

**Schweizerische Gesellschaft für Kristallographie  
Société Suisse de Cristallographie  
Swiss Society for Crystallography**

**Sektion für Kristallwachstum und Kristalltechnologie  
Section de Croissance et Technologie des Cristaux**

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**SGK/SSCr NEWSLETTER**

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**Membership fee 2009**

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Fribourg, host-city of our the next SGK/SSCr annual meeting, September 8<sup>th</sup>, 2009

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## Multitopic ligand approach for the synthesis of new mixed metal compounds

Contributed by F. Gschwind and K.M. Fromm (fabienne.gschwind@unifr.ch)  
University of Fribourg, Department of Chemistry, Fribourg, Switzerland

Mixed metal materials can be used in different applications, for instance in opto-electronic devices or as metal oxides in high-Tc superconductors (BSSCO, YBCO) [1-4]. A synthetic strategy to obtain mixed metal oxides is to use decomposition techniques like (metal-organic) chemical vapour deposition (MO-CVD) for the combustion of metal-containing volatile complexes. Complexes of alkaline earth and group 11 metal ions (Cu,Ag,Au) may provide such precursors.

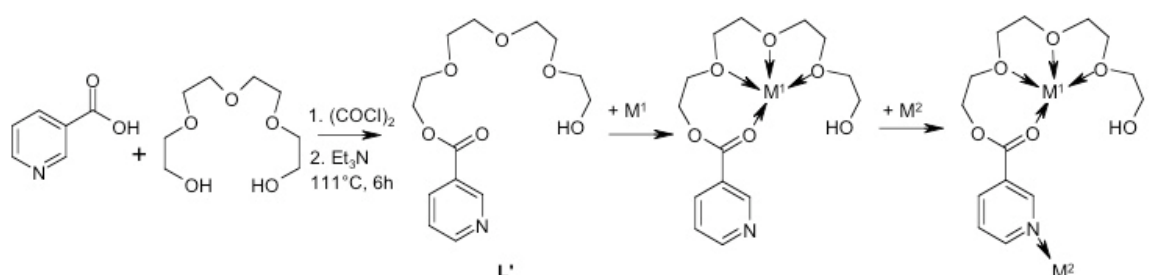
We developed a multitopic ligand system, in which different metal ions can be successively coordinated. This way, it is possible to tailor the properties (e.g magnetic, opto-electronic) of the multimetallic compounds. To obtain mixed metal oxides ( $\text{Ca}_x\text{Cu}_y\text{O}_z$  or  $\text{Ba}_x\text{Cu}_y\text{O}_z$ ), we use different methods like combustion/sintering of the compounds or also evaporation techniques like MO-CVD. The so obtained oxides are characterized by XRD, SEM and EDS.

In this contribution we will show a novel mixed metal barium-copper-complex and first evaporation and annealing results for it.

### Ligand, L

For the coordination of barium ions, an asymmetric ligand with open polyether chains was chosen. This type of ligand is quite flexible and can easily wrap around any metal cation. A second coordination site with N-donor atoms (a pyridyl group) offers the opportunity to coordinate a second metal cation.

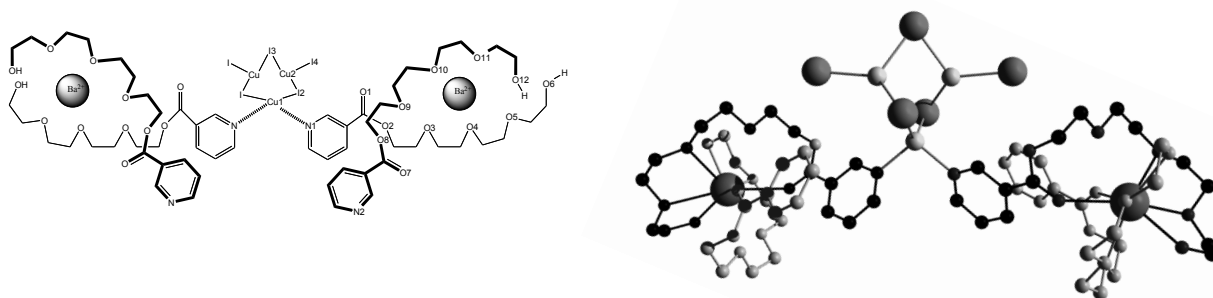
The synthesis is done in two steps, first a chlorination of the nicotinic acid followed by coupling of tetraethylene glycol in a ratio 1:1. The obtained ligand L is an oily liquid and was characterised by NMR and IR.



