X-RAY SPECTROMETRY

Published online in Wiley Online Library

(wileyonlinelibrary.com) DOI 10.1002/xrs.2556

News

Sciences

Connection of 3D chemical information and materials reproduction (June 6, 2014)

Dr B. Kanngießer (Technische Universität Berlin, Germany) and her colleagues have recently reported an interesting archaeological application of 3D chemical analysis based on confocal X-ray absorption near edge spectroscopy. This is highly significant for clarifying the technological background of the decorated black- and red-figured Athenian vases (6th and 5th century BC) and the plain black glaze. The research team discussed the correlation of the iron oxidation state in the black glaze layer with the manufacturing process. The three-stage firing process, which was used in the modern reproduction, was retraced by correlating selected attic black glazed (BG) specimens from different periods (Archaic, Classical, Hellenistic). For more information, see the paper, 'Confocal XANES and the Attic Black Glaze: The Three Stage Firing Process through Modern Reproduction', L. Luhl *et al*., Anal. Chem., Article ASAP (DOI: 10.1021/ac500990k).

X-ray frequency comb (June 1, 2014)

So far, laser combs in visible light wavelength have been known as an extremely precise measure of dimensions. What would happen if they move into the X-ray region? The advent of an X-ray free electron laser (XFEL) may realize an X-ray frequency comb in the near future. Dr S. M. Cavalettobe (Max-Planck-Institut fur Kernphysik, Heidelberg, Germany) is proposing such an ambitious experiment. The research could open up wide-ranging applications: ultraprecise X-ray atomic clocks, determination of many X-ray fundamental parameters, quantitative understanding of astrophysical models and quantum electrodynamics. For more information, see the paper, 'Broadband high-resolution X-ray frequency combs', S. M. Cavaletto *et al*, Nature Photonics, June 2014 (DOI: 10.1038/nphoton.2014.113).

Synchrotron imaging of birds' ancestor (May 23, 2014)

At ESRF in Grenoble, France, several very interesting imaging experiments are going on. Some fossils of Archaeopteryx, which were believed to live 150 million years ago, are being imaged by using a pin-hole X-ray camera at synchrotron beamlines BM5 and ID19. The main question is about their wings – whether they could fly or not. So far, the research has encountered a number of challenges. The project is conducted by Germany's Burgermeister-Muller-Museum (the Solnhofen Museum). For more information, see the following Web site, http://www.solnhofen.de/index.php?id=0,49

Electrochemical X-ray fluorescence (April 4, 2014)

A group led by Prof. Julie V. Macpherson (Warwick University, England) has reported electrochemical X-ray fluorescence, which can quantitatively detect heavy metals in solution. In this technique, electrochemical preconcentration of a species of interest onto the target electrode is achieved by cathodic electro-deposition. X-ray fluorescence can then help unambiguous elemental identification and quantification of metal concentration. The key is that the electrochemical preconcentration step improves the detection limit by over 4 orders of magnitude, and it can reach the sub-ppb level. For more information, see the paper, 'Electrochemical X-ray Fluorescence Spectroscopy for Trace Heavy Metal Analysis: Enhancing X-ray Fluorescence Detection Capabilities by Four Orders of Magnitude', L. A. Hutton *et al*., Anal. Chem., 86, 4566 (2014).

Application of TXRF to the determination of halide in liquid (March 17, 2014)

Prof. K. Binnemans (KU Leuven, Heverlee, Belgium) and his colleagues have published several papers on the application of TXRF to the determination and quantification of halide impurities in liquid. So far, the detection of halide ions in solution has been problematic because volatile hydrogen halide compounds are formed when the sample is mixed with the acidic metal standard solution. The loss of hydrogen halide during the drying step of the sample preparation procedure gives imprecise and inaccurate results. To avoid this, the research group is proposing to introduce an alkaline copper standard $Cu(NH_3)_4(NO_3)_2$. For more information, see the papers, 'Determination of Halide Impurities in Ionic Liquids by Total Reflection X-ray Fluorescence Spectrometry', T. V. Hoogerstraete *et al*., Anal. Chem., 86, 3931 (2014), and 'Determination of Halide Ions in Solution by Total Reflection X-ray Fluorescence (TXRF) Spectrometry', T. V. Hoogerstraete *et al*., Anal. Chem., 86, 1391 (2014).

