



## 12<sup>th</sup> EUROPEAN CONGRESS ON ELECTRON MICROSCOPY

July 9-14, 2000  
Brno, Czech Republic



**FINAL CIRCULAR  
AND  
PROGRAMME**

<http://www.eurem2000.isibrno.cz>

Full information on EUREM 12, Brno 2000 is available at

<http://www.eurem2000.isibrno.cz>

### OPENING HOURS

#### Registration (Entrance to pavilion E)

Sunday	July 9	09. <sup>00</sup> – 18. <sup>00</sup>
Monday	July 10	09. <sup>00</sup> – 18. <sup>00</sup>
Tuesday	July 11	09. <sup>00</sup> – 18. <sup>00</sup>
Wednesday	July 12	09. <sup>00</sup> – 18. <sup>00</sup>
Thursday	July 13	09. <sup>00</sup> – 12. <sup>00</sup>

#### Congress office (Pavilion E, first floor, front side)

Sunday	July 9	09. <sup>00</sup> – 18. <sup>00</sup>
Monday	July 10	09. <sup>00</sup> – 17. <sup>00</sup>
Tuesday	July 11	09. <sup>00</sup> – 17. <sup>00</sup>
Wednesday	July 12	09. <sup>00</sup> – 17. <sup>00</sup>
Thursday	July 13	09. <sup>00</sup> – 17. <sup>00</sup>
Friday	July 14	09. <sup>00</sup> – 14. <sup>00</sup>

#### Bank (Čs. Obchodní banka, lobby of the pavilion E)

Saturday	July 8	13. <sup>00</sup> – 17. <sup>00</sup>
Sunday	July 9	09. <sup>00</sup> – 18. <sup>00</sup>
Monday	July 10	08. <sup>00</sup> – 18. <sup>00</sup>
Tuesday	July 11	08. <sup>00</sup> – 17. <sup>00</sup>
Wednesday	July 12	08. <sup>00</sup> – 17. <sup>00</sup>
Thursday	July 13	08. <sup>00</sup> – 17. <sup>00</sup>
Friday	July 14	08. <sup>00</sup> – 17. <sup>00</sup>

#### Exhibition (Pavilion E, ground floor)

Monday	July 10	11. <sup>15</sup> – 18. <sup>30</sup>
Tuesday	July 11	08. <sup>00</sup> – 18. <sup>30</sup>
Wednesday	July 12	08. <sup>00</sup> – 18. <sup>30</sup>
Thursday	July 13	08. <sup>00</sup> – 18. <sup>30</sup>
Friday	July 14	08. <sup>00</sup> – 13. <sup>30</sup>

#### Travel Agency (BVV Fair Travel, "High rise" building, ground floor)

Monday	July 10	09. <sup>00</sup> – 17. <sup>00</sup>
Tuesday	July 11	09. <sup>00</sup> – 17. <sup>00</sup>
Wednesday	July 12	09. <sup>00</sup> – 17. <sup>00</sup>
Thursday	July 13	09. <sup>00</sup> – 17. <sup>00</sup>
Friday	July 14	09. <sup>00</sup> – 17. <sup>00</sup>

### EXTRA PROCEEDINGS

In addition to what you receive upon your choice of the proceedings volumes or CD-ROM included in the registration fee, extra items are available as follows:

Volume I, Biological Sciences	50 USD
Volume II, Physical Sciences	50 USD
Volume III, Instrumentation and Methodology	50 USD
Volume IV, Supplement	15 USD
CD-ROM (containing Volumes I, II and III)	10 USD

When purchasing pay please the price at the counter of Čs. Obchodní banka in the lobby of the pavilion E and collect the item(s) against presentation of the receipt in the EUREM office (pavilion E, first floor, front side).

Edited by Petr Schauer, Ilona Müllerová and Luděk Frank.  
Design and printed by Reklamní atelier Kupka.

Cover:

Scenery of the Brno Trade Fair Area from the South.



**Dear Colleagues,**

the four-year period of preparation for EUREM 12 is now behind us. Rhodos is now here and now we jump.

It is my greatest pleasure to welcome you in Brno. I feel indebted to you that you have decided to participate in the congress, to contribute your scientific results and your newest instruments and other relevant products to its programme, and to come in person to the congress sessions and events. We have worked for four years to prepare for you a week of challenging scientific inspiration and a pleasant stay in Brno, a university city with a long history of electron microscopy and the gateway to the picturesque Moravian countryside. This week will bring the fruits of all our efforts and we hope in your success and satisfaction as the ultimate goal and sense of everything we have done.

This programme brochure summarizes the scientific events of EUREM 12. The brightest stars will be 8 plenary "keynote" lectures, the summaries of which are given in this brochure. In 52 symposia and three sessions of the post-deadline posters, altogether 124 invited lectures, 178 oral contributions and 481 posters will be presented. Five tutorials and three satellite workshops complement the program. These numbers are similar to those at previous European congresses but quantity is not a decisive factor here. Its quality is to be assessed by you and we believe that we will gain high marks.

I wish everyone – including myself – this week so pleasant and trouble-free that no one will be looking forward to the end.

Luděk Frank  
President of EUREM 12

## ACKNOWLEDGEMENTS

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The organizers are pleased to express their gratitude to all who contributed in any way to the preparation of the congress. The International Scientific Advisory Board was active in the initial formation of the scientific program. Cordial thanks are due to the symposia chairpersons, who reviewed the submitted papers and compiled the programs of the symposia. We particularly acknowledge the willingness of renowned scientists to present the keynote lectures on highly topical themes. The same thanks are addressed to the invited speakers who will deliver the introductory lectures of the symposia. Tutorials and workshops play an important part in the congress and we would like to thank tutors and workshop organizers for all their efforts.

In organizing the instrument exhibition, we received invaluable assistance from many individuals and companies in the microscopy industry. Let us hope that the event is a complete success for all the companies involved.

Throughout the entire preparation period, we benefitted from the support and professionalism of Brno Trade Fairs and Exhibitions, Inc. (BVV, a.s.). Among those at BVV who considerably helped with organization, we would particularly like to thank Mgr. Alena Přikrylová and Mr. Robert Grof. Thanks are also due to the management of the hotels Holiday Inn and Voroněž I/II who offered us favourable conditions for accommodation and further services. The same is true for the BVV Fair Travel agency.

The organisers feel honoured by the patronage of Professor Rudolf Zahradník, President of AS CR, and Dr. Petr Duchoň, Mayor of the City of Brno. The support from the City of Brno and its Mayor has been invaluable in many respects which are important for congress preparation.

We gratefully acknowledge the support of the following sponsors:

**AutoCont, Inc.**  
**City of Brno**  
**Czech Holography, Ltd.**  
**Delong Instruments, Ltd.**  
**FEI / Philips Electron Optics**

As this was the first time we had prepared such a large congress, we were frequently in need of the assistance and advice of persons with previous experience in the organisation of such events. On several occasions, this advice was of crucial importance. Those who helped us in this respect include in particular Dr P. Hawkes and Professor A. Howie, but also Professor E. Wisse, Professor D. Cockayne, Professor A. Maunsbach and Professor W. Baumeister.

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Organised by the Czechoslovak Society for Electron Microscopy under the auspices of the European Microscopy Society and the International Federation of Societies for Electron Microscopy and in co-operation with the Institute of Scientific Instruments AS CR under the Patronage of Professor Rudolf Zahradník, President of AS CR, and Dr Petr Duchoň, Mayor of the City of Brno.

# TOPICAL INFORMATION

## Congress sessions

The congress sessions and events take place in the Congress centre, hotel Voroněž 1 (CHV), and in pavilion E of the BVV Trade Fair Area (Výstaviště). In pavilion E, the exhibition of scientific posters is located on the first floor (central part), session room A is also on the first floor (front part), while the session rooms B, C, D, E, F, G, H and K are on the second floor, central part. The exhibition of instruments is located on the ground floor.

## Important

Volume 4 of the EUREM Proceedings will be printed after the congress. This will contain the lectures of the Ernst Ruska Prize winners, all post-deadline posters (30 of them have been accepted), and the rest of the invited lectures which are not contained in the relevant symposia in Volumes 1 to 3.

Volume 4 will be distributed by the end of 2000 to those who fill in the order form, submit it to the Congress Office during the congress and pre-pay the price (15 USD + 5 USD for packing and transport).

**The Order Form for Volume 4 is enclosed in the congress bag.**

## Admission

Admission to all congress events is allowed SOLELY upon presentation of the congress badge. The badges have to be worn at all venues and functions. Replacements for lost badges will be made at the Registration desk and will require proof of identification (passport) and a service charge of 10 USD.

The **green** badge indicates a member of organisation bodies.

The **yellow** badge indicates a congress participant with full admission rights.

The **blue** badge entitles the bearer to enter the ground floor of pavilion E and to participate in both official congress evenings.

The **white** badge is valid solely for the ground floor of pavilion E.

The **silver** badge represents an admission ticket to the tutorial/workshop indicated on it.

One-day registration/admission badges are of an appropriate colour and the day of validity is clearly indicated on them. Such badges are valid only on the day indicated.

## Symposia chairpersons and speakers

Symposia chairpersons and speakers presenting both invited and contributed talks are asked to meet in front of the session room mentioned in the Schedule 10 minutes before the scheduled time.

Session room G is permanently available for testing the materials intended for projection. A data projector (beamer) is also provided there.

## Posters

Posters should be pinned to boards on the first floor of pavilion E on Monday, July 10, at 13.<sup>00</sup> at the latest. The boards are labelled by the poster numbers and pins are available on site.

## Catering

Four fast food stands are available in pavilion E, situated at both staircase landings on the first and second floors. In addition, the snack bar in the pavilion lobby and the self-service restaurant at the rear of the first floor offer more comfortable catering, including hot food. The opening hours of all catering facilities in pavilion E will be from 9.<sup>00</sup> to 18.<sup>00</sup>. A larger capacity restaurant and also a self-service restaurant, offering good-quality lunches at moderate prices, are located in the area surrounded by the wings of pavilion A (accessible via the A3 entrance) and operate daily from 11.<sup>00</sup> to 15.<sup>00</sup>. Restaurants in adjacent hotels are available for lunches and dinners as well.

Coffee vouchers, which are issued with participants' bags, can be used at a special stand in the area of the instrument exhibition in the rear part of the hall. This stand operates from Monday daily 9.<sup>00</sup> to 18.<sup>00</sup>.

## Trips, return transport

The choice of trips, which was presented in the Second Circular, was negotiated with the BVV Fair Travel agency. The agency office in the "High rise" building of the Trade Fair Area is at your disposal for confirmation of your participation in trips, for choice of a suitable date and time, and all details and queries. You are advised to visit the agency office as soon as possible so that you do not miss the opportunity to participate in attractive events.

Accommodation in Prague after the congress can be reserved in the same place.

Transport from Brno to Prague Airport will also be organised by BVV Fair Travel. The bus departures are scheduled to

Friday	July 14	17. <sup>00</sup>
Saturday	July 15	08. <sup>00</sup>

and will leave from the parking area in front of the hotel Voroněž 2. Seats can be booked and tickets will be sold in the agency office until Wednesday, July 12, 17.<sup>00</sup>.

## Social programme

All types of registration valid during the whole congress (regular and student registration, irrespective of EMS membership, accompanying person registration and exhibitor registration, including the free registrations connected with the exhibition area) entitle the registrants to participate in two official EUREM evenings.

One-day registrations of all kinds, admission to exhibition (the white badge) and tutorial and workshop registrations do not include participation in the social programme.

The Welcome Party will take place on Sunday, July 9, from 18.<sup>00</sup> to 21.<sup>00</sup> in wing A1 of pavilion A. Here you can not only admire the fascinating concrete construction, an architectural wonder of the year 1928, but also enjoy good Moravian wine, food and dulcimer-band music.

The Theatre Evening is scheduled for Thursday, July 13, from 19.<sup>30</sup> to 23.<sup>30</sup>, and will take place in the Janáček Opera House (the so-called "New Opera") in Brno city

centre. It is easy to reach by tram no. 1 from the stop Výstaviště (on the elevated bank in front of the main entrance to the Trade Fair Area), going towards Řečkovice (i.e. to the right from the viewpoint of the Trade Fair Area). Your destination is the second stop after the main railway station; shortly before the stop the tram passes the Opera House on the right hand side (one stop earlier, the Old Opera is also on the right hand side). If in doubt, please refer to the Brno City Map enclosed in your bag.

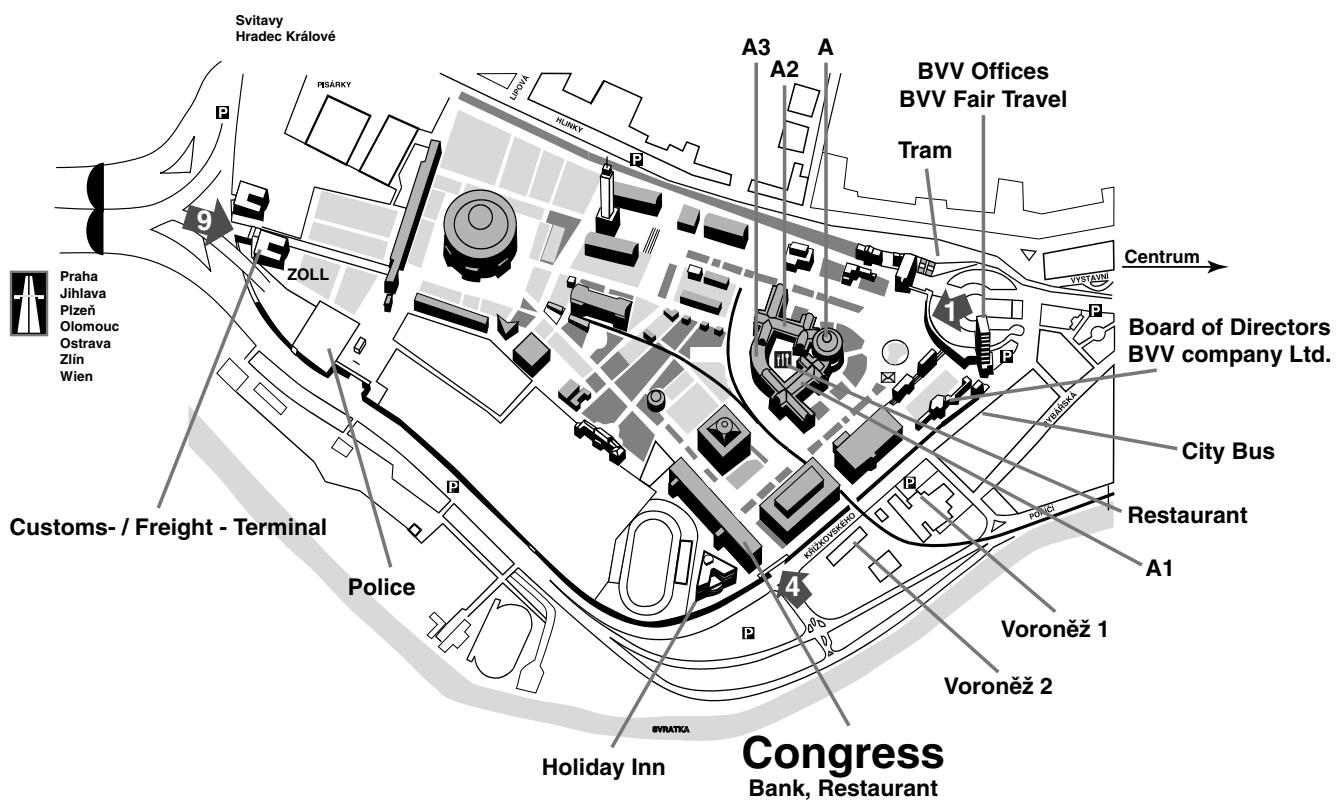
In the theatre there will be a concert of classical music (the performance lasts about 90 minutes) and afterwards a banquet will be served in the opera foyers.

**Important notice:** Your congress bag contains, among others, the concert programme flyer and the admission ticket (labelled as "vstupenka"). The ticket has to be presented at the theatre entrance.

### City transport

The Trade Fair Area is located just outside the city centre, about ten minutes' ride by tram. Tram no. 1 serves this locality, as mentioned above. The next stop in the direction of the city centre is on Mendel Square with the old monastery, the Mendel museum and with the famous wine-cellars "U královny Elišky" (Queen Elisabeth) and

with stops of other trams heading uphill to the city centre from the opposite side. Also round trip buses no. 44 (to the city centre) and no. 84 (away from the centre) are available, with stops near the hotel Voroněž 1. You pay for your journey using tickets purchased in advance and stamped (immediately after entering the vehicle) in a special machine. The basic ticket for 11,- CZK is valid for 30 minutes from the time stamped by the machine. When changing lines, you do not need to re-stamp your ticket. Basic tickets for 11,- CZK can be purchased at the reception desk in hotel Voroněž 1.



# THE EUREM 12 PROGRAMME

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## SUNDAY, JULY 9

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12.00-14.50	<b>T6</b>	<b>Very low energy in a standard SEM</b> (I. Müllerová, L. Frank, Brno) (CHV)
13.00-17.50	<b>W1</b>	<b>Electron crystallography</b> (I.G. Voigt-Martin, Mainz; J. Fryer, Glasgow) (CHV)
15.00-17.50	<b>T2</b>	<b>Quantitative EELS</b> (F. Hofer, Graz) (CHV)
18.00-21.00		Welcome party (PAVILION A)

## MONDAY, JULY 10

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8.30-9.10		Opening ceremony (CHV)
9.10-9.40		Plenary lecture: <b>On the development of electron microscopes in Brno</b> (A. Delong, Brno) (CHV)
9.50-11.00		Lectures of the Ruska prize laureates (CHV)
11.15-11.45		Exhibition opening (PAVILION E, ground floor)
12.00-14.50	<b>T5</b>	<b>Quantitative high-resolution EM</b> (H.W. Zandbergen, Delft) (ROOM K)
	O4	Ultramicrotomy of industrial materials (Diatome / Leica)
	O6	Latest developments in Gemini high resolution imaging (LEO Electron Microscopy)
13.30-14.50		<b>POSTERS (B1-B5, P1-P4, I1-I4)</b> (PAVILION E, first floor)
15.00-15.50	<b>L8</b>	<b>Nanoscale analysis by energy filtering EM</b> (J. Mayer, Aachen) (CHV)
16.00-18.30	<b>B2</b>	<b>Membrane traffic</b> (ROOM H)
	<b>B6</b>	<b>Electron microscopy in molecular pathogenesis</b> (ROOM A)
	<b>B17</b>	<b>Stereology and quantitative methods</b> (ROOM D)
	<b>P1</b>	<b>Metals and alloys</b> (ROOM B)
	<b>P6</b>	<b>C and C-like materials</b> (ROOM E)
	<b>I8</b>	<b>Advances in probe microscopies</b> (ROOM C)
	<b>I10</b>	<b>EELS and EFTEM</b> (ROOM F)
	O10	TEM sample preparation (Technoorg Linda)
18.30-20.00		<b>POSTERS</b> (free discussion) (PAVILION E, first floor)

## TUESDAY, JULY 11

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8.30-9.20	<b>L6</b>	<b>Structural and chemical surface electron microscopy with slow electrons</b> (E. Bauer, Tempe) (CHV)
9.30-12.00	<b>B8</b>	<b>Progress on biological sample preparation methods</b> (ROOM A)
	<b>B15</b>	<b>Electron crystallography of protein crystals</b> (ROOM E)
	<b>P11</b>	<b>Amorphous materials and quasicrystals</b> (ROOM H)
	<b>P13</b>	<b>In-situ electron microscopy</b> (ROOM B)
	<b>I5</b>	<b>Low energy electron microscopy</b> (ROOM F)
	<b>I16</b>	<b>X-ray microscopy</b> (ROOM D)
	O2	TEM sample preparation with focused ion beams (FEI / Philips Electron Optics)
	O17	Secondary Electron Imaging in Variable Pressure Mode (LEO Electron Microscopy)
12.10-14.50	<b>T1</b>	<b>TEM Specimen Preparation in the Physical Sciences</b> (R. Anderson, New York; L. Madsen, Linkoping) (ROOM K)
	O7	User interfaces (Oxford Instruments Analytical) (ROOM C)
	O8	Cryo-SEM (Oxford Instruments Analytical)
	O12	Contamination free TEM specimen preparation (Fischione Instruments)

13.00-14.50	<b>W3</b> <b>EM in viral diagnosis</b> (H. Gelderblom, Berlin; J. Schramlová, Prague) (ROOM B)
13.30-14.50	<b>POSTERS (B6-B10, P5-P8, I5-I8, Ipd)</b> (PAVILION E, first floor)
15.00-15.50	<b>L1</b> <b>Electron microscopy at the millenium</b> (P. Hawkes, Toulouse) (CHV)
16.00-18.30	<b>B1</b> <b>Nuclear import and export</b> (ROOM D) <b>B19</b> <b>Biomaterials</b> (ROOM A) <b>P8</b> <b>Polymers and radiation sensitive materials</b> (ROOM E) <b>P12</b> <b>Electron crystallography and CBED</b> (ROOM F) <b>I4</b> <b>Correction of aberrations and HR electron microscopes</b> (ROOM B) <b>I11</b> <b>Surface oriented microanalytical techniques</b> (ROOM H) <b>O19</b> Low keV operation with a tungsten emitter SEM (Hitachi Scientific Instruments) (16.00 - ROOM K, 16.30 - booth no. 5)
16.30-19.30	<b>EMS business meeting</b> (for EMS members and representatives of EMS-affiliated Microscopy Societies)
18.30-20.00	<b>POSTERS</b> (free discussion) (PAVILION E, first floor)

## WEDNESDAY, JULY 12

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8.30-9.20	<b>L5</b> <b>State of the art electron microscopy in cell biology</b> (G.W. Griffiths, Heidelberg) (CHV)
9.30-12.00	<b>B7</b> <b>Electron and confocal microscopies, correlation methods</b> (ROOM C) <b>B9</b> <b>Structure and morphogenesis of viruses</b> (ROOM B) <b>P2</b> <b>Intermetallics</b> (ROOM E) <b>P9</b> <b>Catalysts, clusters, small particles</b> (ROOM A) <b>I1</b> <b>Wave and particle properties of the electron</b> (ROOM F) <b>I9</b> <b>Quantitative X-ray spectroscopy in EM</b> (ROOM H) <b>O5</b> Specimen preparation for TEM (Gatan) (ROOM D)
12.10-14.50	<b>T3</b> <b>Docking X-ray data into EM structures</b> (R. Schroeder, Heidelberg) (ROOM K) <b>O13</b> Image processing and analysis of single biological macromolecules (Image Science Software) <b>O15</b> Digital imaging (LEO Electron Microscopy) <b>O18</b> Future of analytical imaging (Gatan) (ROOM D)
13.30-14.50	<b>POSTERS (B11-B15, P9-P12, Ppd, I9-I12)</b> (PAVILION E, first floor)
15.00-15.50	<b>L7</b> <b>Probe microscopies: complementary tools to EM</b> (A. Engel, Basel) (CHV)
16.00-18.30	<b>B5</b> <b>Plant cell ultrastructure and signalling pathways</b> (ROOM F) <b>B16</b> <b>Scanning probe microscopies in biology</b> (ROOM H) <b>P7</b> <b>Epitaxial structures and nanostructures</b> (ROOM B) <b>P15</b> <b>General materials microscopy</b> (ROOM A) <b>I2</b> <b>Advances in electron optics</b> (ROOM E) <b>I7</b> <b>Modern light microscopy techniques</b> (ROOM C) <b>O11</b> Digital image processing and electron tomography (Tietz Video&Image Processing Systems)
18.30-20.00	<b>POSTERS</b> (free discussion) (PAVILION E, first floor)

## THURSDAY, JULY 13

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8.30-9.20	<b>L3</b> <b>Prospects of quantitative high resolution electron microscopy</b> (D. Van Dyck, Antwerp) (CHV)
9.30-12.00	<b>B4</b> <b>Supermolecular complexes reconstruction and tomography</b> (ROOM E) <b>B13</b> <b>Functional architecture of the cell nucleus</b> (ROOM C) <b>B14</b> <b>Neurobiology: cells and signal transfer</b> (ROOM D) <b>P3</b> <b>Ceramics and composites</b> (ROOM A) <b>P4</b> <b>Magnetic materials</b> (ROOM H) <b>I3</b> <b>Quantitative electron microscopy</b> (ROOM B) <b>I12</b> <b>Image processing and simulation</b> (ROOM F) <b>O9</b> TEM specimen preparation for materials science (South Bay Technology)

12.10-14.50	<b>T4</b> <i>CANCELLED</i>
	O14    EFTEM in practice (LEO Electron Microscopy)
	O16    Automatic particle analysis and classification (Hitachi Scientific Instruments, Oxford Instruments) (booth no. 5)
13.30-14.50	<b>POSTERS (B16-B19, Bpd, P13-P16, I13-I16)</b> (PAVILION E, first floor)
15.00-15.50	<b>L2</b> <b>TEM of nanostructured materials</b> (G. van Tendeloo, Antwerp) (CHV)
16.00-18.30	<b>B10</b> <b>Cryo-preparation for EM and cryo-analysis</b> (ROOM H) <b>B18</b> <b>Achievements in multi-photon imaging</b> (ROOM C) <b>P5</b> <b>Perovskites</b> (ROOM B) <b>P10</b> <b>Interfaces and grain boundaries</b> (ROOM E) <b>I6</b> <b>Low vacuum microscopy and charging</b> (ROOM A) <b>I14</b> <b>Electron optical systems, guns and lenses</b> (ROOM F)
19.30-23.30	Evening in theatre

