

## SYNCHROTRON LIGHT NEWS

### VARIA

**MAX-IV - Future Opportunities.** MAX IV synchrotron soon (in 2016) will become the strongest synchrotron-radiation source in the world, offering the opportunity to conduct research using the radiation in a wide energy range. On 18-19 June, the International Conference "MAX-IV - Future Opportunities" was held in Lund (Sweden). It was devoted to the future of synchrotron MAX IV being now under construction. A part of the meeting took place at the MAX IV site; the participants had opportunity to spot familiar with the progress of the construction of a linear accelerator and a large MAX-IV storage ring. The applied technology there are a pioneering and unique in the world. The conference was attended by MaxLab users and by representatives of ministries of science of the Baltic countries Sweden, Norway, Denmark, Finland, Estonia and Poland. Data on the scientific community interested in synchrotron radiation research were presented as well as the policy guidelines concerning the construction and use of the new synchrotron.

**2014 Year of Crystallography.** the United Nations yesterday declared that 2014 will be the official International Year of Crystallography, following the initiative of International Union of Crystallography

**SOLARIS, the first synchrotron in East-Central Europe under construction.** On May 16th, 2012, the corner stone of Solaris, the first synchrotron in East-Central Europe, was laid. This moment and the talk by Professor Karol Musiol, Rector of the Jagellonian University, is available at <http://www.youtube.com/watch?v=vNLPSe3bNjA>. Now, the Solaris building is ready for installation of the equipment.



The audience during the introductory talk of prof. Karol Musiol, Rector of the Jagellonian University.

**Lectures on synchrotron radiation in Cracow.** Each year at the Jagellonian University the students and PhD students have the opportunity to attend the lectures on synchrotron radiation and its application. Information (in Polish) is available at

[https://www.usosweb.uj.edu.pl/kontroler.php?action=actionx:katalog2/przedmioty/pokazPrzedmiot\(prz\\_kod:WFAIS.IF-Y326.0\)](https://www.usosweb.uj.edu.pl/kontroler.php?action=actionx:katalog2/przedmioty/pokazPrzedmiot(prz_kod:WFAIS.IF-Y326.0))

**Polish contribution to ESRF.** Completing of Polish contribution to ESRF will be possible after acceptance by the Parliament the changes in regulation of financial rules in science, planned for the autumn 2013. The ESRF is still accepting Polish proposals.

### **Kai Siegbahn prize awarded to Claudio Masciovecchio**

Kai Siegbahn prize was awarded to Claudio Masciovecchio from the Elettra Synchrotron Light Laboratory in Italy. "for combining the development of new instrumental facilities based on light scattering concepts, both on the ELETTRA storage ring and at FERMI@Elettra free electron laser, reporting results of significant value in the field of dynamics of disordered matter, bio-protector materials, and nanostructured materials". The award ceremony took place at the University of Uppsala on 10 September 2012.

### **EPS launches new prizes**

EPS launches new science of light research prizes:

- in the field of electromagnetic science, and
- in the field of laser science and its application.

### **The Aminoff Prize 2012**

The Royal Swedish Academy of Sciences has awarded The Gregori Aminoff Prize in crystallography 2012 to Marat Yusupov and Gulnara Yusupova (France) and Harry F. Noller (USA) "for their crystallographic studies on ribosomes, translators of the code of life".

### **The Aminoff Prize 2013**

The Royal Swedish Academy of Sciences (RSAS) has awarded the Gregori Aminoff Prize in Crystallography 2013 to Carlo Gatti (Italy) Mark Spackman (Australia) "for developing experimental and theoretical methods to study electron density in crystals, and using them to determine molecular and crystalline properties".

### **PSI facility news:**

<http://www.psi.ch/print/info/psi-user-facilities-newsletter-i2013>

### **WORTH READING**

#### **Topological crystalline insulator states in $Pb_{1-x}Sn_xSe$**

P. Dziawa, B.J. Kowalski, K. Dybko, R. Buczko, A. Szczerbakow, M. Szot, E. Łusakowska, T. Balasubramanian, B.M. Wojek, M.H. Berntsen, O. Tjernberg, T. Story  
*Nature Materials* **11** (2012) 1023–1027.