Measurement of steady-state diffusion by the use of confocal X-ray microscopy (December 13, 2013)

An interesting application of confocal micro-X-ray fluorescence has been reported by Dr Tianxi Sun (Beijing Normal University, China) and his colleagues. The technique employs a polycapillary focusing X-ray lens and a polycapillary parallel X-ray lens, as well as the laboratory X-ray source (Mo tube). In the present research, the scan of the confocal point can give the Cu^{2+} ion distribution near the surface of the electrode in a steady-state diffusion in an electrolytic tank. The research group studied the effects of the concentration of the electrolyte and the bath voltage on the shape of the layer on the nonuniform distribution of the Cu^{2+} ions. For more information, see the paper, 'Spatially Resolved In Situ Measurements of the Ion Distribution Near the Surface of Electrode in a Steady-State Diffusion in an Electrolytic Tank with Confocal Micro X-ray Fluorescence', S. Peng *et al*., Anal. Chem., 86, 362 (2014).

Professional

10th Ewald prize – A. Janner and T. W. J. M. Janssen (December 5, 2013)

The International Union of Crystallography (IUCr) has announced that Professors A. Janner and T. W. J. M. Janssen (both from the

Institute for Theoretical Physics, University of Nijmegen, The Netherlands) have been awarded the tenth Ewald prize for the development of superspace crystallography and its application to the analysis of aperiodic crystals. The presentation of the Ewald Prize will be made during the Montreal Congress Opening Ceremony on 5 August 2014. The Ewald prize consists of a medal, a certificate and an award of $30,000. Former recipients are E. Dodson (UK), C. Giacovazzo (Italy), G. M. Sheldric (Germany) in 2011, D. Sayre (USA, 2008), P. Coppens (USA, 2005), M. M. Woolfson (UK, 2002), G. N. Ramachandran (India, 1999), M. G. Rossmann (USA, 1996), N. Kato (Japan, 1993), B. K. Vainshtein (Russia, 1990), J. M. Cowley (USA) and A. F. Moodie (Australia) in 1987. For further information, visit the Web page, http://www.iucr.org/people/ewald-prize/10th-ewald-prize

The 8th Asada award (September 24, 2013)

The recipient of the 8th Asada Award, which is presented by the Discussion Group of X-ray Analysis, Japan, in memory of the late Professor Ei-ichi Asada (1924–2005) to promising young scientists in X-ray analysis fields in Japan, is Dr Hironori Ohashi (Kyushu Univ.), 'Characterization of gold catalysts by the combined use of X-ray and Mossbauer spectroscopy'. The ceremony was held during the 49th Annual Conference on X-Ray Chemical Analysis and the 15th International Conference on Total Reflection X-Ray Fluorescence Analysis and Related Methods (TXRF2013), at Osaka City University, Osaka.

Denver X-ray conference awards (August 7, 2013)

During the plenary session of the 63rd Annual Denver X-Ray Conference, three awards were presented. The 2013 Barrett Award was presented to Vaclav Petricek of the Institute of Physics, Academy of Sciences of the Czech Republic, Praha, Czech Republic, for developing the theory of incommensurate/modulated/composite crystal structures and its implementation in the computing system Jana2006 (the most widely-used system for solving and refining aperiodic structures), and for making possible the correct archival of such structures in the Powder Diffraction FileTM. The 2013 Jenkins Award was presented to Rene Van Grieken of the University of Antwerp, Antwerp, Belgium, for contributions to the development and application of X-ray methods to a wide variety of topics, from aerosols in the environment to conservation and from new techniques and microanalysis to biomedical applications. He has been a leader in the X-ray community and has served it in many capacities over the years, including Editor-in-Chief of *X-ray Spectrometry* as well as being a member of various national and international commissions involved in analytical and environmental chemistry. He has disseminated his knowledge in an impressive list of papers, books, and invited lectures. The 2013 Hanawalt Award was presented to Robert B. Von Dreele of Argonne National Laboratory, Lemont, IL, USA, for his insight, courage and creativity in bringing powder diffraction to the macromolecular community. For further information, visit the Web page, http://www.dxcicdd.com/