## FRIDAY, JULY 14

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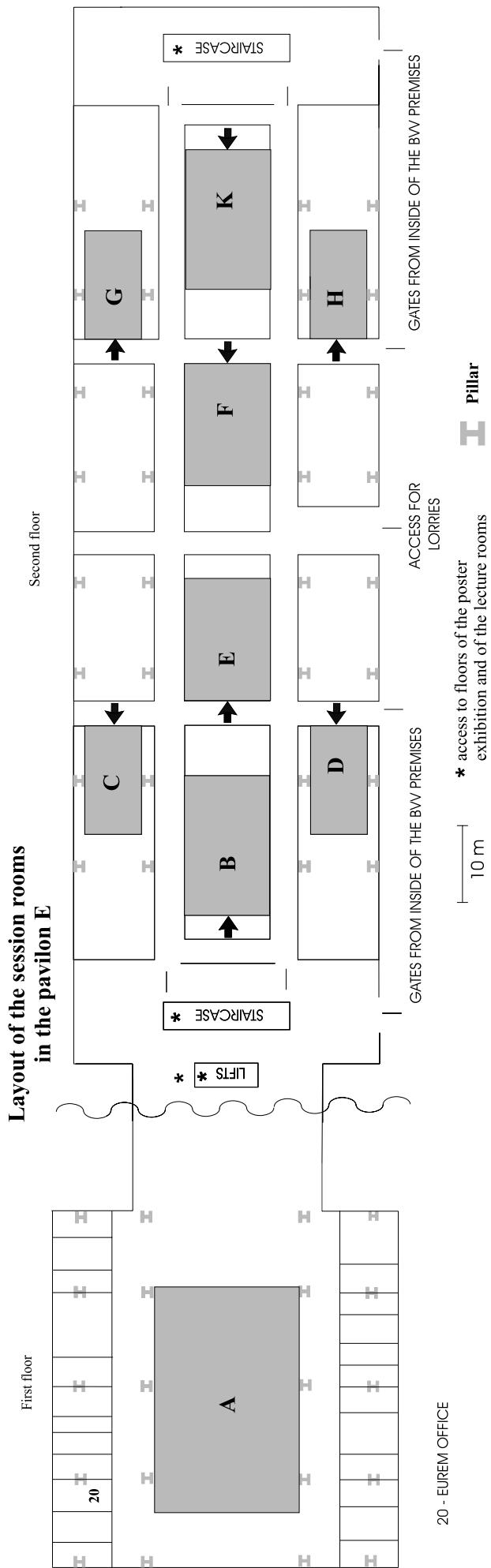
8.30-9.20	<b>L4</b> <b>High performance electron microscopes of the future</b> (H. Rose, Darmstadt) (CHV)
9.30-12.00	<b>B3</b> <b>Progressive detection methods in light and electron microscopy</b> (ROOM F) <b>B11</b> <b>EM microanalysis in biology</b> (ROOM E) <b>B12</b> <b>Cytoskeleton structure and dynamic</b> (ROOM C) <b>P14</b> <b>Specimen preparation in material sciences</b> (ROOM H) <b>P16</b> <b>EM in geology, archaeology, arts, and in forensic applications</b> (ROOM D) <b>I13</b> <b>Computerised microscopy</b> (ROOM A) <b>I15</b> <b>Filters, analysers and detectors</b> (ROOM B)
13.00-13.30	Exhibition closing (PAVILION E, ground floor)
13.30-16.00	<b>I17</b> <b>EMS Symposium</b> (CHV)
16.00-16.30	Closing ceremony (CHV)

## NOTES:

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- **ROOMS:**

CHV	Congress Hall Voronez
ROOM A	PAVILION E, first floor
ROOMs B to K	PAVILION E, second floor
- **Bn** - Symposia on Biological Sciences, **Pn** - Symposia on Physical Sciences, **In** - Symposia on Instrumentation and Methodology, **Ln** - Keynote Lectures, **Tn** - Tutorials, **Wn** - Workshops, **On** - Open Labs (organized by manufacturers).
- **POSTERS** - the midday sessions are separate for groups of symposia, with obligatory presence of the authors at posters, while the evening sessions are free both for authors and participants.
- The time between 12.00 and 15.00, with relatively less rich programme, is intended for informal discussions in lobbies.
- No fixed time is reserved for coffee breaks. At the registration, coffee vouchers will be distributed, against which coffee will be available at snack stands during the congress time.



# BIOLOGICAL SCIENCES

## B01 • NUCLEAR IMPORT AND EXPORT

[Tuesday, July 11, 16.00-18.30, Room D]

**Chair:** U. Aebi, Basel; T. D. Allen, Manchester

**Oral presentations:**

- 16.00-16.50 Structural dissection of nucleocytoplasmic transport (*invited*)  
*D. Stoffler, B. Fahrenkrog, B. Feja, J. Koeser, U. Aebi*
- 16.50-17.40 Structural and functional dynamics in the nuclear pore (*invited*)  
*T.D.Allen, E.Kiseleva, S.A.Rutherford, L.Cotter, J.Cronshaw, M.W.Goldberg*

**Posters:**

[Monday, July 10, 13.30-14.50]

- B01-1 Nucleolus-like bodies or Nematosomes - an ultrastructural sign of cell stimulation  
*V. Bourneva, R. Denkova, I. Christov, B. Nikolov, K. Baleva, E. Yaneva*
- B01-2 Ultrastructure of nuclear RNP particles extruded into cytoplasm in apoptotic cells  
*D. Krajčí*

## B02 • MEMBRANE TRAFFIC

[Monday, July 10, 16.00-18.30, Room H]

**Chair:** M. Pavelka, Vienna; J. Klumperman, Utrecht

**Oral presentations:**

- 16.00-16.10 Membrane traffic in biosynthetic and endocytic pathways (*invited*)  
*M. Pavelka*
- 16.10-16.50 Golgi apparatus and endocytosis (*invited*)  
*A. Ellinger, M. Vetterlein, P. Debbage, M. Pavelka*
- 16.50-17.30 Immuno-EM analysis of protein sorting events in the exo- and endocytic pathway (*invited*)  
*J. Klumperman*

**Posters:**

[Monday, July 10, 13.30-14.50]

- B02-1 Ultrastructural characteristics of differentiating intercalated cells in embryonic chick kidney  
*J. Soleimani Rad*
- B02-2 SEM observations on the endothelial surface following temporary clipping vasospastic common carotid artery  
*M.Z.Berkman, A.C. Iplikcioglu, N. Engür, F. Ercan, T. Erbengi*
- B02-3 Interactions and fusion between macrophage and smooth muscle cell foam cells in the human atherosclerotic plaque  
*H. Robenek, G. Plenz, N.J. Severs*
- B02-4 The presence of Golgi tendon organs in pig extraocular muscle  
*R. Blumer, J.-R. Lukas, R. Wasicky, P.C. Brugger, W. Hötzenecker, R. Mayr*
- B02-5 Electron microscopical study of adenylate cyclase toxin interactions with membranes  
*J. Vodolánová, O. Benada, P. Sebo*
- B02-6 Effect of cyclosporin-A on atrial natriuretic peptide granules in rat atrial myocytes  
*M. Ozturk, I. Seckin, S. Yilmazer, B. Uruluer, S. Bolkent, G. Satiroglu*
- B02-7 Subcellular distribution of MAL, a component of the detergent-insoluble membrane subdomains, in MDCK cells  
*J.A. Martínez-Menárguez, R. Puertollano, M.A. Alonso, J. Ballesta*
- B02-8 The maturation of secretory granules of rat parotid acinar cell would involve a fusion of immature granule forms. A further support by Menkes protein immunolabelling.  
*F. D'Amico, E. Skarmoutsou, S. Sanfilippo*

## B03 • PROGRESSIVE DETECTION METHODS IN LIGHT AND ELECTRON MICROSCOPY

[Friday, July 14, 09.30-12.00, Room F]

**Chair:** F. Wachtler, Vienna; A.K. Raap, Leiden

### Oral presentations:

- 09.30-10.05 Combined binary ratio fluorescence in situ hybridization (COBRA-FISH): A generic multicolor FISH technique (*invited*)  
*A.K. Raap*
- 10.05-10.40 Signal enhancement for EM detection procedures (*invited*)  
*Ch. Schöfer, K. Weipoltshammer, F. Wachtler*
- 10.40-10.55 Identification and double immuno electron microscopy (EM) labeling of organelles in 3D space  
*A.A. Mironov, jr., J.Y. Sokolova, A.A. Mironov*
- 10.55-11.10 Examination of hyaluronidase digestion as an effective antigen retrieving method for immunolabeling basic fibroblast growth factor at electron microscope level  
*R.G. Aktas, R. J. Kayton*
- 11.10-11.25 Immunoelectron microscopic evidence for receptor-mediated endocytosis in porcine oocytes  
*A. Russinova*
- 11.25-11.40 Structure of the ovary in adolescent women with functional disturbances with regard to progressive apoptosis and prevalence of antiovarian autoantibodies  
*J. Martínek, Z. Jirsová, J. Hořejši*
- 11.40-11.55 Analysis of the mouse and hamster zona pellucida using antibodies against porcine zona pellucida  
*M. Avilés, T. Okinaga, R. Fayerer-Hosken, J. Ballesta*

### Posters:

[Monday, July 10, 13.30-14.50]

- B03-1 Critical account of various techniques used for squid age estimates  
*M. R. Lipinski*
- B03-2 An electron microscope investigation of the stability of lysosomes in post-mortem bovine muscle using the immunogold technique  
*M. Mobarak, M. G. Zeece, W. J. Reville*
- B03-3 An immunocytochemical study in the hippocampus of the genetic absence epilepsy rats from Strasbourg (GAERS)  
*T. San, S. Sanlı, F. Onat, F. Ercan, S. Cavdar*
- B03-4 Electron microscopic modification of a light microscopic histochemical method for detection of  $\text{Na}^+$ ,  $\text{K}^+$  - ATPase activity  
*M. Jirkovská, J. Šmídová*
- B03-5 Changes of ouabain sensitive ATPase in apical membrane of rat colon enterocytes after dietary potassium depletion  
*R. Vágnerová, J. Pácha, J. Šmídová*
- B03-6 Functional adaptation of plasmalemma of the proximal tubular epithelium to the luminal transport requirements  
*Z. Jirsová, Z. Zemanová*
- B03-7 Topochemistry of glycogen in oviducts of sexually immature mice under normal and experimental conditions  
*S. Čech, I. Lauschová*
- B03-8 Influence of exogenous glucose on glycogen topochemistry in mouse blastocysts developed in vitro  
*J. Šťastná, S. Čech*
- B03-9 Hemopoietic progenitors driven to different lineages by specific cytokines  
*S. Burattini, L. Zamai, S. Papa, F. Luchetti, A. Bassini, S. Pierpaoli, G. Zauli, E. Falcieri*
- B03-10 Comparison of high resolution backscatter electron (BSE) imaging in an in-lens Hitachi S-900 FESEM and a below-to-lens Hitachi S-4700 FESEM using the Autrata modified YAG BSE detector  
*S.L. Erlandsen, Y. Chen, Ch. Frethem*
- B03-11 Analysis of the mouse and hamster zona pellucida using antibodies against porcine zona pellucida  
*M. Avilés, T. Okinaga, R. Fayerer-Hosken, J. Ballesta*

## B04 • SUPERMOLECULAR COMPLEXES RECONSTRUCTION AND TOMOGRAPHY

[Thursday, July 13, 09.30-12.00, Room E]

**Chair:** W. Baumeister, Martinsried; M. van Heel, London;

### Oral presentations:

- 09.30-10.10 Electron tomography of molecules and cells (*invited*)  
*S. Nickell, J. Böhm, D. Typke, W. Baumeister*
- 10.10-10.50 Three-dimensional structures of single molecules by cryo-EM (*invited*)  
*M. van Heel*
- 10.50-11.10 The quaternary structure of the ionotropic glutamate receptor B  
*W. Tichelaar, M. Safferling, G. Kümmerle, H. Cisse, D.R. Madden*
- 11.10-11.30 The DnaB-DnaC complex: a structure based on interactions among asymmetric dimers  
*M. Bárcena, T. Ruiz, L.E. Donate, S.E. Brown, N.E. Dixon, M. Radermacher, J.-M. Carazo*
- 11.30-11.50 The 3D arrangement of RNA and proteins in the spliceosomal U1 snRNP  
*H. Stark, P. Dube, R. Lührmann, B. Kastner*

### Posters:

[Monday, July 10, 13.30-14.50]

- B04-1 3-D structure of a Balbiani ring RNP particle as revealed by cryo electron microscopy and constrained maximum entropy tomography  
*S. Masich, U. Skoglund, B. Daneholt*
- B04-2 Cryo electron tomography of the naturally assembled splicing machine  
*O. Medalia, D. Typke, S. Grayer-Wolf, M. Angenitzki, J. Sperling, R. Heger, R. Sperling*
- B04-3 Ultrastructural mapping of the domain architecture of the DnaB hexameric helicase  
*Y. Robledo, D. Lanzarot, M. Valle, J.P. Albar, N. Dixon, J.M. Carazo, L.E. Donate*
- B04-4 Eukaryotic type II chaperonin CCT interacts with actin through specific subunits  
*O. Llorca, E.A. McCormack, G. Hynes, J. Grantham, J. Cordell, J.L. Carrascosa, K.R. Willison, J.J. Fernandez, J.M. Valpuesta*
- B04-5 A novel method for automated acquisition of tilt series for electron tomography based on pre-calibration of the specimen stage  
*U. Ziese, A.H. Janssen, T.P. van der Krif, A.G. van Balen, W.J. de Ruijter, A.J. Koster*
- B04-6 3-D Reconstruction of the ATP-Synthase from chloroplasts  
*Ch. Mellwig, B. Böttcher*
- B04-7 Implementation of energy-filtered low-dose electron tomography on an intermediate-voltage TEM  
*J. Böhm, S. Nickell, D. Typke, W. Baumeister*

## B05 • PLANT CELL ULTRASTRUCTURE AND SIGNALLING PATHWAYS

[Wednesday, July 12, 16.00-18.35, Room F]

**Chair:** M. C. Risueno, Madrid; M. Čiamporová, Bratislava

### Oral presentations:

- 16.00-16.35 In situ localization and expression of MAP kinases during pollen development, embryogenesis and cell proliferation (*invited*)  
*P.S. Testillano, M.J. Coronado, J.M. Segui, O. Vicente, M.C. Risueno*
- 16.35-17.20 GFP reveals the dynamics of the higher plant secretory system (*invited*)  
*C.R. Hawes, S. Andreeva, H. Zheng, F. Brandizzi, I. Moore, P. Boevink, C. Saint-Jore*
- 17.20-17.35 Ultrastructural interaction of organelles containing DNA and ethylene producing/binding sites  
*T. Selga, M. Selga*
- 17.35-17.50 The study of calcium balance of leaves under water deficit  
*O. Nedukha*
- 17.50-18.05 Microspore switch to embryogenesis involves defined changes in the ultrastructural organization  
*M.C. Risueno, J.M. Segui, M.J. Coronado, J. Domenech, G. Prestamo, P. Gonzales-Melendi, P.S. Testillano*
- 18.05-18.20 Determination of unit cell size of prolamellar bodies from maize leaves  
*B. Schoefs, S. Hucek, M. Husák*

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- 18.20-18.35 Morphological characterisation of the Arabidopsis-mutant MYB23 by cryo-scanning electron microscopy.  
*K. Adler, V. Kirik, G. Zimmermann, H. Bäumlein*

**Posters:**

[Monday, July 10, 13.30-14.50]

- B05-1 A TEM study of in vitro biosynthesis of plant (1-3)-beta-D-glucans  
*J. Lai Kee Him, H. Chanzy, J. L. Putaux, V. Bulone*
- B05-2 The cellulose system of the prickly pear cactus spines  
*R. Vuong, D. Dupeyre, M. E. Malainine, M. Vignon*
- B05-3 Comparison of chloroplast ultrastructure at two different stages of seed maturation in Gleditsia triacanthos L.  
*B. Schoefs*
- B05-4 Ultrastructural changes in leaves of Zannichellia palustris in response to high salinity  
*A.D. Barnabas, R. Jimmy, K. Govender, W.J. Przybylowicz, J. Mesjasz-Przybylowicz*
- B05-5 Taxonomic value of seed micromorphology in cactaceae  
*S. Espinosa-Matias, C. Nunez-Mariel, M.E. Engleman, J. Reyes, J. Marquez-Guzman*
- B05-6 Structure and composition of olive cuticle in relation to water stress  
*B. Lanza, V. Marsilio*
- B05-7 The lead distribution in two tissues of Lemna minor L. root  
*S. Samardakiewicz, A. Woźny*
- B05-8 Strain interaction of nuclei, mitochondria and dictyosomes controlled by ethylene in winter rye (*Secale cereale* L.) leaves  
*M. Selga, T. Selga*
- B05-9 Changes in the ultrastructure of inclusions in Caragana arborescens Lam. epidermal cells  
*D. Chernyshov, E. Kordyum*
- B05-10 The Salt Glands of Odyssea paucinervis (Poaceae)  
*R. Somaru, G. Naidoo, Y. Naidoo*

## B06 • ELECTRON MICROSCOPY IN MOLECULAR PATHOGENESIS

[Monday, July 10, 16.00-18.30, Room A]

**Chair: W. Mosgoeller, Vienna; J. Slezák, Bratislava**

**Oral presentations:**

- 16.00-16.40 A multidisciplinary approach including electron microscopy and confocal microscopy is recommended to evaluate pathomechanisms in cardiac diseases (*invited*)  
*J. Schaper*
- 16.40-17.20 Nucleolar structural changes and reduced ribosome biosynthesis due to perinatal low oxygen (asphyxic) conditions in rat neurons (*invited*)  
*W. Mosgoeller, P. Kastner, C. Kohlhauser, H. Hoeger, G. Lubec*
- 17.20-17.35 Bronchial epithelium of liquidators of the Chernobyl accident consequences: An ultrastructural research  
*V. Polyakova*
- 17.35-17.50 Changes in mitochondrial fine structure in regenerating rat Leydig cells after EDS treatment  
*M. Bakalska, P. Angelova, L. Kancheva, B. Nikolov*
- 17.50-18.05 Ultrastructural analysis of liver metastasis formation  
*A. Márquez, H.J. Finol, M. Pulido-Méndez, L. Sosa*
- 18.05-18.20 Comparison of the effect of epinephrine administration on the ultrastructure of the tracheal and bronchiolar epithelium  
*V. Konrádová, J. Uhlík, L. Vajner, J. Zocová*

**Posters:**

[Monday, July 10, 13.30-14.50]

- B06-1 Effect of orally administered cadmium on surface and glandular epithelial cells of the stomach in rats  
*M. Asar, Ü. A. Kayisli, V.N. Izgüüt-Uysal, G. Öner, M. Kaya, S. Polat*
- B06-2 Ultrastructural pathology of liver metastases from colon adenocarcinomas  
*H.J. Finol, A. Márquez, M. Pulido-Méndez*
- B06-3 Ultrastructural pathology in spironolactone vacuolar myopathy  
*E. López-Nadorphy, H.J. Finol, A. Márquez*
- B06-4 Effects of melatonin and vitamin E on structural changes in liver tissue induced by iron overload in the rabbits  
*A. Gökcimen, E. Karaöz, C. Özogul*

- B06-5 Light and electron microscopic observation on in vitro proliferation and differentiation of human granulosa cells  
*O. Evirgen, M. Tekelioglu, H. Satiroglu, C. Ünlü*
- B06-6 The role of nitric oxide in diabetic capillary  
*E. Erdemli, E. Demirel-Yilmaz, M. Tekelioglu*
- B06-7 Ultrastructural mucosal changes of the tracheobronchial tree in larengectomised patients  
*F. Erisir, H. Oktar, N. Yilmaz, T. Demir, G. Yilmazer*
- B06-8 Evaluating the fine structural effect of ovariectomy on the rat submandibular salivary glands  
*S. Solakoglu, M. Yaltirkik, F. Onar, B. Ahishali, O. Oral, C. Kasapoglu, C. Oral*
- B06-9 Ultrastructural effects of metformin on pancreatic B cells of streptozotocin-induced diabetic rats  
*S. Bolkent, A. Tabakoglu-Oguz, R. Yanardag, Ö. Özsoy-Sacan*
- B06-10 The effects of glibornuride on ultrastructural changes of liver in streptozotocin diabetes  
*S. Bolkent, R. Yanardag, Ö. Özsoy-Sacan, Ö. Karabulut-Bulan*
- B06-11 Ultrastructural analysis of erythroid cell precursors in myelodysplastic syndrome (a case report)  
*S.F. Müftüoglu, P. Atilla, N. Yarali, F. Kaymaz, F. Duru*
- B06-12 Ultrastructure of early human chorionic villi with a special reference to differentiation of cytotrophoblast  
*E. Asan, A.N.Cakar, F. Kaymaz, S.F. Müftüoglu, A. Dagdeviren*
- B06-13 Ultrastructural findings of ischemia-reperfusion injury on liver sinusoid endothelium  
*F. Kaymaz, S.F. Müftüoglu, E. Genc, Ü. Örs*
- B06-14 Ultrastructural studies on neutrophils of gastric mucosa in gastric ulcer  
*Y. Canberk*
- B06-15 Ultrastructure of isthmus of laying hens fed with normal, high calcium and insufficient calcium diet  
*S. Daglioglu, H.H. Bozkurt, O.Arda, A. Özpinar*
- B06-16 The effect of methimazole on renomeduller interstitial cells  
*I. Seckin, A. Dariyerli, A. Bahat, G. Yigit, G. Satiroglu, H. Hatemi*
- B06-17 An unique dialogue between the mural trophoblast cells and uterine epithelium in the rat  
*R. Demir*
- B06-18 The fine structure of inner cell mass cells (ICMCs) of blastocyst at the beginning of implantation in the rat  
*R. Demir, E. Turkyay-Korgun*
- B06-19 Is there a structural resistance to trophoblastic invasion in the human decidual glandular epithelium during early pregnancy?  
*A.Y. Demir-Weusten, R. Demir*
- B06-20 Giant mitochondria in rat brown adipocytes after short-term sucrose consumption  
*M. Cakic-Milosevic, V. Koko, J. Radovanovic, V. Davidovic*
- B06-21 Ultrastructural effects of tamoxifen on rat kidney cortex  
*G. Yilmazer, M. Uygun, G. Kizilay*
- B06-22 Ultrastructural effects of tamoxifen on rat uterus  
*G. Yilmazer, M. Uygun, G. Kizilay*
- B06-23 Morphological findings in kidneys of streptozotocin induced diabetic rats treated with cyclosporin A  
*S. Akdeniz, E. Kotiloglu, A. Cevik, S. Solakoglu*
- B06-24 Ultrastructural findings in rat testes in a varicocele model  
*S. Solakoglu, H. Erol, M. Koyutürk, S. Akdeniz*
- B06-25 Evaluation of ultrastructural changes in paranasal sinus mucosa after functional endoscopic sinus surgery in patients with chronic rhinosinusitis  
*B. Ahishali, N. Keles, K. Deger, S. Solakoglu*
- B06-26 Ultrastructure and microenvironment of high endothelial venules in the lymph node of a patient with hypogammaglobulinemia  
*E. Asan, Y. Ugur, P. Korkusuz, M. Onerci*
- B06-27 Ultrastructure of corticotrophs from rats adrenalectomized bilaterally  
*E. Özbek*
- B06-28 The influence of cigarette smoking on the epithelium of the vestibule  
*Mukaddes Esrefoglu, E. Selimoglu, Muammer Esrefoglu, Ö. Vuraler*
- B06-29 Electron microscopic examination of coagulation mechanisms under effect of Fraxiparine(R)  
*H. Sunar, G. Hüseyinova, G. Saygin, E. Duran*
- B06-30 Spermatogenetic process in the internally self-fertilizing hermaphroditic teleost Rivulus mamoratus (Cyprinodontiformes, Rivulidae)  
*H.-S. Kweon, E.-H. Park*

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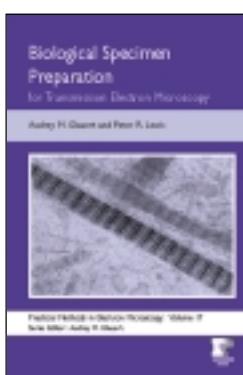
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- B06-32 Improvement of negative effects of cyclosporine-A administered in curative dosages on liver morphology  
*M. Uygun, G. Yilmazer, F. Alkan, Y. Uz, G. Kizilay, S. Ciner*
- B06-33 Morphological effect of some substances on the Langerhans cells  
*J. Schramlová, P. Barták, K. Blažek, M. Vaněk*
- B06-34 Glycogen-containing vesicles, vacuole and multivesicular body in the brown adipocyte  
*A. Korac, J. Radovanovic, V. Davidovic*
- B06-35 The effect of pretreatment with erythrocytes on the development of diabetes and insulitis in mice given multiple doses of streptozotocin  
*S. Yilmazer, A. Erensoy, B. Balkan, G. Satiroglu*
- B06-36 The effects of fasting on ultrastructure of hepatocytes in mice  
*E. Özbek*
- B06-37 Structural, ultrastructural and biochemical effects of certain alcohols and aldehydes on rat isolated, perfused liver  
*C. Rosioru, C. Craciun, V. Miclaus, I. Petrescu, V. Craciun, C. Ilie*
- B06-38 Studies concerning the actions of some topical dermocorticoids on pubertal rat thymuses after beta-adrenoreceptors blocking  
*A. Ardelean, C. Craciun, S. Fratila, V. Craciun*
- B06-39 Ultrastructural studies concerning the action of some topical dermocorticoids upon prepubertal rat thymus, before and concomitantly with the beta-adrenoreceptors blocking  
*C. Craciun, S. Fratila, A. Ardelean, V. Craciun*
- B06-40 Electronmicroscopical lesions in remnant kidneys after low-dose radiation  
*M. Aunapuu, Ü. Pechter, T. Suuroja, A. Arend, M. Ots*
- B06-41 Morphological and arthroscopy analyses in the treatment of osteoarthritis  
*D. Guerra, L. Frizziero, I. Pasquali-Ronchetti*
- B06-42 The origin of the M (membranous) cell in human pharyngeal tonsil  
*K. Özbilgin, I. Tuglu, S. Vatansever, S. Inan, M. Kaya*
- B06-43 Somatostatin inhibits bile duct epithelial cell proliferation and fibrosis after extrahepatic biliary obstruction  
*F. Olum, D. Erdogan*
- B06-44 Ultrastructural changes in the respiratory system of guinea pigs after exposure to sulphur dioxide  
*V.S. Inan, H. S. Vatansever, M. Sargon, M. Tuncel*
- B06-45 Comparison of histological and ultrastructural differences of thyrotrophin releasing hormone (TRH) in fetal rat lung maturation  
*H. S. Vatansever, S. Lacin, K. Özbilgin, A. Uysal, F. Koyuncu, M. Yurtseven, H. Caglar*
- B06-46 Ultrastructural analysis of ovarian granulosa cells after in vitro treatment with local peptide factors  
*R. Denkova, V. Bourneva, I. Christov, B. Nikolov, K. Baleva, E. Yaneva*
- B06-47 Ultrastructural changes induced by long term and overdose heparin application in liver tissue  
*Y. Saran, B. Can, M.C. Güven, N. Zaloglu, B. Turan*
- B06-48 Injury of skeletal muscle increase granulocytes in fish Oreochromis niloticus  
*C.H. Pellizzon, M. Dal Pai-Silva, V. Dal Pai*
- B06-49 Ultrastructural effects of saturated and unsaturated oil consumption on myocard and coronary arteries  
*D. Erdogan, C. Elmas, C. Özogul, R. Soylu, C. Ilgaz, A. Günyakti*
- B06-50 Ultrastructural diagnostic features of the xanthelasma  
*S. Arda, G. Hüseyinova, Ö. Yalcin*
- B06-51 Effects of fasting and overdose vitamin C on pancreas ultrastructure  
*B. Kaplan, B. Gönüll, G. Karabay, D. Erdogan*

