

4–8 August 2008
Denver Marriott Tech Center Hotel
Denver, Colorado U.S.A.

PROGRAM

57th Annual Conference on Applications of X-ray Analysis
Denver X-ray Conference

Joint meeting with ICRS-8

**The 8th International Conference
on Residual Stresses**

Reception Sponsors



Plenary Session: **Stress and Society**

Exhibits, Workshops, Sessions
Training & Applications
Techniques & Instrumentation



Sponsored by
International Centre for Diffraction Data

DENVER X-RAY CONFERENCE®



**57th Annual Denver X-ray Conference &
The 8th International Conference on Residual Stresses
4–8 August 2008
Denver Marriott Tech Center Hotel • Denver, Colorado U.S.A.**

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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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Mark Bourke, Los Alamos National Lab, Los Alamos, NM
Tom Holden, Northern Stress Technologies, Deep River, Ontario, Canada

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.

2008 Denver X-ray Conference & ICRS-8 Program

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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

Need a ride from Denver International Airport to the Denver Marriott Tech Center? We recommend Super Shuttle. Visit their web site for details: <http://www.supershuttledenver.com>.

Exhibitor Information

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

Company Name	Booth #(s)	Company Name	Booth #(s)
AMPTEK, Inc.	61	Mike Handley Analytical Services	17
Analytical Services, Inc.	43	Moxtek, Inc.	28
Anton Paar USA	45	PANalytical	54, 55, 56 & 57
Australian X-ray Tubes (AXT)	16	Photonic Science Ltd.	3
Blake Industries, Inc.	1	PREMIER Lab Supply, Inc.	10 & 11
Bruker AXS, Inc.	22, 23, 24 & 25	Princeton Instruments	9
Chemplex Industries, Inc.	62	Proto Manufacturing Inc.	5 & 6
Corporation Scientifique Claisse Inc.	50 & 51	Rigaku	34, 35 & 36
e2v Scientific Instruments Ltd	40	Rocklabs	17
EDAX Inc.	29	SCT/Euro-Industries	19
GE Inspection Technologies	58 & 59	Sigma Chemicals	16
Hecus X-ray Systems GmbH	47	SII NanoTechnology USA, Inc.	39
Herzog Automation Corp	18	Skyray Instrument	48 & 49
HORIBA Jobin Yvon	33	Spectro	30
Incoatec GmbH	13	SPEX Sample Prep LLC	38
Inel	32	TEC	46
Innov-X Systems	60	Thermo Scientific	26 & 27
International Centre for Diffraction Data	52 & 53	UltraVolt, Inc.	4
Kitco Inc.	2	Wiley-Blackwell	44
Materials Data, Inc. (MDI)	20 & 21	Xenocs	8
Micro Photonics	7	XOS	41 & 42

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:

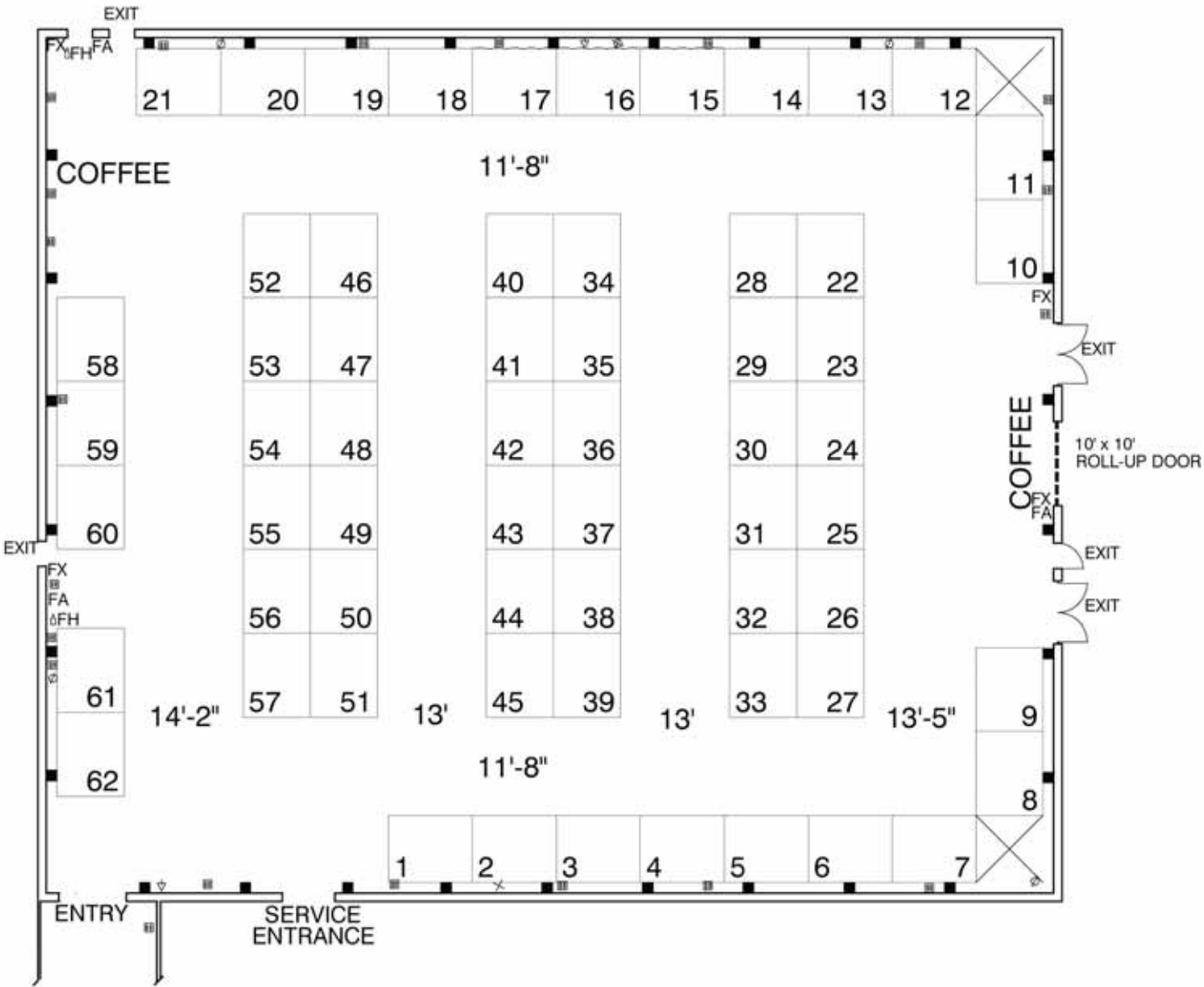
GE Inspection Technologies

MDI

And to our Media Sponsor:

Materials Today

Exhibit Floor Plan



Evening Technical Sessions & Social Functions & General Information

*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.