**Figure 1:** schematic drawing of the synthesis of L and the successive coordination of two metal cations.

## Coordination of **L** to barium and copper ions: Crystal structure of $[\text{Ba}_2\text{Cu}_3(\text{L})_2\text{I}_7(\text{CH}_2\text{Cl}_2)_6]_n$ , **1**

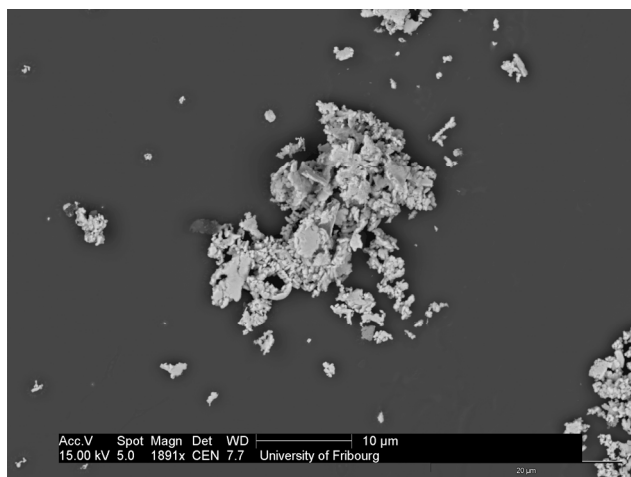
To obtain a bimetallic BaCu-species, **L** was added to a suspension of  $\text{BaI}_2$  and  $\text{CuI}$  in dry  $\text{CH}_2\text{Cl}_2$ , from which single crystals and a precipitate are obtained after slow evaporation. Crystals as well as the precipitate turn out to consist of the heterometallic barium-copper complex  $[\text{Ba}_2\text{Cu}_3(\text{L})_2\text{I}_7(\text{CH}_2\text{Cl}_2)_6]_n$ , **1**. **1** crystallises in the monoclinic space group  $I2/a$  with half a molecule in the asymmetric unit. One molecule consists of two barium and three copper cations, four ligands **L**, and five iodide counter ions (Fig. 2). Two additional iodide anions as well as solvent molecules are not directly connected to the cationic entity. Each barium cation is coordinated by two ligand molecules, which bind to the alkaline earth cation via the ten oxygen donor atoms and in a head-to-head fashion. One of these two ligands binds to a copper ion Cu1 via the pyridyl moiety. This copper ion (special position  $0, y, 0.25(g)$ ) is connected to a second, symmetry equivalent barium complex, again coordinated by one of the N-atoms. Cu1 is furthermore part of a  $\text{Cu}_3\text{I}_5^{2-}$ -cluster unit, in which three copper ions are bridged by three iodide ions, adopting a "twistane" conformation of the six-membered  $\text{Cu}_3\text{I}_3$ -ring. Cu2 and its symmetry equivalent each carrying a terminal iodide, I4, to complete their coordination number to three, while Cu1 is tetrahedrally coordinated. Remarkably, within the cationic complex of **1**, the correct stoichiometric ratio between the metal ions  $\text{Ba}:\text{Cu} = 2:3$  is realized, which is needed to produce the superconducting oxide  $\text{Y}_1\text{Ba}_2\text{Cu}_3\text{O}_7$ .



**Figure 2:** Scheme (left) and ball and stick model (right) of the cationic complex in **1**

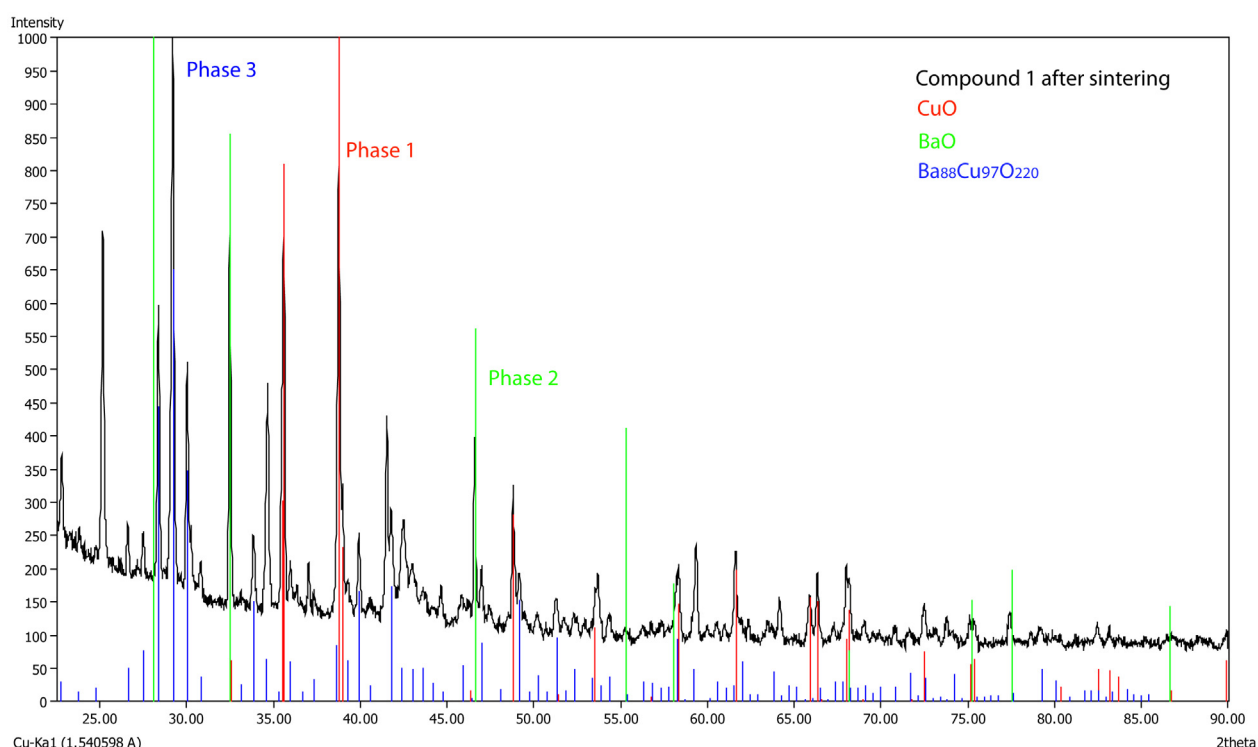
One of the two Ba-coordinating ligands does not bind to a second metal ion, and its uncoordinated pyridyl moiety is thus able to form H-bonds with one HO-group of a neighbour  $[\text{Ba}_2(\text{L}')_4\text{Cu}_3\text{I}_5]^{2+}$ -unit. A ladder-type structure is obtained in which the complexes are arranged in ribbons. The terminal iodide ions of the  $\text{Cu}_3\text{I}_5$ -unit, I4 and its symmetry equivalent, are H-bonded to one  $\text{CH}_2\text{Cl}_2$  molecule each. The lone iodide I1 and its symmetry equivalent are involved in weak H-bonding, connecting the ribbons into a three-dimensional network.

