2008 Denver X-ray Conference Organizing Committee

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Terry Maguire, International Centre for Diffraction Data, Newtown Square, PA
Scott T. Misture, NYS College of Ceramics at Alfred University, Alfred, NY
I. Cev Noyan, Columbia University, New York, NY
Brian Toby, APS—Argonne National Laboratory, Argonne, IL
René Van Grieken, University of Antwerp, Antwerp, Belgium
Mary Ann Zaitz, IBM, Hopewell Junction, NY

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ICRS-8 Program Committee Chairs

Michael Prime, Los Alamos National Laboratory, Los Alamos, NM
Ersan Üstündag, Iowa State University, Ames, IA

Program & On-line Registration

This program and on-line registration are 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.
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Hotel Reservation
Rates are applicable until 8 July 2008 (subject to availability).

The 2008 Denver X-ray Conference (DXC) and the 8th International Conference on Residual Stresses (ICRS) will be held at the Denver Marriott Tech Center Hotel, 4900 S. Syracuse Street, Denver, CO 80237, U.S.A., phone: 1.800.228.9290, or dial direct: 1.888.238.1491, fax: 1.303.740.2523, web site: http://marriott.com/property/propertypage/DENTC.

Attendees are responsible for making their own reservations. Please identify yourself as a Denver X-ray Conference attendee, including those registering for ICRS, when booking your reservation. If registering on-line, please use booking code: dxrdxra. A special conference rate of $125.00 per night plus tax has been contracted for our group. Don’t wait to book your reservation—there are a limited number of rooms available at the special conference rate! Rates are applicable until 8 July 2008 (subject to availability). All reservations must be accompanied by a first night room deposit, or guaranteed with a major credit card.

Student Rooms
There are a limited number of hotel rooms being offered to students at a discounted rate of $65 per night plus tax. Student rooms are shared—each room will be equipped with two double beds to accommodate two persons. Please visit the Denver X-ray Conference web site: www.dxcicdd.com for a Student Room Authorization form. Student identification will be required. Rooms will be booked on a first come, first served basis.

Registration

Two Conferences for the Price of One!
Registration to the DXC includes access to the ICRS program, excluding the ICRS dinner and poster session on Thursday evening.
ICRS registrants will have access to the DXC program, including exhibits, poster sessions, and evening receptions.

On-site Registration
All on-site registrations will be conducted at the Conference Registration Desk, located on the ground floor (level one) of the Denver Marriott Tech Center, near the Evergreen Ballroom. See the hotel layout on page 36 of this Program for the exact location.

Registration Times:
Sunday, 3 August 4:00 p.m.-7:00 p.m.
Monday, 4 August 8:00 a.m.-3:00 p.m.
Tuesday, 5 August 8:00 a.m.-3:00 p.m.
Wednesday, 6 August 8:00 a.m.-2:00 p.m.
Thursday, 7 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 $50 processing fee, if the cancellation is received at least two weeks before the conference (Monday, 21 July 2008). No refunds will be issued for cancellations received after 21 July 2008.

Ground Transportation/Shuttle Service
Exhibit Information
Exhibits will be located in the Rocky Mountain Event Center (formerly the Columbine Ballroom) on the Ground Floor of the hotel. Please see the hotel layout on page 36 of this Program for the exact location.

2008 Denver X-ray Conference Booth Assignments as of April 2008

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Exhibit Hours:
Monday 10:00 a.m.-5:00 p.m.
Tuesday 10:00 a.m.-5:00 p.m.
Wednesday 12:00 p.m.-7:00 p.m.
Thursday 10:00 a.m.-2:00 p.m.

Don’t miss the vendor-sponsored Wine and Cheese Reception
Wednesday Evening 5:00–7:00 p.m.

Special Thanks to our Evening Reception Sponsors:

PANalytical
Chemplex Industries
GE Inspection Technologies
Thermo Scientific

And to our Coffee Break Sponsors:

GE Inspection Technologies
MDI

And to our Media Sponsor:

Materials Today
Spouses are welcome to attend all social functions. Wine & Cheese Receptions and Poster Sessions will be held in the Evergreen Ballroom, unless noted otherwise.

**Sunday**
3 August 6:00–8:00  Welcoming Reception
Sponsored by Thermo Scientific & ICDD

**Monday**
4 August 6:00–8:00  XRD Poster Session and Wine & Cheese Reception
Sponsored by PANalytical

**Tuesday**
5 August 6:00–8:00  XRF Poster Session and Wine & Cheese Reception
Sponsored by Chemplex Industries, Inc. & GE Inspection Technologies

**Wednesday**
6 August 5:00–7:00  Vendor-sponsored Wine & Cheese Reception to be held in the exhibit hall—Rocky Mountain Event Center

**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 Conifer 2 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’ high x 8’ wide 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 & ICRS Book of Abstracts will be available at the Conference Registration Desk.
Advantages of area detectors for texture analysis have been well recognized by many users. Compared to point or line detectors, texture can be measured using area detectors with high sensitivity, high speed and high accuracy. Area detectors can reveal the microstructure and texture information simultaneously. Texture measurement is extremely fast since diffraction intensities and backgrounds for multiple poles and multiple directions can be measured simultaneously. The orientation relationship between different layers of films or coating and substrate can be accurately measured since all diffraction patterns of all layers and substrate are collected with the same sample orientations. This workshop will cover the recent progress in theory, instrumentation, data collection and analysis strategy with area detectors for texture analysis.

**Introduction to Rietveld**

Organizer & Instructors:

**Evergreen “B”**

J.A. Kaduk, INEOS Technologies, Naperville, IL  
J. Faber, Emeritus, ICDD, Newtown Square, PA

The first half of this Workshop will be aimed at beginners to the Rietveld method. We will cover some basic theory, but the main emphasis will be on the actual process of refinement, which parameters to refine, and what the parameters mean. In the second half, the emphasis will be on quantitative phase analysis, the use of chemical information in the refinement and its interpretation, and other topics of interest.

**XRF**

Organizer & Instructors:

**Evergreen “C”**

M. Mantler, Vienna University of Technology, Vienna, Austria  
B. Vrebos, PANalytical, Almelo, The Netherlands  
W.T. Elam, EDAX/University of Washington, Redmond, WA

Part 1 (Morning):  
1. Classical fundamental parameter models and mathematical foundation.  
2. Fundamental parameter models for thin films (introduction).

3. Coherent and incoherent scattering (introduction).  
5. Obtaining net intensities (includes background subtraction, line overlaps).

**Basic XRF**

Organizer & Instructors:

**Evergreen “D”**

W.T. Elam, EDAX/University of Washington, Redmond, WA  
G.J. Havrilla, Los Alamos National Laboratory, Los Alamos, NM

This workshop provides a basic introduction to the principles of XRF, and is specifically aimed at those new to the field. It will consist of a general overview of the technique, followed by more specific details of the basic principles with emphasis on understanding how to use XRF and what its capabilities are. A few particular applications will be presented to provide an understanding of how the basic principles affect actual practice.

**Non-ambient XRD**

Organizer & Instructors:

**Evergreen “A”**

S.T. Misture, NYS College of Ceramics at Alfred University, Alfred, NY  
E.A. Payzant, Oak Ridge National Laboratory, Oak Ridge, TN  
S. Skinner, Imperial College London, London, England  
C. Resch, Anton Paar GmbH, Graz, Austria

Use of high temperature instrumentation for laboratory X-ray, synchrotron, and neutron diffraction systems will be covered in detail. The workshop will focus on high temperature studies under controlled atmosphere, and will include details of instrumentation and calibration, with special emphasis on pitfalls and problems. Finally, some examples of applications and advanced data analysis will be included.

**Combined Use of X-rays and Neutrons**

Organizer & Instructors:

**Evergreen “B”**

A. Hug, J. Hodges, L. Coates, Spallation Neutron Source, Oak Ridge, TN

X-rays and Neutrons are complementary scattering techniques for characterizing structures and dynamics of materials of interest that range from solid state oxides to proteins. Neutron scattering lengths are independent of the atomic number of elements as a result of which neutrons can distinguish between isotopes of the same element and are good at detecting light elements in the presence of heavier elements in families of compounds such as metal oxide, hydrides, etc. In biological samples, one can make use of the substitution of hydrogen with...
deuterium to locate their position. This half-day workshop will be dedicated to understanding the fundamentals of using both X-rays and Neutrons along with specific examples of how to analyze combined sets of X-ray and Neutron data from the same sample.

**XRF**

Quantitative Analysis II Evergreen “C”
Organizer & Instructors:
M. Mantler, Vienna University of Technology, Vienna, Austria
B. Vrebos, PANalytical, Almelo, The Netherlands
W.T. Elam, EDAX/University of Washington, Redmond, WA

Part 2 (Afternoon):
1. Analysis of thin films.
2. Modeling (computing) of inc+coh scattering, polarization.
3. EDS: Detector response function.
4. EDS: Background subtraction.
5. EDS: Artifacts in spectra.

**Energy Dispersive XRF** Evergreen “D”
Organizer & Instructors:
B. Scruggs, EDAX, Inc., Mahwah, NJ
J. Heckel, Spectro Analytical, Kleve, Germany
C. Streli, P. Wobrauschek, Atomstitut— Vienna University of Technology, Vienna, Austria

The Energy Dispersive X-ray Fluorescence (ED-XRF) workshop provides a comprehensive review of XRF spectroscopy for both the beginner and experienced X-ray spectroscopist. Topics to be covered are instrumentation including sources and detectors, and qualitative and quantitative analysis. Applications will be discussed including mobile, online, bulk and micro ED-XRF analyses.

**XRD & XRF**

Cultural Heritage and Conservation Applications I Evergreen “A”
Organizer & Instructors:
K. Trentelman, Getty Conservation Institute, Los Angeles, CA
L. Glinsman, National Gallery of Art, Washington, D.C.
A. Drews, Ford Research & Advanced Engineering, Dearborn, MI
C. McGlinchey, The Museum of Modern Art, New York, NY

This workshop will explore the application of XRF and XRD to the study of cultural heritage materials. Lectures will describe the types of questions about works of art these techniques are used to help answer; the limitations of analyzing works of art, where sampling or even touching the object may not be allowed; the types of instrumentation that have been utilized in this field over the past several decades; and the optimization of portable XRF instruments. In addition, a panel discussion and hands-on session will explore further the issues and challenges involved in the analysis of works of art.

**XRD**

ICRS-8 Workshop on Stress Analysis I Evergreen “B”
Organizers:
I.C. Noyan, Columbia University, New York, NY
M. Prime, Los Alamos National Laboratory, Los Alamos, NM

This workshop will cover stress determination techniques using mechanical and diffraction methods as well as briefly reviewing basics of stress/strain and residual stress. It will be a basic tutorial aimed at engineers starting out to make such measurements, select measurement techniques, or just understand and interpret results. We will cover hole drilling, slitting, contour, layer removal and eigenstress analysis, as well as neutron and X-ray diffraction techniques.

**XRF**

XRF Specimen Preparation I Evergreen “C”
Organizer & Instructors:
J.A. Anzelmo, Anzelmo & Associates, Inc., Madison, WI
D. Broton, CTL Group, Skokie, IL
L. Arias, Bruker AXS, Madison, WI
J. Metz, Sharp and Howells Pty Ltd, Bulleen, Australia

The workshop will begin in the morning with a review of simple ratio method techniques and continue through more advanced internal ratio preparation methods of analysis involving the fusion process (Metz). A discussion of sample preparation physics and a detailed discussion of the fusion method of sample preparation will follow (Anzelmo). The afternoon session will begin with an overview of the sampling process including equipment and techniques starting from the bulk sample through specimen preparation (Broton). This will be followed by a detailed description of liquid analysis techniques and equipment (Arias).

**Trace Analysis** Evergreen “D”
Organizer & Instructors:
P. Wobrauschek, Atomstitut—TU Wien, Vienna, Austria
R. Van Grieken, University of Antwerp, Antwerp, Belgium
G. Havrilla, Los Alamos National Laboratory, Los Alamos, NM

Motivation to analyze samples on their trace element contents are many fold, mostly driven by possible health hazards of some chemical elements, but also while observing changing material characteristics. Trace analysis requires physical and technical efforts to...
improve detection limits in XRF. A variety of approaches are available as modern excitation sources and X-ray optics to improve the beam quality, excitation geometries can be varied from conventional 45 degree incidence to gracing incidence leading to TXRF. Sample preparation techniques like micro spots using nanoliter to picoliter droplets open new interesting fields of applications. Impact and importance on a wide range of materials including environmental and biological systems will be given.

**Tuesday afternoon 2:00 p.m.–5:00 p.m.**

**XRD & XRF**

**Cultural Heritage and Conservation Applications II**

*Organizer & Instructors:*

- K. Trentelman, Getty Conservation Institute, Los Angeles, CA
- L. Glinsman, National Gallery of Art, Washington, D.C.
- A. Drews, Ford Research & Advanced Engineering, Dearborn, MI
- C. McGlinchey, The Museum of Modern Art, New York, NY

For description, please see Cultural Heritage and Conservation Applications I on page 6 of this Program.

**Nanomaterials and Their Applications**

*Organizers & Instructors:*

- R.L. Snyder, Georgia Institute of Technology, Atlanta, GA
- V. Petkov, Central Michigan University, Mt. Pleasant, MI
- Z.L. Wang, Georgia Institute of Technology, Atlanta, GA
- B. Bunker, University of Notre Dame, Notre Dame, IN

This workshop will focus on the synthesis, applications and characterization of nanomaterials. We will begin with a broad survey of their synthesis and unusual properties with a wide survey of their applications. We will then move on to focus on the ways we can characterize these atomic and molecular structured materials.

**XRD**

**ICRS-8 Workshop on Stress Analysis II**

*Evergreen “B”*

*Organizers:*

- I.C. Noyan, Columbia University, New York, NY
- M. Prime, Los Alamos National Laboratory, Los Alamos, NM

For description, please see Stress Analysis I on page 6 of this Program.

**High-throughput X-rays**

*Evergreen “D”*

*Organizers & Instructors:*

- B. Toby, Argonne National Laboratory-APS, Argonne, IL
- K. Chapman, APS—Argonne National Laboratory, Argonne, IL
- B. He, Bruker AXS, Inc., Madison, WI

New powder diffraction methods and instrumentation, particularly at synchrotron X-ray sources, have greatly expanded experimental capabilities. Complete high quality diffraction measurements, with a data range suitable for pair distribution analysis, can be collected in a fraction of a second. The new 11-BM instrument at the APS offers high resolution diffraction patterns, optimal for indexing, structure solution and refinement, which can be collected in less than an hour. This 11-BM instrument will be available to the public for mail-in use—a first for US powder diffraction. The goals of this half-day workshop are to provide an overview to the instrumentation utilized for high-throughput diffraction capabilities and some background on the support infrastructure needed to support high-throughput work. In the case of the 11-BM diffractometer, attendees will learn about how to use this instrument for their own research.

**XRF**

**XRF Specimen Preparation II**

*Evergreen “C”*

*Organizer & Instructors:*

- J.A. Anzelmo, Anzelmo & Associates, Inc., Madison, WI
- D. Broton, CTL Group, Skokie, IL
- L. Arias, Bruker AXS, Madison, WI
- J. Metz, Sharp and Howells Pty Ltd, Bulleen, Australia

For description, please see XRF Specimen Preparation I on page 6 of this Program.
The Monday evening Poster session will be held in conjunction with a Wine and Cheese Reception, sponsored by PANalytical.

Chairs: **T.N. Blanton**, Eastman Kodak Company Research Labs, Rochester, NY  
**J.A. Kaduk**, INEOS Technologies, Naperville, IL

Session chairs will select the three best posters for awards.