**A compact X-ray free-electron laser emitting in the subångström region**

T. Ishikawa, H. Aoyagi, T. Asaka, Y. Asano, N. Azumi, T. Bizen, H. Ego, K. Fukami, T. Fukui, Y. Furukawa, S. Goto, H. Hanaki, T. Hara, T. Hasegawa, T. Hatsui, A. Higashiya, T. Hirono, N. Hosoda, M. Ishii, T. Inagaki, Y. Inubushi, T. Itoga, Y. Joti, M. Kago, T. Kameshima, H. Kimura, Y. Kirihara, A. Kiyomichi, T. Kobayashi, C. Kondo, T. Kudo, H. Maesaka, X.M. Maréchal, T. Masuda, S. Matsubara, T. Matsumoto, T. Matsushita, S. Matsui, M. Nagasono, N. Nariyama, H. Ohashi, T. Ohata, T. Ohshima, S. Ono, Y. Otake, C. Saji, T. Sakurai, T. Sato, K. Sawada, T. Seike, K. Shirasawa, T. Sugimoto, S. Suzuki, S. Takahashi, H. Takebe, K. Takeshita, K. Tamasaku, H. Tanaka, R. Tanaka, T. Tanaka, T. Togashi, K. Togawa, A. Tokuhisa, H. Tomizawa, K. Tono, S. Wu, M. Yabashi, M. Yamaga, A. Yamashita, K. Yanagida, C. Zhang, T. Shintake, H. Kitamura, N. Kumagai  
*Nature Photonics* **6** (2012) 540–544.

**A high resolution and large solid angle x-ray Raman spectroscopy end-station at the Stanford Synchrotron Radiation Lightsource**

D. Sokaras, D. Nordlund, T.-C. Weng, R. Alonso Mori, P. Velikov, D. Wenger, A. Garachtchenko, M. George, V. Borzenets, B. Johnson, Q. Qian, T. Rabedeau, U. Bergmann  
*Review of Scientific Instruments* **83**, 4 (2012) 043112.

**Mapping element distributions in plant tissues using synchrotron x-ray fluorescence techniques**

E. Donner, M.D. de Jonge, P.M. Kopittke, E. Lombi, Chapter 9 in, *Plant Mineral Nutrients: Methods and Protocols*, F.J.M. Maathuis (ed.), *Methods in Molecular Biology* vol. 953 (Springer 2013), pp. 143-159.

**Coherent synchrotron emission from electron nanobunches formed in relativistic laser-plasma interactions**

B. Dromey, S. Rykovanov, M. Yeung, R. Hörlein, D. Jung, D.C. Gautier, T. Dzelzainis, D. Kiefer, S. Palaniypan, R. Shah, J. Schreiber, H. Ruhl, J.C. Fernandez, C.L.S. Lewis, M. Zepf, B.M. Hegelich,  
*Nature Physics* **8** (2012) 804–808.

**Dynamic synchrotron imaging of diabetic rat coronary microcirculation in vivo**

M.J. Jenkins, A.J. Edgley, T. Sonobe, K. Umetani, D.O. Schwenke, Y. Fujii, R.D. Brown, D.J. Kelly, M. Shirai, J.T. Pearson  
*Arteriosclerosis, Thrombosis, and Vascular Biology* **32** (2012) 370-377.

**Emphysema diagnosis using X-ray dark-field imaging at a laser-driven compact synchrotron light source,**

S. Schleede, F.G. Meinel, M. Bech, J. Herzen, K. Achterhold, G. Potdevin, A. Malecki, S. Adam-Neumair, S.F. Thieme, F. Bamberg, K. Nikolaou, A. Bohla, A.Ö. Yildirim, R. Loewen, M. Gifford, R. Ruth, O. Eickelberg, M. Reiser, F. Pfeiffer  
*PNAS* **109**, 44 (2012) 17880–17885.

**In situ biological dose mapping estimates the radiation burden delivered to ‘spared’ tissue between synchrotron X-ray microbeam radiotherapy tracks**

K. Rothkamm, J.C. Crosbie, F. Daley, S. Bourne, P.R. Barber, B. Vojnovic, L. Cann, P.A.W. Rogers  
*PLoS ONE* **7**, 1 (2012) e29853.

**Biomedical applications of the ESRF synchrotron-based microspectroscopy platform**

S. Bohica, M. Cotte, M. Salomé, B. Fayard, M. Kuehbach, P. Cloetens, G. Martinez-Criado, R. Tucoulou, J. Susini  
*Journal of Structural Biology* **177**, 2 (2012) 248–258.

**Development of a laser-based heating system for in situ synchrotron-based X-ray tomographic microscopy**

J.L. Fife, M. Rappaz, M. Pistone, T. Celcer, G. Mikuljan and M. Stampanoni  
*Journal of Synchrotron Radiation* **19**, 3, 2012, 352-358.

**The Debye-Scherrer camera at synchrotron sources: A revisit**

T. Straasø, J. Becker, B. B. Iversen, J. Als-Nielsen  
*Journal of Synchrotron Radiation* **20**, 1 (2013) 98-104.

**Multimodal hard X-ray imaging of a mammography phantom at a compact synchrotron light source**

S. Schleede, M. Bech, K. Achterhold, G. Potdevin, M. Gifford, R. Loewen, C. Limborg, R. Ruth, F. Pfeiffer  
*Journal of Synchrotron Radiation* **19**, 4 (2012) 525-529.