In order to test if this mixed metal compound is *a)* volatile and *b)* a precursor for mixed metal oxides, around 0.8 g of **1** was placed in a crucible and evaporated onto a Si-substrate. A film was grown by MOCVD with  $10^{-5}$  mbar pressure and at a temperature of 130-140 °C. SEM shows distinct agglomerations of ca. 20  $\mu\text{m}$  formed by particles of a few  $\mu\text{m}$  in size, indicating a non-uniform deposition process. The EDS analysis of the agglomerates shows that all necessary peaks (Ba/Cu/I) can be observed. Large areas of the substrate with apparently no or very few particles on it, are covered with a thin film of a compound which is very sensitive to the electron beam and decomposes.



**Figure 3:**

SEM picture after evaporation of **1** on a Si-substrate (left) and powder x-ray analysis (bottom)



In a second step the powder of **1** alone was heated in an oven at 400° under oxygen atmosphere. The residual black powder was analysed by powder Xray, and identified as mixture of three oxide phases, namely CuO, BaO and the mixed metal oxide Ba<sub>88</sub>Cu<sub>97</sub>O<sub>220</sub>, the latter belonging to the group of BaCuO<sub>2+x</sub> oxides which are studied in the context of their magnetic properties. [5].

## References

- [1] K. M. Fromm, *Dalton Transactions*, **2006**, *43*, 5103-5112.
- [2] R. C. Mehrotra, A. Singh, M. Bhagat, *Journal of Sol-Gel Sciences and Technology*, **1998**, *13*, 45-49
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# **PROGRAM OF THE ANNUAL MEETING OF THE SWISS SOCIETY OF CRYSTALLOGRAPHY**

**September 8<sup>th</sup>, 2009**

Organizer: Katharina Fromm, Fribourg

## **Call for Abstracts**

The annual meeting of the SGK/SSCR and the general assemblies of SGK/SSCr and SKT 2009 will take place in Fribourg on September 8 (meeting and general assemblies). It is organized by the Département de Chimie, Université de Fribourg.

Abstracts should be submitted to Katharina.fromm@unifr.ch (subject=SGK/SSCr Annual Meeting). They will be published in issue 77 of our newsletter.

### **Deadlines:**

Abstract submission: **July 1, 2009**

Registration/Dinner: **Sept. 1, 2009**

A template for the abstract is available from [www.unifr.ch/crystallography](http://www.unifr.ch/crystallography), together with all other meeting information.

### **Registration:**

Please register at <http://www.unifr.ch/crystallography>, free of charge, in order to optimize our organisation

### **Dinner:**

Sept. 7, 2009, 19h (day before the meeting)