## **B07 • ELECTRON AND CONFOCAL MICROSCOPES, CORRELATION METHODS**

[Wednesday, July 12, 09.30-12.00, Room C]

**Chair: D. Hernandez-Verdun, Paris; I. Raška, Prague**

### **Oral presentations:**

- 09.30-10.10 Immunolabelling and structure - bridging the gap between light and electron microscopy (*invited*)  
*H. Schwarz*

- 10.10-10.50 From Miller spreads to phosphorus maps of nucleoproteins: transcription seen by complementary microscopies (*invited*)  
M.F. Trendelenburg, H. Spring, A. Haking, H. Tröster, M. Pawlita, C. Crucifix
- 10.50-11.05 Electron and confocal microscopic identification of free radicals produced by human granulocytes in phagocytosis  
K.-I. Hirai, K. Moriguchi, N. Ohno, M. Shiojiri
- 11.05-11.20 Visualizing membrane traffic in vivo by combined video fluorescence and 3-D-electron microscopy (*invited*)  
A.A. Mironov, A.A. Mironov Jr., R. Polishchuk, J.Y. Sokolova, K. Burger, A. Koster, A. Luini
- 11.20-11.35 Imaging of nucleolar assembly: comparison of different microscopies (*invited*)  
M. Savino, J. DeMey, J.-B. Sibarita, J. Gébrane-Younes, D. Hernandez-Verdun
- 11.35-11.50 Transport of ribosomal RNA within the nucleolus (*invited*)  
D. Staněk, K. Koberna, A. Pliss, V. Čtrnáctá, J. Malínský, M. Mašata, V. Kopský, J. Večeřová, I. Raška

**Posters:**

[Tuesday, July 11, 13.30-14.50]

- B07-1 Synergetic effects of confocal laser scanning microscopy and scanning electron microscopy for forensic investigations  
H. Ditrich

## B08 • PROGRESS ON BIOLOGICAL SAMPLE PREPARATION METHODS

[Tuesday, July 11, 09.30-12.00, Room A]  
**Chair: G. W. Griffiths, Heidelberg; M. Thiry, Liege**

**Oral presentations:**

- 09.30-10.10 Dynamic cellular bioassays using light- and electron microscopy and systematic random sampling (*invited*)  
G. Griffiths, A. Habermann
- 10.10-10.50 A new tool for studying the dynamics of RNA within the cell (*invited*)  
M. Thiry
- 10.50-11.05 Scanning electron microscopy of vascular corrosion casts: a potential tool in vascular research  
A. Lametschwandtner, H. Bartel, R. Sommer, W.D. Krautgartner, B. Minnich
- 11.05-11.20 The effect of osmolarity and storage on the ultrastructure of Turkey spermatozoa  
H.H. Bozkurt, S. Alkan, S. Daglioglu, I.K. Ileri
- 11.20-11.35 Advances in the monolayer flat embedding in the acrylic resin LR-White and single cell relocation for light and electron microscopy.  
M. Steiner, P. Samorapoomphit, M. Duchenne, W. Mosgoeller
- 11.35-11.50 Ultrastructure of spirochetes isolated from culicine mosquitoes  
Y.O. Sanogo, S. Reipert, J. Halouzka, Z. Hubálek, M. Němec

**Posters:**

[Tuesday, July 11, 13.30-14.50]

- B08-1 Ultrastructural investigation of different cell types using zinc iodide osmium tetroxide in lymphoid node  
E. Deveci, A. Dagdeviren, S. S. Inalöz, M. Yiincü, M. Akkus
- B08-2 Ultrastructural alterations in cold-stored small bowel: a comparison of Euro-Collins and Lactated Ringer solutions  
S. Öner, F. Ercan, S. Arbak, A. Yalin
- B08-3 Indomethacin-induced bladder epithelium: a light and electron microscopic study with lanthanum tracer method  
S. Cetinel, C. Hürdag, F. Ercan, Y. Ersoy, T. San
- B08-4 The 3D-structure of vascular networks as revealed by scanning electron microscopy (SEM) of vascular corrosion casts: qualitative and quantitative aspects  
R. Sommer, B. Minnich, T. Stöllinger, H. Bartel, W.D. Krautgartner, A. Lametschwandtner
- B08-5 The Imidazole-Osmium postfixation as method for membrane visualization for transmission electron microscopy  
T. Voigt, I. Bensemann-Ryvkin, W. Dauber
- B08-6 Immunolocalization of venom metalloproteases in venom glands of adult and new-born snakes Bothrops jararaca  
S.M. Carneiro, M.T. Assakura, F.A.C. Barrence, S.R.T. Cardoso, A. Sesso, A.C.M. Camargo
- B08-7 Importance of the fixative and embedding protocol for reliable ultrastructural preservation of pulvinar tissues.  
E. Fernández, L. Moyset, N. Cortadellas, E. Simón
- B08-8 ERL-embedded Borrelia - comparison of immunolabeling of etched and nonetched specimen  
J. Kuret, M. Krašna, E. Ružič-Sabljić
- B08-9 Effect of low-intensity microwave radiation on rat kidney: an ultrastructural study  
Y. Nerguz, M.A. Ketanu, Z. Akda, A.R. Ersay, M.S. Celuk
- B08-10 Changes in size and shape of biological specimens as determined by preparative techniques for SEM  
R.H.M. Cross

**B10 • CRYO-PREPARATION FOR EM AND CRYO-ANALYSIS**

[Thursday, July 13, 16.00-18.30, Room H]

**Chair:** **J. Dubochet**, Lausanne; **H. Plattner**, Konstanz;**Oral presentations:**

- 16.00-16.40 Time resolved EM, ESI and EDX analysis of exo-endocytosis within the sub-second time range in a synchronous system (*invited*)  
*H. Plattner, M. Hardt*
- 16.40-17.20 Vitreous sections of cells and suspensions (*invited*)  
*J. Dubochet, D. Studer, A. Leforestier, F. Livolant, A. Senn, N. Sartori Blanc*
- 17.20-17.35 A vitrification robot for time resolved cryo-electron microscopy  
*P. Frederik, P. Bomans, V. Franssen, P. Laeven*
- 17.35-17.50 Heat and mass transfer prior to vitrification in cryo-TEM: the need for 100% relative humidity  
*D.H.W. Hubert, P.H.H. Bomans, P.M. Frederik*
- 17.50-18.05 Cryo-electron microscopy of liquid crystalline phases of nucleosome core particles  
*A. Leforestier, J. Dubochet, F. Livolant*
- 18.05-18.20 Development of side-entry, multiple specimen and double tilt cryotransfer holders for biological TEM applications  
*B.L. Armbruster, R. Zolkowski, P.R. Swann*

**Posters:**

[Tuesday, July 11, 13.30-14.50]

- B10-1 Platelet balloons: facts not artifacts  
*M.W. Hess, J. Juhanoja, P. Siljander*
- B10-2 The cell in absence of aggregation artefact  
*N. Sartori Blanc, A. Al-Amoudi, J. Dubochet*

**B11 • EM MICROANALYSIS IN BIOLOGY**

[Friday, July 14, 09.30-12.00, Room E]

**Chair:** **G. Roomans**, Uppsala; **D. Neumann**, Halle**Oral presentations:**

- 09.30-10.10 ESI and EELS in biology (*invited*)  
*D. Neumann*
- 10.10-10.50 Energy-dispersive X-ray analysis in biomedicine (*invited*)  
*G.M. Roomans*
- 10.50-11.05 Histological structure and elementary composition of the most inner enamel in human permanent teeth  
*M. Takahashi, K. Kobayashi*
- 11.05-11.20 Use of red cells as a mass standard for quantification  
*A. Warley*
- 11.20-11.35 Osmoregulation of epithelia studied by analytical electron microscopy  
*K. Zierold*
- 11.35-11.50 TEM - X-ray microanalysis of single cells from aquatic environments  
*M. Heldal, S. Norland, E.S. Erichsen*

**Posters:**

[Wednesday, July 12, 13.30-14.50]

- B11-1 Carbonaceous component of breathable (PM2.5) urban aerosol: an electron microscopy study  
*L. Paoletti, B. De Berardis, M. Diociaiuti*
- B11-2 EFTEM tells us what the Tyrolean Iceman inhaled 5300 years ago  
*F. Hofer, C. Mitterbauer, I. Papst, M.A. Pabst*
- B11-3 Spherites in the midgut of Gyas annulatus show seasonal changes  
*S. Lipovšek, I. Papst, T. Novak, M.A. Pabst*
- B11-4 Filter electron microscopy for identification of silicon compounds in plants  
*U. zur Nieden, D. Neumann*
- B11-5 X-ray elemental analysis of the heavy metal uptake in a hot vent cirripede (Crustacea)  
*W. Klepal, T. Wolf, M. Weidinger*

**B09 • STRUCTURE AND MORPHOGENESIS OF VIRUSES**

[Wednesday, July 12, 09.30-12.00, Room B]

Chair: **J. L. Carrascosa**, Madrid; **S. Fuller**, Heidelberg;**Oral presentations:**

- 09.30-10.10 Enveloped virus structure in water (*invited*)  
*E.J. Mancini, B. Gowen, I. Ferlenghi, M. Clarke, D. Thomas, T. Ruttan, T. Wilk, S.L. Allison, J. Schalich, F.X. Heinz, S.C. Harrison, F. Rey, H.G. Kräusslich, S. Fuller*
- 10.10-10.50 Viral metamorphosis: visualizing capsid proteins and their maturation (*invited*)  
*A. Steven, D. Belnap, N. Cheng, J. Conway, B.L. Trus*
- 10.50-11.05 Morphogenesis of bacteriophage T4 capsid as studied by cryo-electron microscopy and 3D image reconstruction  
*K. Iwasaki, B.L. Trus, P.T. Wingfield, N. Cheng, G. Campusano, V. Rao, A.C. Steven*
- 11.05-11.20 Molecular organisation of submembrane protein shells in mature and immature retroviral particles  
*M.V. Nermut*
- 11.20-11.35 Bactericidal phage tail-like particles of Budvicia and Pragia  
*J. Šmarda, O. Benada*
- 11.35-11.50 IIMS: a database focused on macromolecular structure  
*J.M. Carazo, G.J. Barton, S.D. Fuller, M. Radermacher*

**Posters:**

[Tuesday, July 11, 13.30-14.50]

- B09-1 On vectorless transmission of the phytopathogenic viruses ZYMV and WMV II – a method for virus routine detection in soil samples  
*S. Richter*
- B09-2 Structural diagnostic virology: current contribution to public health in Spain  
*M.I. Herrera, L. Cuevas, A. Vivo, Y. Santa-María, E. Pérez-Pastrana, J.A Fernández del Campo, A. de la Loma*
- B09-3 An electron microscopic study of detergent effect to HIV particles  
*I. Takahashi, M. Takama, M. Ozel, H. Gelderblom, A.-M. Ladhoff*
- B09-4 Transendothelial migration of fungal pathogen  
*E. Erdemli, C. Akbay, E. Demirel-Yilmaz, H. Ataoglu*
- B09-5 The importance of the endoplasmic reticulum of hepatocytes in the pathogenesis of the chronic hepatitis C infection  
*B. Coskun, G. Ersöz, E. Asan, O. Kandemir, T. Baykal, A. Kaya*
- B09-6 The effects of Fusarium graminearum on livers and duodena of rats  
*A. Özbek, E. Özbek, E. Demirci, F. Sahin, M. Ciftci*
- B09-7 Entamoeba as an eukaryote cytopathology investigation model (electron microscopy study)  
*K. Hovnanyan*
- B09-8 Ultrastructural study of interactions of artificial polyomavirus capsid-like particles and wild type virions with cell substructures  
*D. Liebl, Z. Richterová, T. Adamec, Z. Palková, J. Forstová, J. Štokrová, J. Korb*
- B09-9 Study of cervical dysplasia tissue by EM and LM  
*A.A. Manykin, F.V. Lysitcin, E.A. Guschina, D.V. Korogodin, E.V. Efremova, L.E. Zavalishina, M. Raygoza-Anaya*
- B09-10 Ultrastructural studies on mitochondrial intermembranous space of AIDS patients: snake-like structures, HIV-like particles and cytoplasmic particles  
*J. Radovanovic, A. Korac, V. Koko*
- B09-11 The effect of Borrelia garinii on Epstein-Barr virus infection  
*D. Hulinská, J. Schramlová, K. Roubalová, H. Dřevová*
- B09-12 New insights on the structure and morphogenesis of vaccinia virus  
*C. Risco, D. Rodríguez, J.P. Lechaire, J.R. Rodríguez, F. Gaill, M. Esteban, J.L. Carrascosa*
- B09-13 Potato virus Y induces synthesis of cysteine and aspartic proteinase inhibitors in potato (*Solanum tuberosum L.*)  
*M. Poljšak-Priatelj, M. Ravnikar, B. Štrukelj*

- B11-6 Minerals of the radular teeth of a deep-sea hydrothermal vent gastropod (Neoleptopsidae: Mollusca)  
*R. Cruz, A. Warén, M. Farina*
- B11-7 Characterization of particles in polluted ambient air by x-ray microanalysis in SEM  
*E. Namork, T. Krekling, B.V. Johansen*
- B11-8 Ion localization in plants as investigated by LTSEM and EDX X-ray microanalysis  
*A. Minnoccia, S. Luca, V. Claudio*
- B11-9 Changes in sodium, chlorine and potassium during apoptotic cell death. An X-ray microanalytical study  
*A. Warley, F. Arrebola, S. Zabiti, F.J. Canizares, M.A. Cubero, E. Fernández-Segura, A. Campos*
- B11-10 X-ray Microanalysis of chloride transport in nasal epithelial cells  
*A. Dragomir, Ch. Andersson, L. Hjelte, G.M. Roomans*
- B11-11 X-ray microanalysis of metallic inclusions in human gingiva  
*O. Benada, Z. Venclíková*
- B11-12 An electron probe X-ray microanalysis study during organogenesis from internode-derived nodules of *Humulus lupulus* var. Nugget  
*A.M. Fortes, M.S. Pais*

## B12 • CYTOSKELETON STRUCTURE AND DYNAMIC

[Friday, July 14, 09.30-12.00, Room C]

**Chair:** K. Holmes, Heidelberg; E. Dráberová, Prague

**Oral presentations:**

- 09.30-10.10 The structural basis of muscle contraction (*invited*)  
*K.C. Holmes*
- 10.10-10.50 Interaction of kinesin motor proteins with microtubules (*invited*)  
*A. Hoenger, M. Thormählen, R. Diaz-Avalos, M. Doerhoefer, K.N. Goldie, J. Müller, E. Mandelkow*
- 10.50-11.10 Electron cryomicroscopy of the F-actin - myr5-head insertion complex: disordered binding or decent decoration?  
*H. Stegmann, M. Bähler, R.R. Schröder*
- 11.10-11.30 Reversible internalization of flagella by *Tritrichomonas foetus*  
*B.L. Granger, S.J. Warwood, M. Benchimol, W. de Souza*
- 11.30-11.50 A working model for rotative-helicoidal propulsion of intracellular cyanogenic particle-filaments assemblies in carpocallus  
*B.T. Matienko*

**Posters:**

[Wednesday, July 12, 13.30-14.50]

- B12-1 The architecture of the cytoskeleton in nephron cells from vertebrates  
*V. B. Zaitsev*
- B12-2 An ultrastructural evaluation of epidermolysis bullosa  
*P. Atilla, F. Kaymaz, S.F. Müftüoglu, E. Asan, B. Talim, S. Gögiş*

## B13 • FUNCTIONAL ARCHITECTURE OF THE CELL NUCLEUS

[Thursday, July 13, 09.30-12.00, Room C]

**Chair:** C. G. Cremer, Heidelberg; P. Hozák, Prague

**Oral presentations:**

- 09.30-10.10 Confocal laser-scanning 3D fluorescence microscopy, quantitative image analysis and computer modelling of X-chromosome territories (*invited*)  
*G. Kreth, P. Edelmann, S. Dietzel, T. Cremer, Ch. Cremer*
- 10.10-10.50 Transcription factories (*invited*)  
*A. Pombo, D.A. Jackson, F.J. Iborra, M. Hollinshead, H. Kimura, K. Sugaya, P.R. Cook*
- 10.50-11.05 The nuclear envelope regulates the Xenopus Cdc6 protein during DNA replication  
*M. Jarnik, T.L. Gales, T.R. Coleman*
- 11.05-11.20 Increased accumulation of acridine orange in developing microcells of human sarcoma cell line HT-1080  
*I. Buikis, L. Harju, T. Freivalds*
- 11.20-11.35 Arsenic trioxide induces apoptosis in HepG2 cells: the roles of nuclear matrix associated proteins PML and NuMA  
*Z.H. Wang, D. Yu, H.K. Li, Z.M. Chai, C.C. Ng, P.F. Chen, E.C. Chew, S.B. Cheng Chew*

- 11.35-11.50 Altered nuclear matrix protein profiles in etoposide treated HL-60 cells  
*M.L. Jin, J.Y.H. Chan, P. Zhang, Z.H. Wang, H.K. Li, C.C. Ng, P.F. Chen, S.B. Cheng Chew, E.C. Chew*
- 11.50-12.00 Nuclear myosin I  
*P. Hozák, L. Pestic-Dragovich, L. Stojiljkovic, A.A. Philimonenko, G. Nowak, P. de Lanerolle*

## B14 • NEUROBIOLOGY: CELLS AND SIGNAL TRANSFER

[Thursday, July 13, 09.30-12.00, Room D]

**Chair: A. Triller, Paris; J. Maršala, Košice**

### Oral presentations:

- 09.30-10.10 Nitric oxide synthesizing neurons and the signal transfer in the spinal cord dorsal horn (*invited*)  
*J. Maršala*
- 10.10-10.50 Targeting of components of the postsynaptic membrane at cholinergic synapses: an EM study (*invited*)  
*S. Marchand, F. Bignami, G. Camus, F. Stetzkowski-Marden, J. Cartaud*
- 10.50-11.10 Fine structure of the hippocampus from guinea pig given haloperidol  
*E. Özbek, N. Aydin, M.D. Aydin, A. Sahin*
- 11.10-11.30 Influence of mother's hypoxia and mother's ethanol addiction on the differentiation of ventricular zone of rat brain vesicle  
*H. Brichová*
- 11.30-11.50 Alteration of mast cells population after denervation of extensor digitorum longus (EDL) in rats  
*C.H. Pellizzon, R.M. Santos, M. Dal Pai-Silva, V. Dal Pai*

### Posters:

[Wednesday, July 12, 13.30-14.50]

- B14-1 Immunohistochemical (IMH) and electronmicroscopical studies of skin innervation in neuropathic patients  
*M. Pilmane, L. Jermacane, S. Boka, V. Ose, E. Vitols*
- B14-2 Ultrastructural and light microscopical studies of skeletal striated muscles in neuropathic patients with myopathic syndrome  
*M. Pilmane, V. Ose, L. Jermacane, S. Boka, E. Vitols, A. Kovaldins*
- B14-3 The ultrastructure of the nervous elements in the cestode *Proteocephalus longicollis*  
*M. Bruňanská, M.K.S. Gustafsson, H. P. Fagerholm, J. Nebesářová*
- B14-4 Effect of trimetazidine on ischemia-reperfusion injury of optic nerve  
*S.F. Muftuoglu, S. Özden, B. Kildaci, F.F. Kaymaz, N. Cakar*
- B14-5 Ultrastructural effects of anti-tumoral agents in sciatic nerve  
*D. Erdogan, C. Özogul, K.C. Karayol, N. Yildiz, N. Demirez, M. Görgün, D. Yamac*

## B15 • ELECTRON CRYSTALLOGRAPHY OF PROTEIN CRYSTALS

[Tuesday, July 11, 09.30-12.00, Room E]

**Chair: A. Brisson, Groningen; P. Bullough, Sheffield**

### Oral presentations:

- 09.30-10.05 The structure of protein-membrane complexes revealed via the eye of electron microscopy and the touch of atomic force microscopy (*invited*)  
*A. Brisson, W. Bergsma-Schutter, N. Govorukhina, W. Keegstra, Ch. Mazeres, S. Mazeres, F. Oling, G. Oostergetel, I. Reviakine*
- 10.05-10.40 Structure of microsomal glutathione transferase by electron crystallography of 2D crystals (*invited*)  
*H. Hebert, I. Schmidt-Krey, K. Mitsuoka, T. Hirai, K. Murata, Y. Cheng, Y. Fujiyoshi, R. Morgenstern*
- 10.40-11.00 Characterisation of spider (*Araneus diadematus*) cocoon silk fibres  
*J.Y. Barghout, Ch. Viney, J.T. Czernuszka*
- 11.00-11.20 Understanding the influence of dynamic scattering in electron diffraction and imaging: simulations using bacteriorhodopsin  
*O. Vossen, H. Müller, P. Schorsch, R.R. Schröder*
- 11.20-11.40 Structure of bovine rhodopsin determined by electron cryomicroscopy  
*A. Krebs, P. Edwards, C. Villa, G.F.X. Schertler*
- 11.40-12.00 Electron crystallography of membrane-bound human blood coagulation factor VIII  
*S. Stoylova, P.J. Lenting, G. Kemball-Cook, A. Holzenburg*

**Posters:**

- [Wednesday, July 12, 13.30-14.50]
- B15-1 3-D model of Na,K-ATPase from frozen hydrated membrane crystals  
*H. Hebert, K. Thomsen, A.B. Maunsbach*
- B15-2 On the imaging of half-periods (43 Å) in crystalline catalase  
*W.H. Massover*
- B15-3 Electron cryomicroscopy of imidazole glycerol phosphate dehydratase to 10 Å resolution and phasing  
<sup>o</sup>  
*X-ray data*  
*R. Taylor, C. Levy, S. Sedelnikova, D. Holmes, D. Rice, P. Bullough*
- B15-4 Purification, characterisation and two dimensional crystallisation of the Bacillus subtilis multidrug resistance protein, Bmr

## B16 • SCANNING PROBE MICROSCOPIES IN BIOLOGY

[Wednesday, July 12, 16.00-18.30, Room H]

**Chair: A. Engel, Basel; H. E. Gaub, Munich**

**Oral presentations:**

- 16.00-16.50 Single molecule force spectroscopy by AFM-related techniques (*invited*)  
*H.E. Gaub*
- 16.50-17.40 Membrane protein structure and dynamics observed at high resolution by electron and atomic force crystallography (*invited*)  
*A. Engel, B.J. Heymann, D.J. Müller, H. Stahlberg*
- 17.40-18.00 Atomic-force microscopy of bacteriophages φkz and T4  
*N. B. Matsko, D.V. Klinov, A.A. Manykin, V.V. Demin*
- 18.00-18.20 Imaging of specific DNA/PNA complexes by atomic force microscopy  
*D.V. Klinov, D.I. Cherny*

**Posters:**

[Thursday, July 13, 13.30-14.50]

- B16-1 Elemental composition of statoliths of various cephalopod species  
*M. R. Lipiński, W.J. Przybylowicz, J. Mesjasz-Przybylowicz*
- B16-2 HOPG as a support for AFM of biological objects  
*D.V. Klinov, N. B. Matsko, V.V. Demin*
- B16-3 Scanning electron microscopic study of the lingual papillae and their connective tissue cores of the bactrian camel  
*K. Kobayashi, M. Kumakura, M. Takahashi*
- B16-4 An atomic force microscopy study of mtDNA conformation  
*A. Alessandrini, O. Cazzalini, L. Iamele, C. Scotti, L. Bianchi, U. Valdre, V. Vannini*
- B16-5 Atomic force and electron microscopy of high molecular weight circular DNA complexes with trivaline  
*L.P. Martinkina, D.V. Klinov, A.A. Kolesnikov, V.Y. Yurchenko, S.A. Streletsov, T.V. Neretina, V.V. Demin, Y.Y. Vengerov*
- B16-6 Gramicidin A aggregation in phospholipid Langmuir-Blodget monolayers: an atomic force microscopy study  
*M. Diociaiuti, F. Bordi, A. Motta, A. Carosi, E. Ercolini, G. Arancia, C. Cametti, C. Coluzza*