The 2013 Compton award (May 1, 2013)

The Advanced Photon Source (APS) and APS Users Organization have announced that the 2013 Arthur H. Compton Award has been presented jointly to David E. Moncton, John N. Galayda, Michael Borland, and Louis Emery. The award recognizes the recipients' visionary leadership and technical ingenuity in introducing 'top-up' operation to the synchrotron radiation community. The award consists of a plaque and $2500. Former recipients of this award are Edward Stern, Farrel Lytle, Dale Sayers (posthumously) and John Rehr (2011); Simon Mochrie, Mark Sutton and Gerhard Grubel (2009); Andrzej Joachimiak and Gerold Rosenbaum (2007); Gunter Schmahl and Janos Kirz (2005); Martin Blume, Doon Gibbs, Kazumichi Namikawa and Denis McWhan (2003); Wayne A. Hendrickson (2001); Sunil K. Sinha (2000); Donald H. Bilderback, Andreas K. Freund, Gordon S. Knapp and Dennis M. Mills (1998); Philip M. Platzman and Peter M. Eisenberger (1997); and Nikolai Vinokurov, Klaus Halbach (1995).

Multimedia

Podcast on wavelength-dispersive X-ray fluorescence spectroscopy (February 10, 2014)

An interesting and useful tutorial on X-ray analytical methods for newcomers is now available in the Materials Today Podcast. Dr Ravi Yellepeddi (Thermo Fisher Scientific) explains the principle of X-ray fluorescence, recent progress in instruments, and the variety of applications in industry and research laboratories. The talk is around 30 min. Visit the following Web site, http://www.materialstoday.com/characterization/podcasts/wavelength-dispersive-xray-fluorescence/

The synchrotron song published on YouTube (January 23, 2013)

Perhaps some readers already know Dr Ken Lea's synchrotron song, but now, it is available on YouTube. The song is about synchrotron radiation and many scientific studies, which have been performede at The Synchrotron Radiation Source (SRS), Daresbury Laboratory in UK, from 1980 to 2008. As so many scientific terms (wavelength, beamline, monochromator, polarization, collimation, surface acoustic wave, sample chamber etc) are included in the lyrics, it may not be easy for ordinary people to sing this song. Visit the following You Tube site and have fun!

http://www.youtube.com/watch?v=-Rc5OfEcSZk

New products

Silvaco's X-ray pixel detector developed for X-ray free electron laser applications (June 4, 2014)

Silvaco Japan Co., Ltd (Silvaco) has announced that RIKEN SPring-8 Center (RIKEN) has successfully developed its high performance X-ray pixel detector with a multi-port, charge-coupled device (MULTI-port CCD), which is the eye of the X-ray Free Electron Laser facility 'SACLA', using Silvaco's TCAD products. For further information, visit the web page, http://www.silvaco.com/

Bruker's new online XRF coating analyzer (April 4, 2014)

Bruker has introduced its new online coating analyzer S2 KODIAK^{TM}, which delivers information on both coating thickness and layer composition in real-time. The main applications are sheet metal, glass, thin film solar cells, paper coatings and polymer films. For further information, visit the web page, http://www.bruker.com/

Rigaku launches new 2D photon counting X-ray detector for diffraction studies (April 1, 2014)

Rigaku Corporation has announced the release of the Rigaku HyPix-3000 detector, a next-generation two-dimensional semiconductor detector designed specifically to meet the needs of the home lab diffractionist. The HyPix-3000 is a hybrid pixel array

detector with a large active area of approximately 3000 mm^2, a small pixel size of 100 μm^2, a high count rate of greater than 1 Mcps/pixel, as well as a readout speed of nearly 4 ms. One particularly attractive feature is seamless switching from time delay and integration (2D-TDI) mode to 2D snapshot mode to 1D-TDI mode to 0D mode with a single detector. For further information, visit the web page, http://www.rigaku.com/

