R. Stock, Northwestern University, Chicago, IL
- 3:50 D-035 SYNCHROTRON IN HIGH-RESOLUTION PHASE DETERMINATION
S.L. Morelhão, Universidade de São Paulo, São Paulo, Brazil
S. Kycia, Laboratório Nacional de Luz Síncrotron/LNLS, Campinas, Brazil
- 4:10 D-022 INVESTIGATION OF LOCAL TEXTURES IN EXTRUDED MAGNESIUM BY
 SYNCHROTRON RADIATION
H.-G. Brokmeier, **A. Günther**, **S. Yi**, **W. Ye**, Technical University Clausthal &
 GKSS-Research Center, Geesthacht, Germany
T. Lippmann, **U. Garbe**, HASYLAB at DESY, Hamburg, Germany
- 4:30 D-071 METHODOLOGY OF SYNCHROTRON EDXRD STRAIN PROFILING
I. Zakharchenko, **Y. Gulak**, **M. Croft**, **T. Tsakalakos**, Rutgers University, Piscataway, NJ
Z. Zhong, NSLS, Brookhaven National Laboratory, Upton, NY

SESSION D-1 RIETVELD APPLICATIONS I

Organized by: **J.A. Kaduk**, BP Amoco, Naperville, IL

- 1:30 D-016 STRUCTURE DETERMINATION FROM POWDER DIFFRACTION DATA: RELATIONS BETWEEN STRUCTURES AND PHYSICAL PROPERTIES — Invited
Q. Huang, National Institute of Standards & Technology, Gaithersburg, MD and University of Maryland, College Park, MD
- 2:00 D-067 X-RAY AND NEUTRON RIETVELD REFINEMENTS OF BaR_2CuO_5 AND $\text{Ba}_5\text{R}_8\text{Zn}_4\text{O}_{21}$ (R=LANTHANIDES)
W. Wong-Ng, B. Toby, J. Dillingham, W. Greenwood, National Institute of Standards & Technology, Gaithersburg, MD
J. Kaduk, BP-Amoco Research Center, Naperville, IL
- 2:20 D-028 RIETVELD REFINEMENTS OF U-NB ALLOYS
E.J. Peterson, W.L. Hults, D.F. Teter, D.W. Brown, J.C. Cooley, A.M. Kelly, L.B. Daulesberg, D.J. Thoma, Los Alamos National Laboratory, Los Alamos, NM
- 2:40 D-066 CRYSTAL STRUCTURE DETERMINATION FROM X-RAY POWDER DIFFRACTION DATA
P.Y. Zavalij, State University of New York at Binghamton, Binghamton, NY
- 3:00 D-080 IN SITU HIGH-TEMPERATURE PHASE TRANSFORMATION IN DyNbO_4 USING THE THERMAL-IMAGE TECHNIQUE
L. Siah, W.M. Kriven, University of Illinois at Urbana-Champaign, Urbana, IL
- 3:20 Break
- 3:40 D-018 STRAIN, CRYSTALLITE SIZE AND PHASE COMPOSITION IN NANOCRYSTALLINE SOLIDS — Invited
X. Bokhimi, The National University of Mexico (UNAM), México D.F., Mexico
- 4:10 D-023 ANISOTROPIC STRAIN-LIKE LINE BROADENING DUE TO INHOMOGENEITIES
A. Leineweber, E.J. Mittemeijer, Max Planck Institute for Metals Research, Stuttgart, Germany
- 4:30 D-061 RIETVELD QUANTITATIVE X-RAY DIFFRACTION ON COMPLEX MIXTURES—WHAT CAN WE DO? — Invited
R.S. Winburn, Minot State University, Minot, ND
- 5:00 D-020 QUANTITATIVE PHASE ANALYSIS OF HVOF WC COATINGS USING RIETVELD MODELLING OF X-RAY DIFFRACTION PATTERNS
J. Savarimuthu, D.E. Simon, University of Tulsa, Tulsa, OK

SESSION D-2 THIN FILMS

Organized by: T.C. Huang, Emeritus, IBM Almaden Research Center, San Jose, CA

- 1:50 D-092 IN-PLANE XRD STUDY OF EPITAXIALLY-GROWN ORGANIC THIN FILMS FOR ELECTROLUMINESCENT DEVICE APPLICATIONS — Invited
K. Inaba, K. Omote, J. Harada, Rigaku Corporation, Tokyo, Japan
M. O'fuji, H. Hoshi, Y. Takamishi, K. Ishikawa, H. Takezoe, Tokyo Institute of Technology, Tokyo, Japan
- 2:20 D-064 THERMAL STABILITY OF STRAINED Si ON RELAXED SiGe: HIGH-RESOLUTION XRD STUDIES
P.M. Mooney, J.L. Jordan-Sweet, S.J. Koester, J.A. Ott, J.O. Chu, K.K. Chan, IBM Research Division, T.J. Watson Research Center, Yorktown Heights, NY
- 2:40 D-072 TIME-RESOLVED X-RAY DIFFRACTION OF THE KINETICS OF TEXTURE FORMATION IN THE C49-C54 TiSi₂ PHASE TRANSFORMATION
A.S. Özcan, K.F. Ludwig, Jr., Boston University, Boston, MA
C. Lavoie, C. Cabral, Jr., J.M.E. Harper, IBM, T.J. Watson Research Center, Yorktown Heights, NY
- 3:00 D-102 ANALYSIS OF THE SURFACE MORPHOLOGY OF CVD-GROWN DIAMOND FILMS WITH X-RAY DIFFRACTION
M.J. Fransen, J. te Nijenhuis, J.H.A. Vasterink, Philips Analytical, Almelo, The Netherlands
- 3:20 Break
- 3:40 D-024 DETECTION OF VERY SMALL PREFERRED ORIENTATION IN THIN FILM LAYERS BY ROCKING-CURVE MEASUREMENT
H. Toraya, H. Hibino, T. Ida, Nagoya Institute of Technology, Tajimi, Japan
- 4:00 D-040 A NEW SMALL ANGLE X-RAY SCATTERING TECHNIQUE FOR DETERMINING NANO-SCALE PORE/PARTICLE SIZE DISTRIBUTIONS IN THIN FILMS
Y. Ito, K. Omote, J. Harada, Rigaku Corporation, Tokyo, Japan
- 4:20 D-013 VACANCY-INDUCED CHANGES IN SURFACE MORPHOLOGY DURING Ag HOMOEPITAXY
C.E. Botez, W.C. Elliott, P.F. Miceli, University of Missouri-Columbia, Columbia, MO
P.W. Stephens, State University of New York at Stony Brook, Stony Brook, NY
- 4:40 D-068 HIGH-TEMPERATURE X-RAY STUDY OF PHASE EVOLUTION OF Ba₂YCu₃O_{6+x} FILMS USING THE BaF₂ PROCESS
W. Wong-Ng, M. Vaudin, I. Levin, L.P. Cook, J.P. Cline, National Institute of Standards & Technology, Gaithersburg, MD
R. Feenstra, Oak Ridge National Laboratory, Oak Ridge, TN

SESSION C-3 SYNCHROTRON APPLICATIONS II

Organized by: **C. Lavoie**, IBM, Yorktown Heights, NY
 Co-chair: **K. Ludwig**, Boston University, Boston, MA