**D-3 X-ray Probe Analyses of Complicated Precipitates Formed in Copper-Base Alloys**  
S. Sato, Y. Takahashi, T. Sanada, NISSAN ARC, LTD., Kanagawa, Japan  
K. Shinoda, K. Wagatsuma, S. Suzuki, Tohoku University, Miyagi, Japan

**D-7 State-of-the-Art Multilayer Optics for Diffractometry**  
B. Hasse, C. Michaelsen, A. Oehr, F. Hertlein, S. Kroth, Incoatec GmbH, Geesthacht, Germany

**D-10 Synthesis, Structural and Chemical Characterization of Ca(HO3PCH2)2-N(H)-(CH2)6-N(H)-(CH2PO3H)2·2H2O**  
L. León-Reina, A. Cabeza, R.M.P. Colodrero, M.A.G. Aranda, University of Málaga, Málaga, Spain  
E. Barouda, K.D. Demadis, University of Crete, Crete, Greece

**D-12 Particle Size Analysis of Sub Micron Materials Using Ultra Small Angle X-ray Scattering**  
K. Nagao, T. Konya, R. Matsuo, Y. Iwasaki, Rigaku Corporation, Tokyo, Japan

**D-13 A Study on The Total Evaluation of Pharmaceutical Products Using General Purpose XRD Equipment**  
M. Sasaki, T. Kubo, A. Kishi, Rigaku Corporation, Tokyo, Japan

**D-14 X-ray Diffractometric Determination of Chrysotile Asbestos in Building Materials with Rietveld Refinement**  
T. Asahi, S. Kobayashi, T. Matsuda, K. Nakayama, M. Kitano, T. Nakamura, Meiji University, Kanagawa, Japan

**D-15 Investigation of Co-Crystallized Pharmaceutical Ingredients Using Synchrotron Radiation**  
M. Herrmann, U. Förter-Barth, H. Kröber, P.B. Kempa, M. Juez-Lorenzo, Fraunhofer ICT, Pfinztal, Germany  
S. Doyle, ISS ANKA FZK, Karlsruhe, Germany

**D-21 Usage of Probability Scoring to Sort XRPD Scans of Dying Protein on Similarity**  
T. Degen, PANalytical B.V., Almelo, The Netherlands  
I. Margiolaki, J.P. Wright, European Synchrotron Radiation Facility (ESRF), Grenoble, France

**D-23 Zirconium Oxide: Rietveld and Reverse Monte Carlo Analyses**  
F. Zhang, S. Lun, A. Lui, S.-W. Chan, Columbia University, New York, NY  
P.J. Chupas, P.L. Lee, Argonne National Laboratory, Argonne, IL  
J.C. Hanson, W.A. Caliebe, Brookhaven National Laboratory, Upton, NY

**D-26 Quantitative Determination of Asbestos in Bulk Insulation by XRD**  
D.S. Kendall, R.A. Martinez, US EPA, Denver, Colorado

**D-29 High-Temperature Characterization of Three-Dimensional Distribution of Residual Stresses in CrN Coatings on Steel**  
K.J. Martinschitz, Ch. Kirchlechner, J. Keckes, R. Daniel, Ch. Mitterer, University of Leoben, Leoben, Austria

**D-31 Mechanical Properties of Thin Films Characterized by a Combination of $sin^2 \psi$; and X-ray Diffraction Substrate Techniques**  
K.J. Martinschitz, J. Keckes, University of Leoben, Leoben, Austria

**D-32 X-ray Diffraction Study of Anisotropic State of Residual Stress After Down-Cut and Up-Cut Face Grinding**  
Z. Pala, N. Ganev, Czech Technical University in Prague, Prague, Czech Republic  
J. Drahekoupli, ASCR, Prague, Czech Republic

**D-38 Probing the Micro-Mechanical Behavior of Bone Via High-Energy X-rays**  
J. Almer, Argonne National Laboratory, Argonne, IL  
S. Stock, Northwestern University, Chicago, IL

**D-39 The X-ray Diffraction Characteristics of Different Materials**  
Y. Zhang, J. Liu, X. Xu, Beijing University of Technology, Beijing, China

**D-43 New Analytical Expression of the Threshold Limit of the Mixing Parameter of Pseudo-Voigt Function**  
F. Hadj Larbi, A. Khereddine, D. Bradaï, USTHB, Algiers, Algeria

**D-52 Residual Stresses After CMP on Thin Films**  
W.-E. Fu, Industrial Technology Research Institute, Hsinchu, Taiwan  
M.-K. Chen, C.-C.A. Chen, National Taiwan University of Science and Technology, Taipei, Taiwan
Monday, 4 August, XRD Poster Session
Evergreen Ballroom, 6:00 p.m.–8:00 p.m.

D-59  THE RIETVELD REFINEMENT OF THE RARE EARTH ORTHOBORATES
A. Yilmaz, S. Seyyidoglu, Middle East Technical University, Ankara, Turkey

D-61  AUTOMATED SAXS MEASUREMENTS OF PROTEIN SOLUTIONS WITH A LABORATORY BASED SAXS SYSTEM
M. Kriechbaum, P. Laggner, P. Hermegger, Austrian Academy of Sciences (IBN), Graz, Austria and Hecus X-ray Systems GmbH, Graz, Austria

D-63  QUANTIFICATION OF RETAINED AUSTENITE IN ASTM A743 GRADE CA6NM CAST MARTENSITIC STAINLESS STEEL THROUGH X-RAY DIFFRACTION
J.V. Rojas Marín, A. Toro Betancur, National University of Colombia, Antioquia, Columbia

D-65  A NEW HIGH-THROUGHPUT SAXS SCREENING TOOL
P. Kotnik, H. Schnablegger, Anton Paar GmbH, Graz, Austria
G. Langenbuecher, Anton Paar USA, Ashland, VA

D-68  X-RAY DIFFRACTION AND HIGH PRESSURE STUDIES ON ORGANIC THERMAL ENERGY STORAGE MATERIALS—TRIS (HYDROXYMETHYL AMINOMETHANE (TRIS))
R.S. Chellappa, Carnegie Institution of Washington, Washington, DC
M. Kunz, S. Clark, Lawrence Berkeley National Laboratory, Berkeley, CA

D-70  GRAZING-INCIDENCE DIFFRACTION APPLIED AS A CROSSCUTTING TOOL IN THE NANO BIO REGIME
B.D. Pate, X. Han, The Dow Chemical Company, Midland, MI
D. Keane, Northwestern University, Evanston, IL

D-71  X-RAY DIFFRACTION CHARACTERIZATION OF MOVPE ZnSe FILMS DEPOSITED ON (100) GaAs USING CONVENTIONAL AND HIGH-RESOLUTION DIFFRACTOMETERS
T.N. Blanton, C.L. Barnes, M. Holland, K.B. Kahan, Eastman Kodak Company, Rochester, NY
V. Gupta, F. Bai, Rochester Institute of Technology, Rochester, NY

Tuesday, 5 August, XRF Poster Session
Evergreen Ballroom, 6:00 p.m.–8:00 p.m.

The Tuesday evening Poster session will be held in conjunction with a Wine and Cheese Reception, sponsored by Chemplex Industries, Inc. and GE Inspection Technologies.

Chairs: P. Palmer, San Francisco State University, San Francisco, CA
J. Kawai, Kyoto University, Kyoto, Japan

Session chairs will select the three best posters for awards.

F-45  HIGH-RESOLUTION XRF IN 35-60 KEV:-LANTHANIDES’ K-SPECTRA
M. Mizusawa, K. Sakurai, National Institute For Materials Science, Ibaraki, Japan
Y. Terada, Japan Synchrotron Radiation Research Institute, Spring-8, Hyogo Japan

C-6  THIN FILM TECHNOLOGY FOR PREPARATION OF X-RAY WAVEGUIDE-RESONATORS
E.V. Egrov, V.K. Egrov, IMTRAS, Chemogolovka, Moscow District, Russia
R.E. Ayala-Jiménez, Fisichem Incorporated, Miami, FL
M.S. Afanas’ev, MIREA, Moscow, Russia

C-4  RADIOISOTOPE RH-101 AS X-RAY SOURCE FOR INSTRUMENTS ON SPACE MISSIONS
Ch. Stenzel, Astrium GmbH, Friedrichshafen, Germany
Ch. Schroer, Tu Dresden, Dresden, Germany
B. Lengeler, RWTH Aachen, Germany
R. Vianden, Univ. of Bonn, Germany

F-16  RADIOACTIVE SAMPLE EFFECTS ON EDXRF SPECTRA
C.G. Worley, Los Alamos National Laboratory, Los Alamos, NM
Tuesday, 5 August, XRF Poster Session
Evergreen Ballroom, 6:00 p.m.-8:00 p.m.

F-57 **Tabletop Spectrometer for Grazing Incidence XRF**
N. Zoeger, D. Ingerle, C. Streli, F. Meier, P. Wobrauschek, Atominstitut, Tu Wien, Vienna, Austria
G. Pepponi, Fondazione Bruno Kessler-irst, Povo, Italy

F-56 **Micro X-ray Fluorescence Spectrometer for Light Element Analysis with Low Power Tube Excitation**
S. Smolek, C. Streli, N. Zoeger, P. Wobrauschek, F. Meier, Atominstitut, Tu Wien, Vienna, Austria

F-55 **Grazing-Exit-XRF Experiments at HASYLAB Beamline L**
F. Meier, C. Streli, P. Wobrauschek, N. Zoeger, Atominstitut, Tu Wien, Vienna, Austria
G. Pepponi, Fondazione Bruno Kessler-irst, Povo, Italy

F-54 **Sample Morphology: Influence on Total Reflection X-ray Fluorescence Analysis**
C. Horntrich, F. Meier, C. Streli, P. Kregsamer, N. Zoeger, P. Wobrauschek, Atominstitut, Tu Wien, Vienna, Austria
G. Pepponi, Fondazione Bruno Kessler-irst, Povo, Italy

F-59 **Dosage of Silica in Polymers by X-ray Fluorescence**
P. Ricou, S. Kodjie, X. Shen, Arkema Inc., King of Prussia, PA

F-30 **Development of Soil Standard Materials Containing Hazardous Metals for X-ray Fluorescence Analysis**
Y. Shibata, J. Suyama, M. Kitano, T. Nakamura, Meiji University, Kawasaki, Kanagawa, Japan

K. Nakano, K. Tsuji, Osaka City University, Osaka, Japan

F-22 **Sample Preparation for Total-Reflection X-ray Fluorescence Analysis of Blood Samples**
K. Tsuji, M. Hino, H. Wanihuchi, Osaka City University, Osaka, Japan
H. Kohno, K. Aranami, Y. Shimizu, T. Yamada, Rigaku Industrial Corporation, Osaka, Japan

F-23 **Large Area Silicon Drift Detectors**
A. Pahlke, T. Eggert, S. Pahlke, R. Stoetter, F. Wiest, KETEK GmbH, Munich, Germany

F-17 **Crystalline Phase Analysis and Elemental Analysis of Alkali-Washed Fly Ash and Activated Sludge Ash**
A. Ohbuchi, M. Kitano, T. Nakamura, Meiji University, Kanagawa, Japan

F-58 **X-ray Fluorescence (XRF) Analysis of Hanford Low Activity Waste Simulants: Method Development**
D.M. Missimer, A.R. Jurgensen, R.L. Rutherford, Savannah River National Laboratory, Aiken, SC

F-47 **Analysis of Ores and Concentrates by Using Benchtop WDXRF**
Y. Kataoka, H. Homma, Y. Yamada, H. Kohno, Rigaku Industrial Corporation, Osaka, Japan
H. Inoue, Rigaku Americas Corporation, The Woodlands, TX

C-10 **The Synergy of XRD and XRF in a Shale and Slate Analysis**
L. Fields, M. Martin, Rigaku Americas Corporation, The Woodlands, TX

F-33 **Handheld XRF for Archaeometallurgical Studies: In-Situ Alloy and Metal Analysis of a Private Sword Collection**

F-46 **Applications of Polarized EDXRF System for Light Matrix Samples**
T. Nakamura, T. Moriyama, M. Doi, H. Kohno, Rigaku Industrial Corporation, Osaka, Japan
H. Inoue, Rigaku Americas Corporation, The Woodlands, TX

F-78 **Tissue Elemental Mapping Using HDXRF with Doubly Curved Crystals**
D. Li, Z. Chen, X-ray Optical System, Inc., East Greenbush, NY
A.H. Koeppen, S.C. Michael, V.A. Medical Center, Albany, NY

F-70 **Healthy Pharmaceutical Drugs—Control of Impurities in Active Pharmaceutical Ingredients by EDXRF**
K. Behrens, A. Scothern, H. Ress, Bruker AXS GmbH, Karlsruhe, Germany
A. Seyfarth, Bruker AXS Inc., Madison, WI

F-84 **Evaluation of X-ray Fluorescence Spectrometers for Possible Implementation in a Manufacturing Laboratory—Metals In Alumina**
L.L. Brehm, D.W. Burns, The Dow Chemical Company, Midland, MI
8:30  Chairman of the Denver X-ray Conference, Welcoming Remarks  
      Robert L. Snyder, Georgia Institute of Technology, Atlanta, GA

8:35  Presentation of Awards

2008 Birks Award Presented to Rene Van Grieken, University of Antwerp, Antwerp, Belgium
Presented by: Tim Elam, EDAX/University of Washington, Redmond, WA

2008 Jerome B. Cohen Student Award (Winner announced at the Plenary Session)
Presented by Cev Noyan, Columbia University, New York, NY

2008 McMurdie Award Presented to Jeffrey Dann, OSRAM Sylvania, Towanda, PA
Presented by: Thomas Blanton, Eastman Kodak Company Research Labs, Rochester, NY

8:45  Plenary Session Remarks by the Chairs

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

9:00  S214  Materials State Awareness: Dealing with Uncertainty in Design and Service  
      R.B. Thompson, Iowa State University, Ames, IA

9:45  S191  Dental Stress, Mechanical Not Psychological, Even Some Residual Stress  
      M. Bagby, West Virginia University School of Dentistry, Morgantown, WV

10:30  Break

11:00  S212  Residual Stresses in U.S. Nuclear Power Systems  
       A.A. Csontos, U.S. Nuclear Regulatory Commission, Washington, D.C.