## Program 2009:

8h30 – 9h00	Registration + Poster hanging
9h00 – 9h05	Welcome (W. Steurer, K. Fromm)
9h05 – 9h50	Prof. Hubert Huppertz, University of Innsbruck, Austria <i>"New aspects in the chemistry of borates"</i>
9h50 – 10h15	Prof. Klaus Yvon, University of Geneva, Switzerland <i>"Hydrogen induced metal-insulator transitions in metal – hydrogen systems"</i>
<hr/>	
10h15 – 10h35	Coffee Break / Posters
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10h35 – 11h20	Prof. Dietmar Stalke, University of Göttingen, Germany tba
11h20 – 11h55	Poster Appetizers
<hr/>	
11h45 – 14h00	Business Lunch + Poster Session
<hr/>	
14h00 – 14h45	Prof. Sander van Smaalen, University of Bayreuth, Germany <i>"Periodic and aperiodic crystals analysed by the Maximum Entropy Method."</i>
14h45 – 15h10	Prof. Bernard Grobéty, University of Fribourg, Switzerland <i>"Kinetics of chrysotile breakdown"</i>
15h10 – 15h35	Prof. Antonia Néels, University of Neuchâtel, Switzerland <i>"Engineering of thin film crystallinity for wear resistant coatings"</i>
<hr/>	
15h35 – 15h55	Coffee Break / Posters
<hr/>	
15h55 – 16h40	Surprise Guest tba
16h40 – 17h00	Poster Prizes and Closing Remarks
<hr/>	
17h00 – 18h00	Annual Meeting of the Swiss Society of Crystallography & END

## **News for and from members**

**We welcome the following new members of the SGK/SSCr:**

### **Personal members**

Aurélien Crochet, Departement de Chimie, Université de Fribourg  
(Ph.D. student)

Cécile Garcia, Laboratory for Neutron Scattering, ETH Zürich & Paul Scherrer Institut,  
5232 Villigen PSI (Post-Doc)

Piero Macchi, University of Bern, Dep. of Chemistry and Biochemistry, Freiestr. 3,  
3012 Bern (Post-Doc)

Partha Pratim DAS, Organic Chemistry Institute, University of Zurich,  
Winterthurerstr. 190, 8057 Zürich (Ph.D. student)

## **Travel grants for young SGK/SSCr members**

The committee will award the grants according to the following rules:

- Preference is given to PhD students
- Proof has to be given that there are no grants available covering the expenses
- A supporting letter by the supervisor of the applicant is necessary

If you wish to apply for a travel grant, please send the above mentioned documents to the president of the SGK/SSCr anytime.

Details for applications are given at:

<http://www.sgk-sscr.ch/TravelGrants.pdf>

## Membership Fees 2009

The membership fee for 2009 stays unchanged: **CHF 30** for regular members, CHF 10 for students (up to ph.D. candidates).

The fee is already included in the new balance stated on the back of the mailing letter. We may remind you that you also **can pay for up to three years in advance**.

Please pay the full amount due immediately **by bank transfer** to the UBS account: IBAN CH39 0027 9279 C029 1110 0 , BIC: UBSWCHZH80A

Please avoid cash payments at a post office (PC 80-2-2, UBS Zürich, Account No. 230-C0291110.0) as Postfinance is charging significant handling fees to the society.

Thank you for your cooperation.

Your treasurer,  
Michael Hennig

## Unidentified Payment

Credit advice Produced on 20 December 2008

Bookkeeping entry date 16.12.2008

Einzahlung Giro	Versament Virement	Versamento Girata
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## Zeitschrift für Kristallographie

A special issue on Hydrogen in Metals (Vol. **223**, Issue 10, 2009) is available.

We would like to thank the editor, Prof. K. Yvon, for his effort, all the authors for their contributions, and last but not least also Prof. Walter Steurer for granting open access for a limited time.

## In Memoriam Prof. Walter Meier

Contributed by Christian Bärlocher (Ch.Baerlocher@mat.ethz.ch)



After a rich and fulfilling life, Walter Meier died peacefully in his retirement home on Feb 13, 2009. He was an extraordinary man with many special interests, to which he devoted his full attention and energy. He not only became an internationally distinguished zeolite scientist, but also a recognized builder of musical instruments. But let us start at the beginning.

His early professional career was by no means straightforward. After completing an apprenticeship as a laboratory technician at the University of Bern, he went on to study chemistry at the Technikum Winterthur (as it was then called) and received his degree in 1949. He then started a second degree in physics at the ETH, and after he had received that diploma in 1954, he moved to the Imperial College in London, where he finished

his Ph.D. in physical chemistry in less than 3 years. The theme of his dissertation was ion exchange in zeolites, and zeolite science became his major scientific interest for the remainder of his professional life.

Even at this point in his career, it was obvious that Walter Meier would never be satisfied with the ordinary, so it was "natural" that he would cross the Atlantic to the Caltech to work with Linus Pauling on the crystal structures of zeolites. He spent 3 years there, and afterwards he went - where else? - to MIT in Boston with David Shoemaker for another year. But then, in 1961, it was time to come back to Switzerland.

He obtained an appointment as a physics professor at the Technikum Winterthur, which allowed him to pursue one of his other interests - teaching. That is where I first met him. I was a student in one of his lectures, where among other things, we learned to construct nomograms. But Walter Meier was not satisfied with just doing a good job

teaching, he also continued to do research on zeolites, and in 1966, this earned him an appointment as associate professor of Crystallography and Mineral Synthesis at the ETH and the University of Zürich. In the beginning he continued to come to the Technikum, and I encountered him frequently in the IBM 1620 computer room, where he was busy shuffling computer cards to calculate his Fourier maps. Although he was very busy, he happily took the time to show me how to use this high tech IBM1620, which I wanted to use for my diploma work.