- 9:00 C-08 IN SITU SYNCHROTRON STUDIES OF CHEMICAL VAPOR DEPOSITION —
 Invited
G.B. Stephenson, D.D. Fong, S.K. Streiffer, J.A. Eastman, O. Auciello, P.F. Fuoss, G.-R. Bai, L. Thompson, Argonne National Laboratory, Argonne, IL
M.E.M. Aanerud, C. Thompson, Northern Illinois University, Dekalb, IL
- 9:30 F-10 TRACE-LEVEL SPECIATION AND MICROANALYSIS BY MEANS OF
 MONOCHROMATIC AND “PINK” BENDING MAGNET RADIATION
 FOCUSSED WITH POLYCAPILLARY OPTICS
K. Proost, K. Janssens, L. Vincze, University of Antwerp, Antwerp, Belgium
G. Falkenberg, HASYLAB at DESY, Hamburg, Germany
- 9:50 F-12 X-RAY ABSORPTION FINE STRUCTURE (XAFS) IMAGING WITH A
 NONSCANNING X-RAY FLUORESCENCE MICROSCOPE
K. Sakurai, M. Mizusawa, National Institute for Materials Science, Ibaraki, Japan
- 10:10 Break
- 10:30 F-13 SYNCHROTRON X-RAY FLUORESCENCE WITH A COMPACT JOHANSSON
 SPECTROMETER (R=100mm)
K. Sakurai, S. Kuwajima, M. Mizusawa, National Institute for Materials Science,
 Ibaraki, Japan
- 10:50 D-076 HIGH-RESOLUTION SYNCHROTRON ABSORPTION MICROTOMOGRAPHY
 AND MICROBEAM DIFFRACTION STUDY OF THE MINERAL PHASE
 MICROSTRUCTURE IN SEA URCHIN TEETH
S.R. Stock, Northwestern University, Chicago, IL
K. Ignatiev, Georgia Institute of Technology, Atlanta, GA
T. Dahl, J. Barss, A. Veis, Northwestern University Medical School, Chicago, IL
J. Almer, F. DeCarlo, Argonne National Laboratory, Argonne, IL
- 11:10 F-46 ALTERED PB/CA CONCENTRATIONS IN DIFFERENT BONE AREAS
 INVESTIGATED BY SR-XRF
P. Wobrauschek, N. Zöger, G. Pepponi, C. Strelti, S. Zamini, Atominstitut der
 Österreichischen Universitäten, Wien, Austria
G. Falkenberg, HASYLAB at DESY, Hamburg, Germany
W. Osterode, Universitätsklinik für Innere Medizin IV, Wien, Austria

Session D-3 Rietveld Applications II
Organized by: **J.A. Kaduk**, BP Amoco, Naperville, IL

- 9:00 CRYSTAL STRUCTURES OF ORGANIC/PHARMACEUTICAL COMPOUNDS —
Invited
P.W. Stephens, SUNY Stony Brook, Stony Brook, NY
- 9:30 D-078 MONOPOTASSIUM DIHYDROGEN CITRATES
J.A. Kaduk, BP Chemicals, Naperville, IL
- 9:50 D-038 INDEXING OF POWDER DIFFRACTION PATTERNS BY ITERATIVE USE OF
SINGULAR VALUE DECOMPOSITION
A.A. Coelho, **A. Kern**, Bruker AXS GmbH, Karlsruhe, Germany
- 10:10 Break
- 10:30 D-026 X-CELL—A NOVEL INDEXING ALGORITHM FOR ROUTINE AND PROBLEM
CASES
M.A. Neumann, Accelrys Ltd., Cambridge, UK
- 10:50 D-083 RIETVELD REFINEMENT OF 2-THETA SPLIT RANGES—A METHOD FOR
REDUCING ANALYSIS TIME
K. Laursen, **T. White**, Nanyang Technological University, Singapore
- 11:10 D-037 CONVOLUTION BASED PROFILE FITTING
A. Kern, **A.A. Coelho**, Bruker AXS GmbH, Karlsruhe, Germany
R.W. Cheary, University of Technology Sydney, Sydney, Australia
- 11:30 D-100 BAYESIAN/MAXIMUM ENTROPY ANALYSIS OF BIMODAL SIZE-DISTRIBUTIONS
FROM NANOPARTICLE-BROADENED LINE PROFILES
N. Armstrong, **W. Kalceff**, University of Technology, Sydney, Australia
J.P. Cline, National Institute of Standards & Technology, Gaithersburg, MD
- 11:50 D-001 STRUCTURE DETERMINATION OF NANOCRYSTALLINE MATERIALS BY THE
ATOMIC PAIR DISTRIBUTION FUNCTION TECHNIQUE
V. Petkov, Michigan State University, East Lansing, MI

SESSION D-4 INDUSTRIAL APPLICATIONS OF XRD I

Organized by: **R.L. Snyder**, The Ohio State University, Columbus, OH
C.R. Hubbard, Oak Ridge National Laboratories, Oak Ridge, TN

- 8:30 D-070 APPLICATION OF SYNCHROTRON EDXRD STRAIN PROFILING IN SHOT PEENED MATERIALS
M. Croft, I. Zakharchenko, Y. Gulak, T. Tsakalakos, Rutgers University, Piscataway, NJ
Z. Zhong, NSLS, Brookhaven National Laboratory, Upton, NY
- 8:50 D-112 ZINC/IRON PHASE TRANSFORMATION STUDIES ON GALVANNEALED STEEL SHEET COATINGS BY X-RAY DIFFRACTION
S. Wienströer, M. Genenger, C. Nazikkol, H. Mittelstädt, ThyssenKrupp Stahl AG, Duisburg, Germany
M.J. Fransen, Philips Analytical, Almelo, The Netherlands
- 9:10 D-101 REEL-TO-REEL TEXTURE ANALYSIS OF HTS COATED CONDUCTORS USING A MODIFIED GADDS SYSTEM
J.L. Reeves, V. Selvamanickam, IGC SuperPower, Schenectady, NY
R.L. Snyder, The Ohio State University, Columbus, OH
- 9:30 D-055 USING LATTICE PARAMETERS AND LINE BROADENING TO MONITOR NEAR-SURFACE STRAIN IN DESIGNING SINTERED CERAMIC MATERIALS—A FORMIDABLE CHALLENGE
S. Pratapa, B. O'Connor, Curtin University of Technology, Perth, Australia
- 9:50 D-032 CRYSTAL STRUCTURE DETERMINATIONS OF THE THREE-LAYER AURIVILLIUS CERAMICS USING A NEW HIGH-RESOLUTION X-RAY POWDER DIFFRACTOMETER
M. Haluska, S. Speakman, S.T. Misture, New York State College of Ceramics at Alfred University, Alfred, NY
- 10:10 Break
- 10:30 D-115 APPLICATIONS OF X-RAY DIFFRACTION IN THE DIESEL ENGINE INDUSTRY — Invited
R. England, Cummins, Inc., Columbus, IN
T.R. Watkins, Oak Ridge National Laboratory, Oak Ridge, TN
- 11:00 D-119 A TEXTURE MEASUREMENT INSTRUMENT FOR INDUSTRIAL PROCESS CONTROL — Invited
H. Weiland, Alcoa Technical Center, Alcoa Center, PA
- 11:30 D-104 ANNEALING STUDIES OF PURE AND ALLOYED TANTALUM EMPLOYING ROCKING CURVES AND $\Theta/2\Theta$ PATTERNS
R.J. De Angelis, University of Florida, Shalimar, FL
D.W. Richards, M.P. Kramer, J.W. House, Air Force Research Laboratory, Eglin AFB, Florida