Corporate

Bruker acquires Prairie Technologies (September 12, 2013)

Bruker Corporation has announced that it has acquired Prairie Technologies, Inc. (Prairie), a provider of life science fluorescence microscopy products. For further information, visit the web page, http://www.bruker.com/

SpectroscopyNow.com

For additional news about X-ray analysis and other spectroscopy sciences, please browse the Wiley website. http://www.SpectroscopyNow.com

Kenji Sakurai
News Editor
sakurai@yuhgiri.nims.go.jp
or sakurai@pas.tsukuba.ac.jp

X-RAY SPECTROMETRY

Published online in Wiley Online Library

(wileyonlinelibrary.com) DOI 10.1002/xrs.2568

News

Sciences

Micro analysis of heterogeneous aerosol particles (14 September 2014)

So far, high-resolution microscopic analysis of individual atmospheric particles has been fairly difficult because of problems with the filters used for capturing particles. The research group in the National Institute for Standards and Technologies, USA, is proposing a multiplatform approach for microscopically assessing chemical and optical properties of individual heterogeneous urban dust particles. The procedures described in the paper could also be useful for similar analysis. The method uses 5 steps: (i) particles embedded in fibrous filters are transferred to polished silicon/germanium wafers with electrostatically assisted high-speed centrifugation, (ii) particles with light absorbing/scattering behavior are identified from bright/dark field light-microscopy, (iii) particles identified from light microscopy are compositionally mapped at high-definition with field-emission scanning electron microscopy and energy-dispersive X-ray spectroscopy, (iv) compositionally mapped particles are further analyzed with focused ion-beam tomography whereby a series of thin slices from a particle are imaged, and the resulting image stack is used to construct a three-dimensional (3D) model of the particle, and (v) particle chemistry is assessed over two distinct regions of a thin focused ion-beam slice of a particle with energy-filtered transmission electron microscopy and electron energy-loss spectroscopy associated with scanning transmission electron microscopy. For more information, see the paper, 'Qualitative Multiplatform Microanalysis of Individual Heterogeneous Atmospheric Particles From High-Volume Air Samples', J. M. Conny *et al.*, Anal. Chem., Just Accepted (DOI: 10.1021/ac5022612 Publication Date (Web): 14 September).

Full-field XANES imaging (11 August 2014)

Professor L. Vincze (Ghent University, Belgium) and his colleagues have reported on the latest fluorescence mode XANES imaging using the SLcam, which is an energy dispersive pnCCD detector. At BM26A, ESRF, the measurements were carried out for iron foil with some oxides and geological standard samples. The typical detection limit and measuring time were 0.5 wt% and 15 h, respectively. Readers might think that energy-resolution can be sacrificed near the absorption edges of interest in order to shorten the measuring time in the same way as ordinary XANES measurement by means of X-ray fluorescence. Although the use of ordinary X-ray CCD in accumulation mode for a very similar experiment was published 10 years ago [e.g. M. Mizusawa *et al.*, J. Synchrotron Rad. 11, 209 (2004)], the present system has the advantage of being able to reduce the background from the major light elements contained in the sample. For more information, see the paper, 'Full-Field Fluorescence Mode Micro-XANES Imaging Using a Unique Energy Dispersive CCD Detector', P. Tack *et al.*, Anal. Chem., 86, 8791 (2014).

Synchrotron micro X-ray fluorescence analysis of radioactive air-particulates emitted by the nuclear power plant accident in Fukushima, Japan (1 August 2014)

A research team led by Professor I. Nakai (Tokyo University of Science, Japan) has recently clarified the detailed chemical nature of radioactive aerosol microparticles emitted during the Fukushima Daiichi Nuclear Power Plant accident. They collected three fine particles of two microns in dia, containing radioactive cesium, on 14 and 15 March 2011, in Tsukuba, 172 km away from the power plant. In addition to Fe, Zn, Rb, Zr, Mo, Sn, Sb, Te, Cs, and Ba, U was detected in two particles. The oxidation states of the heavy elements were also studied by X-ray absorption spectra. The experiments were performed at BL37XU, SPring-8, Japan. For more informatiosee the paper, 'Detection of Uranium and Chemical State Analysis of Individual Radioactive Microparticles Emitted from the Fukushima Nuclear Accident Using Multiple Synchrotron Radiation X-ray Analyses', Y. Abe *et al.*, Anal. Chem., 86, 8521 (2014).