As it turned out, this proved to be a good investment of his time, because I joined his group the year after he was appointed by the ETH, and started to do my own Fourier calculations on an IBM 1620 that was lying around at the University of Zurich. Walter always allowed his coworkers and Ph.D. students a lot of freedom to explore a subject for themselves, but could be counted on to help when they got stuck. He was extremely meticulous and exact, especially in his own work. This is particularly evident in his writing and in his drawings. Nonetheless, we more normal beings could get along with him quite easily, provided we did not smoke. This was something he could not tolerate, and I think he made non-smoking a condition for employment.

Walter became full professor at the ETH and the University in 1973, and retained this double professorship until his retirement in 1992. He was extraordinary, not only in his professional life, but also in his private endeavors, which were earmarked with the same drive for the unusual and for perfection. He was a fan of car and motorbike racing, and went with his wife Yvonne and their son Markus all over Europe to attend such races. For his son Markus, he built a "Seifenkiste" which was an exact copy of the Bugatti Type 37, and the prizes Markus won were not for speed, but for the most beautiful car!

Walter also had a special passion for music. Since he could not become a top player of an instrument himself, he started to collect, restore and improve musical glass instruments. He was well known in this music scene. I once listened to a top-ranked player of such an instrument in New Orleans, and when I started talking to him, it soon became apparent that he knew Walter very well. The biggest musical project, however, was the construction of his very own instrument, the lithophone or "stone piano". This consists of plates of serpentine connected to a true piano keyboard that allows it to be played like a piano. The instrument was first presented and played in 1991 at the Heureka Exhibition in Zürich.

Walter also had some special involuntary adventures. He very much liked the natural parks of the western USA and he had a special ambition to visit the Waves in the Parya Wilderness at the border between Utah and Arizona. There are no good maps and only a few people are allowed in. Walter made several attempts to walk there and at one time he got completely lost and almost did not find his way back. Probably the biggest adventure he did not seek, was in 1971 on the way to a zeolite conference, when his Swissair plane was hijacked by the Palestinians, and he ended up in the desert of Jordan instead of in Worcester, USA.

Back to his passion for model building: Walter built many models for his lectures – to demonstrate the precession method, to illustrate screw axes or to present crystal structures - all were done to perfection and many are still in use today. I still remember very well the model building exercises with the students, where they glued together

models of cardboard, of wooden polyhedra and of plastic spheres. The students were fascinated, and proudly took their finished models home. His yellow zeolite structure models, made with flexible electrical tubing, cut with a home-made "spaghetti cutting machine" connected via custom-made metal tetrahedra are well known in the zeolite community, and we still use them in our daily work. Another valuable teaching aid was Walter's crystallographic teaching pamphlet that illustrates the various concepts of space group symmetry via patterns of hands and feet.

In his time, he was the unquestionable authority on zeolite crystal structures. He had a longstanding industrial collaboration with Mobil Oil, and that led to one of the highlights of his scientific career. He and co-workers at Mobil solved the structure of the industrially important zeolite ZSM-5. That structure remained the most complex one known for 25 years, and it was solved without the benefit of single crystal data. However, he will probably be best remembered for the *Atlas of Zeolite Structure Types*, which quickly became the best known reference book in zeolite science. His great skill in making good illustrations, his care for detail and his ambition to set the highest standards in everything he did were responsible not only for the success of "his" *Atlas* but also for the quality of all of his publications. His credo "quality before quantity" earned him an enviable reputation, not only in his scientific career but also in his various non-ETH activities.

Because of his many interests Walter will be remembered by some as an innovative teacher, and by others as an excellent crystallographer, as a gifted model builder, as the authority in zeolite framework structures with their order and disorder, or as a passionate builder/creator of musical instruments. He will be remembered by all, however, as a person who was never satisfied with the ordinary and who always strove for perfection in all the extraordinary things his mind or hands touched.



## In Memoriam Walter Bollmann

Contributed by Hans Grimmer (Hans.Grimmer@psi.ch)



From left: Walter Bollmann, Hans Grimmer and David H. Warrington collaborating in 1972

Walter Bollmann, member of the Swiss Society for Crystallography since 1969 died in Thônex, Geneva on January 29, 2009 at the age of 88.

He was born on September 24, 1920 in Zürich, studied Mathematics and Physics at ETH, where he obtained his doctoral degree with Professor Paul Scherrer in 1951. Two years later he joined Battelle Institute Geneva, where he first worked on electron diffraction and later became well-known for his excellent work in transmission electron microscopy (TEM) of metals and alloys. He developed a method of specimen preparation by electropolishing, which became known as Bollmann technique and was successfully used in many laboratories. Applying the technique to austenitic steel, Bollmann was one of the first who was able to recognize dislocation lines in TEM micrographs [1]. A very personal and very readable account of his TEM work at Battelle is given in [2], where he describes also his studies of the recrystallization of nickel, of the hcp-fcc phase transition in cobalt, and of radiation damage in graphite.