Session F-1 Quantitative XRF

Organized by: **J. Gilfrich**, Emeritus, SFA, Inc./NRL, Washington, DC
 Co-chair: **B. Vrebos**, Philips Analytical, Almelo, The Netherlands

- 9:00 F-22 ACCURACY OF THEORETICAL INFLUENCE COEFFICIENT METHODS —
 Invited
M. Mantler, Vienna University of Technology, Vienna, Austria
- 9:30 F-36 QUANTITATIVE APPROACHES IN MICRO X-RAY FLUORESCENCE — Invited
G.J. Havrilla, Los Alamos National Laboratory, Los Alamos, NM
- 10:00 F-08 ACCURACY OF FUNDAMENTAL PARAMETERS CALCULATIONS USING A
 NEW ATOMIC DATABASE
W.T. Elam, R.B. Shen, B. Scruggs, J. Nicolosi, EDAX, Inc., Mahwah, NJ
- 10:20 Break
- 10:40 F-23 NUMERICAL DESCRIPTION OF PHOTOELECTRIC ABSORPTION
 COEFFICIENTS FOR FUNDAMENTAL PARAMETER PROGRAMS
H. Ebel, R. Svagera, Vienna University of Technology, Vienna, Austria
A. Shaltout, National Research Center, Cairo, Egypt
- 11:00 F-01 ACCURATE QUANTIFICATION OF RADIOACTIVE MATERIALS BY X-RAY
 FLUORESCENCE: GALLIUM IN PLUTONIUM METAL
C.G. Worley, Los Alamos National Laboratory, Los Alamos, NM
- 11:20 F-21 APPLYING THE CONCEPT OF TRUENESS TO ALLOY ANALYSIS USING
 WDXRF AND BORATE FUSION
J.R. Sieber, National Institute of Standards & Technology, Gaithersburg, MD
- 11:40 F-33 APPLICATION OF THE BACKSCATTER FUNDAMENTAL PARAMETER
 METHOD WITH SIMULTANEOUS EXCITATION BY ^{55}Fe AND ^{109}Cd
 RADIOISOTOPE SOURCES
D. Wegrzynek, A. Markowicz, E. Chinea-Cano, International Atomic Energy
 Agency, Vienna, Austria
P. Potts, The Open University, Milton Keynes, UK
- 12:00 F-43 THE USE OF VARIOUS PEAK DECONVOLUTION MODELS FOR ED-XRF
 ANALYSIS OF LAYERED MATERIALS
A. Wittkopp, B. Cross, F. Ferrandino, NeXray Corporation, Ronkonkoma, NY

Session C-4 Microbeam Analysis (Combinatorial & Robotic Applications)

Organized by: **G.J. Havrilla**, Los Alamos National Laboratory, Los Alamos, NM

- 1:30 C-05 SCANNING X-RAY MICROTOPOGRAPHY STUDY OF ELECTROMIGRATION IN INTEGRATED CIRCUITS — Invited
P.-C. Wang, IBM Corporation, Hopewell Junction, NY
- 2:00 F-26 1, 2 AND 3D MICRO-ANALYSIS USING SR-BASED SPECTROSCOPY AND IMAGING — Invited
A. Simionovici, ESRF, Grenoble, France
- 2:30 F-53 QUANTITATIVE ASPECTS OF MICROBEAM X-RAY ANALYSIS — Invited
L. Vincze, University of Antwerp, Antwerp, Belgium
- 3:00 F-05 PUSHING THE DETECTION LIMITS OF MICRO X-RAY FLUORESCENCE
T.C. Miller, G.J. Havrilla, Los Alamos National Laboratory, Los Alamos, NM
- 3:20 Break
- 3:40 F-41 MICROANALYSIS WITH A POLYCAPILLARY IN A VACUUM CHAMBER
P. Wobrauschek, N. Marosi, C. Strelt, Atominstitut der Österreichischen Universitäten, Wien, Austria
- 4:00 F-37 ELEMENTAL IMAGING USING MICRO X-RAY FLUORESCENCE IN ART AND ARCHEOLOGY
G.J. Havrilla, T. Miller, Los Alamos National Laboratory, Los Alamos, NM
K. Trentleman, Detroit Institute of Art, Detroit, MI
R. Morton, Philips Petroleum, Bartlesville, OK
- 4:20 D-099 DIAGNOSIS OF Ln-DOPED PZT FILMS VIA MICRODIFFRACTION: CORRELATION OF PROPERTIES TO OBSERVED FWHM
M.A. Rodriguez, G. Brennecka, B.A. Tuttle, Sandia National Laboratories, Albuquerque, NM
- 4:40 D-111 MEASUREMENT OF STRAIN FIELDS OF INDIVIDUAL DOMAINS IN BaTiO₃ USING X-RAY MICRODIFFRACTION
R.C. Rogan, E. Üstündag, G.A. Swift, California Institute of Technology, Pasadena, CA
N. Tamura, Lawrence Berkeley National Laboratory, Berkeley, CA
- 5:00 D-105 STUDY OF FIBER-REINFORCED COMPOSITES USING X-RAY MICROTOPOGRAPHY
J.C. Hanan, E. Üstündag, C.C. Aydiner, M.A. Brown, G.S. Welsh, G.A. Swift, California Institute of Technology, Pasadena, CA
J.L. Jordan-Sweet, I.C. Noyan, IBM Research Division, Yorktown Heights, NY

Session D-5 INDUSTRIAL APPLICATIONS OF XRD II

Organized by: **R.L. Snyder**, The Ohio State University, Columbus, OH
C.R. Hubbard, Oak Ridge National Laboratories, Oak Ridge, TN

- 1:30 D-097 METHODS FOR ANALYZING METAL TRITIDES IN THE X-RAY DIFFRACTION LABORATORY
R. Tissot, M. Eatough, Sandia National Laboratories, Albuquerque, NM
- 1:50 D-116 APPLICATIONS OF X-RAY DIFFRACTION IN THE IMAGING INDUSTRY — Invited
T.N. Blanton, Eastman Kodak Company, Rochester, NY
- 2:20 D-103 APPLICATIONS OF X-RAY POWDER DIFFRACTION IN THE PHARMACEUTICAL INDUSTRY — Invited
G.A. Stephenson, Eli Lilly & Company, Indianapolis, IN
- 2:50 D-096 PULP AND PAPER PLANT MATERIALS ISSUES ADDRESSED BY XRD METHODS
C.R. Hubbard, R.A. Peascoe, J.R. Keiser, Oak Ridge National Laboratory, Oak Ridge, TN
- 3:10 Break
- 3:30 D-079 HIGH-PRECISION PARALLEL-BEAM X-RAY DIFFRACTION SYSTEM FOR PHARMACEUTICALS ANALYSIS
T. Kubo, Rigaku Corporation, Osaka, Japan
- 3:50 D-086 A NEW MOVABLE DIFFRACTOMETER FOR INDUSTRIAL APPLICATIONS OF NDT-XRD FOR IN FIELD MEASUREMENTS
G. Berti, University of Pisa, Pisa, Italy
S. Aldrighetti, Officina Elettrotecnica di Tenno, Italy
- 4:10 D-011 COMPARISON BETWEEN CONVENTIONAL AND TWO-DIMENSIONAL XRD
B.B. He, U. Preckwinkler, K.L. Smith, Bruker AXS, Inc., Madison, WI
- 4:30 D-077 ADVENTURES IN CORROSION DEPOSITS — Invited
J.A. Kaduk, BP Chemicals, Naperville, IL
- 5:00 D-065 CHARACTERIZATION OF THE SOLIDS WASTE IN THE HANFORD WASTE TANKS USING A COMBINATION OF XRD, SEM, AND PLM
R.W. Warrant, G.A. Cooke, Fluor Hanford, Richland, WA