Monday morning 9:00 a.m.–12:00 p.m.

XRD

Texture Analysis with Area Detectors

Evergreen “A”

Organizers & Instructors:

B.B. He, Bruker AXS, Inc., Madison, WI

T.N. Blanton, Eastman Kodak Company, Rochester, NY

R. Tissot, Sandia National Labs, Albuquerque, NM

U. Preckwinkel, Bruker AXS, Inc. Madison, WI

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

Evergreen “B”

Organizer & Instructors:

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

Quantitative Analysis I

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 1 (Morning):

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

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

Basic XRF

Evergreen “D”

Organizers & Instructors:

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.

Monday afternoon 2:00 p.m.–5:00 p.m.

XRD

Non-ambient XRD

Evergreen “A”

Organizer & Instructors:

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

Evergreen “B”

Organizer & Instructors:

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

2008 DXC Workshops

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, Atominstitut—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.

Tuesday morning 9:00 a.m.–12:00 p.m.

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 instru-

mentation 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, Atominstitut—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

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

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

Nanomaterials and Their Applications

Evergreen “E&F”

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”

Organizer & 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.

Monday, 4 August, XRD Poster Session

Evergreen Ballroom, 6:00 p.m.–8:00 p.m.

Reception Sponsor



PANalytical

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 $\text{Ca}(\text{HO}_3\text{PCH}_2)_2\text{-N(H)}\text{-(CH}_2)_6\text{-N(H)}\text{-(CH}_2\text{PO}_3\text{H)}_2 \cdot 2\text{H}_2\text{O}$**
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. Matsudaira, K. Nakayama, M. Kitano, T. Nakamura, Meiji University, Kanagawa, Japan
- D-15 INVESTIGATION OF CO-CRYSTALLIZED PHARMACEUTICAL INGREDIENTS USING SYNCHROTRON RADIATION**
M. Herrmann, U. Förster-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. Ganey, Czech Technical University in Prague, Prague, Czech Republic
J. Drahokoupil, 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. Bradai, 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. Herrnegger, 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. Langenbucher, Anton Paar USA, Ashland, VA
- D-68 X-RAY DIFFRACTION AND HIGH PRESSURE STUDIES ON ORGANIC THERMAL ENERGY STORAGE MATERIALS—TRIS(HYDROXYMETHYL) AMINOMETHANE (TRIS)**
W.-M. Chien, V.K. Kamisetti, J.C. Fallas, E.D. Emmons, D. Chandra, A.M. Covington, University of Nevada, Reno, Reno, NV
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 NANOBIO 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. Kahen, Eastman Kodak Company, Rochester, NY
V. Gupta, F. Bai, Rochester Institute of Technology, Rochester, NY

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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. Egorov, V.K. Egorov, IMT RAS, Chernogolovka, 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. Strel, F. Meirer, 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. Strel, N. Zoeger, P. Wobrauschek, F. Meirer, Atominstitut, Tu Wien, Vienna, Austria
- F-55** **GRAZING-EXIT-XRF EXPERIMENTS AT HASYLAB BEAMLINE L**
F. Meirer, C. Strel, 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. Meirer, C. Strel, 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
- F-19** **PREPARATION OF THE MULTI-LAYERED PLASTIC REFERENCE MATERIALS FOR CONFOCAL 3D-MICRO X-RAY FLUORESCENCE ANALYSIS**
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, H. Matsui, M. Hino, H. Wanibuchi, 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 ARCHAEOLOGICAL STUDIES: IN-SITU ALLOY AND METAL ANALYSIS OF A PRIVATE SWORD COLLECTION**
J. Feuer, T. Turner, K. Russell, Innov-X Systems, Inc., Woburn, MA
- 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

Plenary Session: STRESS AND SOCIETY

Wednesday a.m. EVERGREEN BALLROOM

Chairs: **I.C. Noyan**, Columbia University, New York, NY
M. Prime, Los Alamos National Laboratory, Los Alamos, NM
E. Üstündag, Iowa State University, Ames, IA

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

XRD & XRF NEW DEVELOPMENTS IN XRD & XRF INSTRUMENTATION

Wednesday p.m. EVERGREEN "A"

Chair: **V.E. Buhrke**, Consultant, Portola Valley, CA

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 PICOFOX 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**
E. Brown, D. Carolan, X. Chen, J. Egan, B. Hubbard-Nelson, R. Nasella, I. Rosmarin, R. Russell, D. Sackett, C. Weaver, Innov-X Systems, Inc., Woburn, MA
- 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**
L. Feng, V.D. Saveliev, C.R. Tull, S. Barkan, M. Takahashi, E.V. Damron, SII NanoTechnology USA Inc., Northridge, CA
- 4:30 F-64 EXPANDING THE DETECTOR EFFICIENCY OF SILICON DRIFT DETECTORS WITH OPTIMIZED RADIATION ENTRANCE WINDOW**
A. Niculae, H. Soltan, 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**
Y. Platonov*, J. Rodriguez, G. Fournier, Rigaku Innovative Technologies, Auburn Hills, MI
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

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**
E.J. Peterson, T.R. Conant, P. Burton, A. De La Riva, J.P. Gabaldon, L.R. Houk, H. Pham, K. Lovato, J. Paiz, A.K. Datye, University of New Mexico Center for Micro-Engineered Materials, Albuquerque, NM
- 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

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**
R.E. Ayala-Jiménez, C.H. Alvarado, Fisichem Inc., Miami, FL
- 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, Belarussian State University, Minsk, Belarus
A. Ulyanekov, 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. Kuru, M. Wohlschlägel, 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

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 J52P408 ENGINES BY EDXRF**
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

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

- 9:30 F-13 INVITED—DISCOVERY OF A HIDDEN VAN GOGH PAINTING BY MEANS OF HIGH-ENERGY XRF MAPPING**
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'KEEFE 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 GROUTS 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. Giacciai, Walters Art Museum, Baltimore MD

XRD & XRF INDUSTRIAL APPLICATIONS

Thursday a.m. EVERGREEN "B"

Chairs: **R.L. Snyder**, Georgia Institute of Technology, Atlanta, GA
E.A. Payzant, Oak Ridge National Laboratory, Oak Ridge, TN