11:45  S190  More Miles for Tired Iron: The Application of Engineered Compressive Residual Stresses in Aging Aircraft  
       M. Shepard, US Air Force Research Laboratory, WPAFB, OH

1:30  D-19  High-Performance Silicon Strip Detector for In-House XRD System  
       T. Taguchi, H. Toraya, M. Kuribayashi, Rigaku Corporation, Tokyo, Japan  
       P. Grybos, R. Szczygiel, P. Maj, AGH University of Science and Technology, Krakow, Poland

1:45  D-6   X-ray Diffractometry with a Microfocus Source  
       B. Hasse, C. Michaelsen, Incoatec GmbH, Geesthacht, Germany  
       U. Preckwinkel, H. Cordes, N. Yang, Bruker AXS Inc., Madison, WI

2:00  D-34  Wavelet Analysis of X-ray Diffraction Signal From Measurements of Stress and Austenite  
       G. Roy, CANMET/MTL, Ottawa, Ontario, Canada

2:15  D-51  New High-Performance Device for Parallel-Beam X-ray Diffractometer Scan  
       H. Toraya, Rigaku Corporation, Tokyo, Japan

2:30  D-25  An Innovative EDXRD Probe  
       C.M. Dozier, N. Anibou, XStream Systems, Inc., Sebastian, FL

2:45  D-66  Detectors for Demanding X-ray Diffraction Experiments  
       K. Knorr, B. Hinrichsen, G. Vanhoyland, Bruker AXS, Karlsruhe, Germany

3:00  F-71  New S2 PICOFIX Benchtop TXRF  
       A. Seyfarth, M. Rider, Bruker AXS Inc., Madison, WI  
       H. Stosnach, A. Gross, Bruker AXS Microanalysis, Berlin, Germany

3:15  Break
3:30 F-53 New Development for the Automation of Borate Fusion Sample Preparation for XRF
L. Bérubé, Corporation Scientifique Claisse, Sainte-Foy, Quebec, Canada

3:45 F-81 High Volume Scrap Material Sorting Using XRF

4:00 F-76 Turn-Key Solutions with Integrated Flexibility From Package to Real Solution
K. Behrens, Bruker AXS GmbH, Karlsruhe, Germany
K. Roscoe, A. Seyfarth, Bruker AXS Inc., Madison, WI

4:15 F-7 Development of a Novel Multi-Element Silicon Drift Detector Array

4:30 F-64 Expanding the Detector Efficiency of Silicon Drift Detectors with Optimized Radiation Entrance Window
A. Niculae, H. Soita, G. Lutz, P. Lechner, A. Bechteler, R. Eckhardt, K. Hermenau, PNSensor GmbH, Munich, Germany
O. Jaritschin, A. Liebel, A. Simsek, PNDetector GmbH, Munich, Germany
G. Schaller, F. Schopper, L. Strüder, MPI Semiconductor Laboratory, Munich, Germany

4:45 F-66 Mg-Based Multilayer XRF Analyzers with Two- and Three-Layers Structure Design
K. Shimizu, Rigaku Industrial Corporation, Osaka, Japan

5:00 C-3 Microfocus Liquid-Metal-Jet X-ray Tubes and Applications
O. Hemberg, M. Otendal, Excillum AB, Stockholm, Sweden
T. Tuohimaa, H.M. Hertz, Royal Institute of Technology, Stockholm, Sweden

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XRD & XRF Analysis of Nanomaterials
Wednesday p.m. Evergreen “B”

Chairs: R.L. Snyder, Georgia Institute of Technology, Atlanta, GA
V. Petkov, Central Michigan University, Mt. Pleasant, MI

2:00 C-17 Invited—Formation of Novel Oxide Nanostructures
Z.L. Wang, Georgia Institute of Technology, Atlanta, GA

2:30 C-18 Pulsed Laser Deposition Technique for the Synthesis of Nanostructures
J.-I. Hong, M. Kirkham, J. Bae, Z.L. Wang, R.L. Snyder, Georgia Institute of Technology, Atlanta, GA

2:50 F-60 Invited—XAFS Studies of Nanosystems: How X-ray, Electron Microscopy, and Optical Techniques Each Contribute to Structural Characterization
B.A. Bunker, University of Notre Dame, Notre Dame, IN

3:20 Break

3:40 C-12 Invited—Hard X-ray Full Field 3D Imaging with sub-50 nm Resolution
A. Tkachuk, M. Feser, F. Duewer, J. Gelb, G. Hsu, S. Wang, W. Yun, Xradia, Inc., Concord, CA

4:10 D-57 Alumina-Supported Palladium Catalyst Crystallite Size Determination by EXAFS, XRD, and TEM

4:30 D-33 Invited—Natural Nanoparticle Shape, Structure, Properties and Reactivity from X-ray Studies
G.A. Waychunas, B. Gilbert, Y.-S. Jun, J.F. Banfield, Lawrence Berkeley National Laboratory, Berkeley, CA
H. Zhang, University of California at Berkeley, Berkeley, CA
C. Kim, Chapman University, Orange, CA

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XRD Thin Films
Wednesday p.m. Evergreen “C”

Chairs: T.N. Blanton, Eastman Kodak Company Research Labs, Rochester, NY
T. Huang, Emeritus, IBM Almaden Research Center, San Jose, CA

2:00 D-60 Invited—Determination of Crystallographic Polarity of Thin Films Using High Resolution XRD
K. Inaba, Rigaku Corporation, Tokyo, Japan

2:30 D-28 Local Residual Stresses and Thermal Fatigue in CrN Coatings on Steel Characterized by High-Temperature Synchrotron X-ray Diffraction
K.J. Martinschitz, Ch. Kirchlechner, R. Daniel, Ch. Mitterer, J. Keckes, University of Leoben, Leoben, Austria
2:50 D-30 A NOVEL DIFFRACTION TECHNIQUE TO DETERMINE MECHANICAL MODULI OF FIBRE-TEXTURED THIN FILMS  
K.J. Martinschitz, J. Keckes, University of Leoben, Leoben, Austria

3:10 F-32 SIMULTANEOUS DETERMINATION OF MAIN, MINOR AND TRACE ELEMENTS IN FERTILIZERS BY TOTAL REFLECTION X-RAY FLUORESCENCE  

3:30 Break

3:50 D-1 INVITED—LONG RANGE SCANS AND MANY-BEAM EFFECTS FOR HIGH-RESOLUTION X-RAY DIFFRACTION FROM MULTILAYERED STRUCTURES  
T.A. Ulyanenkova, T. Baumbach, University Karlsruhe, Karlsruhe, Germany  
A.I. Benediktovich, I. Feranchuk, Belarusian State University, Minsk, Belarus  
A. Ulyanenkov, Bruker AXS GmbH, Karlsruhe, Germany

4:20 D-36 GRAIN GROWTH AND TEXTURE SHARPENING IN COPPER, NICKEL AND PALLADIUM THIN FILMS, INVESTIGATED BY NON-AMBIENT X-RAY DIFFRACTION MEASUREMENTS  
Y. Kuni, M. Wohlschlögel, U. Welzel, E. Mittemeijer, Max Planck Institute for Metals Research, Stuttgart, Germany

4:40 D-9 DETERMINATION OF ACTIVATION ENERGY IN TEXTURED METAL-METAL MULTILAYER FILMS VIA 2D XRD  
M.A. Rodriguez, D.P. Adams, R.G. Tissot, Sandia National Laboratories, Albuquerque, NM

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**XRF Fusion & Industrial Applications of XRF**  
Wednesday p.m. Evergreen “D”  
Chair: J.A. Anzelmo, Anzelmo & Associates, Inc., Madison, WI

1:30 F-34 INVITED—FURTHER STUDIES OF THE BORATE FUSION METHOD OF SAMPLE PREPARATION  
M. Loubser, P.H. van Rooyen, J.P.R. de Villiers, University of Pretoria, Pretoria, South Africa

2:00 F-83 FURTHER STUDIES OF THE BORATE FUSION METHOD OF SAMPLE PREPARATION: THE APPLICATIONS  
M. Loubser, P.H. van Rooyen, J.P.R. de Villiers, University of Pretoria, Pretoria, South Africa

2:20 F-74 IRON ORE ANALYSIS—A NEW APPROACH FOR NEW REQUIREMENTS  
K. Behrens, Bruker AXS GmbH, Karlsruhe, Germany  
A. Seyfarth, Bruker AXS Inc., Madison, WI

2:40 F-9 NEW DEVELOPMENT IN LITHIUM BORATE FUSION FOR FERROALLOYS  
P. Daigle, Corporation Scientifique Claisse, Inc., Ste-Foy, Quebec, Canada

3:00 Break

3:20 F-82 INVITED—APPLICATIONS OF XRF IN THE OIL INDUSTRY  
R.W. Morton, ConocoPhillips, Bartlesville, OK

3:50 F-50 OPTIMIZING THE BALANCE OF QUALITY AND TURNAROUND TIME FOR A PROCESS CONTROL XRF LABORATORY  
S.W. Bowe, Kennecott Utah Copper, Magna, UT

4:10 F-2 FINDING AN ELEMENT TRACER FOR USE IN THE EARLY DETECTION OF 4½ BEARING FAILURE IN J 52P408 ENGINES BY EXRF  
G.R. Humphrey, Joint Oil Analysis Program, Pensacola, FL

4:30 F-44 ANALYSIS OF HEAVY AND LIGHT ELEMENTS BY COMPACT X-RAY FLUORESCENCE SPECTROMETER  
K. Muraoka, Y. Araki, T. Utaka, K. Taniguchi, Institute of X-ray Technologies Co. Ltd, Osaka, Japan

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**XRD & XRF Cultural Heritage I**  
Thursday a.m. Evergreen “A”  
Chair: K. Trentelman, Getty Conservation Institute, Los Angeles, CA

9:00 F-77 INVITED—CONFOCAL X-RAY FLUORESCENCE OF PAINTINGS: DECONSTRUCTING AN ATYPICAL 17TH C. COLLABORATION FROM ANTWERP, ASSESSING A 14TH C. CATALONIAN PANEL, AND IMAGING A LOST N.C. WYETH  
J. Mass, Winterthur Museum, Winterthur, DE  
A. Woll, Cornell High Energy Synchrotron Source, Ithaca, NY  
C. Bisulca, Istituto di Ricerca sulle Onde Elettromagnetiche, Florence, Italy  
M. Cushman, Williamstown Art Conservation Center, Williamstown, MA  
N. Ocon, North Carolina Museum of Art, Raleigh, NC
J. Dik, Technical University of Delft, The Netherlands
K. Janssens, University of Antwerp, Belgium
G. Van der Snickt, University of Antwerp, Belgium
K. Rickers, DESY, Hamburg, Germany
L. Van der Loeff, Kroeller-Mueller Museum, Otterlo, The Netherlands

10:00  C-2  Ancient Warriors and the Origin of Chinese Purple
Z. Liu, Lawrence Berkeley National Laboratory, Berkeley, CA

10:20  Break

10:40  C-1  XRF and XRD Analysis of Converted Lead Pigment on a Georgia O’Keeffe Pastel Drawing
L.B. Brostoff, R.J. Speakman, Museum Conservation Institute, Smithsonian Institution, Suitland, MD
C. Maynor, Smithsonian American Art Museum, Smithsonian Institution, Washington, DC

11:00  F-48  Research in the Identification and Provenancing of 20th Century Photographs
D.C. Stulik, A. Kaplan, Getty Conservation Institute, Los Angeles, CA
D. Miller, California State University at Northridge, Northridge, CA

11:20  F-51  Determination of Strontium Concentrations in Calcium-Based Grounds with XRF & ICP-MS
C. Namowicz, M. Walton, K. Trentelman, Getty Conservation Institute, Los Angeles, CA

11:40  F-68  X-ray Fluorescence of a Medieval Mosan Reliquary of Saint Amandus
J. Giaccai, Walters Art Museum, Baltimore MD

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XRD & XRF  Industrial Applications
Thursday a.m.  Evergreen “B”

9:00  D-37  Invited—X-ray and Thermal Analysis of Cements and Concrete for Evaluation of Cement Additives and Concrete Admixtures

9:30  D-2  Application of 2-Dimensional XRD for the Characterization of Microstructure of Self-Leveling Compounds (SLC)
S. Seifert, J. Neubauer, F. Goetz-Neunhoeffer, University of Erlangen-Nuremberg, Erlangen, Germany
H. Motzet, Schoenexx GmbH, Rosendahl, Germany

9:50  D-4  Quantitative In-Situ X-ray Diffraction Analysis of Early Hydration of Portland Cement at Defined Temperatures
C. Hesse, F. Goetz-Neunhoeffer, J. Neubauer, University of Erlangen-Nuremberg, Erlangen, Germany
M. Braeu, BASF Construction Chemicals, Trostberg, Germany
P. Gaebelien, BASF Construction Chemicals GmbH, Trostberg, Germany
M. Degenklob, PCI GmbH, Augsburg, Germany

10:10  F-1  Analysis of Platinum Group Elements (PGE) by Means of Total Reflection X-ray Fluorescence (TXRF) Spectrometry
H. Stosnach, Bruker AXS Microanalysis GmbH, Berlin, Germany

10:30  Break

J.F. Woltoek, PAAnalytical, Almelo, The Netherlands

11:20  D-41  Residual Stress Analysis of Non-Polar GaN Epilayers by GIXRD
Y.-i. Jang, K.-h. Park, LG Electronics Institute of Technology, Seoul, Korea

11:40  D-16  Study on the X-ray Diffraction Behavior of a Big Crystal Grain in Oriented 3% Silicon Steel
J.F. Fang, Zh.L. Tian, J. Huo, J.Y. Zhang, Y. Zhang, Central Iron and Steel Research Institute, Beijing, P.R. China
XRF  REGULATORY APPLICATIONS
Thursday a.m.  EVERGREEN “C”  
Chair: W.T. Elam, EDAX/University of Washington, Redmond, WA

9:00  F-85  INVITED—SCREENING TOYS AND CONSUMER GOODS WITH HANDHELD XRF
S. Piorek, Thermo NITON Analyzers LLC, Billerica, MA

9:30  F-8  FORENSICS APPLICATIONS OF X-RAY FLUORESCENCE MICROSCOPE
S. Mamedov, J. Goldey, G. Setola, A. Whitley, Horiba Jobin Yvon Inc. Edison, NJ

9:50  F-28  FDA REGULATORY APPLICATIONS OF FIELD PORTABLE EDXRF
R.M. Jacobs, U.S. FDA, Alameda, CA
P.T. Palmer, CA SFU, San Francisco, CA

10:10  F-40  SEARCHING FOR PURE TIN ON ELECTRONIC COMPONENTS: TIN WHISKER PREVENTION
G.J. Havrilla, M. Sweet, Los Alamos National Laboratory, Los Alamos, NM

10:30  Break

11:00  F-72  ROHS COMPLIANCE IN PAINTS AND RESINS
A. Seyfarth, Bruker AXS Inc., Madison, WI
A. Buehler, K. Behrens, Bruker AXS GmbH, Karlsruhe, Germany
J. Sardisco, Analytical Services, The Woodlands, TX

11:20  F-79  CHOOSING XRF FOR ROHS APPLICATIONS
J.R. Bogert, Matrix Metrologies, Holbrook, NY

11:40  F-43  ANALYSIS OF ELEMENTS IN ENVIRONMENTAL SAMPLES BY MICRO-XRF
Y. Araki, Institute of X-ray Technologies Co. Ltd, Osaka, Japan
S. Maeo, M. Krämer, Osaka Electro-Communication University, Osaka, Japan
T. Utaka, K. Taniguchi, Institute of X-ray Technologies Co. Ltd, Osaka, Japan and Osaka Electro-Communication University, Osaka, Japan

2:00  C-8  INVITED—PORTABLE XRD/XRF INSTRUMENTATION FOR THE STUDY OF WORKS OF ART
G. Chiari, Getty Conservation Institute, Los Angeles, CA
P. Sarrazin, inXitu, Inc., Mountain View, CA
M. Gailhanou, Université Paul Cézanne, Marseille, France

2:30  F-25  INVITED—XRF DETECTION OF HEAVY METAL PESTICIDES IN ARCHAEOLOGICAL AND ANTHROPOLOGICAL ARTIFACTS
A.N. Shugar, Art Conservation Dept., Buffalo State College, Buffalo, NY

3:00  F-52  ON THE USE OF HANDHELD XRF FOR DETERMINATION OF ARSENIC AND MERCURY IN A MUSEUM COLLECTION
K. Cross, P.T. Palmer, San Francisco State University, San Francisco, CA

3:20  Break

3:40  F-49  ISSUES, TRANSITIONS AND COLLABORATIONS ASSOCIATED WITH USE OF HAND-HELD XRF IN NATURAL HISTORY MUSEUMS
C. Podsiki, The Field Museum, Chicago, IL

4:00  D-47  CULTURAL HERITAGE STUDIES WITH HIGH-ENERGY X-RAYS AT THE APS 1-ID BEAMLINE
D.R. Haefner, J.D. Almer, Argonne National Laboratory, Argonne, IL
F. Casadio, Art Institute of Chicago, Chicago, IL
D.C. Dunand, Northwestern University, Evanston, IL
B.D. Newbury, ExxonMobil Development Company, Houston, TX
M.L. Young, Ruhr-Universität, Bochum, Germany

4:20  F-6  THE YIN AND YAN OF XRF ANALYSIS AS A TOOL IN THE INVESTIGATION OF CULTURAL HERITAGE WORKS
B.J. Kaiser, Bruker AXS, Kennewick, WA

4:40  F-61  SANDRA: A PORTABLE XRF SYSTEM FOR NON DESTRUCTIVE STUDIES OF MEXICAN CULTURAL HERITAGE
J.L. Ruvalcaba Sil, Universidad Nacional Autónoma de México, Mexico DF, Mexico
1:30 C-13  INVITED—TIME RESOLVED X-RAY FULL-FIELD MICRO-IMAGING OF TRANSIENT FLUID DYNAMICS  
K. Fezzaa, APS—Argonne National Laboratory, Argonne, IL

2:00 F-12  INVITED—A HIGH RESOLUTION HARD X-RAY BIOIMAGING FACILITY AT SSRL  
P. Pianetta, J. Andrews, S. Brennan, SLAC, Menlo Park, CA  
E. Almeida, NASA Ames Research Center, Moffett Field, CA  
M. van der Meulen, Cornell University, Ithaca, NY  
A. Tkachuk, J. Gelb, J. Rudati, M. Feser, W. Yun, Xradia, Concord, CA