SESSION D-6 NEUTRON DIFFRACTION

Organized by: **E. Üstündag**, California Institute of Technology, Pasadena, CA
M.A.M. Bourke, Los Alamos National Laboratory, Los Alamos,

- 1:30 D-012 THE PRECISION OF DIFFRACTION PEAK LOCATION AND THE OPTIMISED DESIGN OF A STRESS DIFFRACTOMETER — Invited
M.R. Daymond, ISIS Facility, Rutherford Appleton Lab., Oxon, UK
- 2:00 D-036 DIFFRACTION MEASUREMENTS DURING MECHANICAL LOADING IN SUPERELASTIC AND SHAPE-MEMORY ALLOYS — Invited
R. Vaidyanathan, University of Central Florida, Orlando, FL
- 2:30 D-085 DEVELOPMENT OF TEXTURE DURING DEFORMATION OF HEXAGONAL CLOSE PACKED METALS
D.W. Brown, S.R. Agnew, W.R. Blumenthal, T.M. Holden, C. Tomé, Los Alamos National Laboratory, Los Alamos, NM
- 2:50 D-057 LATTICE DILATION IN A HYDROGEN CHARGED STEEL
G.L. Nash, Electro-Motive Division, LaGrange, IL
P. Nash, Illinois Institute of Technology, Chicago, IL
H. Choo, University of Tennessee, Knoxville, TN
L.L. Daemen, M.A.M. Bourke, Los Alamos National Laboratory, Los Alamos, NM
- 3:10 Break
- 3:30 D-108 EFFECT OF BEAM DIVERGENCE ON STRAIN DATA FROM NEUTRON DIFFRACTION
E. Üstündag, R.A. Karnesky, California Institute of Technology, Pasadena, CA
I.C. Noyan, IBM Research Division, Yorktown Heights, NY
M.A.M. Bourke, D.W. Brown, Los Alamos National Laboratory, Los Alamos, NM
- 3:50 D-110 DEFORMATION MECHANISMS OF DUCTILE-PHASE-REINFORCED BULK METALLIC GLASS COMPOSITES
S.-Y. Lee, E. Üstündag, B. Clausen, H. Choi-Yim, California Institute of Technology, Pasadena, CA
D.W. Brown, M.A.M. Bourke, Los Alamos National Laboratory, Los Alamos, NM
- 4:10 D-062 EFFECT OF REINFORCEMENT PARTICLE FRACTURE ON THE LOAD PARTITIONING IN AN AL-SIC COMPOSITE
B.S. Majumdar, New Mexico Tech, Socorro, NM
H. Choo, University of Tennessee, Knoxville, TN
P. Rangaswamy, M.A.M. Bourke, Los Alamos National Laboratory, Los Alamos, NM
- 4:30 D-106 HIGH TEMPERATURE ELASTIC STRAIN EVOLUTION IN Si_3N_4 - BASED CERAMICS
G.A. Swift, E. Üstündag, B. Clausen, California Institute of Technology, Pasadena, CA
M.A.M. Bourke, Los Alamos National Laboratory, Los Alamos, NM
H.-T. Lin, Oak Ridge National Laboratory, Oak Ridge, TN
C.-W. Li, Honeywell Corporation, Morristown, NJ

- 4:50 D-107 CONSTITUTIVE BEHAVIOR OF PZT-BASED FERROELECTRIC CERAMICS
R.C. Rogan, E. Üstündag, B. Clausen, California Institute of Technology, Pasadena, CA
M.R. Daymond, Rutherford Appleton Laboratory, Oxon, UK
C.M. Landis, Rice University, Houston, TX
V. Knoblauch, Robert Bosch GmbH, Stuttgart, Germany

SESSION F-2 POLARIZED X-RAY OPTICS

Organized by: **B. Chappell**, Macquarie University, Sydney, AustraliaCo-chair: **R.W. Ryon**, Emeritus, Lawrence Livermore National Laboratories, Livermore, CA

- 2:00 POLARIZED BEAM XRF ANALYSIS OF GEOLOGIC MATERIALS — Invited
B. Chappell, Macquarie University, Sydney, Australia
- 2:30 F-29 POLARIZED BEAM XRF ANALYSIS—PAST AND FUTURE — Invited
J. Heckel, SPECTRO A.I., Kleve, Germany
- 3:00 Break
- 3:20 F-30 POLARIZATION FOR BACKGROUND REDUCTION IN EDXRF—THE
TECHNIQUE THAT WOULD NOT WORK — Invited
R.W. Ryon, Lawrence Livermore National Laboratory, Livermore, CA
- 3:50 F-48 THE USE OF POLARIZED LIGHT ED-XRF FOR LOW SULFUR CONTENT
DETERMINATION IN AUTOMOTIVE FUELS
M. Van Driessche, ChevronTexaco Technology Gent, Gent, Belgium

Session C-5 X-RAY OPTICS

Organized by: **N. Gao**, X-ray Optical Systems, Inc., Albany, NYCo-chair: **G.J. Havrilla**, Los Alamos National Laboratory, Los Alamos, NM

- 8:30 F-35 DUAL-POLYCAPILLARY MICRO X-RAY FLUORESCENCE INSTRUMENT — Invited
G.J. Havrilla, Los Alamos National Laboratory, Los Alamos, NM
N. Gao, X-ray Optical Systems, Inc., Albany, NY
- 9:00 D-117 XRD THIN FILM ANALYSIS USING POLYCAPILLARY COLLIMATING OPTICS — Invited
Q. Xiao, B. York, H. Zadoori, IBM Storage Technology Division, San Jose, CA
- 9:30 F-51 NOVEL DOUBLY CURVED CRYSTALS WITH LARGE CAPTURE ANGLE
Z. Chen, F. Wei, P. Schields, D. Gibson, X-ray Optical Systems, Inc., Albany, NY
- 9:50 D-114 LOW-POWER SYSTEM FOR AN IN-LINE PHASE MONITOR
H. Huang, T. Bievenue, P. Schields, X-ray Optical Systems, Inc., Albany, NY
T. Davis, Purdue University, West Lafayette, IN
- 10:10 Break
- 10:30 C-02 DESIGNING POLYCAPILLARY X-RAY OPTICS FOR DIFFRACTION AND FLUORESCENCE
S.P. Formica, X-ray Optical Systems, Inc., Albany, NY and University at Albany, SUNY, Colonie, NY
S.M. Lee, University at Albany, SUNY, Colonie, NY
- 10:50 D-095 DEVELOPMENTS IN HIGH-ENERGY X-RAY OPTICS AT ADVANCED PHOTON SOURCE BEAMLINE 1-ID
S.D. Shastri, K. Fezzaa, D.R. Haeffner, B. Lai, W.-K. Lee, J.M. Maser, Argonne National Laboratory, Argonne, IL
- 11:10 F-15 DEVELOPMENT OF WAVELENGTH DISPERSIVE X-RAY FLUORESCENCE SPECTROMETER USING MULTICAPILLARY X-RAY LENS FOR X-RAY DETECTION
Y. Mokuno, Y. Horino, National Institute of Advanced Industrial Science & Technology, Osaka, Japan
T. Narusawa, Kochi University of Technology, Kochi, Japan
S. Kuwabara, Shimadzu Corporation, Kanagawa, Japan
S. Shibata, H. Soejima, Shimadzu Scientific Research, Kyoto, Japan
- 11:30 D-069 HIGH-RESOLUTION LOW BACKGROUND BEAM FORMATION SYSTEM AND ITS APPLICATION IN SMALL ANGLE X-RAY SCATTERING
L. Jiang, B. Verman, B. Kim, Y. Platonov, Osmic, Inc., Auburn Hills, MI
- 11:50 C-01 WAVEGUIDE-RESONANCE MECHANISM FOR AN X-RAY BEAM PROPAGATION, PHYSICS AND PRACTICAL SIGNIFICANCE
V.K. Egorov, E.V. Egorov, IPMT Russian Academy of Science, Chernogolovka, Russia