- 9:00 D-37 INVITED—X-RAY AND THERMAL ANALYSIS OF CEMENTS AND CONCRETE FOR EVALUATION OF CEMENT ADDITIVES AND CONCRETE ADMIXTURES**
J.P. Nicolich, **D.R. Brown**, **F.G. Serafin**, **U.B. Latosiewicz**, **J.H. Cheung**, **P.J. Sandberg**, W. R. Grace & Co. - Conn., Cambridge, MA
- 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-Neunhoffer**, University of Erlangen-Nuremberg, Erlangen, Germany
H. Motzet, Schoenox 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-Neunhoffer**, **J. Neubauer**, University of Erlangen-Nuremberg, Erlangen, Germany
M. Braeu, BASF Construction Chemicals, Trostberg, Germany
P. Gaerberlein, BASF Construction Chemicals GmbH, Trostberg, Germany
M. Degenkolb, 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**
- 10:50 D-20 INVITED—PROBING THIN-LAYERED AND NANO-STRUCTURED MATERIALS—X-RAY SCATTERING TOOLS**
J.F. Woitok, PANalytical, Almelo, The Netherlands
- 11:20 D-41 RESIDUAL STRESS ANALYSIS OF NON-POLAR GAN EPI-LAYERS BY GIXRD**
Y.-i. Jang, **K.-h. Park**, LG Electronics Institute of Technology, Seoul, Korea
S.-r. Cho, **H.-k. Kwon**, LG Innoteck, 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 SFSU, 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

XRD & XRF CULTURAL HERITAGE II

Thursday p.m. EVERGREEN “A”

Chair: **K. Trentelman**, Getty Conservation Institute, Los Angeles, CA

- 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. Podsiiki, 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. Haeffner, 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

XRD & XRF X-RAY MICROIMAGING

Thursday p.m. EVERGREEN “B”

Chair: **Q. Shen**, Northwestern University, Chicago, IL and
APS—Argonne National Laboratory, Argonne, IL

- 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

XRD & XRF MICROBEAM X-RAY ANALYSIS I

Thursday p.m. EVERGREEN “B”

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

- 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*
B. De Samber, T. Schoonjans, G. Silversmit, B. Vekemans, L. Vincze, R. Evens, K. De Schampheleere, C. Janssen, B. Masschaele, L. Van Hoorebeke, University of Ghent, Ghent, Belgium
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

XRD HIGH TEMPERATURE IN-SITU ANALYSIS

Thursday p.m. EVERGREEN “C”

Chair: **S.T. Misture**, NYS College of Ceramics at Alfred University, Alfred, NY

- 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. Mixture, Alfred University, Alfred, NY
- 4:10 D-44 STUDY OF COMBUSTION SYNTHESIS 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. Mixture, Alfred University, Alfred, NY

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 MCLLS 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**
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

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. Cornaby, 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, I. Ponomarev, Y. He, W.M. Gibson, X-ray Optical Systems, Inc., East Greenbush, NY
- 10:50 F-24 STUDY OF MICROHETEROGENEITY USING μ XRF, INAA, AND CHEMOMETRIC METHODS**
J.L. Molloy, 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 Electro-Communication University, Osaka, Japan
S. Maeo, M. Kurakado, Osaka Electro-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. Langenbacher, 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 NANOPARTICLE HALO FORMATION AROUND COLLOIDAL 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

XRF QUANTITATIVE ANALYSIS
Friday a.m. EVERGREEN “C”

Chair: **W.T. Elam**, EDAX/University of Washington, Redmond, WA

- 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** **$L\alpha/L\beta$ 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**
W.T. Elam, B. Scruggs, M. Solazzi, J. Nicolosi, EDAX, Inc., Mahwah, NJ
- 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 Technical Program

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.

- S5 STRESS GRADIENTS IN $Ti_xCr_{1-x}N$ COATINGS**
A. Ulyanenko, H. Guérault, Bruker AXS GmbH, Karlsruhe, Germany
V.V. Uglov, V.M. Anishchik, S.V. Zlotski, Belarussian State University, Minsk, Belarus
T.A. Ulyanenkova, T. Baumbach, University Karlsruhe, Karlsruhe, Germany
A. Lazar, Institute of Solid State Physics, Minsk, Belarus
- S6 RESIDUAL STRESS ANALYSIS WITH MULTIPLE HKL RINGS COLLECTED BY AREA DETECTORS**
B.B. He, Bruker AXS Inc., Madison, WI
- S9 ASSESSING THE QUALITY OF X-RAY OPTIC SURFACES OF SI CRYSTALS CUT BY DIAMOND-WIRE AND ROTATING BLADE SAWING TECHNIQUES**
M. Wieczorek, X. Huang, J. Maj, R. Conley, J. Qian, A. Macrander, R. Khachatryan, Argonne National Laboratory, Argonne, IL
C. Christensen, Diamondwire Technology, Colorado Springs, CO
- S17 INVESTIGATIONS OF LATTICE SPACING ON IN718 VIA NEUTRON LARMOR DIFFRACTION**
J. Repper, M. Hofmann, W. Petry, C. Krempaszky, E. Werner, TU München, Garching, Germany
T. Keller, Max-Planck-Institute for Solid State Research, Stuttgart, Germany
- S23 INFLUENCE OF ALLOY COMPOSITION ON RESIDUAL STRESS IN HEAT TREATED ALUMINIUM ALLOYS**
J.S. Robinson, University of Limerick, Limerick, Ireland
E.C. Oliver, ISIS, Rutherford Appleton Laboratory, Oxford, UK
- S43 OPTIMIZING STEEL WELDING PROCEDURES BY USING NEUTRON AND X-RAY DIFFRACTION**
V. Luzin, Bragg Institute, ANSTO, Menai, NSW, Australia
B. Gross, Welding Technology Institute of Australia, Newington, NSW, Australia
P. Bendeich, Institute of Materials and Engineering, ANSTO, Menai, NSW, Australia
T. Gnäupel-Herold, NCNR, NIST, Gaithersburg, MD
- S50 NEW DEVELOPMENTS AT MATERIALS SCIENCE DIFFRACTOMETER STRESS-SPEC AT FRM II**
J. Kornmeier, R. Wimpory, R. Schneider, Hahn-Meitner-Institut (HMI), Berlin, Germany
M. Hofmann, J. Repper, A. Ostermann, G.A. Seidl, W. Tekouo, TU München, Garching, Germany
U. Garbe, H.G. Brokmeier, GKSS-Forschungszentrum Geesthacht GmbH, Geesthacht, Germany
C. Randau, H.G. Brokmeier, TU Clausthal, Clausthal-Zellerfeld, Germany
- S54 TEXTURE EVOLUTION DURING SEVERE PLASTIC DEFORMATION AND RESIDUAL STRESSES AT LOW AND HIGH TEMPERATURE OF A COPPER MATRIX REINFORCED BY NIOBIUM NANOTUBES**
J.B. Dubois, V. Vidal, L. Thilly, P.O. Renault, University of Poitiers, Futuroscope, France
S. Van Petegem, U. Stühr, H. Van Swygenhoven, Paul Scherrer Institute, Villigen-PSI, Switzerland
F. Lecouturier, Laboratoire National des Champs Magnétiques Pulsés, Toulouse, France
- S60 MICRO-MECHANICAL MODELLING OF ELASTIC THIN FILMS AND COMPARISON WITH IN SITU TENSILE TEST WITH X-RAY DIFFRACTION MEASUREMENT**
G. Geandier, O. Castelnau, LPMTM / CNRS, Villetaneuse, France
L. Thilly, E. Le Bourhis, P.-O. Renault, Ph. Goudeau, LPM-PhyMAT, Poitiers, France
- S67 STUDIES OF STRONTIUM TITANATE THIN FILMS BY X-RAY METHOD**
H. Ji, Y.R. Li, University of Electronic Science & Technology of China, Chengdu, P.R. China
X.Y. Zhou, Y. Wang, The Hong Kong Polytechnic University, Hong Kong, P.R. China
- S68 SALSA: RESIDUAL STRESS DETERMINATION USING NEUTRONS**
D.J. Hughes, T. Pirling, J.-C. Collet-Fenetrier, S. Rowe, Institut Laue Langevin, Grenoble, France