Later, Walter Bollmann became more and more interested in developing a general geometrical theory of crystalline interfaces in order to interpret the dislocation networks that he observed in low-angle grain boundaries. His paper "On the analysis of dislocation networks" [3] was accepted as habilitation thesis by ETH, where he became

"Privatdozent" for lattice defects in crystals at the Department of Earth Sciences in 1962 and was awarded the title of Professor in 1977.

In order to interpret dislocation networks in general crystal interfaces, he developed his O-lattice theory, which he described in a number of papers as well as in two books [4,5]. He interpreted a general high-angle grain boundary as deviating little from an appropriately chosen coincidence boundary, in which the two neighbouring grains have a large fraction of their symmetry translations in common. These common translations form a lattice, called the coincidence-site lattice. He showed that the Burgers vectors of secondary dislocations in high-angle grain boundaries are then among the shortest vectors of another lattice, which he called the "DSC lattice".

Later, his main interest turned to triple lines, i.e. lines where three grains of a polycrystalline material meet. He showed that the balance of the dislocations in the three grain boundaries that meet at a triple line determines its disclination character [6].

As an invited scientist Walter Bollmann worked temporarily at the Argonne National Laboratory, the University of Oxford and the University of Florida in Gainesville.

I got to know Walter Bollmann when I joined Battelle Advanced Studies Center in 1968. A problem of interest at that time was the systematic determination of all possible coincidence-site and DSC lattices for polycrystalline cubic materials, i.e. materials with a primitive, body-centred or face-centred cubic lattice. This problem is dealt with in [7].

I feel very grateful to Walter Bollmann because this collaboration formed the starting point of the most successful one among my research projects. Walter Bollmann was a scientist and teacher who promoted his students and collaborators and generously recognized their contributions, a true gentleman.

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[3] W. Bollmann, Philos. Mag. **7** (1962) 1513-1533.

[4] W. Bollmann, *"Crystal Defects and Crystalline Interfaces"*, Springer, Berlin, 1970.

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## Workshop on diffuse scattering in crystalline materials

25-26 June 2009, Grenoble, France

Organized by Swiss-Norwegian Beamlines & European Synchrotron Radiation Facility

The goal of this 2-day workshop is to bring together people interested in diffuse scattering, in order to share their experience in experiment and theory and to present and discuss new problems in physics and chemistry in which disorder phenomena are important. For a synchrotron facility, such workshops help to define the direction in which we have to develop in order to fulfill the requirements of our user community. It will also be an opportunity for our users to see what can already be done at ESRF and SNBL today and, with their help, what might be possible in the future.

### Topics:

- Disorder phenomena and diffuse scattering
- 3D Pair Distribution Functions and quantitative analysis of diffuse scattering
- Thermal diffuse scattering in combination with inelastic scattering
- Diffuse scattering in the epitaxial nanostructures and other mesoscopic materials.

### Venue:

European Synchrotron Radiation  
Facility, 6 rue Jules Horowitz, Grenoble

### Lecturers:

- Hans-Beat Bürgi, University of Bern, Switzerland
- Tai-Chang Chiang, Frederick Seitz Materials Research Laboratory, University of Illinois, USA
- Miroslav Kobas, DECTRIS Ltd., Switzerland
- Jens Kreisel, MINATEC, France
- Reinhard Neder, Universität Erlangen-Nürnberg, Germany
- Harald Reichert, ESRF, France
- Sergey Vahrushev, A.I. Ioffe PTI, Russia
- Thomas Weber, ETH, Switzerland
- Bjoern Winkler, Goethe-Universität, Frankfurt, Germany

### Registration:

<http://www.esrf.fr/events/conferences/DiffScatt09/diffuse-scattering-in-crystalline-materials>

### For further information:

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PAUL SCHERRER INSTITUT

8<sup>th</sup>

PSI Summer School 2009

# Functional Materials



## Lectures

August 1–7, 2009

Lyceum Alpinum, Zuoz, Switzerland



## Practical Training: Photons, Muons, Neutrons

August 8–10, 2009

Paul Scherrer Institut, Villigen, Switzerland

## Scope

Functional materials are omnipresent in the modern world. They are of key importance for today's technological applications in energy, environment and health.

This school will introduce the concepts behind the design and use of such materials and show how large scale facilities providing photons, muons, and neutrons are used in this field.

The school consists of a lecture series held in the Swiss Alps. Additionally, a practical training at PSI will allow about 25 students to gain hands-on experience in x-ray and neutron diffraction, muon spectroscopy and x-ray microscopy.