## B17 • STEREOLOGY AND QUANTITATIVE METHODS

[Monday, July 10, 16.00-18.30, Room D]

**Chair: L. Kubínová, Prague; H. J. G. Gundersen, Aarhus**

**Oral presentations:**

- 16.00-16.55 Sampling strategies for precise and 3D meaningful quantitation of structure at EM-level (*invited*)  
*H.J.G. Gundersen*
- 16.55-17.50 3-D analysis of microscopical structure by stereology and confocal microscopy (*invited*)  
*L. Kubínová*
- 17.50-18.05 Osteoclasts in osteopontin-deficient mice: a stereological study  
*K. Hultenby, F.P. Reinhold, D. Heinegard, A. Franzén*
- 18.05-18.20 3D-morphometry in SEM: theory and applications  
*B. Minnich, H. Leeb, E.W.N. Bernroder, W.-D. Krautgartner, A. Lametschwandtner*

**Posters:**

[Thursday, July 13, 13.30-14.50]

- B17-1 Ultrastructural and stereological studies of the control of the melanogenesis in the B16/F10 murine melanoma cells  
*C. Ferrer, M. Martínez-Esparza, F. Solano, M.T. Castells, A. Zuasti*
- B17-2 Quantitative analysis of glycoconjugates in the zona pellucida of activated oocytes of mouse and rat  
*M.J. Vielva, M. Avilés, J.A. Martínez-Menárguez, I. Abascal, M.T. Castells, J. Ballesta*
- B17-3 Ultrastructural distribution of oligosaccharide sequences in zona pellucida of preimplantation mouse embryos  
*M.T. Castells, J.A. Martínez-Menárguez, M. Avilés, M.J. Vielva, I. Abascal, J. Ballesta*
- B17-4 Morphological and morphometrical analyses for the identification of carriers for a genetic connective tissue disease  
*D. Quaglino Jr, B. Bacchelli, B. Gheduzzi, F. Taparelli, F. Boraldi, I. Pasquali Ronchetti*
- B17-5 N-acetyl-cysteine counteracts erythrocyte structural alterations occurring in chronic obstructive pulmonary disease: a morphometric analysis  
*E. Straface, P. Matarrese, L. Gambardella, S. Forte, E. Berton, S. Carbone, W. Malorni*

## B18 • NON-LINEAR / MULTIPHOTON FLUORESCENCE MICROSCOPY

[Thursday, July 13, 16.00-18.00, Room C]

**Chair: M. Robert-Nicoud, Grenoble; S. W. Hell, Göttingen**

**Oral presentations:**

- 16.00-16.50 Far-field diffraction resolution limit fundamentally broken by STED (*invited*)  
*S.W. Hell, T.A Klar, M. Dyba, S. Jakobs*
- 16.50-17.40 Multiphoton excitation fluorescence microscopy (*invited*)  
*W. Denk*

## B19 • BIOMATERIALS

[Tuesday, July 11, 16.00-18.30, Room A]

**Chair: H. K. Koerten, Leiden; W. Dietz, Erfurt**

**Oral presentations:**

- 16.00-16.30 Microscopic and X-ray microanalytical investigations in the study of biocompatibility of metallic dental materials (*invited*)  
*W. Dietz, B. Melle, I. Orlob, E. Lenz*
- 16.30-17.00 The role of electron microscopy in research on implants in a bony environment (*invited*)  
*H.K. Koerten, J. Van der Meulen, J.J.M. Onderwater, E.W.A. Koerten, R.H. Nelissen*
- 17.00-17.15 Electron microscopy observations of aerosol-gel hydroxyapatite coatings  
*M. Manso, M. Langlet, C. Jiménez, P. Herrero, J.M. Martínez-Duart*
- 17.15-17.30 Effect of corrosion on tissue in contact with orthopaedic implants  
*B.F. Shahgaldi, A. Warley, J. Compson*
- 17.30-17.45 Three endodontic enamel-dentin adhesive systems for carbon fibre posts: SEM and mechanical performance  
*S. Caiazza, G. Formisano, C. Altamura, M. Majori, P. Ioppolo, R. Bedini*
- 17.45-18.00 High resolution electron microscopy and nanodiffraction for phase identification of small calcium phosphates particles  
*E.I. Suvorova, P.A. Buffat*
- 18.00-18.15 Low voltage scanning electron microscopy (LVSEM) of a nonionic hydrogel: a study of different structural states  
*R. Reichelt, T. Matzelle, U. Keller, N. Kruse*
- 18.15-18.30 The structure of the articular part of the temporal bone in the monkey (Macaca mulatta)  
*R.F. Klinge*

**Posters:**

[Thursday, July 13, 13.30-14.50]

- B19-1 Sand-blasting process influence on carbon-post performance: ultrastructural and mechanical evaluation  
*R. Bedini, P. Ioppolo, G. Formisano, C. Altamura, E. Tundo, S. Caiazza*
- B19-2 A study of different effects of sterilization on surface properties and in vitro fibroblast response to titanium alloy nitrided under glow discharge conditions  
*E. Czarnowska, T. Wierzchon, A. Sowinska, E. Sikorska, E. Karczmarewicz*
- B19-3 Electron microscopy of cellulose and starch from potato cells: morphology and composite processing  
*A. Dufresne, D. Dupeyre, M. R. Vignon*

- B19-4 Scanning electron microscopic (SEM) investigations underline the heterogeneity of endothelial cells from human full term placenta and umbilical cord  
*I. Lang, G. Desoye, E. Schöninkle, M.A. Pabst*
- B19-5 Detection of allergens in surgical and examination latex gloves by immunogold field emission scanning and transmission electron microscopy  
*M. Grote, V. Mahler, S. Spitzauer, T. Fuchs, R. Valenta, R. Reichelt*
- B19-6 Spitting of major allergens from rye grass (*Lolium perenne*) pollen revealed by immunogold field emission scanning and transmission electron microscopy  
*M. Grote, S. Vrtala, V. Niederberger, R. Valenta, R. Reichelt*
- B19-7 Study of texture of pellets prepared with a centrifugal-granulator, with the use of different binder materials  
*P. Kása Jr., K. Pintye-Hódi, P. Szabó-Révész*
- B19-8 Alumina particles in bone-metal interface of failed hip implants  
*B.F. Shahgaldi, A. Warley, T. Brain*
- B19-9 Application of the environmental scanning electron microscope to the field of dental implants  
*J.M. Manero, C. Aparicio, M. Nilsson, F.J. Gil, J.A. Planell*
- B19-10 A study of bone resorption in vitro by means of environmental scanning electron microscopy (ESEM)  
*J.M. Manero, E. Engel, M. Marsal, J. Condemines, S. Serrano, J. Carbonell, J.A. Planell*
- B19-11 A study of an implant/bone interface: comparison between hydroxylapatite (HA) coated and uncoated Shanz screws implanted into sheep femora  
*M. Cimerman, M. Čeh, V. Smrkolj, M. Gec, W. Fleischmann*
- B19-12 TEM on hydroxyapatite and beta-tricalcium phosphate  
*M. Vallet-Regí, N. Rangavittal, A.R. Landa-Canovas, J.M. González-Calbet*

## Bpd • BIOLOGICAL SCIENCES - POST-DEADLINE POSTERS

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### **Posters:**

[Thursday, July 13, 13.30-14.50]

- Bpd-1 Pollen morphology of Asiatic and European species of Genus *Salsola*  
*K.N. Toderich, K. Idzikowska, A. Wozny, K. Takabe*
- Bpd-2 Non-specific events under toxic impact on plant cells in-vivo and in-vitro  
*E. Maximova, J. Kehr*
- Bpd-3 Effects of gadolinium ions on statocyte ultrastructure in pea roots  
*N.A. Belyavskaya*
- Bpd-4 Application polarizing microscopy in practical cardiology for an establishment of markers of disease by myocardial infarct  
*O. Komarova, V. Zaitsev, N. Zaitseva*
- Bpd-5 Electron microscopic investigation of different forms of bacterial growth on agar  
*O.V. Rybalchenko*
- Bpd-6 Ultrastructural investigation of myocardium in rats after noise stress  
*C. Özogul, D. Erdogan, G. Abban*
- Bpd-7 Structure of the luminal plasma membrane protein complex from urinary bladder  
*G.T. Oostergetel, A. Brisson*
- Bpd-8 The synthesis of uroplakins during embryonic development of mice urothelium  
*R. Romih, M. Pšeničník*
- Bpd-9 Estimation of numerical density and height of synapses in chicks following passive avoidance training by using physical disector counting method: an electron microscopical and stereological study  
*B. Unal, S. Kaplan, M.P. Bradley, S. Inaloz, H. Aslan*
- Bpd-10 Ultrastructural characteristics of Calcitriol-induced nephrocalcinosis in the chick embryo  
*G. Torabi Oskoi, J. Soleimani Rad*
- Bpd-11 Nuclear channel system (NCS) in normal endometrium and after hormonal stimulation  
*R. Novotný, J. Malinský, I. Oborná, J. Dostál*
- Bpd-12 Illuminating the natural composite design of mollusc shells  
*I.M. Ross, P. Wyeth*

# PHYSICAL SCIENCES

## P01 • METALS AND ALLOYS

[Monday, July 10, 16.00-18.30, Room B]

**Chair:** H. P. Kärnthal, Vienna; W. Neumann, Berlin

**Oral presentations:**

- 16.00-16.40 TEM analysis of atomic structures of metals and alloys (*invited*)  
*H.P. Kärnthal, B. Mingler, Ch. Rentenberger, T. Waitz*
- 16.40-17.20 Structural and analytical characterization of advanced metallic systems (*invited*)  
*W. Neumann, N. Wanderka, G. Schumacher, R. Schneider*
- 17.20-17.35 Microstructure of model Ni-based superalloys with Co  
*J. Buršík, M. Svoboda*
- 17.35-17.50 Precipitation at early stage during aging in Al-Mg-Si alloys  
*K. Matsuda, T. Kawabata, T. Sato, A. Kamio, S. Ikeno*
- 17.50-18.05 Structure studies of GP-zones in the Al-Zn-Mg alloy system  
*L.K. Berg, V. Hansen, M. Knutson-Wedel, L.R. Wallenberg, D. Schryvers, Y. Langsrud, J. Gjonnes*
- 18.05-18.20 ELNES in a substitutional alloy: the Cu-Ni system  
*S.Clair, C. Hébert-Souche, Ch. Eisenmenger-Sittner, H. Bangert, P. Schattschneider*

**Posters:**

[Monday, July 10, 13.30-14.50]

- P01-1 Alloying distribution as probe of rapidly solidification analysis in welded joints of Alloy 600  
*S. J. Buso, A. de Almeida Filho, W. A. Monteiro*
- P01-2 Alloy Elements Distribution on a PM Tool Steel  
*A. Bôrro Jr, W.A. Monteiro, J. Vatavuk, F. A. Almeida*
- P01-3 SEM Study of Pipes Annealing from 100Cr6 Steel  
*M. Gojic, L. Kosec, P. Matkovic*
- P01-4 TEM-STEM analysis of ultrafine precipitation and segregation in pearlitic structure of microalloyed steel  
*F. A. Khalid*
- P01-5 TEM study of the P phase in model Ni-based superalloys  
*J. Buršík*
- P01-6 Microstructural study of plasma sprayed coatings on Ni-Cr-Al alloys  
*M. Svoboda, J. Buršík*
- P01-7 A SEM study on direct relationship between exogeneous inclusions and surface defects in steels  
*E. Tekin*
- P01-8 HRTEM investigation of precipitates in a Cu-Ag alloy  
*B. Mingler, A. Berger, H. P. Kärnthal*
- P01-9 Measurements of a stacking fault energy of stainless steels  
*A. Wasilkowska, K. Rodak, M. Hetmańczyk, A. Czyrska-Filemonowicz*
- P01-10 Reversed martensitic transformation in a composite-like Fe-30%Ni alloy  
*F. Ciura, A. Wasilkowska, W. Osuch, A. Czyrska-Filemonowicz*
- P01-11 TEM investigations of  $\gamma'$  and  $\gamma''$  precipitates in IN706 alloy  
*B. Dubiel, H.J. Penkalla, J. Wosik, M. Lucki, A. Czyrska-Filemonowicz*
- P01-12 Electron Microscopy of an MA-treated ternary alloy,  $Mg_{0.33}Ni_{0.33}Ti_{0.33}$   
*Y. Kitano, K. Yamada, M. Miyamoto, S. Orimo, H. Fujii, K. Aono, E. Tanabe*
- P01-13 Electron Microscopy of an MA-treated ternary alloy,  $Mg_{0.5}Ni_{0.25}Pd_{0.25}$   
*Y. Kitano, M. Miyamoto, K. Yamada, S. Orimo, H. Fujii, M. Aoki, C. Kawasaki*
- P01-14 TEM studies of precipitates in a melt-spun Cu-Al-Ni-Mn-Ti shape memory alloy  
*D. Stróż, J. Lelatko, H. Morawiec*
- P01-15 Solute drag effect on the grain growth kinetics of the Ti-0.2Pd alloys  
*F.J. Gil, J.M. Manero, M. Marsal, M.P. Ginebra, J.A. Planell*
- P01-16 TEM studies of precipitates in creep deformed 9-10%Cr steels  
*A. Zielińska-Lipiec, H. de Sas Stupnicka, P.J. Ennis, A. Czyrska-Filemonowicz*

- P01-17 Relationship between microstructure and thermomechanical properties of Cu-Al-Ni shape memory alloys obtained by powder metallurgy  
*P. P. Rodríguez, R. B. Pérez-Sáez, V. Recarte, J. San Juan, M. L. Nóbrega*
- P01-18 Connection between surface layer structure on highly dispersed aluminium powders and whisker formation upon the particles  
*N. Zaporina, U. Korsaks*
- P01-19 Different types of carbide in austempered ductile cast iron  
*A. Honarbakhsh-Raouf, D.V. Edmonds*

## P02 • INTERMETALLICS

[Wednesday, July 12, 09.30-12.00, Room E]

**Chair: D. Caillard, Toulouse; R. Gotthardt, Lausanne**

**Oral presentations:**

- 09.30-10.10 Dislocation core geometry and mechanical strength in Ni<sub>3</sub>Al compounds (*invited*)  
*T. Kruml, P. Spätiig, J.L. Martin*
- 10.10-10.50 Interaction between a mechanical twin and a twin interface in a PST TiAl alloy (*invited*)  
*A. Couret*
- 10.50-11.05 The Orthorhombic Ti<sub>2</sub>Al Nb Phase  
*P. Sarosi, A. Partridge, I.P. Jones*
- 11.05-11.20 Lattice deformations at martensite-martensite interfaces in Ni-Al  
*P. Boullay, D. Schryvers*
- 11.20-11.35 The sequence of phase formation in Al-Pt thin films by continuously varying composition  
*A. Kovács, P.B. Barna, J.L. Lábár*
- 11.35-11.50 TEM identification of dislocations originated above and below the peak temperature in [001] oriented Ni<sub>3</sub>Al  
*Ch. Lang, Ch. Renstenberger, H. P. Karnthaler*

**Posters:**

[Monday, July 10, 13.30-14.50]

- P02-1 The study of microstructure of gamma titanium alluminides treated by melts flux method  
*Y. Skrinsky*
- P02-2 Anti-phase-boundary structures in a Fe-Al alloy  
*A. Korner*
- P02-3 Weak-beam observation of dislocation core in Ni<sub>3</sub>(Al, Hf)  
*T. Kruml*
- P02-4 A HREM study of Ni<sub>10</sub>Sn<sub>5</sub>P<sub>3</sub>  
*F.J. García-García, A.K. Larsson, S. Furuseth*
- P02-5 TEM contrast of APB-tubes in Ni<sub>3</sub>Al caused by a non-crystallographic displacement vector  
*C. Rentenberger, C. Lang, T. Waitz, H.P. Karnthaler*
- P02-6 Microstructure of MeV Ni-ion implanted aluminium  
*A. Hessler-Wyser, A. Cuenat, M. Döbeli, R. Gotthardt*
- P02-7 TEM investigation of dislocation reactions in a γ' Ni base alloy above the peak temperature  
*C. Bayreder, C. Rentenberger, H. P. Karnthaler*

## P03 • CERAMICS AND COMPOSITES

[Thursday, July 13, 09.30-12.00, Room A]

**Chair: W. Sigle, Stuttgart; M. Backhaus-Ricoult, Vitry s.S.**

**Oral presentations:**

- 09.30-10.10 Electron microscopy for studying interfacial chemistry in metal-oxide composites (*invited*)  
*M. Backhaus-Ricoult, D. Imhoff*
- 10.10-10.50 Characterization of ceramic materials by electron microscopy techniques (*invited*)  
*W. Sigle*

- 10.50-11.05 Quantitative composition analysis of every atomic column in ceramic devices using HAADF-STEM  
*M. Kawasaki, T. Yamazaki, K. Watanabe, M. Shiojiri*
- 11.05-11.20 Analysis of segregation behaviour of grain boundaries in alpha-Al<sub>2</sub>O<sub>3</sub> by analytical and high-resolution TEM  
*S. Nufer, T. Gemming, W. Kurtz, M. Rühle*
- 11.20-11.35 TEM and EELS investigations of new Ti-rich Ba-Ti-O phases  
*R. Schneider, A. Graff, S. Senz, N.D. Zakharov, D. Hesse, W. Neumann*
- 11.35-11.50 Natural and synthetic mesoporous materials  
*M.E. Espinosa, M. J. Yacamán*

**Posters:**

[Monday, July 10, 13.30-14.50]

- P03-1 Quantitative composition analysis of every atomic column in materials using HAADF-STEM  
*M. Shiojiri, M. Kawasaki, T. Yamazaki, K. Watanabe*
- P03-2 Quantitative composition analysis of every atomic column in As-implanted Si crystals using HAADF-STEM  
*T. Yamazaki, K. Watanabe, Y. Kikuchi, M. Kawasaki, I. Hashimoto, M. Shiojiri*
- P03-3 Deformation mechanism of fine-grained ZrO<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub> with additives  
*A. Kumao, Y. Okamoto, H. Endoh*
- P03-4 (Ti,Zr)<sub>x</sub> Si<sub>y</sub> silicides (S2) as a reaction and diffusion barrier in titanium matrix composites investigated by analytical TEM  
*H. J. Dudek, K. Weber, R. Borath*
- P03-5 Second and ternary silicon rich phases identified by TEM in MMC reinforced with alumina, after heat treatments  
*J. M. Gómez de Salazar, J. L. Baldonedo, M. I. Barrena*
- P03-6 Carbon fiber/carbon matrix (CFC) composites: microstructure and influence of hot isostatic pressure treatments  
*B. Reznik, D. Gerthsen*
- P03-7 High-temperature superconducting polymer-ceramic compositions and the morphological peculiarities  
*S.M.Hayrapetyan, A.O.Tonoyan, S.P.Davtyan, L.K.Hasratyan, V.R.Israyelyan, K.O. Hovnanyan*
- P03-8 Microstructural characterization of aluminium phosphate sealed Al<sub>2</sub>O<sub>3</sub> coating  
*M. Vippola, S. Ahmamiemi, J. Keränen, T. Lepistö, T. Mäntylä*
- P03-9 X-ray mapping of cement clinker using SEM and NMP  
*A. Emanuelson, M. Elfman, S. Hansen*
- P03-10 WDX microprobe quality analysis of solidified refinery waste used for the cement production  
*B. Petric, S. Danjanovic, P. Jovanic, R. Kovačević*
- P03-11 Modeling of the SiC wetting process using morphological analysis of the SEM images  
*D.G. Stankovic, P. B. Jovanic, S. Markovic*
- P03-12 Structure and hardening in Al<sub>2</sub>O<sub>3</sub>-Cr<sub>2</sub>O<sub>3</sub> system studied by TEM  
*J. Lelatko, M. Gigla, K. Niithara, H. Morawiec*
- P03-13 Boron nitride films deposited by RF magnetron sputtering  
*I. Yoshizawa, K. Watanabe, K. Kondo*
- P03-14 Flexibility in the Ba-Co-O System  
*J. M. González-Calbet, K. Boulahya, M. Parras*
- P03-15 EPMA study of PLZT ceramics  
*Z. Samardžija, R.B. Marinenko, S. Bernik, B. Malić, M. Čeh*
- P03-16 Aluminium matrix composites reinforced by ceramic preforms  
*C. Martínez-Cores, I. Gutiérrez-Urrutia, J. San Juan, M. L. Núñez*

## P04 • MAGNETIC MATERIALS

[Thursday, July 13, 09.30-12.00, Room H]

**Chair: J. N. Chapman, Glasgow; J. Zweck, Regensburg**

**Oral presentations:**

- 09.30-10.00 Magnetic thin films and nanostructures: structure- property correlations at relevant length scales (*invited*)  
*K.M. Krishnan*
- 10.00-10.15 TEM Study of novel Sm-Co based high temperature magnets  
*J. Fidler, T. Schrefl, T. Matthias*

- 10.15-10.30 Two-dimensionally dispersed oriented FePt nanoparticles  
*K. Sato, B. Bian, Y. Hirotsu*
- 10.30-11.00 Observation of magnetisation reversal processes (*invited*)  
*J. Zweck, M. Schneider, S. Henzelmann, T. Uhlig, M. Heumann, R. Sattler*
- 11.00-11.30 Imaging magnetic nanostructures (*invited*)  
*J. N. Chapman*
- 11.30-11.45 New methodical ways in the investigation of magnetic nanostructures by using off-axis electron holography  
*R. Huhle, R. Goldberg, H. Lichte*
- 11.45-12.00 Study of antiferromagnetic domains in LaFeO<sub>3</sub> thin films  
*J. W. Seo, J. Fompeyrine, H. Siegwart, A. Scholl, F. Nolting, J. Stöhr, J.-P. Locquet*

**Posters:**

[Monday, July 10, 13.30-14.50]

- P04-1 In-situ observation of re- and demagnetisation processes of a thin magnetic film between micron structured tunnel elements  
*S. Henzelmann, T. Uhlig, M. Heumann, J. Brückl, J. Zweck*
- P04-2 Lorentz transmission electron microscopy of micron and submicron permalloy elements  
*M. Schneider, H. Hoffmann, D. Weiss, J. Zweck*
- P04-3 New techniques for investigation of magnetic structures with applied magnetic in-plane fields in Lorentz TEM  
*M. Heumann, T. Uhlig, M. Schneider, H. Hoffmann, J. Zweck*
- P04-4 Effect of laser irradiation on microstructure of Ag-Co magnetoresistive granular films  
*E. Agostinelli, C. Caliendo, D. Fiorani, A.M. Testa, M. Vittori Antisari*
- P04-5 Cross sectional transmission electron microscopic investigation of thin films for perpendicular magnetic recording media  
*G. Radnócz, Zs. Czigány, P.B. Barna, M. Adamik, J. Ariake, N. Honda, K. Ouchi*

## P05 • PEROVSKITES

[Thursday, July 13, 16.00-18.30, Room B]

**Chair: H. W. Zandbergen, Delft; M. Hervieu, Caen**

**Oral presentations:**

- 16.00-16.40 Charge ordering and phase transitions in perovskite manganites: correlation with CMR properties (*invited*)  
*M. Hervieu, C. Martin, G. Van Tendeloo, B. Mercey, A. Maignan, Z. Jirak, B. Raveau*
- 16.40-17.20 The role of electron microscopy in the research on structure-properties relations of perovskites  
*H.W. Zandbergen*
- 17.20-17.35 New type of charge-order structure in Pr<sub>0.625</sub>Ca<sub>0.375</sub>MnO<sub>3</sub> examined by low-temperature electron diffraction and microscopy  
*T. Asaka, S. Tsutsumi, S. Yamada, T. Arima, Ch. Tsuruta, K. Kimoto, Y. Matsui*
- 17.35-17.50 Substitution, phase relations, and structure in La-Sr-Fe-O  
*A. Bardal, P.E. Vullum, R. Bredesen, M. Menon, T. Grande*
- 17.50-18.05 Oxidation mechanism and ferroelectricity in La<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub> thin films  
*J. W. Seo, J. Fompeyrine, H. Siegwart, J.-P. Locquet*
- 18.05-18.20 Structural changes in fluorinated T' and T\* phases  
*J. Hadermann, A.M. Abakumov, O.I. Lebedev, E.V. Antipov, G. Van Tendeloo*

**Posters:**

[Tuesday, July 11, 13.30-14.50]

- P05-1 HRTEM study of cation-deficient-related A<sub>n</sub>B<sub>n-δ</sub>O<sub>3n</sub> (n=4δ) microphases (A=La, Ba, Sr and B=Ti, Nb)  
*N. Teneze, G. Trolliard, D. Mercurio*
- P05-2 TEM investigation of intergrowths in the Aurivillius phases  
*P. Boullay, G. Trolliard, M. Manier, B. Soulestain, D. Mercurio*
- P05-3 Influence of oxygen content on the charge-ordering process in La<sub>0.5</sub>Ca<sub>0.5</sub>MnO<sub>3</sub>  
*W. Schuddinck, G. Van Tendeloo, C. Martin, M. Hervieu, B. Raveau*
- P05-4 Strained La<sub>1-x</sub>Sr<sub>x</sub>MnO<sub>3</sub> (x=0.1-0.3) thin films studied by HREM  
*O. I. Lebedev, G. Van Tendeloo, S. Amelinckx*
- P05-5 Light element analysis in oxycarbonate superconductor using TEM-EELS with gain correction  
*K. Kimoto, Y. Anan, T. Asaka, E. Muromachi, Y. Matsui*