Gunshot residue analysis by X-ray fluorescence (1 August 2014)

Professor J. Wang (University of California San Diego, USA) and his colleagues have applied X-ray fluorescence to the analysis of gunshot residue, which has been usually detected based on the analysis trace amounts of metallic and organic species deposited on the hands, face, hair, and clothing of the shooter. The researchers tried to couple square-wave stripping voltammetry and scanning electron microscopy plus energy dispersive X-ray spectroscopy. The former method can be used as a rapid screening tool, while the latter contributes to confirmation of the presence of the characteristic morphology and metal composition of gunshot residue particles. For more information, see the paper, 'Orthogonal Identification of Gunshot Residue with Complementary Detection Principles of Voltammetry, Scanning Electron Microscopy, and Energy-Dispersive X-ray Spectroscopy: Sample, Screen, and Confirm', A. M. O'Mahony *et al.*, Anal. Chem., 86, 8031 (2014).

Precise time measurement in sub-femtosecond by the use of X-ray free-electron laser (27 July 2014)

It is now known that X-ray free-electron lasers can produce ultrafast X-ray pulses as short as 3 fs in FWHM. Scientists at the Linac Coherent Light Source, Stanford are trying to reduce delay time errors in optical-pump and X-ray probe measurements to the 1 fs level, by 2D spectrogram measurement of the relative X-ray/optical delay. For more information, see the paper, 'Sub-femtosecond precision measurement of relative X-ray arrival time for free-electron lasers', N. Hartmann *et al.*, Nature Photonics, 8, 706 (2014).

Comparison of excitation mode in synchrotron X-ray fluorescence of environmental samples (15 July 2014)

Professor T. M. Cahill (Arizona State University) and his colleagues have recently compared the performance of the

different excitation modes of synchrotron radiation X-ray fluorescence. The research team evaluated four different beamline configurations for the analysis of three representative environmental samples; a thin aerosol sample, an intermediate thickness biological sample, and a thick rare earth mineral specimen. They found that white beam excitation is optimal for the analysis of thin samples with little mass and that filtered white beam excitation (removing lower energy X-rays by absorber) gives better sensitivity for elements emitting more energetic X-rays. In their study, monochromatic excitation, which tends to be the standard mode of operation, did not give good results in terms of sensitivity. For more information, see paper, >the <?A3B2 show 'Evaluation of Different Synchrotron Beamline Configurations for X.ray Fluorescence Analysis of Environmental Samples', S. R. Barberie *et al*., Anal. Chem., 86, 8253 (2014).

Application of total-reflection X-ray fluorescence to the monitoring of bioaccumulation in gold nanorods (7 July 2014)

A Spanish group has recently published a very interesting application of total-reflection X-ray fluorescence. The research team has evaluated the bioaccumulation kinetics of gold nanorods in various tissues upon intravenous administration in mice. It was found that the main achievement was clearly differentiating two kinds of behaviors; gold nanorods were quickly bioaccumulated by highly vascular filtration organs such as the liver and spleen, while they do not show bioaccumulation rates in the brain and lung for the period of time investigated. For more information, see the paper, 'Evaluation of Bioaccumulation Kinetics of Gold Nanorods in Vital Mammalian Organs by Means of Total Reflection X-Ray Fluorescence Spectrometry', R. Fernandez-Ruiz *et al*., Anal. Chem., 86, 7383 (2014).