2:30 C-19  3-D TOMOGRAPHIC STUDIES OF ANNEALED NANOPOROUS GOLD USING TRANSMISSION X-RAY MICROSCOPE (TXM) AT ADVANCED PHOTON SOURCE  
Y.-c. Chen, Q. Shen, Northwestern University, Evanston, IL and Argonne National Laboratory, Argonne, IL  
Y. Chu, J. Yi, Argonne National Laboratory, Argonne, IL  
M. Cox, D.C. Dunand, Northwestern University, Evanston, IL

2:50 D-58  NANOSTRUCTURE ANALYSIS OF METALLIC MATERIALS BY COHERENT X-RAY DIFFRACTION MICROSCOPY  
Y. Takahashi, H. Furukawa, H. Kubo, K. Yamauchi, Osaka University, Osaka, Japan  
Y. Nishino, T. Ishikawa, RIKEN Spring-8 Center, Hyogo, Japan  
E. Matsubara, Kyoto University, Kyoto, Japan

3:30 C-9  INVITED—REALTIME XRF AND XRD IMAGING—THE INSTRUMENTATION AND THE APPLICATIONS  
K. Sakurai, National Institute for Materials Science, Ibaraki, Japan

4:00 F-39  A TOP-DOWN APPROACH USING X-RAY IMAGING TECHNIQUES: INSTRUMENTAL DEVELOPMENTS AND APPLICATIONS IN LIFE SCIENCE  
S. Bohic, European Synchrotron Radiation Facility, Grenoble, France  
K. Rickers, G. Falkenberg, Hamburger Synchrotronstrahlungslabor at DESY/PETRA III, Hamburg, Germany

4:20 F-38  APPLICATIONS OF CONFOCAL MICRO X-RAY FLUORESCENCE 3-DIMENSIONAL ELEMENTAL IMAGING  
B.M. Patterson, Los Alamos National Laboratory, Los Alamos, NM

4:40  TITLE TO BE ANNOUNCED  
K. Janssens, University of Antwerp, Antwerp, Belgium

2:00 D-35  INVITED—IN-SITU CHARACTERISATION OF NOVEL FUEL CELL MATERIALS  
S.J. Skinner, Imperial College London, London, UK

2:30 D-11  IN-SITU XRD ANALYSIS OF THE GROWTH OF ZnO NANOWIRES  
M. Kirkham, Z.L. Wang, R.L. Snyder, Georgia Institute of Technology, Atlanta, GA

2:50 D-17  KINETICS OF PARTICLE GROWTH FOR SUPPORTED Pt AND Pt/Pd DETERMINED USING HTXRD  
A.R. Drews, R.J. Kudla, Ford Research and Advanced Engineering, Dearborn, MI
3:10 D-54  **In Situ Heating Studies on the Internal Stresses of Multilayer Environmental Barrier Coatings**  
**B.J. Harder, K.T. Faber**, Northwestern University, Evanston, IL  
**J. Almer**, Advanced Photon Source, Argonne, IL  
**K.N. Lee**, Rolls Royce Corporation, Indianapolis, IN

3:30  **Break**

3:50 D-48  **Novel Processing of Nickel Containing Cordierite Glass-Ceramics for Microporous Gas Separation Membranes**  
**M.E. Miller, S.T. Misture**, Alfred University, Alfred, NY

4:10 D-44  **Study of Combustion Syntheses by Time-Resolved X-ray Diffraction: Comparison of Synthesis Mechanisms for Different Combustion Modes**  
**C. Curfs, J. Wright, G.B.M. Vaughan**, ESRF, Grenoble, France  
**H. Boutefnouchet**, Badji Mokhtar University, Annaba, Algeria

4:30 D-55  **Nanoscale Photocatalysts Derived from Layered Phases: Formation and Characterization**  
**E.J. Nichols, S.T. Misture**, Alfred University, Alfred, NY

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**XRF Trace Analysis**  
**Thursday p.m. Evergreen “D”**  

Chair: **M.A. Zaitz**, IBM, Hopewell Junction, NY

2:00 F-67  **Invited—High-Definition X-ray Fluorescence: Principles and Applications**  
**W.M. Gibson**, D. Li, H. Huang, Z. Chen, X-ray Optical Systems, Inc., East Greenbush, NY

2:30 F-5  **MCiLS Approach to EDXRF Analysis on XOS Devices**  
**R.P. Gardner**, F. Li, NC State University, Raleigh, NC  
Z. Chen, M. Cusack, X-ray Optical Systems, Inc., East Greenbush, NY

2:50 F-18  **Preconcentration of the Environmental Water by Agar for XRF Analysis**  
**K. Nakano, K. Okubo, K. Tsuji**, Osaka City University, Osaka, Japan

3:10 F-31  **Heavy Metal Analysis of Water Samples Down to Sub-ppb Level by Using X-ray Fluorescence Analysis Combined with the Concentration Techniques**  
**S. Hayakawa, M. Iwaki, Y. Nishimoto, K. Yamane, T. Hirokawa**, Hiroshima University, Hiroshima, Japan

3:30  **Break**

3:50 F-35  **Automated Picoliter Solution Deposition for TXRF Analysis of Semiconductor Samples**  
**C.M. Sparks**, ATDF, Austin, TX  
**U. Fittschen, G. Havrilla**, Los Alamos National Laboratory, Los Alamos, NM

4:10 F-37  **Picoliter Deposition for MXRF Calibration and Quantification Using Prototype Thermal Inkjet Technology**  
**U. Fittschen, G.J. Havrilla**, Los Alamos National Laboratory, Los Alamos, NM

4:30 F-63  **Synchrotron XRF Analyses of Element Distribution in Fossilized Sauropod Dinosaur Bones**  
**A.R. Pyzalla, M. Dumont**, Max-Planck-Institut fuer Eisenforschung GmbH, Duesseldorf, Germany  
**N. Zoeger, C. Streli, P. Wobrauschek**, Atomic Institute of the Austrian Universities, Wien, Austria  
**M. Sander**, University of Bonn, Bonn, Germany

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**XRD & XRF Microbeam X-ray Analysis II**  
**Friday a.m. Evergreen “A”**  

Chairs: **K. Tsuji**, Osaka City University, Osaka, Japan  
**G.J. Havrilla**, Los Alamos National Laboratory, Los Alamos, NM

8:30 C-11  **Invited—Using Focused Hard X-rays for Investigations Related to Nuclear Waste Disposal**  
**M.A. Denecke**, Institut für Nukleare Entsorgung, Karlsruhe, Germany

9:00 D-40  **Nanodiffraction From Perfect/Weakly-Deformed Single Crystals**  
**H. Yan**, Brookhaven National Laboratory, Upton, NY  
**O. Kalenci, C. Noyan**, Columbia University, New York, NY  
**C. Murray**, IBM TJ Watson Research Center, Yorktown Heights, NY  
**J. Maser**, Argonne National Laboratory, Argonne, IL

9:20 D-27  **Bifocal Miniature Toroidal X-ray Mirrors**  
**S. Comaby, D. Smilgies, D. Bilderback**, CHESS, Ithaca, NY
9:40  F-20  APPLICATIONS OF POLYCAPILLARY OPTICS TO MICRO AND TWO DIMENSIONAL XRF ANALYSIS
K. Tsuji, A. Matsuda, Osaka City University, Osaka, Japan
K. Nakano, Osaka City University, Osaka, Japan and JST Innovation Plaza Osaka, Osaka, Japan
S. Komatani, S. Ohzawa, H. Uchihara, Horiba. Ltd., Kyoto, Japan

10:00  Break

10:20  C-7  INVITED—LATEST DEVELOPMENTS OF ADVANCED X-RAY OPTICS AND THEIR APPLICATIONS IN X-RAY MICROANALYSIS
N. Gao, Z. Chen, L. Ponomarev, Y. He, W.M. Gibson, X-ray Optical Systems, Inc., East Greenbush, NY

10:50  F-24  STUDY OF MICROTHERMOCENTEREITY USING μ XRF, INAA, AND CHEMOMETRIC METHODS
J. L. Miley, J. R. Sieber, R. Zeisler, National Institute of Standards and Technology, Gaithersburg, MD

11:10  D-5  ANALYSIS OF SHEAR STRESS DISTRIBUTION IN AL (Cu) INTERconnects INDUCED BY ELECTROMIGRATION BASED ON SCHMIDT’S LAW AND STUDIED BY SYNCHROTRON POLYCHROMATIC X-RAY MICRODIFFRACTION
K. Chen, K. N. Tu, UCLA, CA
N. Tamura, B. C. Valek, Lawrence Berkeley National Laboratory, Berkeley, CA

11:30  F-42  QUANTITATIVE ANALYSIS OF NANO-PARTICLE BY XRF
T. Utaka, N. Kawada, K. Taniguchi, Institute of X-ray Technologies Co. Ltd, Osaka, Japan and Osaka Electron-Communication University, Osaka, Japan
S. Maeo, M. Kurakado, Osaka Electron-Communication University, Osaka, Japan
Y. Araki, K. Muraoka, T. Itoh, Institute of X-ray Technologies Co. Ltd, Osaka, Japan

XRD  SMALL ANGLE SCATTERING
Friday a.m.  EVERGREEN “B”  
Chair: J. Ilavsky, APS – Argonne National Laboratory, Argonne, IL

8:30  C-20  INVITED—STRUCTURE AND KINETICS OF SELF-ASSEMBLED NANOCRYSTAL SYSTEMS PROBED BY SMALL ANGLE X-RAY SCATTERING TECHNIQUES
X.-M. Lin, J. Wang, Argonne National Laboratory, Argonne, IL

9:00  D-49  INVITED—FLEXIBILITY AND HIGH THROUGHPUT: SUPPORTING SAXS USERS AT A JOINT INDUSTRIAL ACADEMIC BEAMLINE
S. Weigand, B. Stillwell, D. T. Keane, Northwestern University, Evanston, IL
W. E. Guise, E. I. DuPont de Nemours & Co., Wilmington, DE
J. P. G. Quintana, Argonne National Laboratory, Argonne, IL

9:30  D-65  A NEW HIGH-THROUGHPUT SAXS SCREENING TOOL
P. Kotnik, H. Schnablegger, Anton Paar GmbH, Graz, Austria
G. Langenbucher, Anton Paar USA, Ashland, VA

9:50  D-69  ULTRA-SMALL-ANGLE X-RAY SCATTERING (USAXS) IMAGING, CONTRAST MECHANISM AND APPLICATIONS
F. Zhang, G. G. Long, J. Ilavsky, P. R. Jemian, APS—Argonne National Laboratory, Argonne, IL
L. E. Levine, National Institute of Standards and Technology, Gaithersburg, MD

10:10  Break

10:30  D-53  INVITED—ADDRESSING CHALLENGES IN MATERIALS ENGINEERING AND BIOTECHNOLOGY THROUGH COMBINED SAXS AND SANS MEASUREMENTS
A. J. Allen, NIST, Gaithersburg, MD

11:00  D-56  INVITED—CHARACTERIZATION OF NANOMATERIALS FOR LASER FUSION TARGETS
T. van Buuren, T. Willey, S. Kucheyev, C. Saw, T. Baumann, A. Hamza, Lawrence Livermore National Laboratory, Livermore, CA
J. Ilavsky, APS—Argonne National Laboratory, Argonne, IL
A. Nikroo, General Atomics Co., San Diego, CA

11:30  D-18  QUANTITATIVE MEASUREMENT OF NANOPIRICLE HALO FORMATION AROUND COLOIDAL MICROSpheres IN BINARY MIXTURES USING SMALL-ANGLE X-RAY SCATTERING
J. Ilavsky, F. Zhang, G. G. Long, P. R. Jemian, APS—Argonne National Laboratory, Argonne, IL
V. T. Milam, Georgia Institute of Technology, Atlanta, GA
J. A. Lewis, University of Illinois at Urbana-Champaign, Urbana, IL

18
8:30 F-11 INVITED—GENERATING RELIABLE QUALITATIVE AND QUANTITATIVE XRF RESULTS TO SUPPORT FDA LAB AND FIELD INVESTIGATIONS
P.T. Palmer, P. Baker, K. Cross, San Francisco State University, San Francisco, CA
R. Jacobs, San Francisco District Laboratory, FDA, Alameda, CA

9:00 F-62 XRF BY SIMULTANEOUS USE OF K- AND L-LINES OF AN ELEMENT
M. Mantler, Technische Universitaet Wien, Vienna, Austria
B. Beckhoff, Physikalisch Technische Bundesanstalt, Berlin, Germany

9:20 F-80 BENEFITS OF IMPROVED RESOLUTION FOR EDXRF
R. Redus, T. Pantazis, J. Pantazis, A. Huber, Amptek, Inc. Bedford, MA
B. Cross, CrossRoads Scientific, El Granada, CA

9:40 F-41 $\alpha/L_\beta$ INTENSITY RATIO DEPENDS ON THE SPECTROMETER RESOLUTION
J. Kawai, R. Shioi, N. Sasaki, K. Okada, G. Kinugawa, S. Kunimura, T. Yamamoto, Kyoto University, Kyoto, Japan

10:00 BREAK

10:20 F-4 ELEMENTAL ANALYSIS OF POLYOFELINS BY X-RAY FLUORESCENCE USING CHARACTERIZED POLYMER STANDARDS
D.W. Burns, T.L. Lewis, T. Bradley, Dow Chemical, Freeport, TX
T. Hasan, W. Rigot, Dow Chemical, Midland, MI
F. Franklin, Dow Chemical, Houston, TX

10:40 F-15 IMPROVING TRACE ELEMENT DETECTION IN EDXRF BY REDUCING PILEUP ARTIFACTS

11:00 F-26 PRECONCENTRATION, QUANTITATION, AND SPECIATION OF SUB-PPM LEVELS OF ARSENIC (III) AND (V) IN WATER VIA HAND-HELD XRF
P.E. Baker, R. Johnson, P.T. Palmer, San Francisco State University, San Francisco, CA
R.R. Jacobs, San Francisco District Laboratory, FDA, Alameda, CA
ICRS Workshop on Stress Analysis
Tuesday, 5 August
9:00 a.m.–5:00 p.m.
See description on page 6 of this Program.