## Organizers

J. F. van der Veen (chair);  
R. Abela, K. Clausen,  
S. Janssen, E. Morenzoni,  
C. Mudry, S. Müller,  
C. Quitmann, J. Schefer,  
D. Jahns (secretary)

## Selection of invited speakers

### External experts:

J. van Bokhoven, ETH Zurich; R. Cerny, University of Geneva;  
B. Clausen, Haldor Topsoe; J. Frenken, University of Leiden;  
C. Vettier, ESS-S, Sweden, G. Logvenov, BNL and others

### PSI experts:

D. Cheptiakov, B. Delley, L. Heyderman, M. Janousch, A. Kaestner,  
B. Patterson, A. Streun, A. Suter, F. Winkler, A. Wokaun, C. Quitmann

Registration: <http://school.web.psi.ch>

Contact: [zuoz2009@psi.ch](mailto:zuoz2009@psi.ch)

Deadlines: Early registration: 30 April, 2009

Regular registration: 15 June, 2009

## Open Positions



The Paul Scherrer Institute (Switzerland) is a centre for multi-disciplinary research and one of the world's leading user laboratories. With its 1300 employees it belongs as an autonomous institution to the Swiss ETH domain and concentrates its activities on solid-state research and materials sciences, elementary particle physics, energy and environmental research as well as biology and medicine.

The Laboratory for Neutron Scattering (PSI & ETH Zuerich) in collaboration with the Laboratory for Waste Management (PSI) offers a

### **PhD Position: Water dynamics in water-clay systems**

#### *Your tasks*

You will study the water diffusion in porous clay systems by different experimental methods and computer simulations. By quasi-elastic neutron scattering measurements (performed at PSI and other international large scale facilities) and molecular dynamics simulation you will investigate atomic scale motions. You will perform tracer through-diffusion experiments to measure the diffusion at macroscopic scales. The combination of these techniques - applied on samples with different degree of compaction - allows to distinguish between chemical and geometrical effects. The results will enhance our basic understanding of diffusion processes in narrow confinements; they are also relevant in the context of radioactive waste management, where diffusion in clays is an important process.

#### *Your profile*

You have a diploma or master's degree in Physics, Chemistry or a closely related discipline. You have good computer skills and talent for experimental work. You enjoy working in a collaborative and interdisciplinary environment. Written and spoken English are required, German is an advantage. The PhD program belongs to the University of Berne, Institute of Geological Sciences. The working place is at Paul Scherrer Scherrer Institute in Villigen, Switzerland.

For further information please get in touch with: Dr Fanni Juranyi  
Phone +41 (0)56 310 3176, fanni.juranyi@psi.ch

Please submit your application (a letter of application, curriculum vitae, copies of diplomas, list of publications and addresses of three references) to: Paul Scherrer Institut, Human Resources, Thomas Erb, ref. code 3302, 5232 Villigen PSI, Switzerland, thomas.erb@psi.ch

## Calls for proposals

Beside normal proposals, most facilities allow urgent beam time requests.  
Please check directly with the facility.

Facility	Deadline(s)	Link
<b>SLS: Swiss Light Source</b> All except PX lines Protein beam lines (PX)	March 15, Sept. 15 Feb. 15, June 15, Oct. 15	user.web.psi.ch user.web.psi.ch
<b>SINQ: Swiss Spallation Neutron Source</b> All instruments (regular calls)	May 15, Nov. 15	user.web.psi.ch
<b>SμS: Swiss Muon Source</b> All instruments	Dec. 5	user.web.psi.ch
<b>ESRF: European Synchrotron</b> All instruments, long term proposals All instruments, short term proposals	Jan. 15 March 1, Sept. 1	www.esrf.fr www.esrf.fr
<b>SNBL: Swiss Norwegian Beam Line</b>	March 1, Sept. 1	www.esrf.fr/ exp_facilities/BM1A
<b>ILL: Institut Laue Langevin</b> All instruments	Sept. 15, 2009	www.ill.fr
<b>FRM II: Heinz Maier-Leibnitz</b> All instruments	July 17, 2009	user.frm2.tum.de

## Calendar of forthcoming meetings

(please mail missing information on meetings of interest to [Jurg.Schefer@psi.ch](mailto:Jurg.Schefer@psi.ch))