Session D-7 Stress Analysis

Organized by: C.C. Goldsmith, IBM Microelectronics, Hopewell Junction, NY

- 8:30 D-098 RESIDUAL STRESS MEASUREMENTS USING PARALLEL BEAM OPTICS —
Invited
T.R. Watkins, O.B. Cavin, J. Bai, Oak Ridge National Laboratory, Oak Ridge, TN
J.A. Chediak, University of California - Berkeley, Berkeley, CA
- 9:00 D-073 STRESS ANALYSIS USING BREMSSTRAHLUNG RADIATION
F.A. Selim, D.P. Wells, J.F. Harmon, J. Kwofie, R. Spaulding, Idaho State University,
Pocatello, ID
G. Erikson, Boise State University, Boise, ID
T. Roney, Idaho National Engineering & Environmental Laboratory, Idaho Falls, ID
- 9:20 D-043 THE INFLUENCE OF SURFACE ROUGHNESS ON THE REFRACTION OF
X-RAYS AND ITS EFFECT ON BRAGG PEAK POSITIONS
M.H. Ott, D. Löhe, University of Karlsruhe (TH), Karlsruhe, Germany
- 9:40 D-082 OBSERVATION OF HIGH-RESOLUTION DIFFRACTION PROFILES FROM
SINGLE GRAINS WITHIN POLYCRYSTALLINE METALS
U. Lienert, J. Almer, Argonne National Laboratory, Argonne, IL
L. Margulies, S. Nielsen, W. Pantleon, H.F. Poulsen, S. Schmidt, Risoe National
Laboratory, Roskilde, Denmark
- 10:00 Break
- 10:20 D-109 X-RAY STRESS ANALYSIS OF DAMAGE EVOLUTION IN Ti-SiC
UNIDIRECTIONAL FIBER COMPOSITES
J.C. Hanan, E. Üstündag, G.A. Swift, California Institute of Technology, Pasadena, CA
J.D. Almer, U. Lienert, D.R. Haeffner, Argonne National Laboratory, Argonne, IL
- 10:40 D-074 THE USE OF X-RAY DIFFRACTION MEASUREMENTS TO DETERMINE THE
EFFECT OF AGING ON RESIDUAL STRESSES IN UNIDIRECTIONAL AND
WOVEN GRAPHITE/POLYIMIDE COMPOSITES
B. Benedikt, M. Gentz, L. Kumosa, P.K. Predecki, M. Kumosa, The University of
Denver, Denver, CO
- 11:00 D-041 DETERMINATION OF THERMAL RESIDUAL STRESSES IN A FUNCTIONALLY
GRADED WC-Co COMPOSITE
C. Larsson, M. Odén, Linköping University, Linköping, Sweden
- 11:20 D-014 STRESS ERRORS ASSOCIATED WITH MINIATURIZATION OF PUSAI
ASSEMBLY X-RAY STRESS ANALYZER
T. Goto, Fukui University of Technology, Nara, Japan
- 11:40 D-008 COMPACT X-RAY DIFFRACTION TECHNIQUE
A. Mozelev, Small Scale Research & Production Company RADICAL,
Friedrichsdorf, Germany

SESSION F-3 PROBLEM SOLVING / INDUSTRIAL APPLICATIONS OF XRF

Organized by: **D. Broton**, Construction Technology Labs, Skokie, IL

- 8:30 F-07 THE USE OF XRF IN SOLVING PROBLEMS RELATED TO THE PRODUCTION OF ACTIVE PHARMACEUTICAL INGREDIENTS (API) — Invited
F.J. Antosz, J.W. Manski, Pharmacia Corp., Kalamazoo, MI
- 9:00 F-20 CEMENT CONTENT OF HARDENED PORTLAND CEMENT CONCRETE USING XRF, A NOVEL APPROACH — Invited
D. Broton, Construction Technology Laboratories, Skokie, IL
- 9:30 F-28 SPECTRAL INTERFERENCES IN X-RAY FLUORESCENCE ANALYSIS
F.R. Feret, H. Hamouche, Y. Boissonneault, Alcan International Ltd., Québec, Canada
- 9:50 F-34 SULFUR ANALYSIS USING ASTM D 2622 AT REFINERY LABORATORIES
K.F. Dahnke, R.W. Morton, Phillips Petroleum Company, Bartlesville, OK
- 10:10 Break
- 10:30 F-42 EXPERIMENTAL DETERMINATION AND CHARACTERIZATION OF Fe L SPECTRA FROM DIFFERING VALENCE STATES
G. Trudgett, B. Cheary, K. Turner, University of Technology, Sydney, Australia
- 10:50 F-49 FORENSIC ENVIRONMENTAL GEOCHEMISTRY, EVIDENCE OF SEDIMENTARY POLLUTION FROM MINE TAILINGS ACCIDENT USING BULK AND SINGLE PARTICLE XRS AND XANES
S. Török, B. Alföldy, S. Kurunczi, J. Osán, KFKI Atomic Energy Research Institute, Budapest, Hungary
- 11:10 F-09 XRF ANALYSIS OF THE DISTRIBUTION OF HEAVY METAL IONS IN CANCEROUS TISSUES
M. Haschke, Röntgenanalytik Meßtechnik GmbH, Taunusstein, Germany
W. Ebert, Berlin, Germany

Local Attractions*

For more information, contact Guest Services

AIR FORCE (U.S.) ACADEMY: North on U.S. Interstate 25, North Academy Exit. An educational facility for cadets, it is also a major tourist attraction. Points of interest are the Cadet Chapel, Planetarium and Visitor Center.

AMERICAN NUMISMATIC ASSOCIATION: 818 North Cascade Avenue. Headquarters for the coin collecting hobby. The museum displays coins, medals, tokens and paper money documenting many historical events.

BEAR CREEK NATURE CENTER: 245 Bear Creek Road. The educational center features wildlife exhibits, nature trails, hosted activities and tours.

BLACK FOREST OBSERVATORY: 12815 Porcupine Lane, Black Forest. Sky tours at one of the largest public observatories in Colorado. Actual viewing through the observatory telescope. By reservation. Open 7 days a week.

CAVE OF THE WINDS: Four miles west on U.S. Highway 24, Manitou Springs. A one-mile long cavern with numerous passageways. Guided tours through the cavern feature informative programs explaining the formation of the stalagmite and stalactite structures.