- 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**
F. Hofmann, S.Y. Zhang, T.S. Jun, A.M. Korsunsky, University of Oxford, Oxford, Oxfordshire, Great Britain
- 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. Wierzbanski, 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. Wierzbanski, 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, Italia
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 STRAINET: 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

Thursday, 7 August, ICRS-8 Poster Session & Dinner

Evergreen Ballroom, 6:00 p.m.–9:00 p.m.

- 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 EXERCISE**
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, Salzgitter 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. Ellerman, 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. Valgur, 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

S202 THERMAL MODELING AND EXPERIMENTATION FOR RESIDUAL STRESS PREDICTION IN BRAZE-WELDED BERYLLIUM VIA A SURROGATE CuZn_{10} ALLOY

P. Backlund, J. Lee, S. Shah, C. Seepersad, J. Howell, E. Taleff, University of Texas at Austin, Austin, TX
M. Prime, Los Alamos National Laboratory, Los Alamos, NM

S204 THE ENGINEERING MATERIALS DIFFRACTOMETER "TAKUMI" AT J-PARC

S. Harjo, K. Suzuya, K. Aizawa, T. Nakatani, M. Arai, J-PARC Center, JAEA, Tokai, Ibaraki, Japan
A. Moriai, Y. Morii, QUBS, JAEA, Tokai, Ibaraki, Japan
Y. Tomota, Ibaraki Univ., Hitachi, Ibaraki, Japan
K. Akita, Musashi Inst. Tech., Tokyo, Japan
K. Shirakihara, Suzuka College of Tech., Suzuka, Mie, Japan

S210 RESIDUAL STRESSES AND FAILURE IN A WELDED COBALT-MOLYBDENUM HCP ALLOY

P. Huson, E. Criss, B. Kad, University of California – San Diego, San Diego, CA
M. Prime, Los Alamos National Laboratory, Los Alamos, NM

S217 SIMULATION OF TIME-OF-FLIGHT NEUTRON DIFFRACTION USING A NEW SAMPLE KERNEL

S.-Y. Lee, E. Üstündag, Iowa State University, Ames, IA
L. Li, I.C. Noyan, Columbia University, New York, NY
B. Clausen, Los Alamos National Laboratory, Los Alamos, NM

S219 NEUTRON DIFFRACTION STUDY OF STRESS DISTRIBUTION IN STEEL SHEET AROUND ACTIVE NiTi INSERTS

V. Davydov, M. Vrána, P. Lukás, Nuclear Physics Institute, Řež, Czech Republic
B. Malard, J. Pilch, P. Šittner, Institute of Physics, Praha, Czech Republic

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 S140 INVITED—IN-SITU SYNCHROTRON X-RAY TOMOGRAPHY STUDIES OF CREEP VOID EVOLUTION IN BRASS ALLOYS AND STEELS

A.R. Pyzalla, K. Dzieciol, A. Isaac, F. Sket, A. Borbely, G. Suathoff, Max-Planck-Institut fuer Eisenforschung GmbH, Duesseldorf, Germany
T. Buslaps, M. Di Michiel, ESRF, Grenoble, France

2:00 S37 STUDY OF COMPUTERIZED TOMOGRAPHY AND STRAIN MAPPING IN THE VICINITY OF CRACK TIP IN STEEL MATERIAL USING SYNCHROTRON WHITE X-RAY

J. Shibano, T. Arai, S. Miura, M. Kobayashi, Kitami Institute of Technology, Kitami, Hokkaido, Japan
K. Kajiwarra, JASRI, Sayo-cho, Hyogo, Japan
K. Kiriyaama, T. Shobu, JAEA, Sayo-cho, Hyogo, Japan
K. Suzuki, Niigata Univ., Niigata, Niigata, Japan

2:20 S109 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, Nogoya-shi, Aichi, Japan

2:40 S39 CHARACTERIZATION OF A NEW BONE RECONSTRUCTED AT THE INTERFACES WITH IMPLANTS

A. Benmarouane, A. Lodini, UFR Sciences Exactes et Naturelles, LACM, Reims, France
T. Buslaps, V. Honkimaki, ESRF, Grenoble, France
T. Hansen, ILL, Grenoble, France

3:00 BREAK

3:30 S14 INVITED—MEASURING STRAIN IN AMORPHOUS SOLIDS BY HIGH-ENERGY X-RAY SCATTERING

T.C. Hufnagel, Johns Hopkins University, Baltimore, MD

4:00 S28 ELASTIC-PLASTIC DEFORMATION OF A POLYCRYSTALLINE TITANIUM ALLOY STUDIED IN SITU BY ENERGY-DISPERSIVE SYNCHROTRON X-RAY DIFFRACTION

S.Y. Zhang, X. Song, A. Korsunsky, University of Oxford, Oxford, United Kingdom

4:20 S80 RESIDUAL STRESS DETERMINATION IN SURFACE TREATED ALUMINA SAMPLES APPLYING BEAM LIMITING MASKS

T. Manns, B. Scholtes, University of Kassel, Kassel, Germany
A. Rothkirch, HASYLAB at DESY, Hamburg, Germany

4:40 S30 THE BAUSCHINGER EFFECT IN NANOFILAMENTARY Cu/Nb WIRES EVIDENCED BY IN-SITU TENSILE TESTS UNDER SYNCHROTRON RADIATION

L. Thilly, P.O. Renault, V. Vidal, University of Poitiers, PHYMAT, Futuroscope, France
S. Van Petegem, H. Van Swygenhoven, Paul Scherrer Institute, Villigen, Switzerland
F. Lecouturier, LNCMP, Toulouse, France