			<b>Call for Abstracts</b>
<b>2009</b>			
June 14-20	Castellaneta Italy	ICC14: XIV International Clay Conference <a href="http://www.14icc.org/">http://www.14icc.org/</a>	expired
June 15-19	Grenoble France	Course on Software Development for Crystallography <a href="http://www.ill.eu/news-events/workshops-events/csdc/#c19743">http://www.ill.eu/news-events/workshops-events/csdc/#c19743</a>	May 15, 2009
June 21-27	Lekeito Spain	Crystallography online: International School on the of the Bilbao Crystallographic Server, <a href="http://www.crystallography.fr/mathcryst/bilbao2009.php">http://www.crystallography.fr/mathcryst/bilbao2009.php</a>	to be announced
June 22-24	Kuala Lumpur Malaysia	ICNX 2009: International Conference on Neutron and X-Ray Scattering, <a href="http://icsd.ill.fr/ICNX2009.pdf">http://icsd.ill.fr/ICNX2009.pdf</a>	Jan. 31, 2008
June 25-26	Grenoble France	Workshop on Diffuse Scattering <a href="http://www.esrf.fr/events/conferences/DiffScatt09/diffus">www.esrf.fr/events/conferences/DiffScatt09/diffus</a>	
Aug. 2-Aug. 8	Zuoz CH	8 <sup>th</sup> PSI Summer School on Condensed Matter Research Functional Materials, <a href="http://sls.web.psi.ch">http://sls.web.psi.ch</a>	to be announced
August 14-15	Istanbul Turkey	Symmetry and Crystallography in Turkish Art and Culture, Satellite Conference of the ECM-25 <a href="http://www.lcm3b.uhp-nancy.fr/mathcryst/istanbul2009.htm">www.lcm3b.uhp-nancy.fr/mathcryst/istanbul2009.htm</a>	March 15, 2009
August 16-21	Istanbul Turkey	ECM-25: European Crystallographic Meeting <a href="http://www.ecm25.org">http://www.ecm25.org</a>	March 15, 2009
Aug. 30-Sept.12	Zurich CH	The Zurich School of Crystallography: Bring Your Own Crystal, <a href="http://www.oci.uzh.ch/diversa/xtal_school/">http://www.oci.uzh.ch/diversa/xtal_school/</a>	May 15, 2009
Sept. 2-4	Innsbruck Austria	Swiss Physical Society, Joint Annual Meeting of ÖPG/SPS/ÖGAA, <a href="http://oepg2009.uibk.ac.at/">http://oepg2009.uibk.ac.at/</a>	May 15, 2009
Sept. 8	Fribourg CH	Annual Meeting of the SGK/SSCr University Fribourg, <a href="http://www.sgk-sscr.ch/">http://www.sgk-sscr.ch/</a>	July 1, 2009
Sept. 16-19	Aachen Germany	43. Metallurgie-Tagung <a href="http://www.dgm.de/dgm/metallographie">http://www.dgm.de/dgm/metallographie</a>	31.3.2009
Sept. 21-25	Moscow Russia	Clays, Clay Minerals and Layered Materials – 2009 <a href="http://www.cmlm2009.ru/">http://www.cmlm2009.ru/</a>	
Oct. 12-13	Villigen CH	JUM@P'09, 1 <sup>st</sup> PSI User Meeting (SLS,SINQ, SMS)	to be announced

## 2010

Sept. 7-9	Geneva CH	SGK/SSCr Annual Meeting 1 day ,meeting, will be decided later To be approved by the general assembly	
Aug. 27-30	Darmstadt Germany	EPDIC-12 <a href="http://www.epdic12.org/">http://www.epdic12.org/</a>	to be announced
Aug. 29 – Sept. 3	Darmstadt Germany	ECM-26 <a href="http://ecm26.ecanews.org/">http://ecm26.ecanews.org/</a>	to be announced

## 2011

July 17-21	Prague Czech Rep	5 <sup>th</sup> European Conference on Neutron Scattering <a href="http://www.ecns2011.org">http://www.ecns2011.org</a>	to be announced
Aug. 22-29	Madrid Spain	IUCr-2011, 22 <sup>nd</sup> General Assembly and Congress of IUCr <a href="http://www.iucr.org/iucr/cong/iucr-xxii">http://www.iucr.org/iucr/cong/iucr-xxii</a>	to be announced

## 2012

Aug/Sept.	Bergen Norway	ECM-27	to be announced
July 17-21			

## 2013

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## 2014

August	Montreal Canada	IUCr-2011, 23 <sup>rd</sup> General Assembly and Congress of IUCr <a href="http://www.iucr.org/iucr/cong/iucr-xxiii">http://www.iucr.org/iucr/cong/iucr-xxiii</a>	to be announced
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## Become a member of SGK/SSCr

If you are working in the field of crystallography, you will be interested to become a member of our society. For more information as well as online registration, please have a look on our website (<http://www.sgk-sscr.ch>). Presently, the yearly membership fee is sfr. 30 (sfr. 10 for students). For new members, the membership is free until the end of 2007. Please note: SGK/SSCr members can also apply to be a member of the subsection crystal growth (no additional charge) or for individual membership of the European Crystallographic Association, ECA (additional charge: 10 Euro).

### **SGK/SSCr is a member of the Swiss Academy of Science.**

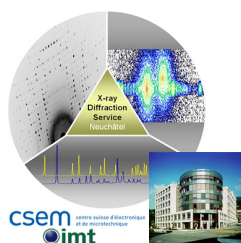
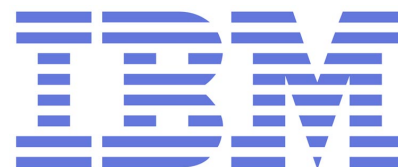
<b>Name</b>	
<b>Given name</b>	
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<b>Membership subsection crystal growth</b>	Yes ( ) No ( )
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<b>Major research interests</b>	
<b>Highest degree received</b>	
<b>from university</b>	
<b>Present position</b>	

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**FAX the completed form to: Dr. Radovan Cerny, 022 379.6108**  
**or use our online application form at <http://www.sgk-sscr.ch>**

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