Thursday, 7 August, ICRS-8 Poster Session & Dinner
Evergreen Ballroom, 6:00 p.m.-9:00 p.m.
S72 Detailed Profiling of Residual Stress in a Cold Expanded Hole
D.J. Hughes, Institut Laue Langevin, Grenoble, France

S73 Plastic Strain Mapping by Peak Broadening Analysis in Titanium

S76 Cyclic Variation of Residual Stress Induced by Machining
J. Outeiro, Portuguese Catholic University, Lisbon, Portugal
J. Pina, University of Coimbra, Coimbra, Portugal
J. Kornmeier, Hahn-Meitner-Institut (HMI), Berlin, Germany
M. Hofmann, TU München, Garching, Germany

S92 Residual Stress Analysis in Thick HVOF Inconel 718 Coatings for Future Repair Applications
A. Manescu, Universita Politecnica delle Marche, Ancona, Italy
C. Lyphout, University West, Trollhattan, Sweden

S93 Micro Area X-ray Residual Stress Measurement Using Multilayer Mirror Optics
K. Sasaki, Y. Hirose, R. Monzen, A. Hosokawa, T. Sasaki, Kanazawa University, Kanazawa, Japan

S95 Genetic Algorithms Used for Optimisation of Elastic Properties
J. Tarasiuk, K. Wierzbowski, AGH University of Science and Technology, Kraków, Poland
A. Lodini, Université de Reims Champagne Ardenne, Reims, France

S97 Corrections in X-ray Grazing Incidence Technique Used for Stress Measurement
S. Wronski, K. Wierzbowski, A. Baczmanski, AGH University of Science and Technology, Kraków, Poland
A. Lodini, LACM, Université de Reims Champagne Ardenne, Reims, France

S98 Relaxation of Residual Stresses in Thin Films Investigated Using Synchrotron Radiation
T. Matsue, Niihama National College of Technology, Niihama, Japan
T. Hanabusa, K. Kusaka, Tokushima University, Tokushima, Japan
O. Sakata, Japan Synchrotron Radiation Research Institute/SPring-8, Hyogo, Japan

S101 Residual Stress Evaluation of Railway Rails
S. Takahashi, T. Sasaki, Y. Hirose, Kanazawa University, Kanazawa, Japan
F. Aoki, East Japan Railway Company, Saitama, Japan

S108 Multiaxial Stress Analysis with Area Detector Type Diffraction Method
T. Sasaki, S. Takahashi, K. Sasaki, Y. Hirose, Kanazawa University, Kanazawa, Japan
Y. Kobayashi, Hitachi, Ltd., Kawasaki, Japan

S110 Residual Stress Evaluation of the Surface of Railway Rails with Synchrotron Radiation
T. Sasaki, Y. Miyazawa, S. Takahashi, R. Matsuyama, Y. Hirose, Kanazawa University, Kanazawa, Japan

S111 Non-Destructive Hardness Testing of Steel Materials Using X-ray Diffraction
S. Takago, K. Funaki, H. Yasui, K. Fujii, Industrial Research Institute of Ishikawa, Kanazawa, Japan
T. Sasaki, Y. Hirose, Kanazawa University, Kanazawa, Japan

S112 Effect of the Bottom-Hole Fillet Radius on the Residual Stress Analysis by the Hole Drilling Method
M. Scafidi, B. Zuccarello, Università degli Studi di Palermo, Palermo, Italy
E. Valentini, SINT Technology s.r.l. - Calenzano, Firenze, Italia

S115 Welding Residual Stress of Austenitic Stainless Steel and its Measurement by Hole-Drilling Method
L. Rongfeng, Wuhan Iron and Steel Corporation, Hubei, China

S123 X-ray In-Situ Residual Stress Measurement of Fiber Reinforced Plastic Composite
Y. Watanabe, M. Nishida, Kobe City College of Technology, Kobe, Hyogo, Japan

S128 HRXRD Strain Analysis on DRIE Etched Silicon
A. Neels, IMT-UniNE / CSEM, Neuchâtel, Switzerland
A. Dommann, CSEM, Neuchâtel, Switzerland
A. Schifferle, O. Papes, E. Mazza, ETHZ, IMES, Zürich, Switzerland

S129 STRAINEET: Stress and Texture Analysis Standardising Interfaces
R.C. Wimpory, R. Schneider, Hahn-Meitner-Institut (HMI), Berlin, Germany
A.G. Youtsos, NCSR Demokritos, Athens, Greece
O. Kirstein, Bragg Institute, ANSTO, Australia
M. Hofmann, TU München, Garching, Germany
C. Ohms, European Commission, Joint Research Centre, Petten, The Netherlands
H.G. Brokmeier, TU Clausthal, Clausthal Zellerfeld, Germany and GKSS-Forschungszentrum Geesthacht GmbH, Geesthacht, Germany

S135 Neutron Diffraction Stress Analysis of Near Surface Stress Gradients of Surface Treated Steel Samples
J. Gibmeier, J. Kornmeier, Hahn-Meitner-Institute, Berlin, Germany
M. Hofmann, TU München, Garching, Germany
S137 Evidence and Analysis of Thermal Static Strain Aging in the Deformed Surface Zone of Finish-Machined Hardened Steel
J. Gegner, L. Schlier, W. Nierlich, SKF GmbH, Schweinfurt, Germany

S139 In-Situ Investigation of Grain Rotations During Tensile Straining of Steel Wires
M. Moscicki, H. Pinto, A. Borbély, A.R. Pyzalla, Max-Planck-Institut fuer Eisenforschung GmbH, Duesseldorf, Germany

S143 Residual Stress Fields of Aeronautical Materials Caused by Mechanical Surface Treatments
X.-R. Wu, F. Lu, Beijing Institute of Aeronautical Materials, Beijing, China

S145 Surface Residual Stresses in Dry Turning of 0.45% C Steel
T. Leppert, University of Technology and Life Sciences, Bydgoszcz, Poland
R.L. Peng, Linköping University, Linköping, Sweden

S147 Usability of a Standard Sample of Sinter Glass Disc
V. Novosel-Radović, F. Šafar, K. Dužić, Sisak Tube Mill Ltd, Sisak, Croatia
N. Radović, University of Zagreb, Zagreb, Croatia

S149 Analysis of Shear Stress Distribution in Al (Cu) Interconnects Induced by Electromigration Based on Schmidt’s Law and Studied by Synchrotron Polychromatic X-ray Microdiffraction
K. Chen, K.N. Tu, UCLA, CA
N. Tamura, B.C. Valek, ALS—Lawrence Berkeley National Laboratory, Berkeley, CA

S150 Measuring Residual Stresses in Stainless Steel Using XRD—Recent Experiences within a VAMAS Inter-Comparison Excercise
A.T. Fry, J.D. Lord, NPL, Teddington, Middlesex, UK

S159 Residual Stresses in Brush-Plated Gold Coating
H. Lille, J. Kõo, A. Ryabchikov, Estonian University of Life Sciences, Tartu, Estonia
R. Laaneots, Tallinn University of Technology, Tallinn, Estonia

S165 Phase Composition and Internal Stress Development During the Oxidation of Iron Aluminides
P. Brito, H. Pinto, A.R. Pyzalla, Max-Planck-Institut für Eisenforschung GmbH, Düsseldorf, Germany
M. Spiegel, Saizgitter Mannesmann Forschung GmbH, Düsseldorf, Germany
M. Klaus, Ch. Genzel, Hahn-Meitner Institut Berlin (c/o BESSY), Germany

S171 Microscopic Load-Sharing in a Duplex Stainless Steel and the Influence of Phase Properties
R. Lin Peng, S. Johansson, Linköping University, Linköping, Sweden
G.C. Chai, Sandvik Materials Technology, Sweden
A. Elleman, T. Manns, University of Kassel, Germany

S178 The Basic Relationship Between Residual Stress Profile Patterns and Fatigue Life of Precision Machined Surfaces in Rolling Contact
Y.B. Guo, A.W. Warren, The University of Alabama, Tuscaloosa, AL

S179 Finite Element Modeling of Residual Stress Profile Patterns in Hard Turning
Y.B. Guo, The University of Alabama, Tuscaloosa, AL

S182 Layer Growing/Removing Method for Determination of Residual Stresses in Orthotropic Non-Homogeneous Cylinders
J. Kõo, J. Valgu, Estonian University of Life Sciences, Tartu, Estonia

S183 Microstructure and Residual Stresses of High-Strength Steel to Aluminium Alloy Friction Stir Welds
R.S. Coelho, A. Kostka, H. Pinto, A. Pyzalla, Max-Planck-Institut für Eisenforschung GmbH, Düsseldorf, Germany
J. dos Santos, GKSS Forschungszentrum Geesthacht GmbH, Geesthacht, Germany

S184 The New Engineering Neutron Diffraction Instrument at HFIR and Its Application to Studies of the Behavior of Structural Materials
C.R. Hubbard, W.B. Bailey, K. An, J. Schmidlin, Oak Ridge National Laboratory, Oak Ridge, TN

S193 Simulation of the Effect of Shear Stresses on the Measured Stresses Inside 50 mm ID Pipes
M. Belassel, J. Pineault, Proto Mfg. Ltd., Oldcastle, Ontario, Canada
M. Brauss, Proto Mfg. Inc., Ypsilanti, MI

S195 VULCAN—The Diffractometer at the SNS for Engineering Mechanics
K. An, X.-L. Wang, A.D. Stoica, C.R. Hubbard, Oak Ridge National Laboratory, Oak Ridge, TN
T.M. Holden, Northern Stress Technology, Deep River, Ontario, Canada
P.K. Liaw, H. Choo, The University of Tennessee, Knoxville, TN
ICRS-8  Diffraction Techniques: Synchrotrons—Macrobeam and High Energy I
Wednesday p.m. Pikes Peak

Chairs: J. Almer, Argonne National Laboratory, Argonne, IL
M. Daymond, Queen’s University, Kingston, Ontario, Canada

1:30 S 140 Invited—In-Situ Synchrotron X-ray Tomography Studies of Creep Void Evolution in Brass Alloys and Steels
A.R. Pyzalla, Max-Planck-Institut fuer Eisenforschung GmbH, Dueseldorf, Germany
T. Buslaps, ESRF, Grenoble, France

2:00 S 37 Study of Computerized Tomography and Strain Mapping in the Vicinity of Crack Tip in Steel Material Using Synchrotron White X-ray
J. Shibano, Kitami Institute of Technology, Kitami, Hokkaido, Japan
K. Kajiwara, Kitami Institute of Technology, Kitami, Hokkaido, Japan
K. Suzuki, Niigata University, Niigata, Japan

2:20 S 109 Simultaneous Measurement of Imaging and Strain of Fatigue Crack in Steel Bars Using High-Energy Synchrotron Radiation
T. Shobu, Japan Atomic Energy Agency, Sayo-gun, Hyogo, Japan
K. Tanaka, Meijo University, Nagaoka-shi, Aichi, Japan

2:40 S 39 Characterization of a New Bone Reconstructed at the Interfaces with Implants
A. Benmarouane, UFR Sciences Exactes et Naturelles, LACM, Reims, France
T. Buslaps, ESRF, Grenoble, France
T. Hansen, ILL, Grenoble, France

3:00 BREAK

3:30 S 14 Invited—Measuring Strain in Amorphous Solids by High-Energy X-ray Scattering
T.C. Hufnagel, Johns Hopkins University, Baltimore, MD

4:00 S 28 Elastic-Plastic Deformation of a Polycrystalline Titanium Alloy Studied In Situ by Energy-Dispersive Synchrotron X-ray Diffraction
S.Y. Zhang, University of Oxford, Oxford, United Kingdom

4:20 S 80 Residual Stress Determination in Surface Treated Alumina Samples Applying Beam Limiting Masks
T. Manns, H. Rothkirch, HASYLAB at DESY, Hamburg, Germany

4:40 S 30 The Bauschinger Effect in Nanofilamentary Cu/Nb Wires Evidenced By In-Situ Tensile Tests Under Synchrotron Radiation
L. Thilly, University of Poitiers, PHYMAT, Futuroscope, France
S. Van Petegem, Paul Scherrer Institute, Villigen, Switzerland
F. Lecouturier, LNCMP, Toulouse, France
1:30 S66 INVITED—RESIDUAL STRESSES IN FRICTION STIR WELDING: NUMERICAL SIMULATION AND EXPERIMENTAL VERIFICATION
G. Buffa, L. Fratini, S. Pasta, University of Palermo, Italy

2:00 S53 INFLUENCE OF THE WELDING SEQUENCE ON RESIDUAL STRESSES IN LASER WELDED T-JOINTS OF ALUMINIUM ALLOYS
P. Staron, F.S. Bayraktar, W. Machold, S. Riekehr, M. Koçak, A. Schreyer, GKSS Research Center, Geesthacht, Germany

2:20 S55 THE INFLUENCE OF ANNEALING ON RESIDUAL STRESSES AT WELD STOP/START POSITIONS
S.K. Bate, I. Symington, Serco Technical & Assurance Services, Warrington, UK
P. Hurrell, Rolls-Royce Plc, Derby, UK
J.A. Francis, M. Turski, University of Manchester, UK

2:40 S56 FINITE ELEMENT ANALYSIS AND NEUTRON DIFFRACTION EVALUATION OF RESIDUAL STRESS IN STELLITE COATING BY PTA PROCESS
A. Nady, A. Benmarouane, H. Bonnefoy, A. Lodini, UFR Sciences Exactes et Naturelles, LACM, Reims, France
V. KloseK, M.H. Mathon, Laboratoire Léon Brillouin, CEA Saclay, Gif sur Yvette, France

3:00 BREAK

3:30 S185 INVITED—USING FINITE ELEMENT ANALYSIS AND SYNCHROTRON X-RAY DIFFRACTION TO UNDERSTAND STRESS DISTRIBUTIONS IN DEFORMING POLYCRYSTALS
M.P. Miller, J.-S. Park, P.R. Dawson, Cornell University, Ithaca, NY
T.-S. Han, Yonsei University, Seoul, Korea

4:00 S87 MODELING THE RELAXATION DUE TO TWINNING IN AN HCP ZIRCONIUM ALLOY
M.R. Daymond, R.Y. Zhang, F. Xu, R.A. Holt, Queen’s University, Kingston, Ontario, Canada

4:20 S116 MODELING AND MEASUREMENT OF RESIDUAL MACRO AND LATTICE STRAINS DURING FOUR-POINT BENDING OF ZIRCALOY-2
F. Xu, R.A. Holt, M.R. Daymond, Queen’s University, Kingston, Ontario, Canada
R.B. Rogge, National Research Council, Chalk River Laboratories, Chalk River, Ontario, Canada

4:40 S216 INVERSE ANALYSIS OF ENGINEERING NEUTRON DIFFRACTION DATA
S.-Y. Lee, B. Denizer, Y. Kim, H. Ceylan, E. Üstündag, Iowa State University, Ames, IA

1:30 S79 INVITED—INDUSTRIAL CHALLENGES FOR RESIDUAL STRESS XRD APPLICATIONS
A. Haase, R. Stabenow, A. Schafmeister, GE Inspection Technologies, Ahrensburg, Germany

2:00 S16 X-RAY STRESS MEASUREMENT OF NICKEL-BASE SINGLE CRYSTAL SUPERALLOY USING TWO-DIMENSIONAL DETECTOR
K. Tanaka, Meijo University, Nagoya, Japan
S. Machiya, Daido Institute of Technology, Japan
Y. Akiwaiwa, Nagoya University, Nagoya, Japan

2:20 S40 ANALYSIS OF RESIDUAL STRESS IN POLYCRYSTALLINE COATINGS – FROM SCIENTIFIC TECHNIQUE TO INDUSTRIAL METHOD
A.C. Vermeulen, PANalytical, Almelo, The Netherlands

2:40 S41 APPLICATION OF X-RAY DIFFRACTION STRESS ANALYSIS AT CONSTANT PENETRATION DEPTH FOR THE DETERMINATION OF BOTH REAL-SPACE RESIDUAL-STRESS AND LATTICE-PARAMETER GRADIENTS
M. Wohlschlögel, U. Welzel, E.J. Mittemeijer, Max Planck Institute for Metals Research, Stuttgart, Germany

3:00 BREAK

3:40 S96 RESIDUAL STRESS MEASUREMENTS BY X-RAY DIFFRACTION: CRITICAL EVALUATION OF ERROR SOURCES
R. Machado, A. Kuznetsov, C.A. Achete, Divisão de Metrologia de Materiais, INMETRO, RJ, Brasil
T. Hirsch, Institut fuer Werkstofftechnik, Bremen, Germany

4:00 S124 RESIDUAL STRESS ESTIMATION OF Ti CASTING ALLOY BY X-RAY SINGLE CRYSTAL MEASUREMENT METHOD
A. Shiro, T. Hanabusa, The University of Tokushima, Tokushima, Tokushima, Japan
M. Nishida, Kobe City College of Technology, Kobe, Hyogo, Japan
T. Jing, Harbin Institute of Technology, Harbin, China
ICRS-8 Industrial Applications: Engineered Stresses
Wednesday p.m. Maroon Peak

2:00 S208 Experimental Investigation of Residual Stress in Laser Shock Peened Friction Stir Weld Joints
O. Hatamleh, NASA - Johnson Space Center, Houston, TX
A.T. DeWald, M.R. Hill, Hill Engineering, LLC, McComb, CA

2:20 S78 Thermal Stability of Mechanical Surface Treatment Induced Residual Stress in Austenitic Stainless Steel by Neutron and Synchrotron Diffraction
A.D. Evans, European Synchrotron Research Facility (ESRF), Grenoble, France
M. Turski, S. Clitheroe, J. Kelleher, P.J. Withers, University of Manchester, Manchester, UK