ICRS-8 MODELING I

Wednesday p.m. LONGS PEAK

Chairs: **C. Tome, I. Beyerlein**, Los Alamos National Laboratory, Los Alamos, NM

- 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

ICRS-8 DIFFRACTION TECHNIQUES: LABORATORY APPLICATIONS

Wednesday p.m. BLANCA PEAK

Chairs: **C. Goldsmith**, IBM Corporation, Hopewell Junction, NY
T. Watkins, Oak Ridge National Laboratory, Oak Ridge, TN

- 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. Akiniwa, 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. Wohlschlägel, 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, Japan
M. Nishida, Kobe City College of Technology, Kobe, Hyogo, Japan
T. Jing, Harbin Institute of Technology, Harbin, China

- 4:20 S168 ASTM STANDARDS FOR RESIDUAL STRESS MEASUREMENT**
C.O. Ruud, Emeritus, The Pennsylvania State University, State College, PA
- 4:40 S105 APPROACHES TO THE PROBLEM OF THE INVERSE LAPLACE TRANSFORM IN RESIDUAL STRESS ANALYSIS BY COMPARISON OF EXPERIMENTAL RESULTS OF $\sigma(\tau)$ AND $\sigma(z)$**
T. Manns, B. Scholtes, University of Kassel, Kassel, Germany
I.A. Denks, Ch. Genzel, Hahn-Meitner-Institute Berlin, Berlin, Germany

ICRS-8 INDUSTRIAL APPLICATIONS: ENGINEERED STRESSES

Wednesday p.m. MAROON PEAK

Chairs: **J. Bunch**, The Boeing Company, Seattle, WA
M. Hill, University of California, Davis, CA

- 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, McClellan, 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
- 2:40 S74 SMALL CREEP DEFORMATIONS AND RESIDUAL STRESS RELAXATION IN WELDED AND SHOT PEENED ALMgSiCu ALUMINUM ALLOYS**
S. Daichendt, T. Hirsch, Institut fuer Werkstofftechnik, Bremen, Germany
- 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, ICMO/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. Rouhaud, 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

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

- 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, Hyuogo, Japan

- 9:20 S61 **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
- 9:40 S134 **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. Götting, B. Scholtes, University of Kassel, Kassel, Germany

ICRS-8 DIFFRACTION TECHNIQUES: NEUTRON I

Thursday a.m. PIKES PEAK

Chairs: **D. Brown**, Los Alamos National Laboratory, Los Alamos, NM
X.-L. Wang, Oak Ridge National Laboratory, Oak Ridge, TN

- 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

Chair: **J. Robinson**, University of Limerick, Limerick, Ireland

- 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
- 9:20 S181 **THE APPLICATION OF DIGITAL IMAGE CORRELATION TECHNIQUES FOR MEASURING RESIDUAL STRESS BY INCREMENTAL HOLE DRILLING**
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

Chair: **M. Prime**, Los Alamos National Laboratory, Los Alamos, NM

- 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. Gollhardt, 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. Horne, 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

Chairs: **C. Murray**, IBM – T.J. Watson Research Center, Yorktown Heights, NY
T. Gnaupel-Herold, NIST Center for Neutron Research, Gaithersburg, MD

- 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. Reiche, 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

Chair: **M. Hill**, University of California, Davis, CA

- 8:50 S201** **INVITED—A STUDY OF RESIDUAL STRESSES IN VACUUM PLASMA SPRAYED TUNGSTEN COATINGS**
T.-S. Jun, S.Y. Zhang, G. Thomas, P. Grant, A. Korsunsky, University of Oxford, Oxford, England
- 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

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

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, Puspipstek, 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 $\sin^2(\psi)$ 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. Bibee, 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, Universitaet 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. Steinzig, 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 PHOTOACOUSTIC IMAGES OF MICROINDENTED AREAS**
A.L. Glazov, K.L. Muratkov, 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. Kõo, A. Ryabchikov, Estonian University of Life Sciences, Tartu, Estonia

ICRS-8 MATERIALS ENGINEERING II

Thursday p.m. BLANCA PEAK

Chairs: **C. Murray**, IBM – T.J. Watson Research Center, Yorktown Heights, NY
T. Gnaupel-Herold, NIST Center for Neutron Research, Gaithersburg, MD

- 1:40 S82 RESIDUAL STRESSES IN COLD-DRAWN RODS: EFFECT OF AN ALTERNATIVE TREATMENT**
J. Ruiz-Hervias, M. Elices, Universidad Politecnica de Madrid, Madrid, Spain
M. Hofmann, J. Rebelo-Kornmeier, TU München, Garching, Germany
V. Luzin, Bragg Institute, Menai NSW, Australia
- 2:00 S100 NEUTRON DIFFRACTION STUDY OF INTERGRANULAR STRESS DEVELOPMENT IN Zr-2.5%Nb**
O. Zanellato, M.E. Fitzpatrick, L. Edwards, The Open University, Keynes, UK
M.R. Daymond, Queen's University, Kingston, Canada
- 2:20 S102 RESIDUAL STRESSES IN METAL MATRIX COMPOSITES FOR HEAT SINK APPLICATIONS DURING THERMAL CYCLING**
M. Schöbel, H.P. Degischer, TU Vienna, Vienna, Austria
T. Buslaps, M. di Michiel, ESRF, Grenoble, France
T. Poeste, R. Schneider, HMI Berlin, Berlin, Germany
S. Kleiner, EMPA, Thun, Germany
J. Hemptenmacher, DLR, Köln, Germany
A. Herrmann, IPP, Garching, Germany
- 2:40 S141 RESIDUAL STRESSES AND IN-SITU MEASUREMENT OF PHASE TRANSFORMATION IN LOW TRANSFORMATION TEMPERATURE (LTT) WELDING MATERIALS**
T. Kannengiesser, A. Kromm, M. Rethmeier, Federal Institute for Materials Research and Testing, Berlin, Germany
J. Gibmeier, Hahn-Meitner-Institute, Berlin, Germany
- 3:00 BREAK**
- 3:20 S197 INVITED—WHY SHOULD WE GIVE UP THE $\sin^2\psi$ AND ALL SIMILAR METHODS?**
B. Ortner, University Leoben, Leoben, Austria
- 3:50 S164 LOAD PARTITIONING IN A DUPLEX STAINLESS STEEL WITH SURFACE STRENGTH GRADIENT AND RESIDUAL STRESSES**
R. Lin Peng, S. Johansson, Linköping University, Linköping, Sweden
J. Gibmeier, Hahn-Meitner-Institut Berlin GmbH, Berlin, Germany
G.C. Chai, Sandvik Materials Technology, Sweden
- 4:10 S189 ASSESSMENT OF LOAD DISTRIBUTION IN DP 600 DUAL PHASE STEEL BY MEANS OF IN-SITU NEUTRON DIFFRACTION**
M. Seefeldt, S. Dillien, K.U. Leuven, Heverlee-Leuven, Belgium
- 4:30 S81 DEVELOPMENT OF MICROSTRESSES OF THE HOT EXTRUDED MAGNESIUM ALLOY AZ31 UNDER CYCLIC TESTING CONDITIONS**
M. Huppmann, W. Reimers, Technische Universität Berlin, Berlin, Germany
- 4:50 S62 COMBINED IN SITU NEUTRON DIFFRACTION AND ACOUSTIC EMISSION INVESTIGATION OF THE DEFORMATION MECHANISMS IN MAGNESIUM ALLOYS**
O. Muránsky, D.G. Carr, ANSTO, Menai, NSW, Australia
M.R. Barnett, Deakin University, Geelong, Australia
E.C. Oliver, ISIS Facility, Didcot, UK