- P05-6 Structure studies of  $\text{Sr}_3(\text{Sr}_{1+x}\text{Nb}_{2-x})\text{O}_{9-3/2x}$  by use of analytical TEM  
*A.E. Gunnaes, H. Fjellvag, R. Glöckner, M. Goringe, T. Norby, A. Olsen*
- P05-7 TEM investigation of manganite thin films on different substrates  
*K. Brand, M. Lehmann, T. Walter, K. Dörr*
- P05-8 TEM analysis of the reduction / reoxidation process in donor-doped  $\text{BaTiO}_3$   
*D. Makovec, M. Drofenik*
- P05-9 Study of the  $(\text{La}, \text{Sr})(\text{Fe}, \text{Al})\text{O}_3/\text{YSZ}$  interface by EDS analysis  
*D. Kuščer, S. Berník, J. Holc, M. Hrovat, D. Kolar*
- P05-10 Electron holography of ferroelectrics  
*H. Lichte, M. Reibold, D. Schulze*
- P05-11 New brownmillerite related phases in the La-Ba-Sr-Cu-Ga-O system  
*M.L. Ruiz-González, J. Ramírez-Castellanos, M. L. González-Calbet*
- P05-12 New structural frameworks and ordering phenomena in the Bi-Sr-M-O system (M=Co,Mn)  
*D. Pelloquin, A.C. Masset, M. Hervieu, C. Michel, B. Raveau*
- P05-13 Analytical electron microscopy (AEM) of isolated planar faults and ordered polytypic sequences in polycrystalline  $\text{CaTiO}_3$   
*M. Čeh, A. Rečník, M. Kawasaki*
- P05-14 EDS study of planar faults in  $\text{SrO}$  doped  $\text{SrTiO}_3$   
*S. Šturm, A. Rečník, Ch. Scheu, M. Čeh*

## P06 • C AND C-LIKE MATERIALS

[Monday, July 10, 16.00-18.30, Room E]

**Chair: A. Loiseau,**

C	h	ã	t	i	l	l	o	n	;	J. L. Hutchison, Oxford
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### Oral presentations:

- 16.00-16.35 Contribution of electron microscopy to carbon nanotube research  
*S. Iijima*
- 16.35-16.50 Quantitative electron diffraction study of single-wall carbon nanotubes  
*L. Hennard, A. Loiseau, C. Journet, P. Bernier*
- 16.50-17.05 Low dimensional crystallisation behaviour within single walled carbon nanotubes revealed by HRTEM  
*J. Sloan, J.L. Hutchison, M.L.H. Green, R.E. Dunin-Borkowski*
- 17.05-17.40 Multicomponent and multiphase nanotubes: BN, BN-C and filled tubes (*invited*)  
*F. Willaime, A. Loiseau, N. Demoncey, K. Suenaga, C. Colliex, H. Pascard*
- 17.40-17.55 Spatially resolved EELS study of surface plasmons in locally highly anisotropic nanotubes and nanospheres  
*M. Kociak, O. Stephan, L. Hennard, K. Suenaga, E. Sandre, C. Colliex*
- 17.55-18.10 Single- and multi-walled nanotubes in the B-C-N system explored by HRTEM and EELS  
*D. Golberg, Y. Bando, L. Bourgeois, K. Kurashima, T. Sato*
- 18.10-18.25 The cross-sectional structure of vanadium oxide nanotubes  
*F. Krumeich, H.-J. Muhr, M. Niederberger, F. Bieri, R. Nesper*

### Posters:

[Tuesday, July 11, 13.30-14.50]

- P06-1 Crystallic peculiarities of carbon fibers formed on Fe-catalyst  
*V. Blank, B. Kulnitskiy, D. Batov*
- P06-2 Electron energy-loss spectroscopy investigation of CN nanostructures  
*S. Trasobares, R. Raty, T. Sikora, G. Hug, C. Colliex*
- P06-3 TEM and STM characterization of  $\text{CN}_x$  thin films deposited from DC arc  
*G. Radnóczki, G. Sáfrán, I. Kovács, O. Geszti, L. P. Bíró*
- P06-4 TEM investigation of nano-structured carbon films  
*M. Reibold, C.-F. Meyer, B. Schultrich, H. Schultrich*
- P06-5 TEM simulation of nano-structured carbon films  
*H. Schultrich, B. Schultrich*
- P06-6 Structural investigations on carbon nanofibres produced by catalytic chemical vapour deposition

*A. Graff, J. Edelmann, M. Ritschel, A. Leonhardt, E. Pippel, J. Woltersdorf, J. Fink*

- P06-7 Chemically sensitive imaging of hard coatings by XANES-spectromicroscopy  
*Ch. Ziehen, O. Schmidt, M. Escher, M. Merkel, G. Schonhense*

- P06-8 TEM and AFM characterisation of carbon nanotubes ropes  
*A.-L. Hamon, A. Marraud, B. Jouffrey*

- P06-9 Si(001) substrate allows the coherent growth of a new carbon nitride phase  
*G. Barucca, G. Majni, P. Mengucci, G. Leggieri, A. Luches*

- P06-10 High yield incorporation of  $ZrCl_4$  into single wall carbon nanotubes imaged by HRTEM  
*G. Brown, S.R. Bailey, J. Sloan, K.S. Coleman, V.C. Williams, J.L. Hutchison, R.E. Dunin-Borkowski, M.L.H. Green*

- P06-11 HRTEM studies of alkali halides incorporated into single walled carbon nanotubes  
*S.R. Bailey, J. Sloan, M.C. Novotny, G. Brown, V.C. Williams, J.L. Hutchison, R.E. Dunin-Borkowski, M.L.H. Green*

- P06-12 Catalyst free synthesis of BN single-wall nanotubes by laser ablation  
*J. Gavillet, M. Lamy de la Chapelle, J.L. Cochon, D. Pigache, A. Loiseau, F. Willaime*

- P06-13 BN ropes and nanotubes: elaboration and mechanical behaviour  
*Th. Laude, B. Jouffrey, S. Gevrey, A. Marraud*

## P07 • EPITAXIAL STRUCTURES AND NANOSTRUCTURES

[Wednesday, July 12, 16.00-18.30, Room B]

**Chair: G. van Tendeloo, Antwerp; P. G. Merli, Bologna**

### Oral presentations:

- 16.00-16.40 Scanning electron microscopy of epitaxial structures (*invited*)  
*P.G. Merli, A. Migliori, V. Morandi*
- 16.40-17.20 HRTEM of epitaxial structures from high-Tc materials (*invited*)  
*K. Verbiest*
- 17.20-17.35 Structural characterisation of (GaIn)(NAs)/GaAs multi-quantum wells grown by MOVPE  
*K. Volz, A.K. Schaper, A. Hasse, T.E. Weirich, F. Höhnsdorf, J. Koch, W. Stolz*
- 17.35-17.50 Study of the effect of vertical size uniformity on diffraction contrast images of stacked In(x)Ga(1-x)As/GaAs quantum dots  
*A. Taurino, M. Catalano, M. De Giorgi, A. Passaseo, R. Cingolani*
- 17.50-18.05 Extracting structural parameters of quantum dots  
*X.Z. Liao, J. Zou, D.H.J. Cockayne, R. Leon, C. Lobo, Z.M. Jiang, X. Wang*
- 18.05-18.20 Influence of the growth duration on the In concentration in epitaxial InGaN layers  
*B. Neubauer, A. Rosenauer, D. Gerthsen, O. Schön, M. Heuker*

### Posters:

[Tuesday, July 11, 13.30-14.50]

- P07-1 HRTEM study of the structure of nanoparticles of beta-zeolite  
*E. Liubich, M. Talianker*
- P07-2 Effect of oxygen treatment of epitaxial (001)  $SrTiO_3$  thin films  
*L. Ryen, P.K. Petrov, Z.G. Ivanov, E. Olsson*
- P07-3  $CoSi_2$  growth on  $Si_{1-x}C_x(001)$  substrates  
*M. Falke, S. Teichert, H. Giesler, G. Beddies, H.-J. Hinneberg*
- P07-4 TEM on wurtzite AlN films on Si(001) substrates  
*J. Jinschek, U. Kaiser, V. Lebedev, W. Richter*
- P07-5 Investigation of rocksalt surfaces as substrate for epitaxial growth of thin films after treatment with water and chlorine gas  
*P. Ott, J.R. Günter*
- P07-6 Electron microscopy investigations of the growth of manganese silicide films on Si(001)  
*A. Mogilatenko, M. Falke, S. Teichert, D. Sarkar, H.-J. Hinneberg*
- P07-7 TEM investigations of self-organization phenomena in stacked InAs/GaAs quantum dots  
*H. Kirmse, R. Schneider, W. Neumann, E. Steimetz, W. Richter*
- P07-8 Nanostructure of epitaxial  $ReSi_{1.75}$  thin films on Si  
*D. Hofman, Ch. Kleint, J. Thomas, K. Wetzig*

- P07-9 Direct strain measurements in InP/GaInP quantum dots by HREM  
*N.Y. Jin-Phillipp, F. Phillip*
- P07-10 Defects and nanowire formation on TiTe<sub>2</sub> layered crystals  
*C. Dieker, R. Adelung, L. Kipp, M. Skibowski, W. Jäger*
- P07-11 HRTEM image processing analysis of nanocrystalline iron-titanium powders  
*A. M. Tonejc, I. Djerdj, A. Tonejc*
- P07-12 Application of TEM energy filtered measurements to the study of Ge redistribution in ion-implanted thin SiO<sub>2</sub> films  
*M. Klimenkov, J. v. Borany, W. Matz, S. Schulze*
- P07-13 HRTEM of epitaxial growth of Ni-rich Ni-Al thin films onto Ag  
*M. Yandouzi, D. Schryvers, L. Toth*
- P07-14 Micro-, atomic and surface structure of epitaxial silver thin films evaporated onto NaCl  
*M. Yandouzi, M. Cannaeerts, C. Van Haesendonck, L. Toth, D. Schryvers*
- P07-15 TEM Study of BaTiO<sub>3</sub> films used as wave guides  
*C. Lei, C.L. Jia, M. Siegert, K. Urban*
- P07-16 A transmission electron microscopy study of the depth distribution of excess Ga or As during recrystallisation of amorphous GaAs  
*D. J. Llewellyn, K. B. Belay, M. C. Ridgway*

## P08 • POLYMERS AND RADIATION SENSITIVE MATERIALS

[Tuesday, July 11, 16.00-18.30, Room E]

**Chair: W. Geymayer, Graz; F. Lednický, Prague**

### Oral presentations:

- 16.00-16.35 Polymer microscopy in the year 2000 and beyond (*invited*)  
*D.C. Martin*
- 16.35-17.10 New microscopic methods to study morphology and micromechanical processes in polymers (*invited*)  
*G.H. Michler*
- 17.10-17.25 Cryo-TEM of composite latex particles containing silica beads  
*J. L. Putaux, S. Chalaye, E. Bourgeat-Lami*
- 17.25-17.40 Electron holography of polymers  
*P. Simon, R. Huhle, H. Lichte*
- 17.40-17.55 Ultrathin sectioning of polymeric materials for low-voltage transmission electron microscopy  
*F. Lednický, J. Hromádková, Z. Pientka*
- 17.55-18.10 Evaluation of crystal structure and morphology of liquid crystal polymers by EM and ED  
*F. Rybníkář, P. Sáha*
- 18.10-18.25 Size and polydispersity from polymerparticles obtained by cryo-TEM, SANS and dynamic light scattering  
*S. Burauer, L. Belkoura, R. Strey, C. C. Co, E. W. Kaler*

### Posters:

[Tuesday, July 11, 13.30-14.50]

- P08-1 SEM investigation of syndiotactic polystyrene blended with olefinic polymers and copolymers  
*R. Braglia, S. Pirato, L. Abis, G. Giannotta, R. Po'*
- P08-2 Structural characterization of reconstituted TF55-alpha oligomers  
*P.J.B. Koeck, J. Sliauzyte, G. Tibbelin, H. Hebert, R. Ladenstein*
- P08-3 Modes of deformation in rubber toughened syndiotactic polystyrene  
*W. Heckmann, F. Ramsteiner, G.E. McKee, M. Geprägs*
- P08-4 XTEM study of Er implanted LiNbO<sub>3</sub> crystal  
*M. G. Blanchin, P. Moretti, V.S. Teodorescu, C. Ghica*
- P08-5 Cryo-TEM of chiral aggregates formed by achiral dye molecules  
*H. v. Berlepsch, S. Kirstein, C. Burger, A. Ouart, S. Dahne, C. Bottcher*
- P08-6 SiO<sub>2</sub>-supported metallocene catalysts for propene polymerization: electron microscopic studies and tomographical reconstructions of polymer growth  
*B. Steinmetz, B. Weimann, G. Fink, B. Tesche*

- P08-7 Catalytical and electron microscopic investigations of heterogeneous Ziegler-catalysts fixed on two-dimensional model-supports  
*S. Hahn, G. Fink, B. Tesche*
- P08-8 Free radical polymerisation of isodecyl acrylate in fluorinated vesicles  
*M. Schmutz, M.P. Krafft, L. Schildknecht, F. Giulieri, E. Nakache, N. Poulain*

## **P09 • CATALYSTS, CLUSTERS, SMALL PARTICLES**

[Wednesday, July 12, 09.30-12.00, Room A]  
**Chair: J. O. Bovin, Lund; L. R. Wallenberg, Lund**

### **Oral presentations:**

- 09.30-10.05 Designing meso- and nanostructures for catalysis (*invited*)  
*L. R. Wallenberg, B. Skarman, D. Klint, M. Lundberg*
- 10.05-10.20 Bimetallic particles elaborated by sequential impregnations of oxide powders  
*S. Giorgio, C. R. Henry*
- 10.20-10.35 Imaging of Ni particles in steam reforming catalysts  
*A. Carlsson, A.K. Datye, T.V.W. Janssens, J. Sehested, P.L. Hansen*
- 10.35-11.10 Nanoscale characterisation of TWC-model catalysts (*invited*)  
*J.J. Calvino, J.M. Gatica, C. López-Cartes, C. Mira, J.A. Pérez-Omil, J.M. Rodríguez-Izquierdo*
- 11.10-11.25 Characterisation of silicon nanocrystals and Er(3+) in silica  
*N. Sharma, C. Chryssou, A. J. Kenyon, C. W. Pitt, C.J. Humphreys*
- 11.25-11.40 CdSe nanoparticle layers buried in SiO<sub>x</sub> thin films  
*H. Hofmeister, D. Nesheva, Z. Levi, S. Hopfe, S. Matthias*
- 11.40-11.55 Cherry-like bimetallic PdPb supported particles  
*F.J. Cadete Santos Aires, R. Touroude*

### **Posters:**

[Wednesday, July 12, 13.30-14.50]

- P09-1 Gold particles supported on TiO<sub>2</sub> (anatase)  
*S. Giorgio, C. R. Henry, B. Pauwels, G. Van Tendeloo*
- P09-2 Imaging and analysis of protein-supported metallic nanoparticles by a modified transmission electron detector and EDX in a FE-SEM  
*W. Habicht, S. Behrens, N. Boukis, E. Dinjus*
- P09-3 Preparation, structure, and sintering of nickel nanoparticles  
*S. Stappert, Ch. Fell, H. Zähres, B. Rellinghaus, E.F. Wassermann, H. Sauer*
- P09-4 Nanoscale Ag particles in glass studied by HREM and EXAFS  
*M. Dubiel, C. Mohr, S. Brunsch, H. Hofmeister*
- P09-5 The effect of reoxidation treatments on metal-support interaction effects in Rh/cerium oxide catalysts  
*S. Bernal, J.J. Calvino, M.A. Cauqui, C. Colliex, C. López-Cartes, J.A. Pérez-Omil*
- P09-6 Microstructure of nanocrystalline phosphors  
*N.A. Allsop, G. Wakefield, J.L. Hutchison, P.J. Dobson*
- P09-7 Electrostatic spray pyrolysis of CdS, ZnO and In<sub>2</sub>O<sub>3</sub>  
*S.E Gledhill, J.L Hutchison, P.J Dobson*
- P09-8 Structural properties of Au clusters on MgO  
*B. Pauwels, G. Van Tendeloo, W. Bouwen, L. Theil Kuhn, P. Lievens*
- P09-9 TEM characterization of TiO<sub>2</sub> nanoparticles synthesized in a tube flow reactor  
*O. Richard, P.P. Ahonen, J. Joutsensaari, E. I. Kauppinen*
- P09-10 Characterization of CoMo catalysts containing zeolites  
*D. Berti, M. Ferrari, L. Zanibelli*
- P09-11 Preparation and investigation of nanoscaled gold catalysts supported on TiO<sub>2</sub>, SiO<sub>2</sub> and MCM41  
*M.-M. Pohl, U. Schütte*
- P09-12 Evidence for inter-grain diffusion of Pt(NH<sub>3</sub>)<sub>4</sub><sup>2+</sup> species during Pt/SiO<sub>2</sub> catalyst preparation by ionic exchange  
*M. Aouine, A. Goguet, F.J. Cadete Santos Aires, J.P. Candy*

- P09-13 Evidence for the formation of a thin surface SiO(x) layer on Si(3)N(4) during methane's partial oxidation reactions at high temperature  
*F. J. Cadete Santos Aires, F. Monnet, J.C. Bertolini*
- P09-14 Study of bimetallic Pd<sub>80</sub>Au<sub>20</sub> films obtained by cluster beam deposition as the early stages of H<sub>2</sub> separation membranes formation  
*F. J. Cadete Santos Aires, J.L. Rousset, P.D. Szkutnik, G. Bergeret, A. Renouprez*
- P09-15 SEM/EDS analysis of the surface reaction layer of BaTiO<sub>3</sub> ceramics exposed to a fluorine-containing atmosphere  
*N. Ule, D. Makovec, M. Drofenik*
- P09-16 TEM study of Ti doped ZSM-5 zeolite  
*M. Klimentov, S.A. Nepijko, X. Bao, W. Matz*
- P09-17 Electron beam induced structural variations of divanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) crystals  
*M. Wieske, D. Su, E. Beckmann, A. Blume, R. Schlögl*

## P10 • INTERFACES AND GRAIN BOUNDARIES

[Thursday, July 13, 16.00-18.30, Room E]

**Chair: W. Mader, Bonn; J. Thibault, Grenoble**

### **Oral presentations:**

- 16.00-16.40 Studying interfaces by high resolution transmission electron microscopy : possibilities and limits through some examples (*invited*)  
*J.-L. Rouvire, M. Arlery, M. Charleux*
- 16.40-17.20 Quantification of segregation to grain boundaries and diffusion at interfaces by energy-filtered transmission electron microscopy (*invited*)  
*T. Walther, J. Barf, W. Mader*
- 17.20-17.35 A combined approach of analytical and high-resolution TEM to determine the interface structure of Cu/(1120) alpha-Al<sub>2</sub>O<sub>3</sub>  
*Ch. Scheu, W. Stein, R. Schweinfest, T. Wagner, M. Rihle*
- 17.35-17.50 Characterization of the interface between lanthanum hexaaluminate and sapphire by exit wave reconstruction  
*A. Steinecker, B. Wessler, W. Mader*
- 17.50-18.05 Volume expansion of sigma3 coherent twin grain boundary in Mo  
*T. Vystavil, J. Gemperlová, A. Gemperle, J.M. Pénisson*
- 18.05-18.20 Investigations of substitutional impurity segregation to the sigma 5(310)/[001] STGB in FCC metals: a EFTEM and HRTEM study  
*J.M. Plitzko, G.H. Campbell, W.E. King, S.M. Foiles*

### **Posters:**

[Wednesday, July 12, 13.30-14.50]

- P10-1 Electronic structure investigations of metal/strontiumtitanate interfaces  
*K. van Benthem, Ch. Scheu, W. Sigle, M. Rihle*
- P10-2 Strain fields near the plate-like oxygen precipitate/Si-matrix interface  
*T. Okuyama, K. Matsunaga, M. Nakayama, Y. Tomokyo, K. Mori, O.V. der Biest*
- P10-3 Dynamical microstructure change with diffusion at metal/metal interface during electron irradiation  
*H. Takahashi, S. Ohta, T. Shibayama*
- P10-4 Grain boundaries in highly anisotropic silicon nitride: 'special' grain boundaries  
*M. E. Brito, K. Watari, K. Hirao, M. Toriyama*
- P10-5 TEM, photoetching and AFM study of Cu-diffused GaAs  
*C. Frigeri, J.L. Weyher, S. Müller, P. Hiesinger*
- P10-6 SEM investigation of electromigration damage in small copper interconnects - influence of microstructure and local orientation  
*H. Wendrock, S. Menzel, T. Koetter, K. Wetzig*
- P10-7 Solid-state reactions between BaTiO<sub>3</sub>(001) substrates and SiO<sub>2</sub> thin films studied by TEM  
*A. Graff, S. Senz, N.D. Zakharov, D. Hesse*
- P10-8 Structure and composition of inversion boundaries in Sn-doped ZnO  
*N. Daneu, T. Walther, A. Rečnik, S. Bernik, W. Mader*
- P10-9 Charge balance models for inversion boundaries in ZnO  
*A. Rečnik, M. Čeh, N. Daneu, T. Walther, W. Mader*

- P10-10 Comparing empirical crystal chemistry methods with ab-initio simulations of the  $\Sigma 5$  grain boundary in  $\text{SrTiO}_3$   
*J. A. Zaborac, N. D. Browning, M. Kim, G. Duscher, M. F. Chisholm, S. J. Pennycook*
- P10-11 SEM analysis in a study of the processes occurring on metal-mould contact surface  
*Z. Janjušević, K. Kovačević, Z. Aćimović, Lj. Pavlović*
- P10-12 Interpretation of HREM-images of projected 3D misfit dislocation networks using a combined molecular statics and multislice approach  
*A. Levay, G. Möbus, V. Vitek, M. Rühle, G. Tichy*
- P10-13 HREM of an heterophase interface: artifacts in the distance profile measurement  
*M. Lamy, J. Thibault*

## P11 • AMORPHOUS MATERIALS AND QUASICRYSTALS

[Tuesday, July 11, 09.30-12.00, Room H]

**Chair:** **M. Vittori-Antisari**, Roma; **C. Beeli**, Zurich

**Oral presentations:**

- 09.30-10.20 Refinement of amorphous structures using modelling, microscopy and diffraction (*invited*)  
*D. Cockayne, D. McKenzie, W. McBride, D. McCulloch*
- 10.20-11.10 HRTEM investigation of stable quasicrystals (*invited*)  
*C. Beeli*
- 11.10-11.35 Determination of the medium range structure of amorphous foils from inelastically filtered images using inelastic transfer functions  
*R. Knippelmeyer, H. Kohl*
- 11.35-12.00 ESI on amorphous materials in the systems Si-B-N-C and Si-B-O  
*W. Assenmacher, W. Mader, M. Kroschel, B. Friede, M. Jansen*

**Posters:**

[Wednesday, July 12, 13.30-14.50]

- P11-1 HREM of crystals with unusual internal lattice bending formed in amorphous films  
*V.Y. Kolosov, A.R. Thököly*
- P11-2 Imaging and analysis of erbium B-phase glass-ceramics  
*Y. Menke, L.K.L. Falk, S. Hampshire*
- P11-3 Structural and spectroscopic characterisation of amorphous silicon suboxides  
*K. Schulmeister, T. Walther, W. Mader*
- P11-4 Quasicrystal formation in (001) Cu/Al/Fe thin layers  
*G. Sáfrán, J.L. Lábár, P.B. Barna, T. Grenet*
- P11-5 RDF of amorphous materials from diffraction patterns measured in the energy filtering transmission electron microscope  
*S. Schulze, O. Stenzel, S. Deutschmann, M. Hietzhold*
- P11-6 Determination of the medium range structure of amorphous foils from inelastically filtered images using inelastic transfer functions  
*R. Knippelmeyer, H. Kohl*
- P11-7 ESI on amorphous materials in the systems Si-B-N-C and Si-B-O  
*W. Assenmacher, W. Mader, M. Kroschel, B. Friede, M. Jansen*

## P12 • ELECTRON CRYSTALLOGRAPHY AND CBED

[Tuesday, July 11, 16.00-18.30, Room F]

**Chair:** **I. G. Voigt-Martin**, Mainz; **J. R. Fryer**, Glasgow

**Oral presentations:**

- 16.00-16.40 The use of modern electron crystallography to probe the molecular parameters of two dimensional SHG chromophores (*invited*)  
*I.G. Voigt-Martin, H. Kothe, A. Yakimanski*
- 16.40-17.20 Direct methods for phase determination in protein electron crystallography (*invited*)  
*D.L. Dorset*

- 17.20-17.35 Structure determination of an organo-metallic salt  
J.R. Fryer, G. Boyce, C.J. Gilmore
- 17.35-17.50 Obtaining the correct polarity of GaN using CBED  
N. Sharma, D. Trickler, C. Humphreys
- 17.50-18.05 Reduction of electron diffraction data for structure refinement  
U. Wilke, W. Mader
- 18.05-18.20 Measurement of oxygen concentration and charges of  $\text{YBa}_2\text{Cu}_3\text{O}_y$  by means of energy filtering convergent-beam electron diffraction  
Z. Akase, Y. Tomokiyo, M. Watanabe

**Posters:**

[Wednesday, July 12, 13.30-14.50]