3:00 S99 Near Surface Stress Gradients Analysis by GIXRD on Laser Shocked 6056 Aluminium Alloy Samples
H.B. Song, LIM UMR CNRS 8006, ENSAM, Paris, France
P. Peyre, LALP UPR CNRS 1578, Arcueil, France
V. Ji, ICMMO/LEMHE UMR CNRS 8182, Orsay, France
C.H. Jiang, Shanghai Jiaotong University, Shanghai, P.R. China

3:20 Break

3:40 S188 Residual Stress Measurements Using Synchrotron X-ray on Nickel-Based Superalloy at Cryogenic Temperatures
K. Akita, D. Miyashita, S.-i. Ohya, Musashi Institute of Technology, Setagaya, Tokyo, Japan
Y. Ono, T. Yuri, T. Ogata, National Institute for Materials Science, Tsukuba, Ibaraki, Japan
T. Shobu, Japan Atomic Energy Agency, Sayo-gun, Hyogo, Japan

4:00 S64 Effect of Residual Stresses on Fatigue Strength of Severe Surface Deformed Steels by Shot Peening
Y. Akiniwa, H. Kimura, Nagoya University, Nagoya, Japan

4:20 S117 Using XRD Elastic and Plastic Strain Data to Evaluate the Effectiveness of Different Cold-Working Techniques in Aerospace Materials
B.S. Matlock, Technology for Energy Corp., Knoxville, TN
D.J. Snoha, S.M. Grendahl, US Army Research Laboratory, Aberdeen Proving Ground, MD

4:40 S151 Numerical and Experimental Investigation on Shot-Peening Induced Deformation: Application to Sheet Metal Forming
F. Cochennec, E. Rouhoud, L. Roucoules, UTT ICD-LASMIS, Troyes, France
B. Flan, Sisson-Lehmann Wheelabrator Group, Charleville-Mézières, France

ICRS-8 Diffraction Techniques: Synchrotrons—Macrobeam and High Energy II
Thursday a.m. Pikes Peak

8:30 S70 Invited—Advances in Near Surface Residual Stress Gradient Analysis of Polycrystalline Materials by Means of Energy Dispersive Diffraction
I.A. Denks, Hahn-Meitner-Institut Berlin, Berlin, Germany

9:00 S148 Fatigue Damage Evaluation of Railway Carbody Structure Using High Energy Synchrotron Radiation
K. Matsumoto, M. Yamamoto, T. Yagi, Railway Technical Research Institute, Tokyo, Japan
T. Shoubu, Japan Atomic Energy Agency, Hyogo, Japan
The New High Energy Materials Science Beamline (HEMS) at PETRA III
N. Schell, F. Beckmann, H.-U. Ruhnau, R. Kiehn, A. Schreyer, GKSS-Research Center, Geesthacht, Germany

In-Situ Study of the Cyclic Deformation Behaviour of the Magnesium Base Wrought Alloy AZ31 by Means of High Energy Synchrotron Diffraction
J. Gibmeier, Hahn-Meitner-Institute, Berlin, Germany
M. Göttin, B. Scholtes, University of Kassel, Kassel, Germany

ICRS-8 DIFFRACTION TECHNIQUES: NEUTRON I
Thursday a.m. PIKES PEAK

10:30 S205 Invited—Evaluation of Substructure Parameters by Peak Profile Analysis of High-Resolution Neutron Diffraction Spectra
P. Lukáš, P. Strunz, V. Davydov, Nuclear Physics Institute, Řež, Czech Republic
R. Kužel, Charles University, Prague, Czech Republic

11:00 S192 Techniques for Neutron Stress Determination with High Spatial Resolution
T. Gnäupel-Herold, NIST Center for Neutron Research, Gaithersburg, MD

11:20 S127 Neutron Diffraction Stress Measurement—Remarks on Calibration and Alignment
C. Ohms, European Commission, Joint Research Centre, Petten, The Netherlands

11:40 S172 Accurate Specimen Mounting and Alignment for Neutron Strain Mapping at ORNL
C.R. Hubbard, W.B. Bailey, J. Schmidlin, Oak Ridge National Laboratory, Oak Ridge, TN
J. James, Open University, Milton Keynes, UK

12:00 Lunch Break
Session will continue at 1:30. See page 28 of the Program for Diffraction Techniques: Neutron II.

ICRS-8 RELAXATION TECHNIQUES: HOLE DRILLING
Thursday a.m. LONGS PEAK

8:30 S154 Invited—Improved Sensitivity from Multiple Images in Residual Stress Measurement by ESPI Hole-Drilling
G.S. Schajer, University of British Columbia, Vancouver, BC, Canada
M. Steinzig, Los Alamos National Laboratory, Los Alamos, NM

9:00 S104 A New Procedure for the Evaluation of Residual Stresses by the Hole Drilling Method Based on Newton-Raphson Technique
G. Petrucci, M. Scafidi, Università degli Studi di Palermo, Palermo, Italy

J.D. Lord, National Physical Laboratory, Middlesex, UK
P. Whitehead, Stresscraft Ltd, Leicestershire, UK

9:40 S3 Combination of Different Measurement Techniques for the Determination of Residual Stress Distributions in Weldments with Mechanical Surface Treatments
T. Nitschke-Pagel, K. Dilger, Institute of Joining and Welding, University of Braunschweig, Braunschweig, Germany

ICRS-8 RELAXATION TECHNIQUES: SLITTING
Thursday a.m. LONGS PEAK

10:30 S126 Invited—Residual Stress Measurements on Thin Films with a Focused Ion Beam Equipment
N. Sabaté, C. Cané, I. Gràcia, CNM-CSIC, Barcelona, Spain
D. Vogel, A. Golhardt, B. Michel, IZM-FHG, Berlin, Germany
K.J. Kang, Chonnam National University, Kwangju, Korea
11:00 S125 Microscale Residual Stress Measurement in Steel Using Focused Ion Beam Slotting and Digital Image Correlation
N. Daynes, G. Home, P.J. Heard, D.Z.L. Hodgson, A. Shterenlikht, University of Bristol, Bristol, UK

11:20 S35 Characterization of Longitudinal Residual Stresses in Friction Stir Welds Using the Cut-Compliance Technique
A.P. Reynolds, C. Canaday, University of South Carolina, Columbia, SC

11:40 S69 Residual Stress Measurements in Steel Beams Using the Incremental Slitting Technique
D.Z.L. Hodgson, D.J. Smith, A. Shterenlikht, University of Bristol, Bristol, UK, M.B. Prime, Los Alamos National Laboratory, Los Alamos, NM

ICRS-8 MATERIALS ENGINEERING I
Thursday a.m. BLANCA PEAK

8:30 S22 Invited—Diffraction Analysis of Stress Gradients in Tin Thin Films: An Explanation for the Occurrence of Whisker Formation?
M. Sobiech, U. Welzel, E.J. Mittemeijer, Max Planck Institute for Metals Research, Stuttgart, Germany
W. Hügel, A. Seekamp, Robert-Bosch GmbH, Reutlingen, Germany

9:00 S15 Micro Stress Accumulation in Multiphase Superalloys
J. Repper, M. Hofmann, W. Petry, C. Krempaszky, E. Werner, TU München, Garching, Germany

9:20 S27 Residual Stresses and Load Partitioning in Novel Metal/Ceramic Composites Exhibiting Lamellar Microstructures
S. Roy, A. Wanner, Universität Karlsruhe (TH), Karlsruhe, Germany
J. Gibmeier, Hahn Meitner Institute Berlin, Berlin, Germany

9:40 S31 Size Effect in the Plasticity of Multiscale Nanofilamentary Cu/Nb Composite Wires During In-situ Tensile Tests Under Neutron Beam
V. Vidal, L. Thilly, P.O. Renault, University of Poitiers, Futuroscope, France
U. Stuhr, S. Van Petegem, H. Van Swygenhoven, Paul Scherrer Institute, Villigen, Switzerland
F. Lecouturier, LNCMP, Toulouse, France

10:00 BREAK

10:40 S213 Characterization of Strained Silicon on Insulator (sSOI) Substrates Using High-Resolution X-ray Diffraction
M. Wormington, Bede Scientific Inc., Centennial, CO
T. Lafford, P. Ryan, Bede plc, Durham, UK

11:00 S161 High Pressure Deformation Study of Zirconium
S.C. Vogel, D.W. Brown, H. Reichle, T.A. Sisneros, H.M. Volz, J. Zhang, Y. Zhao, Los Alamos National Laboratory, Los Alamos, NM
N. Nishiyama, Y. Wang, APS - Argonne National Laboratory, Argonne, IL

11:20 S59 In-Situ X-ray Diffraction Study of Nanocrystalline Metals
S. Brandstetter, S. Van Petegem, J. Zimmermann, B. Schmitt, H. Van Swygenhoven, Paul Scherrer Institut, Villigen, Switzerland

11:40 S77 Neutron Diffraction Study of Intergranular Stress Development in Austenitic Stainless Steel Weld Metal
S. Sharma, R. Haigh, L. Edwards, M.E. Fitzpatrick, The Open University, Milton Keynes, Bucks, UK
M. Turski, University of Manchester, Manchester, UK

ICRS-8 INDUSTRIAL APPLICATIONS: LAYERS AND COMPOSITES
Thursday a.m. MAROON PEAK

8:50 S201 Invited—A Study of Residual Stresses in Vacuum Plasma Sprayed Tungsten Coatings

9:20 S142 Residual Stress Profiles in Alumina-Zirconia Ceramic Composites Fabricated by Tape Casting
J. Ruiz-Hervias, UPM, Madrid, Spain
A. Steuwer, T. Buslaps, ESRF, Grenoble, France
J. Gurauskis, C. Baudin, Instituto de Ceramica y Vidrio (CSIC), Madrid, Spain

9:40 S121 Neutron Diffraction Studies on Strain Evaluation of Rebar in Reinforced Concrete
H. Suzuki, Japan Atomic Energy Agency, Japan
M. Kanematsu, Tokyo University Of Science, Japan
K. Kusunoki, Yokohama National University, Japan
10:00 S26 RESIDUAL STRESSES OF EB-PVD THERMAL BARRIER COATINGS EXPOSED AT HIGH TEMPERATURE
K. Suzuki, Niigata University, Niigata, Japan
T. Shobu, Japan Atomic Energy Agency, Sayo, Hyogo, Japan
K. Tanaka, Meijo University, Nagoya, Japan

ICRS-8 INDUSTRIAL APPLICATIONS: THERMAL PROCESSING
Thursday a.m. Maroon Peak
Chair: J. Bunch, The Boeing Company, Seattle, WA

10:40 S156 NEUTRON DIFFRACTION MEASUREMENTS ON A LARGE SIZE ROLLER BEARING RING
M. Peel, European Synchrotron Radiation Facility, Grenoble, France

11:00 S175 THE EFFECTS OF CASTING PARAMETERS AND HEAT TREATMENT ON RESIDUAL STRESS AND MICROSTRUCTURE VARIATIONS OF AN AL-Si ALLOY
M. Sadrossadat, S. Johansson, Linköping University, Linköping, Sweden

11:20 S90 RESIDUAL STRESS DISTRIBUTION BELOW SUBSURFACE CARBURIZED LAYER IN CARBON STEEL GEAR BY NEUTRON DIFFRACTION
Y. Sakaida, M. Kawauchi, Shizuoka University, Hamamatsu, Shizuoka, Japan
M. Manzanka, Yamaha Motor, Hamamatsu, Shizuoka, Japan

11:40 S131 DEVELOPMENT OF INDUCTION SURFACE HARDENING PROCESS FOR SMALL DIAMETER CARBON STEEL
D. Suzuki, K. Yatsushiro, S. Shimizu, Yamanashi Industrial Technology Center, Yamanashi, Japan
Y. Sugita, YS Electronics, Yamanashi, Japan
M. Saito, Asakawa Heat Treatment, Yamanashi, Japan
K. Kubota, Marushin Heat Treatment, Yamanashi, Japan

1:30 S209 INVITED—NEUTRON DIFFRACTION MEASUREMENTS OF RESIDUAL STRESS IN WELDS FABRICATED FROM HIGHLY ANISOTROPIC MATERIALS
T.M. Holden, Northern Stress Technologies, Deep River, Ontario, Canada
D.W. Brown, B. Clausen, Los Alamos National Laboratory, Los Alamos, NM
D.G. Carr, Australian Nuclear Science and Technology Organisation, Lucas Heights, NSW, Australia

2:00 S122 RESIDUAL STRESS MEASUREMENT OF COARSE CRYSTAL GRAIN IN TITANIUM CASTING ALLOY BY NEUTRON DIFFRACTION
M. Nishida, Kobe City College of Technology, Hyogo, Japan
A. Shiro, Harbin Institute of Technology, Harbin, China
T. Jing, Neutron Scattering Lab, Puspiptek, Indonesia
M.R. Muslih, T. Hanabusa, Tokushima University, Tokushima, Japan

2:20 S107 INTERNAL STRESS GENERATION IN PURE TITANIUM DURING CYCLIC LOADING
E.C. Oliver, STFC Rutherford Appleton Laboratory, Oxfordshire, UK
M.R. Daymond, Queen’s University, Kingston, Ontario, Canada

2:40 S176 APPLICABILITY OF THE SIN$^2$(Φ) TILT METHOD IN NEUTRON STRAIN MAPPING
C.R. Hubbard, Oak Ridge National Laboratory, Oak Ridge, TN
R.A. LeMaster, J.V. Kolwyck, University of Tennessee at Martin, Martin, TN

ICRS-8 DIFFRACTION TECHNIQUES: NEUTRON II
Thursday p.m. Pikes Peak
Chairs: D. Brown, Los Alamos National Laboratory, Los Alamos, NM
X.-L. Wang, Oak Ridge National Laboratory, Oak Ridge, TN

1:30 S209 INVITED—NEUTRON DIFFRACTION MEASUREMENTS OF RESIDUAL STRESS IN WELDS FABRICATED FROM HIGHLY ANISOTROPIC MATERIALS
T.M. Holden, Northern Stress Technologies, Deep River, Ontario, Canada
D.W. Brown, B. Clausen, Los Alamos National Laboratory, Los Alamos, NM
D.G. Carr, Australian Nuclear Science and Technology Organisation, Lucas Heights, NSW, Australia

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M. Nishida, Kobe City College of Technology, Hyogo, Japan
A. Shiro, Harbin Institute of Technology, Harbin, China
T. Jing, Neutron Scattering Lab, Puspiptek, Indonesia
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2:20 S107 INTERNAL STRESS GENERATION IN PURE TITANIUM DURING CYCLIC LOADING
E.C. Oliver, STFC Rutherford Appleton Laboratory, Oxfordshire, UK
M.R. Daymond, Queen’s University, Kingston, Ontario, Canada

2:40 S176 APPLICABILITY OF THE SIN$^2$(Φ) TILT METHOD IN NEUTRON STRAIN MAPPING
C.R. Hubbard, Oak Ridge National Laboratory, Oak Ridge, TN
R.A. LeMaster, J.V. Kolwyck, University of Tennessee at Martin, Martin, TN

ICRS-8 DIFFRACTION TECHNIQUES: GENERAL METHODS
Thursday p.m. Pikes Peak
Chair: To be announced

3:20 S42 INVITED—GRAIN STATISTICS IN NEUTRON STRESS EXPERIMENT
V. Luzin, Bragg Institute, ANSTO, Menai, NSW, Australia

3:50 S11 ASSESSMENT OF MACHINING INDUCED NEAR–SURFACE DAMAGE ON THE BASIS OF X-RAY ELASTIC CONSTANTS
W. Pfeiffer, B. Blug, V. Fuhr, E. Reisacher, Fraunhofer IWM, Freiburg, Germany
4:10 S29 A Method for Determination of 2nd Rank Strain Tensor from Nanocrystalline Diffraction Data and Its Application to Micromechanical Deformation
A. Mehta, M. Bibe, SLAC/Stanford, Menlo Park, CA
D. Bronfenbrenner, UC Berkeley, Berkeley, CA

4:30 S48 X-ray Diffraction at Constant Penetration Depth - A Viable Approach for Characterizing Steep Residual Stress Gradients
T. Erbacher, E.ON Kernkraft, Hannover, Germany
A. Wanner, O. Vöhringer, Universität Karlsruhe, Karlsruhe, Germany
T. Beck, Forschungszentrum Jülich, Jülich, Germany