ICRS-8 INDUSTRIAL APPLICATIONS: MISCELLANEOUS

Thursday p.m. MAROON PEAK

Chair: **J. Bunch**, The Boeing Company, Seattle, WA

- 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. Bibee, 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. Farjian-Sohi, T. Nitschke-Pagel, K. Dilger, University of Braunschweig, Braunschweig, Germany
- 2:40 S203 NEUTRON DIFFRACTION MEASUREMENT OF RESIDUAL STRESSES IN FRICTION STIR PROCESSED NANOCOMPOSITE SURFACE LAYER**
H. Xu, K. An, J. Qu, C.R. Hubbard, Z. Feng, X.-L. Wang, Oak Ridge National Laboratory, Oak Ridge, TN

ICRS-8 INDUSTRIAL APPLICATIONS: WELDING

Thursday p.m. MAROON PEAK

Chair: **M. Hill**, University of California, Davis, CA

- 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**
J.D. Budai, B.C. Larson, G.E. Ice, J.Z. Tischler, T.Z. Ward, Oak Ridge National Laboratory, Oak Ridge, TN
W. Liu, Argonne National Laboratory, Argonne, IL
D.D. Sarma, 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. Löhe, 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**
- 10:20 S88 INVITED—NANOSCALE DIFFRACTION MICROSCOPY AT THE CNM/APS HARD X-RAY NANOPROBE BEAMLINE**
M. Holt, J. Maser, R. Winarski, 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

ICRS-8 MODELING II

Friday a.m. LONGS PEAK

Chairs: **C. Tome, I. Beyerlein**, Los Alamos National Laboratory, Los Alamos, NM

- 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
- 9:40 S170 ON SURFACE TEXTURE AND INTEGRITY IN MACHINED SURFACES**
A.K. Balaji, A.R. Paranjpe, C. Rakurty, The University of Utah, Salt Lake City, Utah
- 10:00 BREAK**
- 10:30 S32 MEASUREMENT OF THE RESIDUAL STRESS FIELD IN AN ALUMINIUM ALLOY 2014A COMPONENT OF COMPLEX GEOMETRY**
S. Hossain, M. Fardi, D.J. Smith, C.E. Truman, University of Bristol, Bristol, UK
U. Stühr, Paul Scherrer Institute, Villigen, Switzerland
- 10:50 S75 IN-SITU STRAIN MEASUREMENTS IN COMPOSITE CASTINGS USING NEUTRON DIFFRACTION**
U. Wasmuth, M. Hofmann, L. Meier, H. Hoffmann, Technische Universität München, Garching, Germany
- 11:10 S130 FINITE ELEMENT SIMULATION OF RESIDUAL STRESS PROFILES IN PEEN FORMING PROCESS**
H.Y. Miao, C. Perron, National Research Council Canada, Québec, Canada
M. Lévesque, École Polytechnique de Montréal, Québec, Canada
- 11:30 S138 STUDY ON THE RESIDUAL STRESS AND THE DISTORTION OF THE LARGE GEARS OR AXLES DURING THE HEAT TREATMENT**
Y. Wang, Y. Ling, R. Kastelein, Z.A. Xu, SIRRI, Zwijnaarde, Belgium

ICRS-8 FATIGUE & FRACTURE

Friday a.m. BLANCA PEAK

Chair: **D. Smith**, Bristol University, Bristol, United Kingdom

- 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
- 9:20 S18 ON THE IMPROVEMENT OF THE FATIGUE BEHAVIOUR OF AUSTENITIC STAINLESS STEEL DUE TO SURFACE RESIDUAL STRESSES PRODUCED BY LOW TEMPERATURE CARBURIZING**
G. Minak, Università di Bologna, Bologna, Italia
- 9:40 S136 OPERATIONAL RESIDUAL STRESS FORMATION IN VIBRATION-LOADED ROLLING CONTACT**
J. Gegner, W. Nierlich, SKF GmbH, Schweinfurt, Germany
- 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. Löhe, 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