CHEYENNE MOUNTAIN ZOO: 4250 Cheyenne Mountain Zoo Road. Set in scenic mountain terrain and open year-round. Features include Primate World and Wolf Woods. Admission includes the Will Rogers Monument, "Shrine of the Sun".

CRIPPLE CREEK: One hour west of Colorado Springs. The historic gold mining town is one of Colorado's three cities with limited stakes gambling. A multitude of casinos beckon you to try your luck amid the noise and excitement.

To enjoy more sightseeing in this western region, the Cripple Creek Narrow Gauge Railroad provides a four-mile excursion. Also, the Cripple Creek Museum offers a glimpse back at the town's lively history. The Molly Kathleen Gold Mine provides tours of its genuine mining facility.

FINE ARTS CENTER: 30 West Dale Street. Famous for its Taylor Museum Collection of southwestern artifacts (textiles, pottery, baskets, wood sculptures) and a complete New Mexico chapel.

FLORISSANT FOSSIL BEDS NATIONAL MONUMENT: West on U.S. Highway 24, Florissant. Exhibits of insects and plants fossilized in a prehistoric lake by mudflows from a volcanic eruption. There are petrified sequoias and a homestead dating to 1878. Programs, displays and tours are available.

FLYING W. RANCH: 3330 Chuckwagon Road. Experience the "Old West" cowboys and settlers in a quaint town with shops and replicated buildings. Enjoy a chuckwagon supper, with live traditional western entertainment by the Flying W. Wranglers. Reservations are required.

GARDEN OF THE GODS: 1805 North 30th Street. Renowned for its magnificent red sandstone formations. The park is a registered National Natural Landmark containing 940 acres. The Visitor Center provides extensive background on this unique area. There are opportunities for many outdoor activities.

Rock Ledge Ranch is located at the east entrance to the Garden of the Gods. It is listed on the National Register of Historic Places and features a general store, blacksmith shop and pioneer farm. Open daily year-round.

GHOST TOWN MUSEUM: 400 South 21st Street. Experience an authentic town from the "Old West", as it actually was a century ago. Set inside the 1899 Colorado Midland Railroad Terminal Building, open year-round.

Continued on next page

Local Attractions*

For more information contact Guest Services
(continued)

HALL OF PRESIDENTS LIVING WAX STUDIO: 1050 South 21st Street. Enjoy the beautifully costumed figures, lavishly decorated room-size and original antiques displayed in a 10,000 square-foot studio. Madame Josephine Tussaud of London provides wax figures.

MANITOU CLIFF DWELLINGS MUSEUM: Manitou Springs. Anasazi Indian cliff dwellings, as well as a pueblo of the Taos Indians.

MANITOU AND PIKES PEAK COG RAILWAY: 515 Ruxton Avenue, Manitou Springs. Climb 14,110 feet to the summit of Pikes Peak on the world's highest cog system.

MIRAMONT CASTLE MUSEUM: 9 Capital Hill Avenue, Manitou Springs. There are nine separate architectural styles in this 46-room structure constructed in 1895. A museum of miniatures is featured, as well as historical information and a wide assortment of antiques.

OLD COLORADO CITY: West on Colorado Avenue. This first permanent settlement in the area was once a rough town of saloons and parlor houses. Now, it is a National Historic District with many interesting shops and restaurants.

PIKES PEAK HIGHWAY: West on Highway 24 in Cascade. Drive on the 14,110-foot summit of Pikes Peak. Toll road open seasonally from May through October.

PIONEERS MUSEUM: 215 South Tejou. Collections of local importance housed in the 1903 former country courthouse. Prize winning Van Briggles pieces, three rooms of furniture from the home of Helen Hunt Jackson, photos and artifacts relating to the early history of Colorado Springs, crystals, fossils and gold-bearing tellurides.

PRORODEO HALL OF FAME & AMERICAN COWBOY MUSEUM: 101 ProRodeo Drive. Historic memorabilia and displays of this uniquely western sport and the authentic "cowboy." Includes a hall of rodeo champions.

ROCK LODGE RANCH HISTORIC SITE: East entrance of Garden of the Gods. Listed on the National Register of Historic Places, this pioneer ranch and farm includes a general store and blacksmith shop reconstructed to show life as it was lived in years past.

ROYAL GORGE: 8 Miles west of Canon City on Highway 50. The world's highest suspension bridge spans the spectacular gorge, 1,053 feet above the Arkansas River. Walk or drive across the bridge, constructed in 1929. Travel to the bottom of the gorge via an incline or across the gorge by way of aerial tram. Open year-round.

ROYAL GORGE RAFTING: 7 Miles west on Canon City on Highway 50. Join the elite group of adventures who challenge the treacherous waters of the Royal Gorge on the Arkansas River.

SEVEN FALLS: South Cheyenne Canyon. Scenic canyon with cascading falls, nature trails and Native American dances. An elevator is available to reach Eagles Nest, overlooking the falls.

U.S. OLYMPIC COMPLEX: 1750 East Boulder Street. Athletes train at this headquarters facility. Tours are available to the public.

VAN BRIGGLE POTTERY: 600 South 21st Street. Fine art pottery and an interesting selection of Oriental artwork. A wide array of gift items. Dates back to 1899. Open year-round.

WESTERN MUSEUM OF MINING AND INDUSTRY: 125 North Gate Road. The mining era of the Pikes Peak region is illustrated in displays. Demonstrations provide a greater understanding of mining techniques and panning for gold.

*Reprinted with permission from Antlers Adam's Mark Hotel, 4 South Cascade Avenue, Colorado Springs, CO. 80903

Directions to Antlers Adam's Mark Hotel*

From Denver International Airport

Take the airport exit on to Pena Boulevard. Follow Pena Boulevard to the Highway 70 West exit. Take I-70 right and follow to I-225. Take I-225 West to I-25. Take I-25 South. Follow I-25 in to Colorado Springs. Take exit #142 (Bijou Street) left to Cascade. Make a right on Cascade Avenue. The Antlers Adam's Mark Hotel is located two blocks down on the right hand side. Approximate travel time: 1 hour and 30 minutes.

From the Colorado Springs Airport

Take Drennan Road out of the airport until you intersect with Academy Boulevard, turn left. Stay on Academy Boulevard until you reach I-25 (the exit will be on the right hand side). Stay on I-25 until you reach exit #142 (Bijou); at the light turn right, go two blocks to the light at Cascade Avenue. Turn right onto Cascade, go two blocks; the circular drive to the Hotel is on the right hand side. Or you may enter the parking garage by turning right on Pikes Peak, which is the street just before you reach the Hotel, in between the Pikes Peak Library and the Antlers Adam's Mark Hotel. Approximate travel time: 25 minutes.