4:50 S65 Application of Energy-Dispersive Diffraction to the Analysis of Highly Inhomogeneous Residual Stress Fields in Thin Film Structures
M. Klaus, W. Reimers, Technische Universität Berlin, Berlin, Germany
Ch. Genzel, Hahn-Meitner-Institut Berlin, Berlin, Germany

5:10 S158 Diffraction Stress Measurement on Coarse Grained Materials
T. Hanabusa, K. Kusaka, The University of Tokushima, Tokushima, Japan
M. Nishida, Kobe City College of Technology, Kobe, Japan

ICRS-8 Relaxation Techniques: Deep Hole and Contour
Thursday p.m. Longs Peak
Chair: M. Hill, University of California, Davis, CA

1:30 S218 Invited—From Surface Profile to Residual Stress Using the Contour Method
Y.S. Xiong, J. Kelleher, P. Frankel, P. Withers, University of Manchester, Manchester, UK

2:00 S113 Mapping Multiple Residual Stress Components Using the Contour Method and Superposition
P. Pagliaro, B. Zuccarello, University of Palermo, Palermo, Italy
M.B. Prime, B. Clausen, M.L. Lovato, M.L. Steinezig, H. Swenson, Los Alamos National Laboratory, Los Alamos, NM
J.S. Robinson, University of Limerick, Limerick, Ireland
G.S. Schajer, University of British Columbia, BC, Canada

2:20 S4 Validation of a New Deep Hole Drilling (DHD) Technique for Measuring Near Yield Residual Stresses
A.H Mahmoudi, C.E. Truman, D.J. Smith, M.J. Pavier, University of Bristol, Bristol, UK

2:40 S51 Influence of Cold Compression on the Residual Stresses in 7449 Forgings
J.S. Robinson, University of Limerick, Limerick, Ireland
C.E. Truman, S. Hossain, University of Bristol, Bristol, UK
E.C. Oliver, ISIS, Rutherford Appleton Laboratory, Didcot, UK
D.J. Hughes, Institut Laue Langevin, Grenoble, France
M.E. Fox, University of Manchester, Manchester, UK

ICRS-8 Other Measurement Techniques
Thursday p.m. Longs Peak
Chair: J. Robinson, University of Limerick, Limerick, Ireland

3:30 S84 Determination of the Residual Stress Fields Around Scratches in Al Alloys
M.K. Khan, M.E. Fitzpatrick, L. Edwards, The Open University, Milton Keynes, UK
S.V. Hainsworth, University of Leicester, Leicester, UK

3:50 S71 Residual Stresses in a Machined and Shrink Fitted Assemblies
B. Su, F. Hossainzadeh, D. Smith, C. Truman, University of Bristol, Bristol, UK

4:10 S45 Procedures for Nondestructive RS-Measurements of Inner Surfaces of Ball Bearing Components
J. Epp, T. Hirsch, Institut fuer Werkstofftechnik, Bremen, Germany

4:30 S106 Complementarity of Experimental and Numerical Methods for Determining Residual Stress States
G. Roy, CANMET/MTL, Ottawa, Ontario, Canada

4:50 S120 Detection of Surface Residual Stresses in Materials by Photocoustic Images of Micróindentsted Areas
A.L. Glazov, K.L. Muratikov, Physical-Technical Institute of RAS, St. Petersburg, Russia

5:10 S57 Residual Stresses Analysis in Brush-Plated Galvanic Coatings Deposited From Nickel Sulfate Electrolyte
H. Lille, J. Köo, A. Ryabchikov, Estonian University of Life Sciences, Tartu, Estonia
1:40 S198 EXPERIMENTAL DETERMINATION OF RESIDUAL STRESSES AROUND HYDRIDE BLISTERS IN ZrNb PRESSURE TUBES
J. R. Santisteban, Centro Atomico Bariloche, Bariloche, Argentina
A. Steuwer, M. Peel, ESRF, Grenoble, France
G. Domizzi, Centro Atomico Constituyentes, San Martin, Argentina

2:00 S63 X-RAY STUDIES OF STRAINED SILICON ON INSULATOR
M. Bibe, A. Mehta, S. Brennan, P. Pianetta, Stanford Synchrotron Radiation Laboratory, Menlo Park, CA

2:20 S2 RESIDUAL STRESS RELAXATION IN WELDED JOINTS UNDER STATIC AND CYCLIC LOADING
M. Farjani-Sohi, T. Nitschke-Pagel, K. Dilger, University of Braunschweig, Braunschweig, Germany

3:00 S104 DETERMINATION OF RESIDUAL STRESSES AROUND HYDRIDE BLISTERS IN ZrNb PRESSURE TUBES
J. R. Santisteban, Centro Atomico Bariloche, Bariloche, Argentina
A. Steuwer, M. Peel, ESRF, Grenoble, France
G. Domizzi, Centro Atomico Constituyentes, San Martin, Argentina

3:20 S105 RESIDUAL STRESS RELAXATION IN WELDED JOINTS UNDER STATIC AND CYCLIC LOADING
M. Farjani-Sohi, T. Nitschke-Pagel, K. Dilger, University of Braunschweig, Braunschweig, Germany

3:40 S106 COMBINED IN SITU NEUTRON DIFFRACTION AND ACOUSTIC EMISSION INVESTIGATION OF THE DEFORMATION MECHANISMS IN MAGNESIUM ALLOYS
O. Muransky, D. G. Carr, ANSTO, Menai, NSW, Australia
M. R. Barnett, Deakin University, Geelong, Australia
E. C. Oliver, ISIS Facility, Didcot, UK

3:00 BREAK

4:10 S199 EXPERIMENTAL DETERMINATION OF RESIDUAL STRESSES AROUND HYDRIDE BLISTERS IN ZrNb PRESSURE TUBES
J. R. Santisteban, Centro Atomico Bariloche, Bariloche, Argentina
A. Steuwer, M. Peel, ESRF, Grenoble, France
G. Domizzi, Centro Atomico Constituyentes, San Martin, Argentina

4:30 S200 X-RAY STUDIES OF STRAINED SILICON ON INSULATOR
M. Bibe, A. Mehta, S. Brennan, P. Pianetta, Stanford Synchrotron Radiation Laboratory, Menlo Park, CA

4:50 S201 RESIDUAL STRESS RELAXATION IN WELDED JOINTS UNDER STATIC AND CYCLIC LOADING
M. Farjani-Sohi, T. Nitschke-Pagel, K. Dilger, University of Braunschweig, Braunschweig, Germany

5:10 S202 COMBINED IN SITU NEUTRON DIFFRACTION AND ACOUSTIC EMISSION INVESTIGATION OF THE DEFORMATION MECHANISMS IN MAGNESIUM ALLOYS
O. Muransky, D. G. Carr, ANSTO, Menai, NSW, Australia
M. R. Barnett, Deakin University, Geelong, Australia
E. C. Oliver, ISIS Facility, Didcot, UK

5:30 BREAK

6:00 S198 EXPERIMENTAL DETERMINATION OF RESIDUAL STRESSES AROUND HYDRIDE BLISTERS IN ZrNb PRESSURE TUBES
J. R. Santisteban, Centro Atomico Bariloche, Bariloche, Argentina
A. Steuwer, M. Peel, ESRF, Grenoble, France
G. Domizzi, Centro Atomico Constituyentes, San Martin, Argentina

6:30 S63 X-RAY STUDIES OF STRAINED SILICON ON INSULATOR
M. Bibe, A. Mehta, S. Brennan, P. Pianetta, Stanford Synchrotron Radiation Laboratory, Menlo Park, CA

6:50 S2 RESIDUAL STRESS RELAXATION IN WELDED JOINTS UNDER STATIC AND CYCLIC LOADING
M. Farjani-Sohi, T. Nitschke-Pagel, K. Dilger, University of Braunschweig, Braunschweig, Germany

7:10 S104 DETERMINATION OF RESIDUAL STRESSES AROUND HYDRIDE BLISTERS IN ZrNb PRESSURE TUBES
J. R. Santisteban, Centro Atomico Bariloche, Bariloche, Argentina
A. Steuwer, M. Peel, ESRF, Grenoble, France
G. Domizzi, Centro Atomico Constituyentes, San Martin, Argentina

7:30 S105 RESIDUAL STRESS RELAXATION IN WELDED JOINTS UNDER STATIC AND CYCLIC LOADING
M. Farjani-Sohi, T. Nitschke-Pagel, K. Dilger, University of Braunschweig, Braunschweig, Germany

7:50 S106 COMBINED IN SITU NEUTRON DIFFRACTION AND ACOUSTIC EMISSION INVESTIGATION OF THE DEFORMATION MECHANISMS IN MAGNESIUM ALLOYS
O. Muransky, D. G. Carr, ANSTO, Menai, NSW, Australia
M. R. Barnett, Deakin University, Geelong, Australia
E. C. Oliver, ISIS Facility, Didcot, UK
3:30 S152 Residual Stress Analysis of Aluminium Welds with High Energy Synchrotron Radiation at the HARWI II Beamline
T. Fischer, A. Schreyer, GKSS Research Centre, Geesthacht, Germany
R. Martins, Joint Research Centre, Petten, The Netherlands

3:50 S119 Residual Stress Mapping in a Pipe Weld Repair Using High Energy X-ray Diffraction
P.J. Bouchard, British Energy Generation Ltd., Gloucester, UK
M. Turski, The University of Manchester, Manchester, UK
L. Edwards, ANSTO, Sydney, NSW, Australia

4:10 S163 The Relaxation of Residual Welding Stresses Upon Progressive Sectioning of Welds
J. Altenkirch, Manchester Materials Science Centre, Manchester, UK and ILL, Grenoble, France
A. Steuwer, ESS Scandinavia Secretariat, Lund, Sweden
M.J. Peel, ESRF, Grenoble, France
P.J. Withers, Manchester Materials Science Centre, Manchester, UK

4:30 S94 Study on the Effect of Welding Residual Stresses on Crack-Tip Constraint
X.B. Ren, Z.L. Zhang, Norwegian University of Science and Technology (NTNU), Trondheim, Norway
B. Nyhus, SINTEF Material and Chemistry, Trondheim, Norway

4:50 S155 Investigation of Residual Stress Distribution in Ferritic Steel Weld Measured by Neutron and Synchrotron Diffraction
A.M. Paradowska, Rutherford Appleton Laboratory, UK
J.H.W. Price, R. Ibrahim, Monash University, Australia
T.R. Finlayson, The University of Melbourne, Australia
U. Lienert, APS—Argonne National Laboratory, Argonne, IL
R. Blevins, ANSTO, Sydney, NSW, Australia

5:10 S47 Measurement of Residual Stresses in Laser Welded EDDS and IFS Plates Using XRD
C.S. Kishore, Sri Venkateshwara College of Engineering, Anna University, Tamilnadu, India

ICRS-8 Diffraction Techniques: Synchrotrons—Microbeam
Friday a.m. Pikes Peak
Chairs: G. Ice, Oak Ridge National Laboratory, Oak Ridge, TN
N. Tamura, Lawrence Berkeley National Laboratory, Berkeley, CA

8:30 S186 Invited—X-ray Microdiffraction Techniques for Measuring Local Microstructure and Strain Distributions
W. Liu, Argonne National Laboratory, Argonne, IL
D.D. Sama, Indian Inst. of Science, Bangalore, India

9:00 S52 Smaller is Stronger: In-Situ Laue Diffraction
R. Maass, J. Zimmermann, S. Van Petegem, H. Van Swygenhoven, Paul Scherrer Institut, Villigen, Switzerland

9:20 S132 Spatially Resolved Strain Measurements on Micro Moulds
A. Kienzler, B. Okolo, V. Schulze, A. Wanner, D. Lohé, Universität Karlsruhe (TH), Karlsruhe, Germany

9:40 S146 Determination of Stress and Texture Gradient in CdTe Thick Films Using a High Energy White Microbeam
P. Gergaud, V. Consonni, G. Feuillet, CEA-LETI, MINATEC, Grenoble, France
T. Buslaps, European Synchrotron Radiation Facility, Grenoble, France

10:00 Break

M. Holt, J. Maser, R. Winsarski, V. Rose, G.B. Stephenson, Argonne National Laboratory, Argonne, IL

10:50 S167 In-Situ Study of Electromigration Induced Strain/Stress Evolution and Distribution in Sn-Cu Lead-Free Solder Joints Using Synchrotron White Beam X-ray Microdiffraction
K. Chen, Lawrence Berkeley National Lab, Berkeley, CA and UCLA, Los Angeles, CA
N. Tamura, Lawrence Berkeley National Lab, Berkeley, CA
F.Y. OuYang, K.N. Tu, UCLA, Los Angeles, CA
11:10 S25 **The Reverse of Triaxial Strain Fields in a Multiferroic BiFeO₃ Thin Film As Studied Using Scanning X-ray Microdiffraction**
C.W. Bark, K.C. Cho, Y.M. Koo, S. Ryu, H.M. Jang, Pohang University of Science and Technology (POSTECH), Pohang, Korea
N. Tamura, ALS—Lawrence Berkeley National Laboratory, Berkeley, CA

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8:40 S86 **Residual Stress and Deformation Simulation of Nitrided Discs**
L. Barrallier, MecaSurf Laboratory, Arts et Metiers ParisTech, Aix en Provence, France
P. Vardon, Eurocopter, Marignane, France
D. Deloison, EADS Innovation Works, Suresnes, France

9:00 S91 **Phase Transformation Involving Residual Stresses During Gaseous Nitriding of Steel**
S. Jegou, R. Kubler, L. Barrallier, Laboratoire MecaSurf, Arts et Metiers ParisTech, Aix-en-Provence, France
F. Roch, Aubert et Duval, ERAMET Group, Paris, France

9:20 S20 **Prediction of Residual Stress Distribution in Plasma Nitrided Tool Steel**
B. Podgornik, J. Vižintin, University of Ljubljana, Ljubljana, Slovenia
V. Leskovšek, Institute for Metals and Technologies, Ljubljana, Slovenia
D. Nolan, University of Wollongong, Wollongong, NSW, Australia

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8:30 S180 **Invited—In Situ Probing of Crack Growth Retardation During Cyclic Loading**
S.Y. Lee, H. Choo, P.K. Liaw, The University of Tennessee, Knoxville, TN
K. An, T.R. Watkins, C.R. Hubbard, Oak Ridge National Laboratory, Oak Ridge, TN

9:00 S153 **Impact of Zirconium Hydride Precipitates on Fracture of a Zirconium Alloy**
M. Kerr, M.R. Daymond, R.A. Holt, Queen’s University, Kingston, Ontario, Canada
J.D. Almer, APS – Argonne National Laboratory, Argonne, IL

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10:00 BREAK
10:20  S34  INVITED—ACCOUNTING FOR RESIDUAL STRESS IN INTEGRITY ASSESSMENT OF 3-D STRUCTURE
R.J. Bucci, M.A. James, Alcoa Technical Center, Alcoa Center, PA
D.L. Ball, Lockheed Martin Aeronautics Co., Fort Worth, TX

10:50  S206  MEASUREMENTS OF RESIDUAL STRESS FIELDS IN FrACTURE COUpons AND RELATION TO OBSERVED FrACTURE PROPERTIES
M.R. Hill, University of California, Davis, CA
J.E. VanDalen, Hill Engineering, LLC, McClellan, CA

11:10  S89  FATIGUE CRACK GROWTH IN PLASTICALLY BENT BEAMS
K.W. Jones, M.L. Dunn, University of Colorado, Boulder, CO

11:30  S199  RESIDUAL STRESS EFFECTS ON FAtigue LIFE OF WELDED STRUCTURES USING LEFM
Z. Barsoum, I. Barsoum, Royal Institute of Technology (KTH), Stockholm, Sweden

ICRS-8  INDUSTRIAL APPLICATIONS: DISTORTION AND MACHINING
Friday a.m.  MAROON PEAK
Chair: J. Bunch, The Boeing Company, Seattle, WA