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

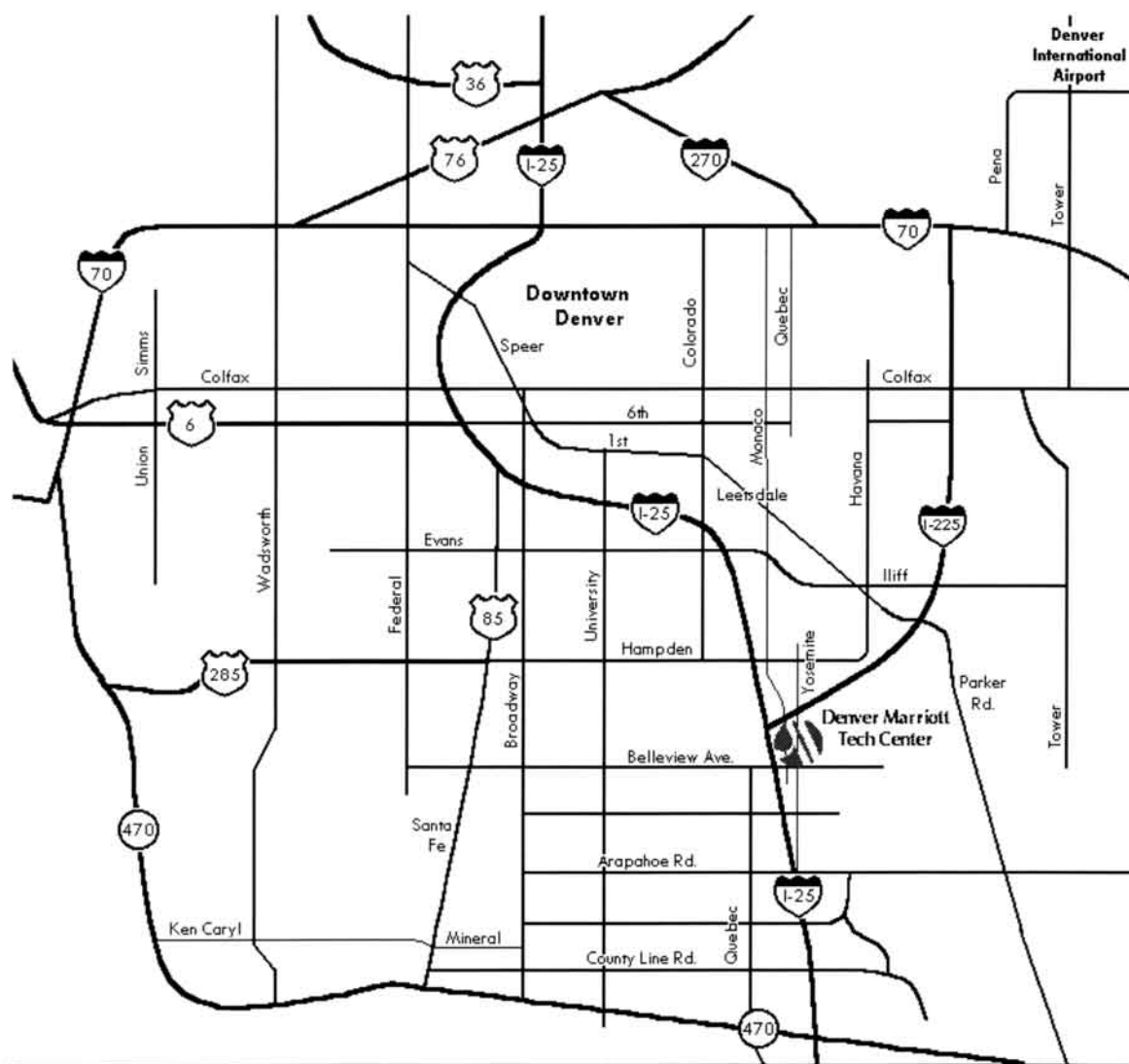
Other Area Attractions

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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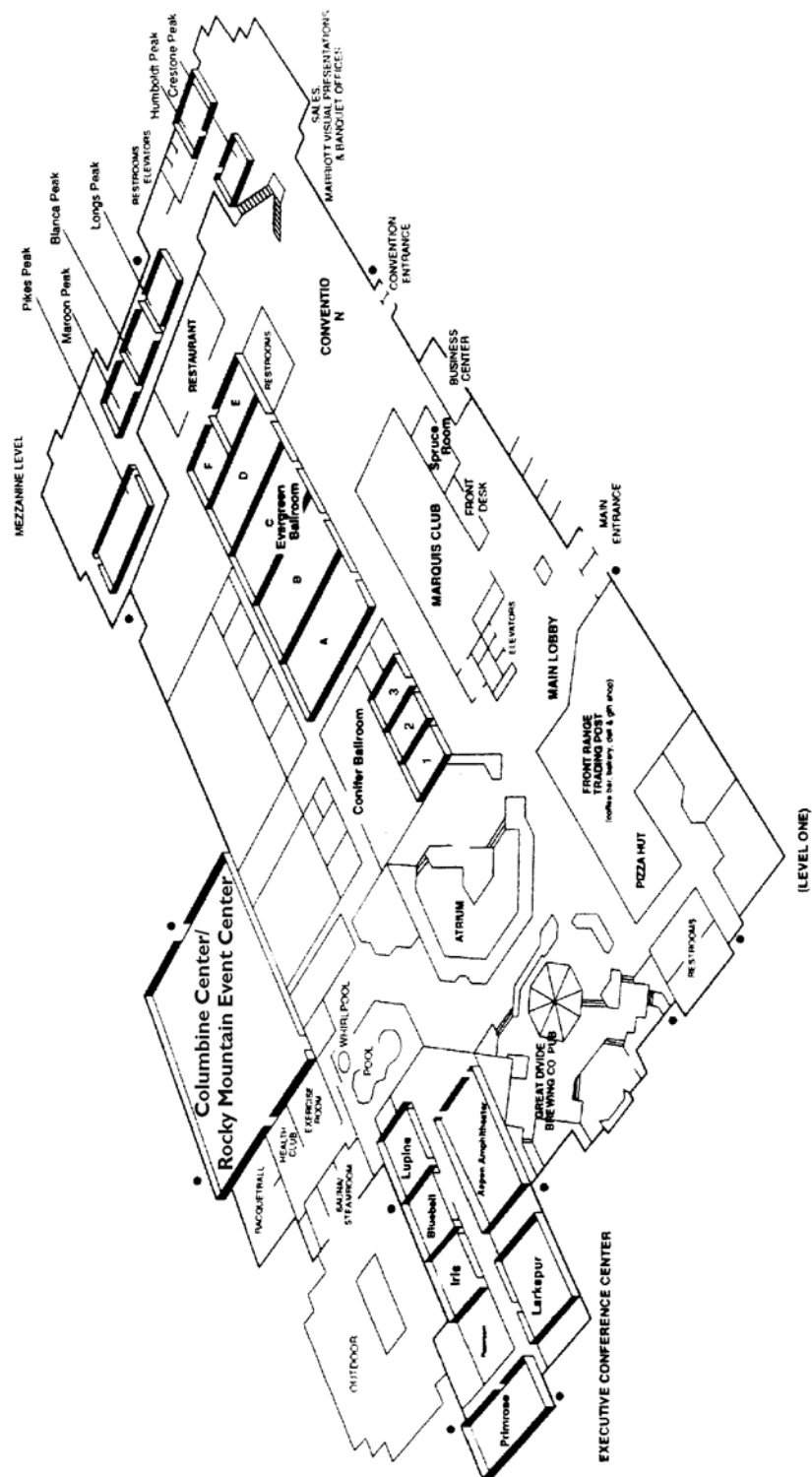
**4900 S. Syracuse Street
Denver, CO 80237**

(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 DTC Blvd.
Left on DTC Blvd.
Right on Union Ave.
Left on Syracuse St.
Hotel is on right