Use of Compton-to-Rayleigh scattering intensity ratio for the aid of reference-free X-ray analysis (20 June 2014)

Dr. V-D. Hodoroaba (BAM, Berlin, Germany) and his colleague have published a report on the feasibility of quantitative X-ray fluorescence (XRF) analysis using coherent (Rayleigh) and incoherent (Compton) X-ray scattering. They have evaluated the ratio of the Compton-to-Rayleigh intensity observed in XRF spectra and also have discussed its relation to the average atomic number. In the so-called reference-free XRF analysis, which uses only fundamental parameters and a theoretical formula and does not rely on the calibration curve, there still exist many difficulties, particularly for matrices of lower mean atomic numbers. The analysis presented in this research has sufficiently high sensitivity to distinguish the average atomic number of specimens even within the 0.1 difference. For more information, see the paper, 'Gaining Improved Chemical Composition by Exploitation of Compton-to-Rayleigh Intensity Ratio in XRF Analysis', V-D. Hodoroaba *et al*., Anal. Chem., 86, 6858 (2014).

Spin-charge dynamics of iron complex clarified by ultrafast X-ray spectroscopy (15 May 2014)

The use of X-ray free-electrons has enabled plenty of fascinating science, such as watching non-equilibrium excited-state dynamics in complexes of 3D transition metals. Scientists at Linac Coherent Light Source, Stanford, have performed femtosecond resolution X-ray fluorescence spectroscopy, with its sensitivity to spin state, elucidating the spin crossover dynamics of $[Fe(2,2\text{-bipyridine})_3]^{2+}$ on photoinduced metal-to-ligand charge transfer excitation. For more information, see the paper, 'Tracking excited-state charge and spin dynamics in iron coordination complexes', W. Zhang *et al*., Nature, 509, 345 (2014).

Professional

X-ray analysis on Mars is hot (9 August 2014)

Most X-ray experiments can be carried out at high quality with ease in an ordinary laboratory. Some experiments, however, have to be performed in the field. It is hard to imagine a more extreme definition of 'in the field' than the planet of Mars, which is why exciting times have come about since NASA's Mars rover 'Curiosity' landed on Mars in August 2012. It has since recorded and sent back a large number of datasets including XRF and X-ray diffraction (XRD) data. Naturally, the scientists involved with the projects have been speaking globally since. During the European Conference on X-Ray Spectrometry 2014 (June, Bologna, Italy), Professor J. L. Campbell (University of Guelph, Canada) gave a keynote lecture entitled 'XRF and PIXE on the Mars Science LAB Curiosity Rover'. At the Denver X-ray conference (July, Big Sky, Montana), the Plenary Session was 'X-rays on Mars', and three scientists gave lectures. Professor D. L. Bish (Indiana University) gave a talk entitled 'The First X-ray Diffraction Results From Mars'. Professor J. L. Campbell's talk on 'XRF Combines with PIXE in Curiosity's Alpha Particle X-ray Spectrometer' was the extension on his talk at the European Conference on X-Ray Spectrometry 2014, and further detailed and specific discussion was performed there. Professor S. M. Clegg talked about 'Exploring Mars with ChemCam on the Curiosity Rover' (ChemCam enables quick element determination by the laser-induced plasma emission spectroscopy). In August, at Montreal, during the International Union of Crystallography's congress, Professor D. L. Bish gave a talk entitled 'The First X-ray Powder Diffraction Measurements on Mars'. These talks highlighted many interesting technological aspects of the measurements: XRF analysis is carried out first by the same CCD camera, which works as an energy-dispersive 2D X-ray detector, even when the main aim of the measurement is obtaining the XRD pattern. In the analysis of unknown samples, generally both chemical composition and the crystal structure are indispensable. Another reason is that XRF helps the systematic use of single photon counting mode of the CCD camera to get a good quality XRD pattern. Second, the samples are vibrated all the time to ensure a smooth and continuous Debye ring. The rover furthermore contains a series of standard samples to check the reliability and reproducibility of the measurements. The readers might be interested in such a compact X-ray analyzer, which combined both XRD and XRF machines. Very similar system is now commercially available. For further information on the scientific activity on Mars, visit the Web page, http://mars.jpl.nasa.gov/msl/