8:30  S7  INVITED—PREDICTION OF DISTORTION OF AIRFRAME COMPONENTS MADE FROM ALUMINUM PLATES
S. Nervi, ESRD Inc., Saint Louis, MO
B.A. Szabó, Washington University in St. Louis, Saint Louis, MO
K.A. Young, Boeing Co., Saint Louis, MO

9:00  S200  DISTORTION PREDICTION IN MACHINED AEROSPACE COMPONENTS
T.D. Marusich, Third Wave Systems, Minneapolis, MN

9:20  S133  RESIDUAL STRESSES AND SURFACE WORKHARDENING INDUCED BY MICRO CUTTING PROCESSES
H. Autenrieth, B. Okolo, V. Schulze, A. Wanner, D. Löhne, Universität Karlsruhe (TH), Karlsruhe, Germany

9:40  S177  CHARACTERISTICS OF RESIDUAL STRESS PROFILES IN HARD TURNED VERSUS GROUND SURFACES WITH AND WITHOUT A WHITE LAYER
A.W. Warren, Y.B. Guo, The University of Alabama, Tuscaloosa, AL

ICRS-8  INDUSTRIAL APPLICATIONS: FRICTION STIR WELDING
Friday a.m.  MAROON PEAK
Chair: J. Bunch, The Boeing Company, Seattle, WA

10:30  S10  RESIDUAL STRESS DETERMINATION IN AZ31 FRICTION STIR WELDS USING X-RAY AND NEUTRON DIFFRACTION
L. Commin, J.-E. Masse, L. Barrallier, Laboratoire Mécasurf, Arts Et Métiers ParisTech, Aix En Provence, France

10:50  S196  EFFECT OF PRESSURE ON THE RESIDUAL STRESS DEVELOPMENT IN THE LINEAR FRICTION WELDED Ti-6246
S. Zabeen, M. Attallah, M. Preuss, University of Manchester, Manchester, UK
S. Bray, Rolls-Royce plc, Derby, UK

11:10  S194  RESIDUAL STRESS IN FRICTION STIR WELDED ALUMINUM ALLOYS
J.A. Pineault, M. Belassel, Proto Mfg. Ltd., Oldcastle, Ontario, Canada
H.J.K. Lemmen, Delft University of Technology, Delft, The Netherlands
M. Brauss, Proto Mfg. Ltd., Ypsilanti, MI
Local Attractions

Museums
Denver Art Museum, (303) 640-2793
Museum of Western Art, (303) 296-1880
Denver Museum of Natural History, (303) 322-7009
IMAX Theater, (303) 370-6300
Gates Planetarium, (303) 370-6351
Molly Brown House Museum, (303) 832-4092

Performing Arts
Denver Center for the Performing Arts, (303) 893-3272
Center Attractions, (303) 893-4100
Denver Center Theater Company, (303) 893-4000
Symphony Orchestra (Boettcher Concert Hall), (303) 592-7777
Temple Buell Theater, (303) 640-2862
Opera Colorado, (303) 778-6464
Paramount Theater, (303) 534-8336

Other Area Attractions
Denver Botanic Gardens, (303) 331-4000
Hudson Gardens, (303) 797-8565
The Denver Zoo, (303) 331-4100
Elitch Gardens, (303) 455-4771
Coors Field, (303) 762-5437
Mile High Stadium, (303) 649-9000
Red Rocks Outdoor Amphitheater, (303) 572-4700
Fiddler’s Green Outdoor Amphitheater, (303) 220-7000

South Metro Denver Movie Theaters
AMC Theaters, Highlands Ranch 24
C-470 & Broadway, (303) 790-4262
Mann Theaters, Tamarac Square
7777 E. Hampden, (303) 755-5100
United Artists, Continental
Hampden & I-25, (303) 758-2345
United Artists, Greenwood Plaza
8141 E. Arapahoe Road, (303) 741-1200

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4900 S. Syracuse Street
Denver, CO 80237
(303) 779-1100

Directions from DIA Airport
Pena Blvd. to I-70 West
I-70 to I-225 South
I-225 to Yosemite (Exit 2)
Yosemite (west along frontage rd.) to DTG Blvd.
Left on DTG Blvd.
Right on Union Ave.
Left on Syracuse St.
Hotel is on right
<table>
<thead>
<tr>
<th>Day &amp; Time</th>
<th>XRD &amp; XRF</th>
<th>XRD</th>
<th>XRF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon. am: Workshops 9:00 – 12:00</td>
<td>Texture Analysis with Area Detectors (He/Blanton) “A”</td>
<td>Quantitative Analysis I (Mantler) “C”</td>
<td>Basic XRF (Elam/Havrilla) “D”</td>
</tr>
<tr>
<td>Mon. pm: Workshops 2:00 – 5:00</td>
<td>Non-ambient XRD (Misture) “A”</td>
<td>Quantitative Analysis II (Mantler) “C”</td>
<td>Energy Dispersive XRF (Scruggs) “D”</td>
</tr>
<tr>
<td>Mon. Eve.: 6:00-8:00 p.m. Wine &amp; Cheese Reception sponsored by PANalytical; XRD Poster Session (Blanton/Kaduk). Evergreen Ballroom</td>
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<tr>
<td>Tue. am: Workshops 9:00 – 12:00</td>
<td>Cultural Heritage I (Trentelman) “A”</td>
<td>Stress Analysis I (Noyan/Prime) “B”</td>
<td>Specimen Preparation I (Anzelmo) “C”</td>
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<tr>
<td>Tue. pm: Workshops 2:00 – 5:00</td>
<td>Cultural Heritage II (Trentelman) “A”</td>
<td>Stress Analysis II (Noyan/Prime) “B”</td>
<td>Trace Analysis (Wobrauschek) “D”</td>
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<tr>
<td>Tue. Eve.: 6:00 – 8:00 p.m. Wine &amp; Cheese Reception sponsored by Chemplex Industries, Inc. and GE Inspection Technologies; XRF Poster Session (Palmer/Kawai). Evergreen Ballroom</td>
<td>Non-ambient XRD (Misture) “A”</td>
<td>High-throughput X-rays (Toby) “D”</td>
<td>Specimen Preparation II (Anzelmo) “C”</td>
</tr>
<tr>
<td>Wed. am: 8:30 – 12:30 Plenary Session: Stress and Society (Noyan/Prime/Üstündag) Evergreen Ballroom</td>
<td>1:30 – 5:15 New Developments in XRD &amp; XRF Instrumentation (Buhrke) “A”</td>
<td>2:00 – 5:00 Thin Films (Blanton/Huang) “C”</td>
<td>1:30 – 4:50 Fusion &amp; Industrial Applications of XRF (Anzelmo) “D”</td>
</tr>
<tr>
<td>Wed. Eve.: 5:00 – 7:00 Vendor sponsored Wine &amp; Cheese Reception. Exhibit Hall “Rocky Mountain Event Center”</td>
<td>2:00 – 5:00 Analysis of Nanomaterials (Snyder/Petkov) “E&amp;F”</td>
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<tr>
<td>Thurs. am: Sessions</td>
<td>9:00 – 12:00 Cultural Heritage I (Trentelman) “A”</td>
<td>9:00 – 12:00 Industrial Applications (Payzant/Snyder) “B”</td>
<td>9:00 – 12:00 Regulatory Applications (Elam) “C”</td>
</tr>
<tr>
<td>Thurs. pm: Sessions</td>
<td>2:00 – 5:00 Cultural Heritage II (Trentelman) “A”</td>
<td>2:00 – 4:50 High Temperature In-situ Analysis (Misture) “C”</td>
<td>2:00 – 4:50 Trace Analysis (Zaitz) “D”</td>
</tr>
</tbody>
</table>

All sessions, workshops and poster sessions/socials will be held in the Evergreen Ballroom: sections “A”, “B”, “C”, “D” or “E&F”, except for Wednesday evening’s social event, which will be held in the Exhibit Hall “Rocky Mountain Event Center”
## The 8th International Conference on Residual Stresses Program-at-a-Glance
### 4–8 August 2008

### Tuesday 9:00 a.m. – 5:00 p.m. ICRS Workshop on Stress Analysis (Noyan/Prime) Evergreen “B”

### Wednesday 8:30 a.m. – 12:30 p.m. Plenary Session: Stress and Society (Noyan/Prime/Ustündag) Evergreen Ballroom

### Special Sessions

<table>
<thead>
<tr>
<th>Day and Time</th>
<th>Meeting Room</th>
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<tbody>
<tr>
<td><strong>Wednesday p.m.</strong></td>
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<tr>
<td>1:30 – 5:00</td>
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<tr>
<td>Diffraction Techniques: Synchrotrons – Macrobeam and High Energy I (Almer/Daymond)</td>
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<tr>
<td>1:30 – 5:00</td>
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<tr>
<td>Modeling I</td>
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<tr>
<td>(Tome/Beyerlein)</td>
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<td>2:00 – 5:00</td>
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<tr>
<td>Industrial Applications: Engineered Stresses (Bunch/Hill)</td>
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<td><strong>Thursday a.m.</strong></td>
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<td>8:30 – 10:00</td>
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<tr>
<td>Diffraction Techniques: Synchrotrons – Macrobeam and High Energy II (Almer/Daymond)</td>
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<tr>
<td>10:30 – 12:00</td>
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<tr>
<td>Diffraction Techniques: Neutron I (Brown/Wang)</td>
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<tr>
<td>8:30 – 10:00</td>
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<tr>
<td>Relaxation Techniques: Hole Drilling (Robinson)</td>
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<td>10:30 – 12:00</td>
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<tr>
<td>Relaxation Techniques: Slitting (Prime)</td>
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<td>8:30 – 12:00</td>
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<td>Industrial Applications: Layers and Composites (Hill)</td>
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<td>8:50 – 10:20</td>
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<tr>
<td>Industrial Applications: Materials Engineering I (Murray/Gnaupel-Herold)</td>
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<tr>
<td><strong>Thursday p.m.</strong></td>
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<td>1:30 – 3:00</td>
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<tr>
<td>Diffraction Techniques: Neutron II (Brown/Wang)</td>
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<td>3:20 – 5:30</td>
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<tr>
<td>Diffraction Techniques: General Methods (Chair TBA)</td>
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<td>3:30 – 5:30</td>
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<tr>
<td>Other Measurement Techniques (Robinson)</td>
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<td>1:30 – 3:00</td>
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<tr>
<td>Relaxation Techniques: Deep Hole and Contour (Hill)</td>
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<td>1:40 – 3:00</td>
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<tr>
<td>Industrial Applications: Miscellaneous (Bunch)</td>
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<td>1:40 – 3:00</td>
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<tr>
<td>Industrial Applications: Welding (Hill)</td>
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<tr>
<td><strong>Friday a.m.</strong></td>
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<tr>
<td>8:30 – 11:30</td>
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<tr>
<td>Diffraction Techniques: Synchrotrons – Microbeam (Ice/Tamura)</td>
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<td>8:30 – 11:50</td>
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<tr>
<td>Fatigue &amp; Fracture (Smith)</td>
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<td>8:30 – 10:00</td>
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<td>Industrial Applications: Distortion and Machining (Bunch)</td>
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<td>10:30 – 11:30</td>
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<tr>
<td>Industrial Applications: Friction Stir Welding (Bunch)</td>
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### Social Events:

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<thead>
<tr>
<th>Social Events</th>
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</thead>
<tbody>
<tr>
<td>Sun. Eve.: 6:00 – 8:00 p.m.</td>
<td>Welcoming Reception Sponsored by Thermo Scientific and ICDD. Evergreen Ballroom.</td>
</tr>
<tr>
<td>Mon. Eve.: 6:00 – 8:00 p.m.</td>
<td>Wine &amp; Cheese Reception Sponsored by PANalytical; XRD Poster Session I (Blanton/Kaduk); Evergreen Ballroom.</td>
</tr>
<tr>
<td>Tues. Eve.: 6:00 – 8:00 p.m.</td>
<td>Wine &amp; Cheese Reception Sponsored by Chemplex Industries, Inc. and GE Inspection Technologies; XRF Poster Session (Palmer/Kawai); Evergreen Ballroom.</td>
</tr>
<tr>
<td>Wed. Eve.: 5:00 – 7:00 p.m.</td>
<td>Vendor Sponsored Wine &amp; Cheese Reception; Exhibit Hall “Rocky Mountain Event Center”.</td>
</tr>
<tr>
<td>Thurs. Eve.: 6:00 – 9:00 p.m.</td>
<td>ICRS-8 Conference Dinner and Poster Session; Evergreen Ballroom.</td>
</tr>
</tbody>
</table>
2008 Denver X-ray Conference & ICRS-8 Registration Form
Denver Marriott Tech Center Hotel, Denver, Colorado U.S.A.
4-8 August 2008

PLEASE TYPE to avoid errors on name tags and attendee list. On-line registration is also available at: www.dxcicdd.com

First Name ___________________________________ Last Name____________________________________
Organization ________________________________________________________________________________
Address ____________________________________________________________________________________
City ________________________ State________________ Zip ______________ Country __________________
Phone _____________________ Fax _________________________ E-mail _____________________________

☐ Check this box if you Do Not want your name included on the attendee list

Registration Fees: Discount fees will only apply if registration form and payment are received by 1 July

D XC: Registration to the DXC includes access to the ICRS program, excluding the ICRS dinner and poster session on Thursday evening.

❑ Full week: exhibits, workshops, sessions† $475 $550
❑ Monday & Tuesday: exhibits, workshops† $425 $500
❑ Wed., Thurs. & Friday: exhibits, sessions† $425 $500
❑ Session organizer, invited speaker & workshop instructor† $100 $100
❑ (Circle one) Student (I.D. required), unemployed, 65 and older $125 $200

ICRS: Registration fees will include access to the Denver X-ray Conference Program, including workshops, sessions, exhibits and evening receptions/poster sessions, as well as, an exclusive dinner reception for attendees of ICRS-8 on Thursday evening, August 7th.

❑ Full week: Mon. & Tues. workshops, Wed.–Fri. sessions, Mon.–Thurs. exhibits* $510 $585
❑ Half week: Wed.–Fri. sessions, Wed.–Thurs. exhibits* $460 $535
❑ Session organizer, invited speaker & workshop instructor* $135 $135
❑ Student: Full or half week (I.D. required) $160 $235

†Includes a copy of Volume 52 of Advances in X-ray Analysis on CD-ROM

*Price includes proceedings on CD-ROM

Payment:
Total Amount Due: _______________

☐ Check enclosed for _______________ made payable to ICDD/DXC
☐ Charge my: ☐ Visa ☐ Mastercard ☐ American Express

Card number________________________________________________ Expiration date_______________
Card holder’s name (please print)_________________________________________________
Signature ________________________________________________________________________________

Please take the time to answer the following questions:

1) Are you primarily interested in XRD or XRF topics?
   ☐ XRD ☐ XRF ☐ Equally interested in both

2) What is your highest education level
   ☐ HS ☐ BS ☐ MS ☐ Ph.D

3) Job Title ____________________________________________________________

To Submit Registration Form:
Mail: ICDD, Denise Flaherty, 12 Campus Boulevard, Newtown Square, PA 19073-3273 U.S.A.
Fax: 610.325.9823

Cancellation Policy: Cancellations must be submitted in writing to Denise Flaherty. A full refund will be issued, less a $50 processing fee, if the cancellation is received at least two weeks before the conference (Monday, 21 July 2008). No refunds will be issued for cancellations received after 21 July 2008. Please contact Denise Flaherty for any additional information, E-mail flaherty@icdd.com or Phone 610.325.9814.
DATES TO REMEMBER

Conference Preregistration begins May 2008
Deadline for pre-registration discount at the DMTC Hotel 8 July 2008
(Conference rate, subject to availability)
Deadline for submission of manuscripts:
at the Conference or no later than 1 September 2008

For More Information
The Call for Papers and the tentative Conference Program can be found on the Denver X-ray Conference web page at: http://www.dxcicdd.com. Please continue to monitor this site for the latest conference information.
For additional information, contact: Denise Flaherty
Phone: 610.325.9814
Fax: 610.325.9823
E-mail: flaherty@icdd.com