Parking

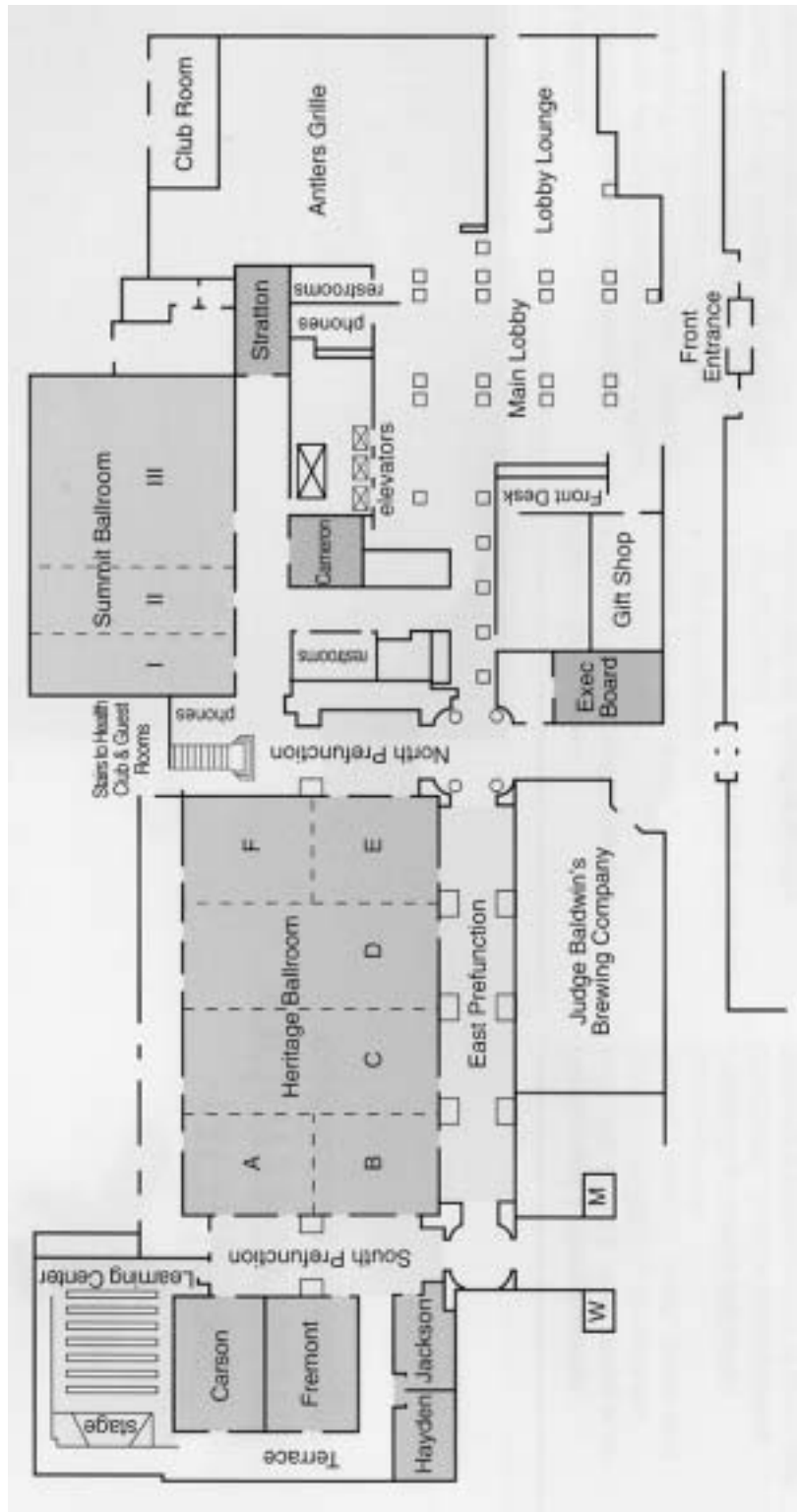
A parking garage is available at the Antlers for conference parking. Please use the entrance on the north side at Pikes Peak Place or the entrance on the west side at Antlers Plaza. Parking vouchers are available for sale at the hotel desk at a cost of \$6.00 per day self park, and \$10.00 per day valet. The daily vouchers allow unlimited access to the parking garage on the voucher date.

For more information on directions, and to view additional maps, please visit the Antlers web site at: <http://www.antlers.com/locator.htm>.

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Antlers Adam's Mark Hotel*

Hotel Layout



HOTEL LAYOUT

*Reprinted with permission from Antlers Adam's Mark Hotel, 4 South Cascade Avenue, Colorado Springs, CO. 80903



EXITS	
North to South	
184	Castle Rock Factory Shops
172	Landscape / Renaissance Football Monument / Woodmoor Exit
161	US45A North Gate / Visitors Center / Chapel
156B	Western Museum Of Mining
151	Briargate / Research Parkway
150A	North Academy Blvd. / Chapel Hill Mall
150B	South Gate USAFA
149	Woodmas Road / Rockinman
148A	North Nevada Avenue
147	Rockinman Rd. / Pro Rodeo Hall Of Fame
146	Garden Of The Gods Road / Garden Of The Gods Park
145	Filmfare Street
143	Limbah Street / US Olympic Training Center
142	Bljuo Street / Downtown Business District / Shopping
141	US HWY 24 / Cimarron Street / Visitor Info. / Manitou Springs
140 AB	South Nevada & Tejon Streets
139	HWY 24E Bypass / Airport
138	Lake Ave. / Circle Dr. / HWY 122 / Broadmoor Hotel / Zoo
135	South Academy Blvd.
132	Windsfield / Fountain, Colorado
123/122	Pikes Peak International Raceway



- | | | | | | |
|---|-----------------|---|-----|--|-----------------|
| 1. Academy Riding Stables of Colorado Springs | B-6 | 27. Garden of the Gods Trading Post | B-4 | 53. Petrosre Stadium | C-7 |
| 2. Anacia Park | Downtown Insert | 28. Garden of the Gods Visitor Center | C-5 | 54. Peterson Air & Space Museum | G-7 |
| 3. Air Force Academy Visitors Center | B-1 | 29. Ghost Town | C-4 | 55. Pikes Peak Center | Downtown Insert |
| 4. American Numismatic | Downtown Insert | 30. Giles Eyrie | C-6 | 56. Pikes Peak Country Attractions Association | B-6 |
| 5. Angler's Covey | B-4 | 31. Iron Springs Chertosa | B-4 | 57. Pikes Peak Highway | A-5 |
| 6. Arcade Amusement | G-1 | 32. Irask Walden League | G-6 | 58. Pikes Peak Auto Hill Church Museum | B-6 |
| 7. Black Forest Observatory | E-6 | 33. Laser Quest | F-6 | 59. Pikes Peak International Raceway | F-9 |
| 8. Cardfree Highway Go-Kart Park | A-5 | 34. Magic Town / Michael Garman's Sculpture | B-5 | 60. Pikes Peak Mountain Bike Tours | C-6 |
| 9. Cove of the Winds / Laser Canyon | C-6 | 35. Manitou Cliff Dwellings Museum | D-9 | 61. Pikes Peak Historical Street Railway | D-5 |
| 10. Challenge Unlimited | C-5 | 36. Manitou & Pikes Peak Cog Railway Company | B-6 | 62. Pikes Peak Vineyards | E-8 |
| 11. Champions Golf & Games | E-6 | 37. Maroon Springs Town Trolley | D-9 | 63. Pine Creek Golf Club | E-2 |
| 12. Chapel Hills Mall | C-9 | 38. My Natural History Museum | A-6 | 64. ProBorden Hall of Fame & Museum of the American Cowboy | D-4 |
| 13. Cheyenne Mountain Zoo | E-6 | 39. McAllister House Museum | B-6 | 65. Rock Ledger Ranch Historic Site | C-5 |
| 14. Children's Museum of Colorado Springs | E-6 | 40. McNulty's Family Fun Park / Boardwalk | D-7 | 66. Rocky Mountain Greyhound Park | D-5 |
| 15. Citadel Mall | D-1 | 41. Memorial Park | A-6 | 67. Rocky Mountain Motorcycle Museum | D-7 |
| 16. Colorado Renaissance Festival | G-8 | 42. Miramont Castle | E-4 | 68. Seven Falls | B-4 |
| 17. Colorado Springs Airport | Downtown Insert | 43. Mountasia Family Fun Center | A-5 | 69. Sky Sox Stadium | G-5 |
| 18. Colorado Springs Fine Arts Center | Downtown Insert | 44. Myers Popcorn | B-8 | 70. Space Discovery Adventure Museum & Gift Shop | E-6 |
| 19. Colorado Springs Pioneers Museum | Downtown Insert | 45. North Cheyenne Canyon Park / Helen Hunt Falls | C-6 | 71. Stables at the Broadmoor | C-9 |
| 20. Compassion International | E-5 | 46. North Pole / Santa's Workshop | C-7 | 72. Summit House and Glen Cove | A-5 |
| 21. Convention & Visitors Bureau | D-7 | 47. Old Colorado City Museum | E-5 | 73. U.S. Forest Service | D-7 |
| 22. Fallen Fire Fighters Memorial | B-4 | 48. Palmer Park | C-7 | 74. U.S. Olympic Complex | D-6 |
| 23. Flying W Ranch | E-2 | 49. Pao's Candy Kitchen | D-6 | 75. Valley Hl Golf Club | E-7 |
| 24. Focus On The Family | E-9 | 50. Patti Jewett Golf Course | E-4 | 76. Van Briggie Art Pottery | C-6 |
| 25. Fountain Creek Park | B-5 | 51. Petrosre Library | D-6 | 77. Western Museum of Mining & Industry | D-1 |
| 26. Garden of the Gods Park | B-5 | 52. Petrosre Library East Branch | E-4 | 78. World Figure Skating Museum | C-3 |