Denver X-ray conference awards (30 July 2014)

During the plenary session of the 65th Annual Denver X-Ray Conference, two awards were presented. The 2014 Birks Award was presented to George Havrilla, Los Alamos National Laboratory for his many contributions to microXRF, especially the development of the confocal XRF microscope. Dr. Havrilla has been a leader in the field of analytical XRF; including 19 years on the Denver X-ray Conference Organizing Committee; 9 years as North American Editor of X-ray Spectrometry; and six years as Co-Editor-in-Chief for Advances in X-ray Analysis. The ICDD Fellow Award was presented to John Getty, Instructor in Geophysical Engineering

and Principal Investigator in the Proppant Research Group at Montana Tech. John has played a key role in the planning and execution of the Denver X-ray Conference for more than 30 years. For further information, visit the Web page, http://www.dxcicdd.com/

Multimedia

YouTube videos of Ultrafast X-ray Summer Seminar 2014 (19 June 2014)

The Ultrafast X-ray Summer Seminar 2014 took place from June 15 to 19 at SLAC National Accelerator Laboratory, California, USA. The program is organized specifically to train students and post-docs on new opportunities in ultrafast science, particularly using X-ray Free Electron Lasers. Almost all the lectures presented by expert scientists are now available as videos on YouTube. The lecture by Dr. Pieter Glatzel (ESRF) on 'Hard X-ray Spectroscopy' (https://www.youtube.com/watch?v=0sMD8lZzuTE) is surely useful for young X-ray spectroscopists. Other exciting lectures are available from Dr. Oleg Shpyrko (UCSD) on 'Coherent X-ray Scattering at Ultrafast Timescales' (https://www.youtube.com/watch?v=OIR_ltSOl2U), Dr. Michael Odelius (Stockholm University) on 'Electronic Structure & Ultrafast Solution Dynamics in Xray vision w/ theoretical spectacles' (https://www.youtube.com/watch?v=lTIzAmYuyWA), Dr. Alexander Fohlisch (Helmholtz Zentrum Berlin) on 'Soft X-ray General and Solid State Aspects' (https://www.youtube.com/watch?v=xTz1oCV5cWI), Dr. Philippe Wernet (Helmholtz Zentrum Berlin) on 'Ultrafast Molecular Spectroscopy with X-rays: Experiment', and Prof. Claudio Pellegrini (UCLA) on 'X-ray Free Electron Lasers' (https://www.youtube.com/watch?v=5v68nuOTwns). For more information on this summer seminar, visit the following Web site, https://conf-slac.stanford.edu/uxss-2014/

New products

Rigaku's new SmartLab 3 (16 June 2014)

Rigaku Corporation has announced the release of the SmartLab 3 system, a highly versatile multipurpose X-ray diffractometer with built-in intelligent guidance. For further information, visit the web page, http://www.rigaku.com/

Corporate

Bruker acquires high-speed, 3D super-resolution fluorescence microscopy company Vutara (28 July 2014)

Bruker Corporation has announced that it has acquired Vutara Incorporated, a technology leader in high-speed, 3D, super-resolution fluorescence microscopy for life science applications. Vutara's estimated revenue for full year 2014 is expected to be approximately $2 million. For further information, visit the web page, http://www.bruker.com/

Spectris absorbs Claisse (18 July 2014)

Spectris (LSE: SXS) has announced that it has acquired the business and assets of the Canadian company La Corporation Scientifique Claisse Inc., a business leader in sample preparation for atomic spectroscopy (including X-ray) analysis. Revenues for the year ending March 2014 were CAD13 million. Claisse will become part of the Materials Analysis segment of Spectris and will be integrated into PANalytical. For further information, visit the web page, http://www.panalytical.com/

SpectroscopyNow.com

For additional news about X-ray analysis and other spectroscopy sciences, please browse the Wiley website. http://www.SpectroscopyNow.com

Kenji Sakurai
News Editor
sakurai@yuhgiri.nims.go.jp
or sakurai@pas.tsukuba.ac.jp