HOTEL LAYOUT



DENVER MARRIOTT TECH CENTER

Denver X-ray Conference *Program-at-a-Glance* 4-8 August 2008

Sun. Eve.: 6:00 – 8:00 p.m. Welcoming Reception. Sponsored by Thermo Scientific and ICDD. Evergreen Ballroom			
Day & Time	XRD & XRF	XRD	XRF
Mon. am: Workshops 9:00 – 12:00		Texture Analysis with Area Detectors (He/Blanton) “A” Introduction to Rietveld (Kaduk) “B”	Quantitative Analysis I (Mantler) “C” Basic XRF (Elam/Havrilla) “D”
Mon. pm: Workshops 2:00 – 5:00		Non-ambient XRD (Misture) “A” Combined Use of X-rays & Neutrons (Huq) “B”	Quantitative Analysis II (Mantler) “C” Energy Dispersive XRF (Scruggs) “D”
Mon. Eve.: 6:00-8:00 p.m. Wine & Cheese Reception sponsored by PANalytical; XRD Poster Session (Blanton/Kaduk). Evergreen Ballroom			
Tue. am: Workshops 9:00 – 12:00	Cultural Heritage I (Trentelman) “A”	Stress Analysis I (Noyan/Prime) “B”	Specimen Preparation I (Anzelmo) “C” Trace Analysis (Wobrauschek) “D”
Tue. pm: Workshops 2:00 – 5:00	Cultural Heritage II (Trentelman) “A” Nanomaterials and their Applications (Snyder/Petkov) “E&F”	Stress Analysis II (Noyan/Prime) “B” High-throughput X-rays (Toby) “D”	Specimen Preparation II (Anzelmo) “C”
Tue. Eve.: 6:00 – 8:00 Wine & Cheese Reception sponsored by Chemplex Industries, Inc. and GE Inspection Technologies; XRF Poster Session (Palmer/Kawai). Evergreen Ballroom			
Wed. am: 8:30 – 12:30 Plenary Session: Stress and Society (Noyan/Prime/Üstündag) Evergreen Ballroom			
Wed. pm: Sessions	1:30 – 5:15 New Developments in XRD & XRF Instrumentation (Buhrke) “A” 2:00 – 5:00 Analysis of Nanomaterials (Petkov/Snyder) “B”	2:00 – 5:00 Thin Films (Blanton/Huang) “C”	1:30 – 4:50 Fusion & Industrial Applications of XRF (Anzelmo) “D”
Wed. Eve.: 5:00 – 7:00 Vendor sponsored Wine & Cheese Reception. Exhibit Hall “Rocky Mountain Event Center”			
Thurs. am: Sessions	9:00 – 12:00 Cultural Heritage I (Trentelman) “A” 9:00 – 12:00 Industrial Applications (Payzant/Snyder) “B”		9:00 – 12:00 Regulatory Applications (Elam) “C”
Thurs. pm: Sessions	2:00 – 5:00 Cultural Heritage II (Trentelman) “A” 1:30 – 3:10 X-ray Microimaging (Shen) “B” 3:30 – 5:00 Microbeam X-ray Analysis I (Tsuji/Havrilla) “B”	2:00 – 4:50 High Temperature In-situ Analysis (Misture) “C”	2:00 – 4:50 Trace Analysis (Zaitz) “D”
Fri. am: Sessions	8:30 – 11:50 Microbeam X-ray Analysis II (Tsuji/Havrilla) “A”	8:30 – 11:50 Small Angle Scattering (Ilavsky) “B”	8:30 – 11:20 Quantitative Analysis (Elam) “C”

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/Üstündag) Evergreen Ballroom				
Special Sessions				
Day and Time	Meeting Room			
	Pikes Peak	Longs Peak	Blanca Peak	Maroon Peak
Wednesday p.m.	1:30 – 5:00 Diffraction Techniques: Synchrotrons – Macrobeam and High Energy I (Almer/Daymond)	1:30 – 5:00 Modeling I (Tome/Beyerlein)	1:30 – 5:00 Diffraction Techniques: Laboratory Applications (Goldsmith/Watkins)	2:00 – 5:00 Industrial Applications: Engineered Stresses (Bunch/Hill)
Thursday a.m.	8:30 – 10:00 Diffraction Techniques: Synchrotrons – Macrobeam and High Energy II (Almer/Daymond) 10:30 – 12:00 Diffraction Techniques: Neutron I (Brown/Wang)	8:30 – 10:00 Relaxation Techniques: Hole Drilling (Robinson) 10:30 – 12:00 Relaxation Techniques: Slitting (Prime)	8:30 – 12:00 Materials Engineering I (Murray/Gnaupel- Herold)	8:50 – 10:20 Industrial Applications: Layers and Composites (Hill) 10:40 – 12:00 Industrial Applications: Thermal Processing (Bunch)
Thursday p.m.	1:30 – 3:00 Diffraction Techniques: Neutron II (Brown/Wang) 3:20 – 5:30 Diffraction Techniques: General Methods (Chair TBA)	1:30 – 3:00 Relaxation Techniques: Deep Hole and Contour (Hill) 3:30 – 5:30 Other Measurement Techniques (Robinson)	1:40 – 5:10 Materials Engineering II (Murray/Gnaupel- Herold)	1:40 – 3:00 Industrial Applications: Miscellaneous (Bunch) 3:30 – 5:30 Industrial Applications: Welding (Hill)
Friday a.m.	8:30 – 11:30 Diffraction Techniques: Synchrotrons – Microbeam (Ice/Tamura)	8:40 – 11:50 Modeling II (Tome/Beyerlein)	8:30 – 11:50 Fatigue & Fracture (Smith)	8:30 – 10:00 Industrial Applications: Distortion and Machining (Bunch) 10:30 – 11:30 Industrial Applications: Friction Stir Welding (Bunch)
Social Events:				
Sun. Eve.: 6:00 – 8:00 p.m.	Welcoming Reception Sponsored by Thermo Scientific and ICDD. Evergreen Ballroom.			
Mon. Eve.: 6:00 – 8:00 p.m.	Wine & Cheese Reception Sponsored by PANalytical; XRD Poster Session I (Blanton/Kaduk); Evergreen Ballroom.			
Tues. Eve.: 6:00 – 8:00 p.m.	Wine & Cheese Reception Sponsored by Chemplex Industries, Inc. and GE Inspection Technologies; XRF Poster Session (Palmer/Kawai); Evergreen Ballroom.			
Wed. Eve.: 5:00 – 7:00 p.m.	Vendor Sponsored Wine & Cheese Reception; Exhibit Hall “Rocky Mountain Event Center”.			
Thurs. Eve.: 6:00 – 9:00 p.m.	ICRS-8 Conference Dinner and Poster Session; Evergreen Ballroom.			

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

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

	by July 1	after July 1
☐ 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

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

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.

	by July 1	after July 1
☐ 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

*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.

REGISTRATION FORM

International Centre for Diffraction Data
12 Campus Boulevard
Newtown Square, PA 19073-3273 U.S.A.



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DATES TO REMEMBER

Conference Preregistration begins	May 2008
Deadline for pre-registration discount at the DMTC Hotel (Conference rate, subject to availability)	8 July 2008
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