- P12-1 Unequivocal determination of lattice parameters from CBED  
H. Heinrich, A. Vananti, G. Kostorz
- P12-2 Micro-characterisation and orientation-relationship of two carbide-phases of S 6-5-2-5- high speed steel  
I. Papst, P. Warbichler, F. Hofer, W. Prantl
- P12-3 Electronmicroscopic characterization of microcrystalline silicon thin films deposited by ECR-CVD  
I. Sieber, N. Wanderka, I. Kaiser, W. Fuhs
- P12-4 The origin of anomalous spots in the electron diffraction patterns of diamond films  
L. Nistor, V. Teodorescu, J. Van Landuyt, V. Ralchenko
- P12-5 Accelerated growth of C-54 TiSi<sub>2</sub> via template mechanism in the poly-Si(Mo)/Ti system  
M. Gribelyuk, J.A. Kittl, S.B. Samavedam
- P12-6 LACBED and HRTEM methods for structure and defects determination in (Al, Cu)<sub>3</sub>Ti ordered intermetallic  
E. Jezierska
- P12-7 Structural investigations of CuIn<sub>3</sub>Se<sub>5</sub> by TEM  
A.T. Tham, D.S. Su, W. Neumann
- P12-8 Composite incommensurate phases in Pb-Cr-S(I) system  
A. Gómez-Herrero, A.R. Landa-Cánovas, L. C. Otero-Díaz
- P12-9 The alpha-AlFeMnSi structure studied by crystallographic image processing  
M. Gigla, H. Morawiec
- P12-10 Characteriazation of the Burgers vector of dislocations from bend contours  
J. P. Morniroli, P. Cordier
- P12-11 Structure analysis on small organic molecules using electron crystallography  
U. Kolb, I.G. Voigt-Martin

## P13 • IN-SITU ELECTRON MICROSCOPY

[Tuesday, July 11, 09.30-12.00, Room B]

**Chair: U. Messerschmidt, Halle; A. Aseev, Novosibirsk**

**Oral presentations:**

- 09.30-10.10 In situ REM study of the behavior of monoatomic steps on a Si surface (*invited*)  
A.V.Latyshev, D.A.Nasimov, V.N.Savenko, A.L.Aseev
- 10.10-10.50 In situ experiments in the electron microscope to study plastic deformation and fracture (*invited*)  
U. Messerschmidt, M. Bartsch
- 10.50-11.05 Inhomogeneous recrystallization in directionally solidified, cold rolled pure aluminium, studied by in-situ EBSD analysis in the SEM  
D.F. Arno, E. Bostadlokken, J.R. Leinum, J. Hjelen
- 11.05-11.20 In-situ TEM study of thermal-stress induced dislocations in a Cu thin film on a SiN<sub>x</sub> coated Si-substrate  
G. Dehm, E. Arzt
- 11.20-11.35 An environmental high resolution transmission electron microscopy study of the in-situ oxidation of Nb<sub>12</sub>O<sub>29</sub> to Nb<sub>10</sub>O<sub>25</sub>  
M.J. Sayagués, J.L. Hutchison
- 11.35-11.50 Determination of Ce oxidation state during CeO<sub>2</sub> reduction by in situ electron energy-loss spectroscopy  
R. Sharma, P. Crozier

**Posters:**

[Thursday, July 13, 13.30-14.50]

- P13-1 In-situ transmission electron microscopy heating of an intermetallic alloy Fe-28Al-4Cr-0.1Ce  
*M. Karlík*
- P13-2 In-situ study of failure processes of plasma spraying Mo coatings  
*J. Siegl, J. Adámek, O. Kovářík, M. Karlík*
- P13-3 In-situ ion milling in the transmission electron microscope (TEM) using a low-voltage focused ion beam (LVFIB)  
*C. Burkhardt, P. Gnauck, E. Plies, W. Nisch*
- P13-4 In situ electrical resistivity measurements of Al-Ge films in the TEM using a modified heating holder  
*M.A. Verheijen, J.J.T.M. Donkers, J.F.P. Thomassen, J.J. van den Broek, R.A.F. van der Rijt, M.J.J. Dona, C.M. Smit*
- P13-5 In-situ reduction of a methanol catalyst in a new FEG TEM  
*P.L. Hansen, J.B. Wagner*
- P13-6 In-situ observation of dislocation motion in Al nanowires  
*B.J. Inkson, G. Dehm, T. Wagner*
- P13-7 In situ SEM investigation of stress induced migration in SAW structures  
*S. Menzel, H. Schmidt, K. Wetzig, M. Weihnacht*
- P13-8 Dynamic studies of creaming and coalescence  
*R. G. Mathews, A. M. Donald*
- P13-9 Defect structure produced by plastic deformation of Al-Pd-Mn single quasicrystals  
*Ch. Dietzsch, M. Bartsch, D. Häussler, U. Messerschmidt, M. Feuerbacher, K. Urban*
- P13-10 Real time digital imaging by new CCD camera for in-situ TEM studies  
*R. Alani, M. Pan*
- P13-11 An unusual deformation mode observed during in situ TEM straining  
*A. Gemperle, N. Zárubová, A. Jacques, J. Gemperlová, M. Janeček, M. Veron*

## **P14 • SPECIMEN PREPARATION IN MATERIAL SCIENCES**

[Friday, July 14, 09.30-12.00, Room H]

**Chair: A. Czyszka-Filemonowicz, Kraków; P. Barna, Budapest**

**Oral presentations:**

- 09.30-10.10 Recent trends and physical background in the development and application of ion beam techniques for TEM sample preparation (*invited*)  
*A. Barna*
- 10.10-10.30 Reduction of the side-wall damage and gallium concentration of focused ion beam prepared TEM cross sections  
*R.M. Langford, A.K. Petford-Long, R. Doole*
- 10.30-10.50 Principle and application of a new high energy focused ion gun  
*K. Volz, A. Hasse, A.K. Schaper, A. Barna*
- 10.50-11.10 Preparation of TEM foils for analysis of complex inclusions in steels  
*J. Walmsley, C. van der Eijk*
- 11.10-11.30 Perpendicular cutting for cross sectional SEM specimen preparation of layered materials by broad ion beam  
*R. Alani, W. Hauffe, R.J. Mitro*

**Posters:**

[Thursday, July 13, 13.30-14.50]

- P14-1 Improvement of quantitative X-ray spectroscopy for FIB-TEM samples  
*Y. Yasufumi, T. Okano, S. Tametou, M. Arai, T. Kouzaki*
- P14-2 Novel approaches to the preparation of TEM samples  
*Q. Li, S.B. Newcomb*
- P14-3 Characterization of a stratified particle using a FIB/TEM system  
*T. Yaguchi, T. Kamino, H. Kobayashi, H. Koike, K. Tohji, K. Nakatsuka, R. Urao*
- P14-4 Ion beam grid cutting (IBGC) for 3D scanning electron microscopy of heterogeneous solids  
*W. Hauffe*
- P14-5 The use of FIB in the TEM characterisation of YSZ buffer layers  
*S.B. Newcomb, W.A.J. Quinton*

- P14-6 The TEM examination of stress corrosion cracks in Al alloys  
*G. Deshais, S.B. Newcomb*
- P14-7 Specimen preparation for electron backscatter diffraction (EBSD) analysis of aluminium silicon cast alloys, electro polishing versus fast atom bombardment (FAB)  
*S. Gulbrandsen-Dahl, G. Heiberg, J. Hjelen, K. Nogita, M. Raanes, A.K. Dahle, L. Arnberg*
- P14-8 The microstructure of  $\text{Si}_3\text{N}_4$  prepared by ion etching  
*M. Gec, K. Krnel, M. Čeh*
- P14-9 Cross sectional preparation of microelectronic structures with the ion milling system RES 100  
*W. Grinewald, M. Hietschold*

## P15 • GENERAL MATERIALS MICROSCOPY

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[Wednesday, July 12, 16.00-18.30, Room A]

**Chair: J. Van Landuyt**, Antwerp; **K. M. Knowles**, Cambridge

**Oral presentations:**

- 16.00-16.40 Analysis of nanostructures by EM techniques: Quantum dots (*invited*)  
*K. Scheerschmidt, P. Werner*
- 16.40-17.20 Electron microscopy and microanalysis of electronic ceramics (*invited*)  
*K.M. Knowles*
- 17.20-17.35 A TEM study of non-parallel twins inducing thickness growth in silver chloride (111) tabular crystals  
*W. Van Renterghem, D. Schryvers, J. Van Landuyt, D. Bollen, C. Van Roost, R. De Keyzer*
- 17.35-17.50 Defects in semiconductor materials studied with cathodoluminescence microscopy  
*H. Isshiki, T. Isshiki, M. Shiojiri*
- 17.50-18.05 Structure and identification of some metastable phases in Mg-rare earth alloys  
*B. Smola, I. Štulíková*
- 18.05-18.20 Morphology and interfaces of macropores in n- and p-Si(001)/(111)  
*C. Jäger, C. Dieker, W. Jäger*

**Posters:**

[Thursday, July 13, 13.30-14.50]

- P15-1 Investigations of microscopic fractures of Syrian cotton about different maturity degree  
*A. Włochowicz, E. Sarna*
- P15-2 Microstructural characterization of superficial zones on brake pads  
*I.Urban, I.Dörfel, W.Österle, W.Gesatzke, P.Schubert-Bischoff, S.Trepte*
- P15-3 Electron microscopy study of Sn/SnSb composite electrodes for lithium-ion batteries  
*I. Rom, I. Papst, M. Schmied, F. Hofer, M. Wachtler, J. O. Besenhard, M.Winter*
- P15-4 Cathodoluminescence microscopy of defects induced in SiC wafer  
*T. Isshiki, H. Isshiki, S. Nishino, M. Shiojiri*
- P15-5 Enhanced SEM doping contrast on an H-passivated silicon surface  
*S. L. Elliott, R. F. Broom, C. J. Humphreys*
- P15-6 Alumina membranes formed by anodical oxidation of aluminum  
*Z. Vértesy, L.P. Biró, E. Veress, G. Mihailescu, S. Pruneanu*
- P15-7 Imaging of 2-D doping profiles using electron microscopy  
*S.A.M. Mentink, M.H.F. Overwijk, M. Kaiser, M.A. Verheijen, C. Dachs, P.A. Stolk, S.L. Elliott, C.J. Humphreys*
- P15-8 Possibilities for quantitative dopant profiling using TEM/AFM and selective chemical etching  
*M.A. Verheijen, M. Kaiser, J.G.M. van Berkum, C.J.J. Dachs, P.A. Stolk*
- P15-9 Morphology and composition of airborne particulate (PM2.5) by transmission electron microscopy  
*D. Berti*
- P15-10 Behavior of H+ implantation induced defects during heating  
*H. Iwata, M. Takagi, Y. Tokuda, T. Imura*
- P15-11 TEM analysis of nanocrystalline reaction layers in Ag-Cu-Ti brazed silicon carbide  
*D.R. Ormston, K.M. Knowles, S.B. Newcomb, J.A. Fernie*
- P15-12 Ordering in  $\text{Hf}_{1-y}\text{V}_y\text{O}_z$  ( $y=0.1, 0.2, 0.3, 0.5$ ): a HREM and EELS study  
*Ch. Leroux, Ch. Turquat, G. Nihoul, V. Serin, A. Glotter*

- P15-13 Silicides phase transformation in beta Ti-25V-15Cr-3Al-0.6Si (wt%)  
*G. Kong, Y.G. Li, P. Blenkinsop, M.H. Loretto*
- P15-14 Quantification of real air samples of asbestos fibres by optical microscopy and transmission electron microscopy  
*J.M. Manero, A. Freixa, E. Valles, J.A. Planell*
- P15-15 EPMA analysis of lead zirconium titanate (PZT) films  
*S. Bernik, R.B. Marinenko, Z. Samardžija, B. Malič, M. Čeh*
- P15-16 The TEM characterisation of a via sidewall etch residue  
*N. Pirila, M. Weyland, S.B. Newcomb*
- P15-17 STM/AFM study of Ge quantum dots grown on Si(111)  
*F. Rosei, M. Fanfoni, A. Sgarlata, N. Motta*
- P15-18 On the imaging of semiconductor doping using low energy electron microscopy  
*M. El-Gomati, T.C.R. Wells, L. Frank, I. Müllerová*

## **P16 • EM IN GEOLOGY, ARCHAEOLOGY, ARTS, AND IN FORENSIC APPLICATIONS**

[Friday, July 14, 09.30-12.00, Room D]

**Chair: S. Hansen**, Lund; **L. Robbiola**, Paris; **M. San Andrés**, Madrid

### **Oral presentations:**

- 09.30-10.05 General applications of electron microscopy in art and archaeology (*invited*)  
*A. Bouquillon, A. Duval*
- 10.05-10.40 Applications of scanning electron microscopy and microanalysis (SEM-EDX) to the study and characterisation of metallic implements of Roman age (*invited*)  
*J. M. Gómez de Salazar, A. Soria, J. Quinones*
- 10.40-11.15 Microstructures as recorders of growth and transformation processes in minerals (*invited*)  
*A. Putnis, U. Golla, K. Pollok*
- 11.15-11.35 The curvature of serpentine minerals : influence of chemical composition, HRTEM observations, and elastic theory  
*R. Perbost, M. Amouric, J. Olives*
- 11.35-11.55 SEM studies of carbonaceous material in metamorphic rocks of the Bündnerschiefer (eastern Switzerland)  
*T. Petrova, J. Rumbholz, R. Guggenheim, W.B. Stern, M. Frey*

### **Posters:**

[Thursday, July 13, 13.30-14.50]

- P16-1 Quantitative investigation of hematite-ilmenite solid solution with EFTEM using oxidation states and elemental distributions  
*U. Golla, A. Putnis*
- P16-2 Mixed layering of illite-smectite minerals : HRTEM-AEM results and lattice-energy calculations  
*M. Amouric, R. Perbost, J. Olives*
- P16-3 The colorings of the St. Peter's facade: A microscopy characterization  
*E. P. Massara, D. Berti*
- P16-4 Preliminary data on the lead-tin yellow used by R. van der Weyden in Descent from the Cross. TEM characterization  
*M. San Andrés, M. I. Báez, M. C. Garrido, J. L. Baldonado, A. Rodriguez*
- P16-5 Authentication of metal artefacts : the importance of SEM and EDX into the examination of archaeological bronzes (Cu-Sn alloys)  
*L. Robbiola, R. Portier*
- P16-6 A TEM and XRD study of the decomposition products of laumontite Ca<sub>4</sub>Al<sub>8</sub>Si<sub>16</sub>O<sub>48</sub>.nH<sub>2</sub>O zeolite up to 1423 K  
*A. Gomez-Herrero, R.M. Rojas, M.L. Fernandez-Diaz, L.C. Otero-Diaz*
- P16-7 A system for mineral classification from SEM EDS image analysis  
*H. Flesche, J.M. Rykkje, A.A. Nielsen, R. Larsen*
- P16-8 Colour zoning and inclusions in sapphires from southern Vietnam  
*M. Jeršek, A. Rečnik, N. Daneu, S. Šturm, B. Mirtič*
- P16-9 Electron diffraction three-dimensional mineral structure ordering  
*V. Samodurov*

**Ppd • PHYSICAL SCIENCES - POST-DEADLINE POSTERS****Posters:**

[Wednesday, July 12, 13.30-14.50]

- Ppd-1 Electron microscopic visualization of metal clusters intercalation into native cellulose matrix  
*N.E. Kotelnikova, G. Wegener, E. Windeisen*
- Ppd-2 The application of high spatial resolution ELNES and EDS to elucidate the grain boundary structure of TZP engineering ceramics  
*I.M. Ross, W.M. Rainforth*
- Ppd-3 High resolution electron microscopy and X-ray diffraction studies of the homologous intergrowth series n.Ba(Nb,Zr)O<sub>3</sub>.3m.NbO where n=2-5 and m=1  
*G. Nilsson, G. Svensson*
- Ppd-4 HREM investigation of Eu<sub>1-x</sub>Ga<sub>2+3x</sub>  
*R. Ramlau, O. Sichevich, M. Schmidt, Y. Grin*
- Ppd-5 Microstructural investigation of bio carbon composites by electron microscopy  
*T. Hata, K. Nishimiya, P. Bronveld, J.T.M. De Hosson, E. Kobayashi, H. Kikuchi, Y. Imamura*
- Ppd-6 Fractal approach to description of the surface structure of polyimide films decorated with gold  
*T.E. Sukhanova, D.V. Novikov, M.E. Vylegzhanova*
- Ppd-7 Segregation in nickel tubing alloys  
*P. Williams, G.J. Tatlock*
- Ppd-8 Strain-induced modulation versus superlattice ordering in epitaxial (GaIn)P layers  
*J. Jiang, A.K. Schaper, Z. Spika, W. Stolz*
- Ppd-9 A new crystallographic orientation relationship between M<sub>23</sub>C<sub>6</sub> and austenite (g)  
*P. Liu*
- Ppd-10 Conditions favoring dislocation glide in (100) planes in copper  
*A. Orlová*
- Ppd-11 Nonstoichiometry in inorganic fluorite type materials M<sub>1-x</sub>R<sub>x</sub>F<sub>2+x</sub> where M=Ba and R=rare earth  
*L. Pascual, R. Munoz, R. Ropero, R.M. Rojas, B.P. Sobolev, P. Herrero*

# INTEGRATED PARTICLE ANALYZER

For **S-3000N/S-3000H SEMs**



HITACHI S-3000 N/H

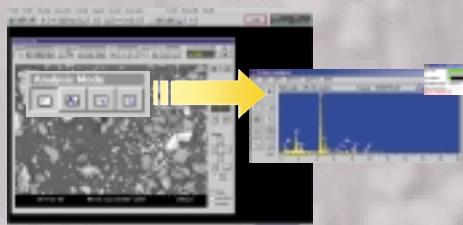
Hitachi and Oxford Instruments' new particle analysis system has been developed to meet the special requirements of integrated SEM and EDX. Operation of the completely integrated system is quick and easy for both microscopy and microanalysis applications. The dedicated high performance particle analysis software can handle up to 500 particles per hour and covers all tasks in the fields such as environmental, coal analysis, contamination and filter control.

#### Particle Analysis Software



- automatic searching and chemical classification of particles
- automatic relocation of particles for further analysis
- analysis of up to 500 particles per hour

#### Integrated EDX Analysis Software



- start EDX aquisition from SEM

#### Automatically Generated Reports



- Class summary report
- Full particle list
- Single particle report

# INSTRUMENTATION AND METHODOLOGY

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## I01 • WAVE AND PARTICLE PROPERTIES OF THE ELECTRON

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[Wednesday, July 12, 09.30-12.00, Room F]

**Chair:** M. Lenc, Brno; H. Lichte, Dresden

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### Oral presentations:

- 09.30-10.05 New experiments in charged particle interferometry and quantum statistics (*invited*)  
*F. Hasselbach*
- 10.05-10.40 Off-axis electron holography - the way to use (*invited*)  
*H. Lichte, M. Lehmann*
- 10.40-10.55 Electrons as waves - and what will come next?  
*T. Tyc, M. Lenc*
- 10.55-11.10 An electron antibunching experiment  
*H. Kiesel*
- 11.10-11.25 Time-resolved observation in transmission electron microscopy using electron correlation measurement  
*N. Osakabe*
- 11.25-11.40 Partial coherence and HREM image simulation  
*H. Müller, P. Schorsch, H. Rose*
- 11.40-11.55 Assessment of the experimental constraints for phase contrast EM and complex object reconstruction  
*E. Majorovits, K. Nagayama, R.R. Schröder*

### Posters:

[Monday, July 10, 13.30-14.50]

- I01-1 Correction of the Fresnel diffraction caused by the biprism filament in phase-shifting electron holography  
*K. Yamamoto, T. Tanji, T. Hirayama, M. Hibino*
- I01-2 Complex electron microscopy  
*K. Nagayama, R. Danev, H. Okawara, K. Murata*
- I01-3 Off-axis electron holography of focused ion beam milled transistors  
*R.E. Dunin-Borkowski, S.B. Newcomb, D. Doyle, A. Deignan, M.R. McCartney*
- I01-4 Miniaturized biprism interferometer for wide separation of the coherent beams  
*H. Prochel, F. Hasselbach*
- I01-5 Holographic studies of thin manganite films  
*M. Lehmann, T. Walter, K. Dörr*
- I01-6 Inelastic electron holography  
*H. Lichte, B. Freitag*
- I01-7 Comparison of accuracy of electron holography and EELS on thickness measurement of amorphous SiO(2)  
*C.-W. Lee, Y. Ikematsu, D. Shindo*
- I01-8 Two-dimensional mapping of electrostatic potential in a SiC MESFET using electron holography  
*A.C. Twitchett, S.J. Lloyd, M. Lehmann, P.A. Midgley*

## I02 • ADVANCES IN ELECTRON OPTICS

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[Wednesday, July 12, 16.00-18.30, Room F]

**Chair:** B. Lencová, Brno; E. Munro, London

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### Oral presentations:

- 16.00-16.40 Recent trends in electron optics (*invited*)  
*E. Munro*
- 16.40-17.20 SMART electron optics (*invited*)  
*D. Preikszas, P. Hartel, R. Spehr, H. Rose*
- 17.20-17.35 Design and manufacturing of magnetic electron optical systems with midsection symmetry  
*R. Spehr, P. Hartel, H. Müller, D. Preikszas, H. Rose*

- 17.35-17.50 Computations of Wien filter properties and aberrations  
*B. Lencová, I. Vlček*
- 17.50-18.05 High resolution imaging near zero Cs  
*L. Y. Chang, F. R. Chen, J. J. Kai, A. I. Kirkland*
- 18.05-18.20 Electron holography in the diffraction plane  
*F. Zhou, E. Pries*

**Posters:** [Monday, July 10, 13.30-14.50]

- I02-1 An active vibration damping system  
*R. Beierlein, F. Hasselbach*
- I02-2 Quadrupole projector system with variable magnification for energy filtering transmission electron microscopes  
*V. Gerheim, H. Rose*
- I02-3 Outline of a variable-axis lens with arbitrary shift of the axis in one direction  
*P. Schmid, R. Janzen, H. Rose*
- I02-4 Electron ray-tracing for numerical determination of aberrations  
*M. Mynář, R. Vašina, R. Kolařík, B. Lencová*
- I02-5 New CAD program for the design in electron optics  
*B. Lencová, J. Zlámal*
- I02-6 Perturbation methods in charged particle optics  
*T. Radlička*

## I03 • QUANTITATIVE ELECTRON MICROSCOPY

[Thursday, July 13, 09.30-12.00, Room B]

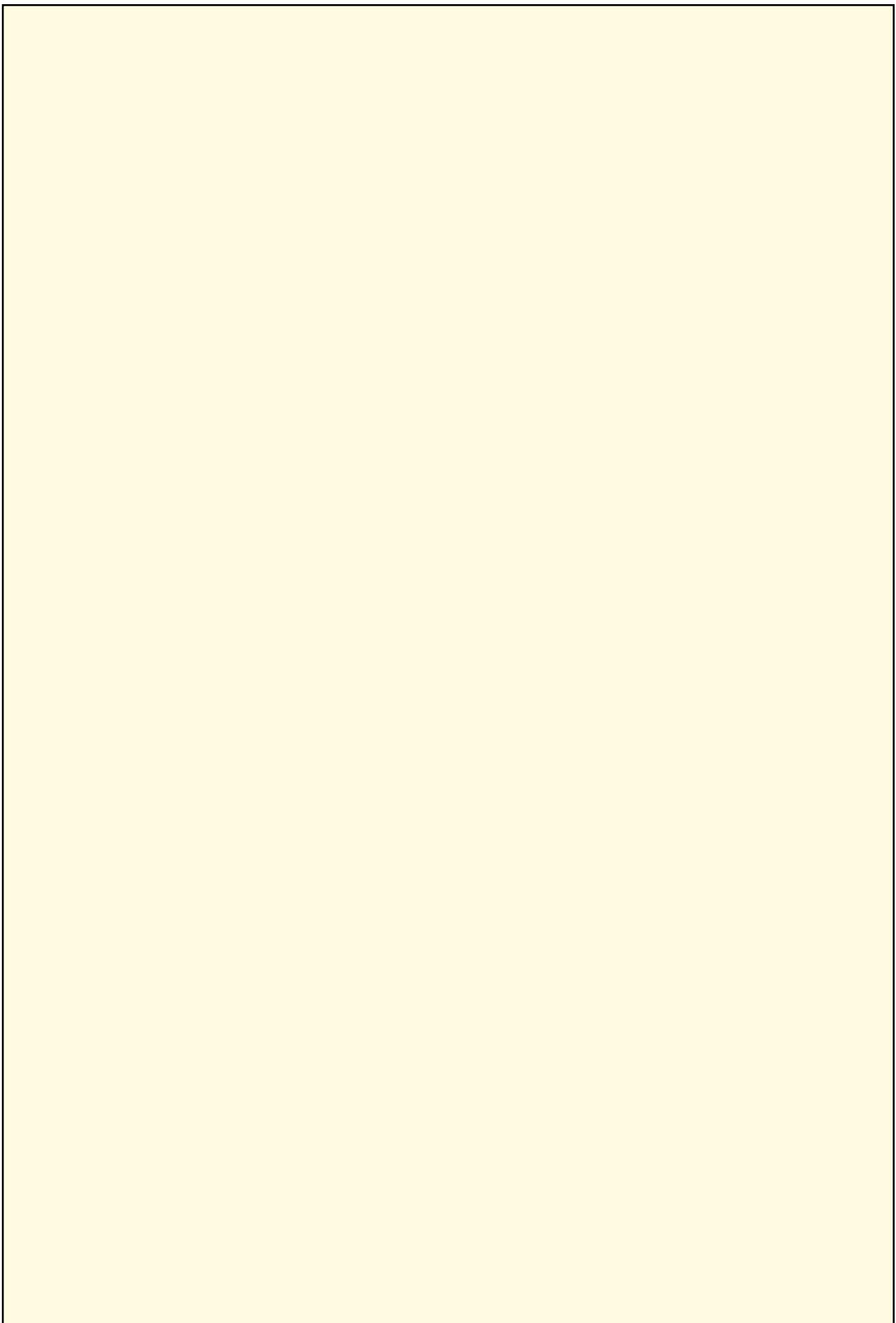
**Chair:** D. Van Dyck, Antwerp; F. Ernst, Stuttgart