**Synchrotron infrared measurements of dense hydrogen to 360 GPa**

C.-S. Zha, Z. Liu, R.J. Hemley  
*Physical Review Letters* **108** (2012) 146402.

**Laser absorption in relativistically underdense plasmas by synchrotron radiation**

C.S. Brady, C.P. Ridgers, T.D. Arber, A.R. Bell, J.G. Kirk  
*Physical Review Letters* **109** (2012) 245006.

**Saturation of the laser-induced narrowband coherent synchrotron radiation process: Experimental observation at a storage ring**

M. Hosaka, N. Yamamoto, Y. Takashima, C. Szwej, M. Le Parquier, C. Evain, S. Bielawski, M. Adachi, H. Zen, T. Tanikawa, S. Kimura, M. Katoh, M. Shimada, T. Takahashi  
*Physical Review ST* **16** (2013) 020701.

**Development and trends in synchrotron studies of ancient and historical materials**

L. Bertrand, M. Cotte, M. Stampanoni, M. Thoury, F. Marone, S. Schöder  
*Physics Reports* **519**, 2 (2012) 51–96.

**Effect of selective area growth mask width on multi-quantum-well electroabsorption modulated lasers investigated by synchrotron radiation X-ray microprobe**

L. Mino, A. Agostino, S. Codato, G. Martinez-Criado, C. Lamberti

*Physics Research Section B* **284** (2012) 6–9.

**Probing the structure of long DNA molecules in solution using synchrotron radiation linear dichroism**

M. Rittman, S.V. Hoffmann, E. Gilroy, M.R. Hicks, B. Finkenstadt, A. Rodger

*Physical Chemistry Chemical Physics* **14** (2012) 353–366.

**Status of the FLASH II project**

K. Honkavaara, S. Ackermann, V. Ayvazyan, N. Baboi, V. Balandin, W. Decking, S. Dusterer, H.-J. Eckoldt, B. Faatz, M. Felber, J. Feldhaus, N. Golubeva, M. Korfer, M. Kuhlmann, T. Laarmann, A. Leuschner, L. Lilje, T. Limberg, N. Mildner, D. Nolle, F. Obier, A. Petrov, E. Plonjes, K. Rehlich, H. Remde, H. Schlarb, B. Schmidt, M. Schmitz, M. Scholz, S. Schreiber, H. Schulte-Schrepping, J. Spengler, M. Staack, N. Stojanovic, K. Tiedtke, M. Tischer, R. Treusch, M. Vogt, H.C. Weddig, T. Wohlenberg, M. Drescher, A. Hage, V. Miltchev, R. Riedel, J. Ronsch-Schulenburg, J. Rossbach, M. Schulz, A. Willner  
*Proc. of FEL2012*, (Nara, Japan) pp. 381-384.

**Step-by-step fabrication of a highly oriented crystalline three-dimensional pillared-layer-type metal–organic framework thin film confirmed by synchrotron x-ray diffraction**

K. Otsubo, T. Haraguchi, O. Sakata, A. Fujiwara, H. Kitagawa

*Journal of American Chemical Society* **134** (2012) 9605–9608.

**Synchrotron radiation imaging for advancing our understanding of cardiovascular function**

M. Shirai, D.O. Schwenke, H. Tsuchimochi, K. Umetani, N. Yagi, J.T. Pearson

*Circulation Research* **112** (2013) 209-221.

**Tracking cellular-level enamel growth and structure in 4D with synchrotron imaging**

P. Tafforeau, J.P. Zermeno, T.M. Smith

*Journal of Human Evolution* **62** (2012) 424e428.

**Rapid-access, high-throughput synchrotron crystallography for drug discovery**

SR. Wasserman, JW. Koss, ST. Sojitra, LL. Morisco, SK. Burley

*Trends in Pharmacological Sciences* **33**, 5, 2012, 261–267.

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**FUTURE CONFERENCES & WORKSHOPS**

**26th Annual MAX-lab User Meeting**, will take place September 23-25, 2013 in Lund, Sweden.

**Annual AVS International Symposium and Exhibition (AVS 2013)** will take place from Oct 27 to Nov 1, 2013 in Long Beach CA. For the first time, the Symposium will hold a series of sessions focused on particular synchrotron-related techniques (named Synchrotron Analysis Focus Topic).

**Contribution of Estonian Research Community at European Infrastructures – MAX-IV Lab, ESS and CERN and facilitating is announced** (M. Kirm, Proc. “Functional materials and nanotechnologies” FM&NT-2012).

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**More news at:** <http://www.lightsources.org/cms/>.

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