AREA MAP

Program-At-A-Glance

29 July–2 August 2002

Sun. eve.: 5:30-7:30 Welcoming Reception Sponsored by: Bede Scientific, SPEX CertiPrep and Claisse Scientifique (Summit)			
Day & Time	XRD & XRF	XRD	XRF
MON. am: Workshops		W-1 Texture Analysis I Schaeben (Learning Center) W-2 Methods of Phase ID Jenkins, Faber, Fawcett (Carson)	W-3 Fundamentals of XRF Gilfrich/Croke (Summit I & II) W-4 Layered Materials Dirken (Fremont)
MON. pm: Workshops		W-5 Texture Analysis II Schaeben (Learning Center) W-6 Advances in DB Technology Faber (Carson)	W-7 Specimen Preparation I Brotton (Summit I & II) W-8 Polarized X-ray Optics Chappell (Summit III)
Mon. eve.: 6:30-8:30 Philips Analytical Reception and XRD Poster Session I. Sponsored by: Philips Analytical (Noyan/Rendle) (Summit)			
TUE. am: Workshops	W-9 Optics Havrilla/Al-Mosheky (Carson)	W-10 Rietveld Applications I Kaduk (Summit III)	W-11 Specimen Preparation II Brotton (Summit I & II) W-12 Mathematical Methods Mantler (Fremont)
TUE. pm: Workshops		W-13 Rietveld Applications II Kaduk (Summit III) W-14 Line Broadening Makinson (Carson)	W-15 Quantitative Analysis – Standardless Methods Anzelmo (Summit I & II) W-16 TXRF Zaitz (Learning Center)
Tue. eve.: 6:30-8:30 MDI and Rigaku/MSC, Inc. Reception and XRD Poster Session II. Sponsored by: MDI and Rigaku/MSC, Inc. (Huang/Barton) (Summit)			
Wed. am: 8:30-12:30 Plenary Session: “Applications of X-ray Analysis to Forensic Materials” (Rendle/Jenkins) (Summit III)			
WED. pm: Sessions	C-1 New Developments in XRD & XRF Instrumentation Buhrke (Carson) C-2 Synchrotron Applications I Lavoie/Ludwig (Summit II)	D-1 Rietveld Applications I Kaduk (Fremont) D-2 Thin Films Huang (Summit I)	
Wed. eve: 6:30 – 8:30 Bruker AXS, Inc. Reception and XRF Poster Session. Sponsored by: Bruker AXS, Inc. (Zaitz/Taniguchi) (Summit)			
THURS. am: Sessions	C-3 Synchrotron Applications II Lavoie/Ludwig (Summit II)	D-3 Rietveld Applications II Kaduk (Fremont) D-4 Industrial Applications of XRD I Snyder/Hubbard (Summit III)	F-1 Quantitative XRF Gilfrich/Vrebos (Summit I)
THURS. pm: Sessions	C-4 Microbeam Analysis Havrilla (Summit II)	D-5 Industrial Applications of XRD II Snyder/Hubbard (Summit III) D-6 Neutron Diffraction Üstündag/Bourke (Fremont)	F-2 Polarized X-ray Optics Chappell/Ryon (Summit I)
FRI. am: Sessions	C-5 X-ray Optics Gao/Havrilla (Summit II)	D-7 Stress Analysis Goldsmith (Fremont)	F-3 Problem Solving/Industrial Applications of XRF Brotton (Summit I)

Any changes to the program will be reflected in the *Book of Abstracts* and on the Denver X-ray Conference web page: <http://www.dxcicdd.com>.

Kitty Ward Travel, Inc.

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2002 Denver X-ray Conference Registration Form

Antlers Adam's Mark Hotel, Colorado Springs, Colorado, U.S.A.

29 July – 2 August 2002

Please circle the workshops that you plan to attend:

W-1 W-2 W-3 W-4 W-5 W-6 W-7 W-8 W-9 W-10 W-11 W-12 W-13 W-14 W-15 W-16

The reduced registration fee will only be applied if **registration form and payment** are received on or before 5 July 2002.

Registration Fees:	by July 5	after July 5
<input type="checkbox"/> Full week: exhibits, workshops, sessions [†]	\$325	\$400
<input type="checkbox"/> Monday & Tuesday: exhibits, workshops [†]	\$275	\$350
<input type="checkbox"/> Wed., Thurs. & Friday: exhibits, sessions [†]	\$275	\$350
<input type="checkbox"/> Session organizers, invited speakers and workshop instructors [†]	\$100	\$100
<input type="checkbox"/> Students, unemployed X-ray people, and persons 65 and older [‡] : full week – exhibits, workshops, sessions	\$75	\$75

[†]Includes a copy of Volume 46 of *Advances in X-ray Analysis* on CD-ROM
[‡]Students and those unemployed must have their status confirmed by phone or letter to the Conference Coordinator (see information at bottom of page). Students registering at the conference are required to show I.D.

Advances in X-ray Analysis on CD-ROM

<input type="checkbox"/> Cumulative Volumes 1–39	\$350	<input type="checkbox"/> Volume 40	\$150	<input type="checkbox"/> Volume 41	\$150
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[☆]See further information regarding **Powder Diffraction** on page 2 of this program

Please check this box if you do not want your name included on the attendee list.

Are you primarily interested in XRD or XRF topics?

XRD XRF Equally interested in both

Please print clearly to avoid errors on name tags and registration list.

Name _____
 Organization _____
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Send registration form and payment to: ICDD, Denise Flaherty, Conference Coordinator,
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◆ E-mail dxc@icdd.com ◆ Phone 610.325.9814 ◆ Fax 610.325.9823

Return by 5 July 2002

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