### Oral presentations:

- 09.30-10.10 Advances in atomic structure determination using the focal-series reconstruction technique (*invited*)  
*A. Thust, C.L. Jia*
- 10.10-10.50 Progress in structure analysis of crystal defects by quantitative HRTEM (*invited*)  
*R. Schweinfest, F. Ernst*
- 10.50-11.05 Image formation using incoherent scattering in a CTEM  
*G. R Ansits*
- 11.05-11.20 Extension of HRTEM resolution using Gerchberg-Saxton algorithm: application to grain boundary and interface  
*F.-R. Chen, J. J. Kai, L. Chang*
- 11.20-11.35 Effect of the objective lens on the measurement of rapidly varying displacement fields from HRTEM images  
*M. Hytch, T. Plamann*
- 11.35-11.50 The effect of strain on chemically sensitive imaging with the (002) reflection in sphalerite type crystals  
*A. Rosenauer, D. Van Dyck*

**Posters:** [Monday, July 10, 13.30-14.50]

- I03-1 Parallel realization of the simulated annealing algorithm and its applications to quantitative electron microscopy  
*S.-Y. Li, M.-Y. Wu, J. Zhu*
- I03-2 Quantitative measurement of intensity profiles of equal thickness fringes of Si and MgO crystals and estimation of crystal potential  
*K. Nishio, T. Isshiki, E. Okunishi, T. Oikawa, M. Kawasaki, H. Endoh, M. Shiojiri*
- I03-3 A Fourier space approach for calculating the electron optical phase shift of superconducting fluxons  
*M. Beleggia, G. Pozzi, A. Tonomura*
- I03-4 Design aspects for an optimum DF STEM probe  
*S. Van Aert, A.J. den Dekker, D. Van Dyck, A. van den Bos*
- I03-5 A quantitative evaluation of different STEM imaging modes  
*A.J. den Dekker, S. Van Aert, D. Van Dyck, A. van den Bos*
- I03-6 Accurate measurements of atomic displacements in  $\text{La}_{0.9}\text{Sr}_{0.1}\text{MnO}_3$  thin films grown on a  $\text{SrTiO}_3$  substrate  
*P. Geuens, O.I. Lebedev, D. Van Dyck, G. Van Tendeloo*



- I03-7 Direct object data retrieval: an inversion of electron diffraction  
*K. Scheerschmidt*
- I03-8 Influence of experimental parameters on the accuracy of lattice-distortion measurements directly from high-resolution micrographs  
*K. Du, N.Y. Jin-Phillipp, F. Philipp*
- I03-9 EELS thickness-measurement without spectrum acquisition  
*M. Tanaka*
- I03-10 Contrast modulations in HRTEM images caused by crystal tilt  
*T. Waitz, H.P. Karnthaler*

## I04 • CORRECTION OF ABERRATIONS AND HR ELECTRON MICROSCOPES

[Tuesday, July 11, 16.00-18.30, Room B]

**Chair:** **A. Delong**, Brno; **M. Haider**, Heidelberg

### Oral presentations:

- 16.00-16.35 Towards sub-Angstrom point resolution by correction of spherical aberration (*invited*)  
*M. Haider*
- 16.35-17.10 Advances in Cs-corrected STEM (*invited*)  
*O.L. Krivanek, N. Dellby, A.R. Lupini*
- 17.10-17.25 Correction of chromatic and spherical aberration using a Wien filter  
*T. Steffen, P.C. Tiemeijer, M.P.C.M. Krijn, S.A.M. Mentink*
- 17.25-17.40 Performance of the mirror corrector for an ultrahigh-resolution spectromicroscope  
*P. Hartel, D. Preikszas, R. Spehr, H. Rose*
- 17.40-17.55 An electrostatic achromat  
*A. Henstra, M.P.C.M. Krijn*
- 17.55-18.10 Electrostatic correction of the chromatic and spherical aberration of charged particle lenses  
*Ch. Weissbaecker, H. Rose*
- 18.10-18.25 Super resolution imaging of complex metal oxides  
*A. I. Kirkland, J. Sloan, R. Meyer, R. E. Dunin-Borkowski, J. L. Hutchison, W. O. Saxton, M. J. Sayagués, R. J. D. Tilley*

### Posters:

[Monday, July 10, 13.30-14.50]

- I04-1 Validity of spherical aberration free focus condition  
*H. Endoh, H. Hashimoto, A. Kumao*
- I04-2 The Triebenberg laboratory - designed for highest resolution electron microscopy and holography  
*H. Lichte, D. Schulze, M. Lehmann, H. Just, T. Erabi, P. Fürst, J. Göbel, A. Hasenpusch, P. Dietz*
- I04-3 A new method for the determination of the wave aberration function  
*R. R. Meyer, A. I. Kirkland, W. O. Saxton*

## I05 • LOW ENERGY ELECTRON MICROSCOPY

[Tuesday, July 11, 09.30-12.00, Room F]

**Chair:** **G. Lilienkamp**, Clausthal; **L. Frank**, Brno

### Oral presentations:

- 09.30-10.05 Aspects of aberration correction in LVSEM (*invited*)  
*J. Zach*
- 10.05-10.40 Scanning low and very low energy electron microscopy (*invited*)  
*I. Müllerová, L. Frank*

- 10.40-11.15 New aspects in LEEM and spectroscopic emission microscopy instrumentation (*invited*)  
G. Lilienkamp
- 11.15-11.30 X-ray photoemission and low energy electron microscope  
V. Kolarík, R. Vašina, M. Mynář, T. Bejdák
- 11.30-11.45 Low voltage electron microscope II. - Applications  
E. Coufalová, A. Delong
- 11.45-12.00 Low energy electron scattering - Monte Carlo simulation  
H. J. Fitting, J. Ch. Kuhr

**Posters:** [Tuesday, July 11, 13.30-14.50]

- I05-1 In-depth imaging in S.E.M.  
P. Lehuédé, J. Appriou-Marciano, J. Cazaux
- I05-2 Double scintillation detector with a conical retarding lens for SEM  
W. Slowko, W. Drzazga
- I05-3 Quantitative topographic contrast in LV SEM  
W. Slowko, J. Hejna
- I05-4 Energy filtering scanning transmission electron microscopy at low voltage with a 'simulated' spherical deflection analyzer  
K.H. Krämer, H. Kohl
- I05-5 Low voltage electron microscope III. - Present and future possibilities  
P. Štěpán, A. Delong
- I05-6 Low voltage electron microscope I. - Design  
A. Delong, K. Hladil, V. Kolarík, P. Pavelka
- I05-7 Dimension measurement in a cathode lens equipped low-energy SEM  
O. Hutař, M. Oral, I. Müllerová, L. Frank
- I05-8 Application of low-energy backscattered electron detection in the inspection of semiconductor devices technology  
O. Hutař, M. Oral, I. Müllerová, V. Romanovský
- I05-9 Signal detection near the critical energy of non-charging illumination in a low-energy SEM equipped with a cathode lens  
J. Káňová, L. Frank

## I06 • LOW VACUUM MICROSCOPY AND CHARGING

[Thursday, July 13, 16.00-18.30, Room A]  
**Chair: J. Cazaux, Reims; R. Autrata, Brno**

### Oral presentations:

- 16.00-16.40 Charging mechanisms in S.E.M.: from the secondary yield to the contrast of images? (*invited*)  
J. Cazaux
- 16.40-17.05 Scanning electron microscopy at low vacuum in specimen chamber (*invited*)  
R. Autrata, J. Jirák
- 17.05-17.20 Possibilities of evaluation of the influence of conditions in the specimen chamber on the quality of imaging in environmental SEM  
M. Michálek, J. Jirák
- 17.20-17.35 ESEM as a routine tool for failure analysis in industry  
D. van der Wal, E. Baken
- 17.35-17.50 ESEM and TEM investigations on experimentally corroded synthetic zirconolite crystals and their replacing secondary phases  
J. Malmström, E. Reusser, R. Guggenheim, M. Düggelin, D. Mathys, R. Gieré, G.R. Lumpkin, M.G. Blackford
- 17.50-18.05 Structure degradation of austenitic stainless steels as effect of corrosion fatigue  
K. Palka, B. Surowska, A. Weronski
- 18.05-18.20 Absorbed electron imaging of non-conductive samples in low-vacuum SEM  
B. Hellum, P. Reme, L.U. Hansen, P.O. Johnsen, J. Hjelen

**Posters:**

[Tuesday, July 11, 13.30-14.50]

- I06-1 SEM analysis of corrosion degradation on tinplate substrates  
*E. Zumelzu, A. Vera, C. Cabezas*
- I06-2 Charging effects in S.E.M.: role of the working distance  
*F. Grillon, J. Cazaux*
- I06-3 Studies of biological specimens by environmental scanning electron microscopy  
*R. Autrata, D. Horký, L. Ilkovics, V. Procházka, T. Skřička*
- I06-4 Microstructural and compositional changes at high temperature oxidation of stainless steel in steam environment  
*F. A. Khalid, N. Hussain, A.H. Qureshi*
- I06-5 Conditions of study of electrode masses structures in environmental scanning electron microscope  
*R. Drnovský, J. Jirák*
- I06-6 An anomalous contrast effect in scanning electron microscopy of insulators: the pseudo-mirror effect  
*M. Belhaj, O. Jbara, S. Odof, K. Msellak, J. Cazaux, E.I. Rau, M.V. Andrianov*
- I06-7 Spectral distribution of backscattered electrons of charged insulators  
*O. Jbara, M. Belhaj, S. Odof, E.I. Rau, M.V. Andrianov*
- I06-8 Combined scintillation and ionisation detectors for environmental scanning electron microscopes  
*V. Romanovský, R. Autrata*
- I06-9 Imaging of semiconductor structures in environmental SEM  
*V. Romanovský, O. Huta*
- I06-10 Effect of the electron beam accelerating voltage and of specimen coating on the image in the microscope operating at higher pressures  
*R. Autrata, J. Jirák, J. Špinka*

## I07 • MODERN LIGHT MICROSCOPY TECHNIQUES

[Wednesday, July 12, 16.00-18.00, Room C]

**Chair:** **E. H. K. Stelzer**, Heidelberg; **P. Tománek**, Brno

**Oral presentations:**

- 16.00-16.50 ..... (*invited*)  
*E.H.K. Stelzer*
- 16.50-17.40 Near field optical microscopy: theory and applications (*invited*)  
*P. Tománek*

## I08 • ADVANCES IN PROBE MICROSCOPIES

[Monday, July 10, 16.00-18.30, Room C]

**Chair:** **E. Meyer**, Basel; **V. Cháb**, Prague

**Oral presentations:**

- 16.00-16.40 Spectroscopy on semiconductor surfaces using photoassisted scanning tunneling microscopy and Kelvin probe force microscopy (*invited*)  
*M. Ch. Lux-Steiner, Ch. Sommerhalter, Th. W. Matthes, J. Boneberg, P. Leiderer*
- 16.40-17.20 Electrochemical applications of SPM (*invited*)  
*P. Janda*
- 17.20-17.35 An in situ STM for applications in catalysis  
*F.J.Cadete Santos Aires, C. Deranlot*
- 17.35-17.50 Direct imaging of AFM force interactions using TEM  
*D. Ertz, H. Olin, L. Olsson, L. Ryen, A. Thölén*
- 17.50-18.30 Force microscopy experiments in ultrahigh vacuum (*invited*)  
*E. Meyer, M. Guggisberg, R. Bennewitz, Ch. Loppacher, V. Barwich, O. Pfeiffer, S. Schär, A. Baratoff*

**Posters:**

[Tuesday, July 11, 13.30-14.50]

- I08-1 AFM in the study of primary neurons isolated from rabbit olfactory mucosa  
*A. Menevse, F.I. Sahin, M.A. Ergun, E. Tan*
- I08-2 Electron transport in point contacts studied by TEM-STM  
*D. Erts, A. Löhmus, R. Löhmus, H. Olin, E. Olsson, L. Ryen, A. Thölén*

## **I09 • QUANTITATIVE X-RAY SPECTROSCOPY IN EM**

[Wednesday, July 12, 09.30-12.00, Room H]

**Chair: J. Wernisch, Vienna; M. Wendt, Jena**

**Oral presentations:**

- 09.30-10.10 X-ray microanalysis at low kV (*invited*)  
*M. Wendt*
- 10.10-10.50 Standardless microanalysis (*invited*)  
*J. Wernisch*
- 10.50-11.10 Automated analysis of submicron particles in SEM?  
*P. Poelt, M. Schmied, T. Brunner*
- 11.10-11.30 Correction of peak overlap in EDX-maps by digital image processing  
*M. von Bradke, R. Ruckdaeschel*
- 11.30-11.55 Short presentations of posters

**Posters:**

[Wednesday, July 12, 13.30-14.50]

- I09-1 Standards for analysis of submicron particles by SEM / EDXS  
*M. Schmied, P. Poelt, J. Dahl*
- I09-2 Combined autoradiography and electron microscopy analysis for granulometric measurements of actinide oxide aerosols  
*H. Le Naour, P. Fritsch*
- I09-3 Quantitative electron microprobe analyses of subsurface micro-inclusions in diamonds  
*V. Gutkin, E. Izraeli, O. Navon*
- I09-4 The use of energy dispersive X-ray microanalysis (EDX) in pollution impact studies  
*M.A. Gregory, T.P. McClurg, A.D. Connell, V.E. Moodley*
- I09-5 Characterisation of industrial TiO<sub>2</sub> pigments with low voltage FE-SEM/EDX and FE-TEM/STEM/EDX methods  
*U. Tapper, E.I. Kauppinen, J. Jalava*

## **I10 • EELS AND EFTEM**

[Monday, July 10, 16.00-18.30, Room F]

**Chair: F.Hofer, Graz; C. Humphreys, Cambridge**

**Oral presentations:**

- 16.00-16.35 Understanding EELS and its applications to metallic alloys and semiconductors (*invited*)  
*C. Humphreys*
- 16.35-17.10 Energy filtering transmission electron microscopy: fundamentals and applications (*invited*)  
*H. Kohl*
- 17.10-17.25 Analysis of the atomic scale oxygen vacancy ordering by EELS and Z- contrast imaging  
*Y. Ito, S. Stemmer, R.F. Klie, N.D. Browning, T.J. Mazanec*
- 17.25-17.40 Extended image-series analysis in the energy-filtered TEM  
*P.J. Thomas, P.A. Midgley*
- 17.40-17.55 Composition and chemical shift analysis of a multilayer using spatially-resolved EELS  
*K. Kimoto, Y. Matsui, T. Aoyama*
- 17.55-18.10 Electron channeling and monopole transitions in ELNES  
*P. Schattschneider, C. Hébert, B. Jouffrey*
- 18.10-18.25 Monochromator for high brightness electron guns  
*H.W. Mook, P.E. Batson, P. Kruit*

**Posters:**

[Wednesday, July 12, 13.30-14.50]

- I10-1 Application of EFTEM for cross-sectional on-product characterization of semiconductor devices  
*H. J. Engelmann, W. Blum, H. Saage, M. Worch, E. Zschech*
- I10-2 Extraction of three-body distribution in amorphous silicon by wavelet analysis of EXELFS  
*S. Muto, K.M. Yu, W. Walukiewicz, H.-Ch. Jin, J.R. Abelson*
- I10-3 Wavelet analysis of extended energy-loss fine structure  
*S. Muto*
- I10-4 Energy-filtering techniques for thick samples  
*B. Kabius, V. Seybold, S. Hiller, A. Rilk, E. Zellmann, W. Probst*
- I10-5 EFTEM analysis of the interaction of Co with a fluorinated organic dielectric  
*S. Hens, J. Van Landuyt, H. Bender, F. Lanckmans, K. Maeck*
- I10-6 Quantitative evaluation of short-range order diffuse scattering in Cu<sub>72.5</sub>Pd<sub>27.5</sub> alloy by energy filter and imaging plate  
*Y. Ikematsu, D. Shindo*
- I10-7 Cryo-EFTEM elemental mapping of particles in frozen solutions  
*J.-O. Bovin, O. Balmes, G. Karlsson*
- I10-8 Electron energy-loss near-edge structures of silicon and silicon carbide  
*M.Y. Park, P. Krüger, H. Kohl*
- I10-9 Effect of the excited state lifetime on the near edge structure in EELS or XANES experiments  
*C. Hébert, M. Kostner, P. Schattschneider*
- I10-10 EELS study of phase transformation in Cu-Al-Ni alloy  
*T. Hanada, R. Kitao, Y. Nakata, Y. Hirotsu*
- I10-11 Stability performance of an energy filtering TEM  
*G. Benner, E. Zellmann, A. Harscher, R. Härtle, B. Kabius, V. Seybold, W. Probst*
- I10-12 Factor analysis of TEM-EEL spectra on nanoscale Fe/Al/Fe layers  
*J. Thomas, H.-D. Bauer, S. Baunack, K. Wetzig, A. Mensch*
- I10-13 Beam brightness and STEM-EELS performance  
*J.E. Barth*
- I10-14 Factors affecting the performance of EELS energy-filters  
*G. Kothleitner, H.A. Brink*
- I10-15 Energy-filtered imaging of Fe and Ni nanoparticles in a field emission gun transmission electron microscope  
*M.J. Sayagués, T.C. Rojas, R.E. Dunin-Borkowski, J.L. Hutchison, A. Fernández*
- I10-16 Direct atomic scale characterization of interfaces and doping layers in field-effect transistors  
*T. Topuria, E. James, N. Browning, Z. Ma*

## **III • SURFACE ORIENTED MICROANALYTICAL TECHNIQUES**

[Tuesday, July 11, 16.00-18.30, Room H]

**Chair: M. M. ElGomati, York; G. Schönhense, Mainz**

**Oral presentations:**

- 16.00-16.40 Photoemission electron microscopy with high chemical and magnetic sensitivity (*invited*)  
*G. Schönhense*
- 16.40-17.20 Auger analysis of sharp topographies: quantification at high spatial resolution (*invited*)  
*M.M. El Gomati, A. Gelthorpe, J. Dell*
- 17.20-17.35 Quantitative secondary electron emissiometry  
*Y.Y. Tomashpolsky, N.V. Sadovskaya*
- 17.35-17.50 Contrast studies on organic monolayers in FESEM and their correlation with SFM data  
*A.G. Bittermann, R. Reichelt*
- 17.50-18.05 Magneto-optical linear dichroism in threshold photoemission electron microscopy of a polycrystalline Fe-film  
*G.K.L. Marx, H.-J. Elmers, G. Schönhense*
- 18.05-18.20 Structural and chemical surface analysis with the double-reflection emission electron microscope DREEM  
*K. Grzelakowski, J. Settemeyer, M. Escher, M. Merkel*

**Posters:**

[Wednesday, July 12, 13.30-14.50]

- I11-1 Secondary electron field emission microscopy - SEFEM  
*H.-J. Fitting, Th. Hingst, E. Schreiber*
- I11-2 Possibilities of measurement of magnetic field distributions by photoemission electron microscopy  
*S.A. Nepijko, N.N. Sedov, G.K.L. Marx, G. Schönhense*
- I11-3 Domain imaging and determination of magnetic moments in Co-films using XMCD-PEEM  
*G.K.L. Marx, M. J. Klais, P. Haibach, G. Schönhense*

## I12 • IMAGE PROCESSING AND SIMULATION

[Thursday, July 13, 09.30-12.00, Room F]

**Chair: J. M. Carazo, Madrid; J. M. González-Calbet, Madrid**

**Oral presentations:**

- 09.30-10.20 Towards more quantitative results from three dimensional electron microscopy of macromolecules (*invited*)  
*J.M. Carazo, N. Jiménez-Lozano, C.O.S. Sorzano, M. Chagoyen*
- 10.20-10.35 ProcessDiffraction: a computer program to process electron diffraction patterns from polycrystalline or amorphous samples  
*J.L. Lábar*
- 10.35-10.50 Detection of particles in elemental maps using 2D-histograms  
*I. Müller, H. Kohl*
- 10.50-11.05 Bimodal stereo-based surface reconstruction in SEM  
*J. Jan, D. Janová*
- 11.05-11.20 EMS simulations for STEM and applications  
*G. Möbus*
- 11.20-11.35 Genetic algorithms as applied to surface morphology reconstruction in the scanning electron microscope  
*X. Li, T. Kodama, Y. Uchikawa*
- 11.35-11.50 Influence of the imaginary part of the atomic scattering factor on diffractograms of thin amorphous foils  
*R. Knippelmeyer, A. Thesing, H. Kohl*

**Posters:**

[Wednesday, July 12, 13.30-14.50]

- I12-1 Backscattered electron stereophotogrammetry based on the BSE-microtomography in the SEM  
*E.I. Rau, R.A. Sennov, V.N. Sokolov, D.I. Yurkovets, V.N. Melnik, A. Boyde, P.G.T. Howell*
- I12-2 Aliasing correction of undersampled crystal images  
*P.J.B. Koeck*
- I12-3 Monte Carlo calculation on 3D distribution of maximum penetration depths of backscattered electrons in the SEM  
*H. Hoffmeister, L. Reimer, H. Kohl*
- I12-4 Image analysis of illuvial soil horizons  
*I. Kyzlassov, S.A. Shoba, V.N. Sokolov*
- I12-5 Application of 2D-FFT for analysis of vanadium carbonitrides precipitates  
*A. Kruk, W. Osuch, F. Ciura, G. Michta*
- I12-6 An implementation of the coherence function multislice method  
*P. Schorsch, H. Müller, H. Rose*
- I12-7 On the optimum energy for backscattered electron imaging of topographic details in scanning electron microscopy  
*P.G. Merli, V. Morandi, R. Rosa*

## I13 • COMPUTERISED MICROSCOPY

[Friday, July 14, 09.30-12.00, Room A]

**Chair: A. J. Koster, Utrecht; I. Daberkow, Münster**

**Oral presentations:**

- 09.30-10.20 Microscope automation: does the computer replace the operator? (*invited*)  
*E. Völk*

- 10.20-10.40 WebXpertEze: intelligent instruments via the Internet  
*N.H.M. Caldwell, B.C. Breton, D.M. Holburn*
- 10.40-11.20 Computer-controlled transmission electron microscopy (*invited*)  
*T.P. van der Klaft, U.Ziese, A.H. Janssen, W.A.M. van Maurik, A.J. Koster*
- 11.20-11.40 COM technology based modular software for scientific instrumentation control  
*J. Vašina, R. Vašina*

**Posters:** [Thursday, July 13, 13.30-14.50]

- I13-1 Computer controlled high-throughput integration system: FastTEM  
*K. Fukushima, R.M. O'Donnell, K. Fujiwara, H. Kai, E. Okunishi, M. Kawasaki, M. Kersker, M. Naruse*

## I14 • ELECTRON OPTICAL SYSTEMS, GUNS AND LENSES

[Thursday, July 13, 16.00-18.30, Room F]  
**Chair: P. Kruit**, Delft; **V. Kolařík**, Brno

**Oral presentations:**

- 16.00-16.40 Modern electron optics in SEM and inspection (*invited*)  
*E. Plies*
- 16.40-17.20 Advances in TEM instrumentation (*invited*)  
*P. Kruit*
- 17.20-17.35 A high resolution add-on lens for scanning electron microscopes  
*A. Khursheed, N. Karuppiyah, S.H. Koh*
- 17.35-17.50 Advances in high-throughput multiple electron-beam lithography  
*M. Mankos, T. H. P. Chang*
- 17.50-18.05 Investigations of an electrostatic duo-hexapole-stigmator  
*J. Bärtle, E. Plies*
- 18.05-18.20 SEM resolution improvement at low voltage with gun monochromator  
*J.E. Barth, M.D. Nykerk, H.W. Mook, P. Kruit*

**Posters:** [Thursday, July 13, 13.30-14.50]

- I14-1 Construction and characterisation of a TEM specimen holder for in situ application of magnetic in-plane fields  
*T. Uhlig, M. Heumann, M. Schneider, H. Hoffmann, J. Zweck*
- I14-2 On the enhancement factors for electron field emitters  
*C. Edgcombe, U. Valdre*
- I14-3 Investigation of an EuS-coated cooled field emitter for application in state of the art electron microscopes  
*H. Wittel, A. Schäfer, F. Hasselbach*
- I14-4 Test specimens for SEM  
*F. Matějka, Z. Ryzí*
- I14-5 Field emission SEM with a newly developed FEGUN and a conical strongly excited objective lens  
*H. Kazumori, A. Yamada, M. Mita, T. Nokuo, M. Saito*

## I15 • FILTERS, ANALYSERS AND DETECTORS

[Friday, July 14, 09.30-12.00, Room B]  
**Chair: B. Jouffrey**, Chatenay-Malabry; **P. Schauer**, Brno

**Oral presentations:**

- 09.30-09.55 On actual questions in filtering and inelastic interactions (*invited*)  
*B. Jouffrey, P. Schattschneider, C. Hébert, M. Nelhiebel*
- 09.55-10.20 Performance of detector elements for electron microscopes (*invited*)  
*P. Schauer, R. Autrata*

- 10.20-10.40 Design of a monochromator for electron sources  
F. Kahl, H. Rose
- 10.40-11.00 First development step and test of the SESAM/SATEM  
S. Kujawa
- 11.00-11.20 Software for the analysis and design of imaging energy filters with homogeneous and inhomogeneous bending magnets  
E. Munro, J. Rouse
- 11.20-11.40 Performance data of a new 2048 x 2048 pixel slow-scan CCD camera for TEM  
S.A. Hiller, B. Kabius, W. Probst, H. Tröster, M. Trendelenburg, C. Crucifix, A. Tröndle
- 11.40-12.00 Geometric distortion correction for imaging plates using reflected light signal improves gain normalization and DQE  
P.Bele, R. Ochs, R.R. Schröder

**Posters:** [Thursday, July 13, 13.30-14.50]

- I15-1 Cryodetectors for high resolution X-Ray spectroscopy  
J. Höhne, M. Bühl, T. Hertrich, U. Hess
- I15-2 Scanning electron microscopy of semiconductor multilayers using a converter of backscattered electrons into secondary electrons  
P. Ascarelli, E. Capelli, F. Corticelli, S. Franchi, P.G. Merli, A. Migliori, V. Morandi, C. Rossi, S. Salvatori, A. Valdre
- I15-3 Simulation of electron trajectories in the 3D field of two coupled hemispherical electrostatic deflectors  
A. Huber, E. Plies
- I15-4 New possibilities of SEBIV mode in SEM  
B. Degel, M. Kienle, E. Plies, E. I. Rau, S. Zhu
- I15-5 Detection of the angular distribution of the signal electrons in VLESEM  
M. Horáček
- I15-6 Direct electron exposed silicon detectors in EELS  
C. Orsholm, S. Csillag
- I15-7 Auger microscopy with a parallel acquisition spectrometer  
M. Jacka, A. Kale, M. Tyndall, M. Prutton
- I15-8 Elemental mapping using omega filter and imaging plate  
D. Shindo, Y. Ikematsu, C.-W. Lee, Y. Murakami, M. Sugiyama
- I15-9 New frame-transfer wide-angle slow-scan CCD camera allows recording of distortion-free images for digital montages  
S.A. Hiller, W. Probst, V. Seybold, E. Zellmann, B. Kabius, A. Tröndle
- I15-10 Combined TEM and CL of self-assembled CdSe quantum dots  
H. Preis, P. Müller, K. Fuchs, S. Kaiser, W. Gebhardt, J. Zweck

## I16 • X-RAY MICROSCOPY

[Tuesday, July 11, 09.30-12.00, Room D]

**Chair: J. Baruchel, Grenoble; G. Schneider, Göttingen**

### Oral presentations:

- 09.30-10.00 Recent achievements in multi-keV X-ray microscopy (*invited*)  
J. Susini
- 10.00-10.30 Amplitude and phase contrast soft X-ray cryo-microscopy of biological samples (*invited*)  
G. Schneider
- 10.30-11.00 New aspects of coherent hard X-ray imaging (*invited*)  
P. Cloetens, W. Ludwig, J.P. Guigay, M. Schlenker, J. Baruchel, D. Van Dyck
- 11.00-11.30 Synchrotron radiation scanning photoemission microscopy: advances and applications (*invited*)  
A. Barinov, L. Casalis, L. Gregoratti, S. Günther, M. Marsi, M. Kiskinova
- 11.30-12.00 Quantitative, chemical state mapping of wood composites via scanning X-ray microscopy (*invited*)  
C. Buckley, C. Phanopoulos, N. Khaleque

**Posters:**

[Thursday, July 13, 13.30-14.50]

- I16-1 Applications of high resolution microcalorimeter type X-Ray spectrometers in material analysis  
*J. Höhne, M. Bühler, T. Hertrich, U. Hess*
- I16-2 One plasma focus device as possible soft X-ray source for microscopy  
*R. Antanasijevic, D. Joksimovic, J. Vukovic*

**I17 • EMS SYMPOSIUM**

[Friday, July 14, 13.30-16.00, Room CHV]

**Chair: P. W. Hawkes, Toulouse; A. Howie, Cambridge****Oral presentations:**

- 13.30-14.05 Environmental scanning electron Microscopy - taking SEM into the future (*invited*)  
*A.M. Donald*
- 14.05-14.40 Imaging of electronic structure: achievements, competition and challenges (*invited*)  
*A. Howie*
- 14.40-15.15 Biomedical EM under change: recent developments and trends (*invited*)  
*A.B. Maunsbach*
- 15.15-15.50 EMS in the European framework (*invited*)  
*J.L. Carrascosa*
- 15.50-16.00 Discussion

**Ipd • INSTRUMENTATION AND METHODOLOGY  
– POST-DEADLINE POSTERS****Posters:**

[Tuesday, July 11, 13.30-14.50]

- Ipd-1 A comparison of surface roughness as measured by Dektak3St profiler, Hommel Tester 1000 and atomic force microscope  
*F. Farshad*
- Ipd-2 Linear thickness dependence of electron contrast in single crystal gold films in the TEM  
*I. Pozsgai, L. Tóth*
- Ipd-3 An in-situ nanosecond mirror electron microscope  
*H. Kleinschmidt, O. Bostanjoglo*
- Ipd-4 Time-resolved transmission electron microscopy on laser-pulse-induced melts in glass films  
*H. Dömer, O. Bostanjoglo*
- Ipd-5 Analysis of strain-balanced semiconductor layers by high resolution electron microscopy  
*H. Meidia, C.J.D. Hetherington, J.S. Roberts, A.G. Cullis*
- Ipd-6 The Philips Tecnai TEM: applications and possibilities in life and materials sciences  
*M.M.H. Storms, D. Hubert, U. Lücke, T. Flervoet, B. Freitag, M. Sidorov, W. Busing*
- Ipd-7 Enhancing the detection efficiency of a SEM MCP detector by a coated thin foil  
*I. Shariv, Y. Karni, E. Elizur, E. Cheifetz*

## KEYNOTE LECTURES

### L1 Millenium of Electron Microscopy

Peter W. Hawkes  
 CEMES-CNRS, B.P. 4347, F-31055 Toulouse  
 Cedex 4, France, [hawkes@cemes.fr](mailto:hawkes@cemes.fr)

The centenary of the electron has recently been celebrated, books have been published on electron microscopy by historians of science and numerous reminiscences have been recorded - the subject has reached maturity. At the same time, new ways of forming images at resolutions far beyond that of the light microscope have emerged and the electron microscope is now one of a family of complementary instruments. We recall some of the key events in the development of electron instruments and electron image formation and evoke some the star actors in that long saga. It is scientifically important that a congress such as EUREM should concentrate on the present and the future but it is culturally important that we should never lose sight of the past.

### L2 TEM of nanostructured materials

Gustaaf Van Tendeloo  
 EMAT, University of Antwerp (RUCA),  
 Groenenborgerlaan 171, B-2020 Antwerpen,  
 Belgium, [gvt@ruca.ua.ac.be](mailto:gvt@ruca.ua.ac.be)

Micro-technology has been replaced by nanotechnology and the local structure of materials becomes increasingly important. A combination of conventional TEM, quantitative HREM, electron diffraction, EDX and EELS provides unique and unchallenged information on the local structure of functional materials. These techniques are applied to study carbon nanotubes, (magnetic) nanoparticles, thin film superconducting or CMR oxides, substrate-film interfaces and nanostructured alloys.

### L3 Prospects of quantitative high resolution electron microscopy

Dirk Van Dyck  
 Department of Physics,  
 University of Antwerp,  
 Groenenborgerlaan 171, B-2020 Antwerpen,  
 Belgium, [dvd@ruca.ua.ac.be](mailto:dvd@ruca.ua.ac.be)

With the resolution becoming sufficient to reveal individual atoms, HREM is now entering the stage where it can compete with X-ray methods to quantitatively determine atomic structures of materials without much prior knowledge, but with the advantage of being applicable to aperiodic objects such as crystal defects. In our view the future electron microscope will be characterised by a large versatility in experimental settings under computer control such as the illumination conditions (TEM-STEM), CBED, detecting conditions (diffraction, image, ptychography) and many other tunable parameters such as focus ( $g$ ), voltage, spherical aberration ( $C_s$ ), beam tilt, etc. Since modern detectors can detect single electrons, also the counting statistics is known. The only

limiting factor in the experiment will be the total number of electrons that interact with the object during the experiment due to the limitations in the exposure time or in the object damage. However, instrumental potentialities will never be exploited fully if not guided by an experimental strategy. Here intuitive guidelines can be very deceptive. For instance an image made with the best electron microscope ( $C_s = 0$ ) at the best focus ( $g=0$ ) from the best object (phase object) would show no contrast at all. Hence, questions such as what is the best  $C_s$ , focus, object thickness, etc. can only be answered properly if done using a method of experiment design.

### L4 High-performance electron microscopes of the future

Harald Rose  
 Institute of Applied Physics,  
 Darmstadt University of Technology,  
 D-64289 Darmstadt, Germany,  
[rose@ltoi.iap.physik.tu-darmstadt.de](mailto:rose@ltoi.iap.physik.tu-darmstadt.de)

Owing to the design of novel correctors, monochromators, imaging energy filters and other electron optical elements and due to the advancement in technology and computer-aided alignment, the realization of high-performance analytical electron microscopes has become possible recently. As examples the designs of a sub-Å sub-eV medium-voltage TEM and of a mirror-corrected low-energy electron microscope will be outlined. Experimental results of the performance of the components of these instruments will be presented and remaining obstacles which have to be overcome will be discussed. It will be demonstrated that the correction of aberrations is possible with present technology and that its realization will lead to a quantum step in the performance of future electron optical instruments.

### L5 State of the art electron microscopy in cell biology

Gareth G. Griffiths  
 European Molecular Biology Laboratory  
 Meyerhofstr. 1, D-69117 Heidelberg,  
 Germany  
[Gareth.Griffiths@embl-heidelberg.de](mailto:Gareth.Griffiths@embl-heidelberg.de)

### L6 Structural and chemical surface electron microscopy with slow electrons

Ernst Bauer  
 Department of Physics and Astronomy,  
 Arizona State University, Tempe,  
 AZ 85287-1504, U.S.A., [ernst.bauer@asu.edu](mailto:ernst.bauer@asu.edu)

In the decade which has passed since the Seattle conference surface imaging with slow electrons has made significant progress, mainly due to the increasing availability of very bright synchrotron radiation sources. This has made it possible to combine structural imaging with

elastically backscattered slow electrons (LEEM) with spectroscopic imaging with characteristic photoelectrons (XPEEM) and has stimulated the development of improved instruments. Another force driving the progress in the field was the strong interest in thin ferromagnetic film systems, which simulated circular magnetic dichroism XPEEM and spin-polarized LEEM. The talk will briefly review these developments, illustrate the present state of art by a number of recent studies and end with a short outlook in the future.

Ref.: Surface Review and Letters, December 1998 (LEEM Workshop Proceedings).

### L7 Probe microscopies: complementary tools to EM

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While NMR is the method of choice of study small soluble proteins at atomic scale in solution, X-ray crystallography has produced most protein structures known today. Among these 5000 proteins, only 12 membrane proteins are found. Electron crystallography allows membrane proteins reconstituted into 2D crystals in the presence of lipids to be analyzed. Thus, the native structure of a membrane protein can ultimately be obtained at atomic resolution. Direct observation of protein surfaces in buffer solution has become possible by the development of the atomic force microscope (AFM). The surface topography and chemical properties measured are complementary to the 3D density maps from electron microscopy. In addition, dynamic conformational changes and the flexibility of protein surfaces can be directly observed. In the future, scanning probe microscopes with multifunctional probes will be used to directly assess function related changes of proteins.

### L8 Nanoscale Analysis

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The review will focus on the possibilities which energy loss spectroscopy offers for the analysis of the chemistry and bonding of structures on a nanometre scale. The required spatial resolution can be achieved by stepping a small probe across the specimen, or by employing energy filtering TEM. Both lines merge in the new generation of TEMs, which are equipped with a field emission gun (FEG) and an imaging energy filter. The bonding at interfaces can be analysed by comparing the near edge structures (ELNES) with the predictions of ab initio band structure calculations. An outlook will be given on the capabilities of future instruments which will be equipped with a monochromator and a high transmissivity energy filter.

## TUTORIALS

### T1

#### TEM Specimen Preparation in the Physical Sciences

**Ron Anderson, Lynnette D. Madsen\***  
**IBM, Hopewell Jct., New York, USA,**  
**anderron@us.ibm.com, \*Department of**  
**Physics, Linkoping University, S-58183**  
**Linkoping, Sweden, lynma@ifm.liu.se**

The tutorial will be divided into 3 parts:

- I. Deciding when and how to perform TEM specimen preparation including an overview of a range of preparation methods, initial preparation steps common to most specimens, and the control of artifacts.
- II. Detailed explanation of the following methods: mechanical methods for specimen preparation (such as the tripod polisher), ion milling, cleaving, focussed ion beam (FIB) methods, and a suggested new protocol that combines mechanical polishing with FIB methods.
- III. How to set-up a minimal TEM preparation facility in either a university or industrial environment: maximizing preparation capability at minimum initial cost.

The tutorial will be useful to individuals interested in preparing TEM samples.

### T2

#### Quantitative EELS and EFTEM

**Ferdinand Hofer**

**Research Institute for Electron Microscopy,  
 Technical University Graz,  
 Steyrergasse 17, A-8010 Graz, Austria,  
 f705hofe@inbox.tu-graz.ac.at**

This tutorial provides a description of the basic principles of electron energy-loss spectrometry and energy-filtering TEM. The following topics will be covered: spectrum processing, quantitative elemental analysis, edge fine structures (ELNES and EXELFS), energy-filtered imaging and elemental mapping. Typical application examples both from materials science and biological sciences will be used to highlight the possibilities and also the limitations of the technique.

### T3

#### Docking X-ray data into EM structures

**Rasmus R. Schroeder**

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 Jahnstr. 29, D-69120 Heidelberg, Germany,  
 Rasmus.Schroeder@mpimf-heidelberg.mpg.de**

EM studies of biological macromolecules reach mostly a level of only moderate resolution. This does neither allow an interpretation of the reconstructed density in terms of secondary structure elements nor an ab initio molecular model building. On the other hand, more and more macromolecular models of proteins and DNA or RNA are available from X-ray crystallography. Many of them are also studied individually or as part of larger complexes using the EM. One way to attempt a biological interpretation of such EM data is then to dock the

known macromolecular models into the EM derived molecular envelope. The tutorial will discuss the quantitative reconstruction of the object density, interactive and algorithm-based model docking, and different examples of marker-based alignment of model and density. Especially the aspect of quantitative reconstruction will be reviewed for two reasons: the reconstructed density very often depends

- 1 - on the correction of the image contrast (CTF correction) and
- 2 - on missing projections in the collected data set (missing cone, missing wedge).

Such effects on the density have to be distinguished from real conformational differences of the object in the crystallographically derived model and the structure studied by EM. It will be shown how the simulation of projection images and reconstructed density from the known molecular model can help to differentiate between real conformational changes and simple reconstruction artefacts. Since this field is developing rapidly it is hoped that many up-to-date examples can be analysed in the tutorial. It is also planned that a full variety of software available for display and docking can be discussed and demonstrated.

### T4

#### Immunoelectron microscopy and labelling techniques

**Julian E. Beesley**

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 Medicines Research Centre,  
 Gunnels Wood Road, Stevenage SG1 2NY, U.K.,  
 jeb41302@glaxowellcome.co.uk**

CANCELED

### T5

#### Quantitative high resolution EM and electron diffraction

**Henny W. Zandbergen**

**National Centre for HREM, Delft University  
 of Technology, Rotterdamseweg 137,  
 2628AL Delft, The Netherlands,  
 h.w.zandbergen@stm.tudelft.nl**

Recent technological improvements of high resolution electron microscopes (HREM) allow one to obtain a resolution of about 0.1 nm, which makes it possible to "see" the individual atomic columns (rows of atoms along the viewing direction (which may be 0.2 to 1 nm separated in the viewing direction)) in a relatively large number of directions. However, the potential power of the technique is still severely limited by remaining difficulties in the quantitative interpretation of the images. For instance, the use of computer simulation, to compare a model with the experimental images, requires much a priori knowledge which makes HREM dependent on other techniques. Recent developments of the processing of HREM images make it possible to retrieve the electron wavefunction (exit wave) at the exit plane of the specimen. Such methods have been suggested by Schiske, Kirkland, Saxton and worked out by Van Dyck and Lichte. Two methods are now in use: through-focus electron holography and off-axis electron holography. Off-

axis electron holography uses the interference between an exit wave and a reference wave to determine phase and amplitude of the exit wave. Through-focus electron holography combines the information from a series of high resolution electron microscope images to calculate the exit wave.

Compared to HREM, electron diffraction has the disadvantage that local information is not readily available. However, the information goes much further in g-space. The point-to-point resolution of the intermediate voltage HREMs is 0.16 to 0.20 nm. Using exit wave reconstruction techniques, the information limit of about 0.11 nm is about the best one can obtain with a good electron microscope. Thus at best the information content of HREM images goes to 0.11 nm in real space ( $g=9 \text{ nm}^{-1}$  in diffraction space). The information in diffraction space is at least two times better, since reflections with g-values larger than  $20 \text{ nm}^{-1}$  can be obtained with some crystal tilt. Since the various types of microscope aberrations do not influence electron diffraction, the recording of high resolution electron diffraction data can be performed with a less expensive microscope. Since one can make the electron beam as small as 1 nm, one can take diffraction data from areas as small as one wants. Thus for the study of single crystalline areas electron diffraction provides more accurate results than HREM, provided one can estimate the phases of the reflections.

The lecture will be focussed on quantitative data analysis in conventional HREM, through focus exit wave reconstruction and electron diffraction. Also combination of exit wave and diffraction analysis will be discussed. In particular the advantages and (less important) the disadvantages of dynamic diffraction will be considered.

### T6

#### Very low energy in a standard SEM

**Ilona Müllerová, Luděk Frank**

**Institute of Scientific Instruments AS CR,  
 Královopolská 147, 61264 Brno,  
 Czech Republic,  
 ilona@isibrno.cz, ludek@isibrno.cz**

The tutorial deals with methods of adaptation of a conventional SEM to the very low energy microscopy (Scanning LEEM). Main issues:

- Overview of behaviour of classical SEM contrasts in the low (<5 keV) and very low (<100 eV) energy range.
- Contrast mechanisms appearing inherently at very low energies.
- High resolution at very low energies, columns with variable beam energy, boosters and retarding field elements.
- SEM with the cathode lens, parameters and properties.
- Adaptation of a SEM to the SLEEM mode, technical solution, parameters.
- Examples of the SLEEM adaptations.
- Applications of the SLEEM mode at various vacuum conditions.

The tutorial will provide motivation and practical guidance to SEM users how to achieve the very low energy imaging in their instruments after a feasible adaptation is made.

**EUREM 2000 • SATELLITE MEETINGS**
**W1**  
**Workshop on electron crystallography**
**Organized by:**

**Dr. I. G. Voigt-Martin, Mainz (e-mail:**  
**voigtmar@mail.uni-mainz.de)**  
**Dr. J. Fryer, Glasgow (e-mail:**  
**106402.2443@compuserve.com)**

**Place and time:**

**Congress Hall, Hotel Voroněž 1,  
 Křížkovského 47, Brno**

**Sunday, July 9, 2000, 13:00 to 18:00**

**List of the workshop topics**

1. Data collection and data reduction
  - 3-d data sets (Dorset)
  - CCD correction (Weickenmeier/ Mayer)
2. Determination of cell parameters and space group
  - Classical methods combined with powder X-ray diffraction (U. Kolb)
  - Trial and error methods (Miehe)
  - Convergent beam methods (J. Etheridge, Mayer/Weickenmeier, Morniroli)
  - Precession methods

**3. Phase recovery:****Direct methods**

- Comparison of classical direct methods and Maximum Entropy method (Dorset)
- Complex direct methods (Marks)

**High resolution microscopy**

- Linear recovery (Hovmöller)
- Non-linear recovery
- Focal series
- Holography

**Modelling**

- Organic samples (Yakimanski)
- Inorganic samples

**Exit wave reconstruction**

- Explanation of approach with practical examples (Van Dyck)

**4. Structure completion (Marks, Dorset)****5. Refinement:**

**Kinematical (Dorset)**

**Dynamical (Jansen, Zandbergen)**

**General refinement (Shu-You Li)**

**HREM co-ordinate refinement (Moebus)**

**6. Available computer programs:****Structure and Space group**

PIEP (Miehe)

**Direct methods**

- SHELX
- SIR
- DIRIDIF
- MULTAN
- MICE
- BUSTER (Dorset)

**HRTEM**

- SEMPER
- CRISP
- EMS
- CERIUS2

**Modelling**

- GAUSS
  - TURBOMOLE
  - MOPAC
  - DREIDING
  - FORCE FIELD
  - GULP
  - DLPOLY
  - CERIUS2
- (Yakimanski,Kolb)

**Exit wave reconstruction**

- MSLS (Jansen)

**7. Theoretical developments**

- Chanelling methods (Van Dyck)
- Projected potential
- Others (J. Gjonnes)

workers or students to accompany them. Thirty five scientists from eight countries participated in the meeting in 1992 and thirty nine from seven countries in 1994, thirty five from four countries in 1996 and fifty scientists from eight countries participated in the seminar in 1998. Prolonged discussions and a relatively flexible program were characteristic of these meetings.

Starting from 1994 the style developed into that of an actual "seminar" by orienting, as much as possible, the attention toward specification and discussion of questions that have not been answered yet rather than toward conference-like presentation of answers to questions. The appropriate atmosphere is created by organising several round table discussions on pre-selected topics, introduced and moderated by top specialists from among the participants. The topics are formulated in the final program of the Seminar.

The majority of participants are supposed to have prepared questions and remarks to as many discussion topics as possible and first of all, they are invited to present an introductory talk to some of the Seminar topics.

It was agreed among the Seminar participants that some printed extract of the meeting is desirable so that for the 5th and 6th turns the Abstract books were printed on the basis of abstracts collected before the Seminar.

In the year 2000 the Seminar is organised as a satellite meeting to EUREM 12. Because voluminous proceedings will be available from the congress, we decided (after discussion with the Seminar participants) not to print the Abstract book of this turn of the Seminar. It is supposed that even the posters from EUREM will be re-exhibited but the discussion will be much deeper and more extensive.

**W2**  
**7<sup>th</sup> International Seminar on Recent Trends in Charged Particle Optics and Surface Physics Instrumentation**

**Skalský dvůr near Brno,  
 July 15 to 19, 2000**

**Chair of the Organisation Committee:  
 Dr. Ilona Müllerová, ISI AS CR Brno,  
 e-mail: ilona@isibrno.cz**

The seminar is the seventh in the series of seminars devoted to instrumentation and methodology for charged particle optics and surface physics, held in 1989 and in 1990 in Brno and in 1992, 1994, 1996 and 1998 in Skalský dvůr near Brno. The seminar has been established as a meeting of personally notified outstanding specialists who have chosen some of their co-

- Negative staining versus thin sectioning TEM.
- Information on the External Quality
- Assessment Programme on EM in Viral Diagnosis.
- Emerging viruses and diagnostic EM.

**The Workshop is co-chaired by:**

**Dr. Hans R. Gelderblom,  
 Robert Koch-Institut, Berlin**

**Dr. Jana Schramlová,  
 National Institute of Public Health, Prague**

**W3**  
**Workshop about EM in viral diagnosis**
**The contents:**

- Does diagnostic EM fit into today's diagnostic repertoire?
- Advantages and disadvantages of EM in viral diagnostics and definition of indications.
- Efficient routine preparation techniques.
- Methods to enrich particle numbers on the grid.

In addition, participants will present diagnostic findings or dubious observations in 2-10 min-contributions: please contact the organisers directly before the workshop. The workshop will end with a diagnostic slide quiz.



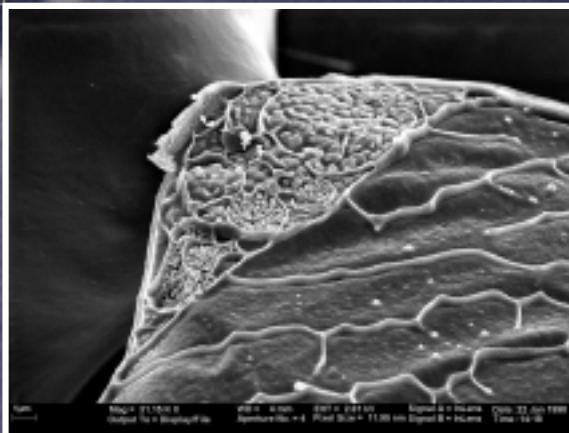
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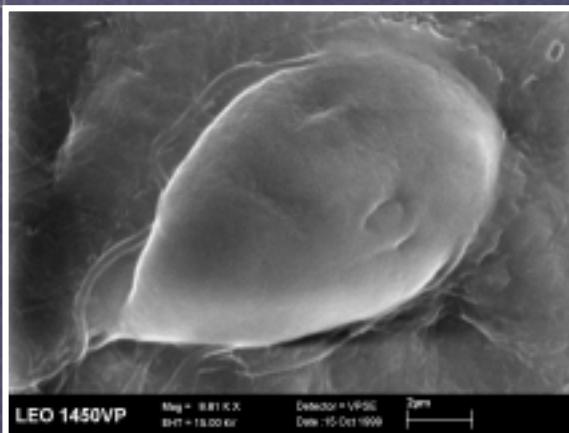
GLOBAL VISUAL INSIGHTS SOLUTIONS, NEW DIMENSIONS

# See LEO in action on stand 23

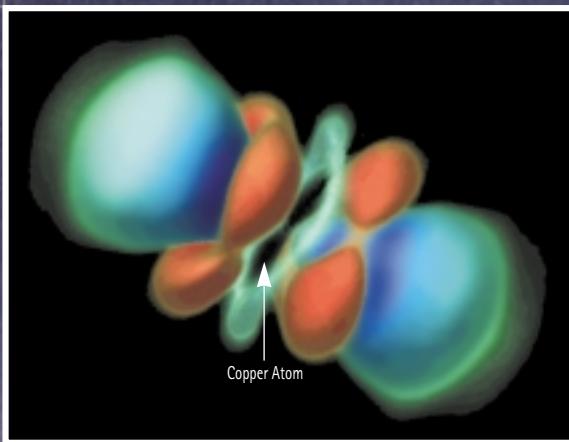
LEO 1500 Series Image:  
Freeze fractured cross  
section of a tobacco leaf  
showing Mitochondria and  
Chloroblasts



LEO 1400 Series Image:  
Giardia intestinal parasite,  
imaged without coating or  
drying, using the VPSE  
detector and peltier cooling  
stage



LEO TEM Series Image:  
Model of copper oxygen  
bond in Cuprite.  
Courtesy of Arizona  
State University



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in variable pressure mode

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and biology using EFTEM with  
integrated OMEGA

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