X-ray mapping of exsolved Fe-Ti oxide from a nepheline syenite (Ontario, Canada). Fine-scale spatial features can be discerned, revealing precise and accurate elemental distribution.

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European Microbeam Analysis Society

EMAS 2019

16th EUROPEAN WORKSHOP on MODERN DEVELOPMENTS AND APPLICATIONS IN MICROBEAM ANALYSIS

19 to 23 May 2019 at the NTNU, Realfagbygget Trondheim, Norway

Organised in collaboration with: Norwegian University of Science and Technology (NTNU)
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**Welcome Address by the Chairperson of the Local Organising Committee**

Dear Participant,

On behalf of the Local Organising Committee I have pleasure in inviting your company to participate in EMAS 2019, the 16th European Workshop on Developments and Applications in Microbeam Analysis, which will be held at the Realfagbygget (Natural Science building) of the Norwegian University of Science and Science (NTNU), Trondheim, Norway.

Trondheim is a famous Middle Age’s city in the centre of Norway with one of the most famous attractions being the Nidaros Dome and the river Nidelva running through the city centre. The river is famous for its good salmon fishing, which also takes place in the city centre and in June one sometimes can see and hear salmon jumping while enjoying refreshments in the local pubs. The Nidaros Dome is built from soapstone and is the most famous attraction in Trondheim. Trondheim is also situated right next to the large Trondheimsfjord, which hosts a rich population of fish and wild life such as small whales (porpoise) or even white tailed eagles.

The River Nidelva is situated quite close to the hotel accommodation and walking paths follow the river all the way through the city, from the famous wooden buildings in the city centre through the forest and the big dam of “Nedre Leirfossen”.

Though Trondheim is a medium sized city (190 464 inhabitants) it is closely surrounded by wild natural resorts, including Bymarka and Estenstadmarka, that are used for cross-country skiing in the winter (October/November-April/May) and hiking in the summer. The resorts host many of the common North Scandinavian animals, such as moose and small predators like lynx and foxes. The resort can be reached in less than 20 minutes by bus or train from the city centre.

We look forward to welcoming you to a scientific programme, which, in addition to the traditional fields, also includes techniques that are undergoing rapid development, such as micro-XRF and EBSD. You travelled from far away to Trondheim to meet your colleagues and to present your scientific highlights, for discussing problems and for starting new collaborations. The framework of the scientific exchange is given by the programme of the workshop, which covers a diversity of subjects starting on the first day with the a full day session on EBSD, which has undergone substantial new developments in recent years, followed by automated mineralogy, followed by a session about complimentary techniques with advanced combination of analytical techniques, automated mineralogy, X-ray fluorescence techniques, and finally recent advances and state of the art application of EPMA techniques.

Such a great event needs an engagement of active members of the Society. Firstly the Local Organising and International Scientific Committees would like to acknowledge Luc Van’t dack for the excellent support of setting up this workshop. His help was essential to the organisation of this well-prepared event.
We are grateful to the invited speakers who agreed to contribute to this workshop by giving talks and preparing a manuscript for the Book of Tutorials and Abstracts. One thing that we look particularly forward to is the traditional round-table discussions where the auditorium can contribute in a dialog with the invited speakers leaded by experts in the specific field.

I am also indebted to the exhibitors who will present the latest developments in scientific instrumentation and software in the exhibition area. Many of the companies are sustaining members of the society. With their support the society can continue its successful work. Special thanks are given to the sponsors of this event.

You are the actors of the success of the workshop as well. I encourage you to exchange your scientific problems and ideas with your international colleagues even if it is in front of the posters, during lunch or in the evening drinking a glass of wine or beer.

Bjørn E. Sørensen
Chair of EMAS 2019
**EMAS President’s Address**

As President of the European Microbeam Analysis Society it gives me great pleasure to welcome you all to Trondheim. This, the 16th EMAS European Workshop, is notable for several reasons: It is the first time that EMAS has visited Norway; it is the most northerly workshop we have held to date; and, since I will be stepping down at the AGM at this meeting, it is the last workshop that I will welcome as President of the Society. We are very grateful to our hosts, the NTNU, for giving us this opportunity to come to this beautiful part of the world. Scandinavia has a very active and knowledgeable microanalysis community and I look forward to some excellent presentation and discussions from both our local and international participants. I hope this is the first of many such workshops here.

I am delighted to welcome Rhonda Stroud, the President of the US MicroAnalysis Society (MAS), and Angus Netting the President of the Australian Microbeam Analysis Society (AMAS), as invited speakers. I also welcome the MAS and AMAS students, both of whom have won awards to be invited to present their work at this meeting. Our 3 societies maintain very strong ties, and we are able to offer significant and prestigious awards to the students at this meeting: the best presenter of the Young Scientists’ Session will receive an invitation to present at the 2020 M&M Meeting in the US, and the winner of the Student Poster Prize an invitation to the next AMAS conference in Australia. Both awards include free registration and travel support from the host society.

Finally, on behalf of the EMAS Board, I would like to thank to all those involved in organising this workshop, in particular Luc Van’t dack, our Society workshop organiser, and Bjørn Sørensen, the chair of both the Local Organising and International Scientific Committees. The Society is also indebted to our sustaining members, many of whom are exhibiting at the workshop, and to those who have provided direct sponsorship for the meeting. Without their generous support the registration costs would have been significantly higher.

The EMAS Workshops are an opportunity to catch up with old friends, make new friends, and learn new things in pleasant surroundings and company. I wish you an enjoyable and fruitful week in Trondheim.

Michael B. Matthews
EMAS President
European Microbeam Analysis Society

Board

President: Michael B. Matthews
AWE Plc.
Reading RG4 9NH, Great Britain
tel: +44-1189-82.42.19  fax: +44-1189-82.72.06
e-mail: matthm@hotmail.com

Vice-President: Xavier Llovet
Universitat de Barcelona, Centres Científics i Tecnològiques (CCiT)
C/ Lluís Solé i Sabaris 1-3, 08028 Barcelona, Spain
tel: +34-93-402.13.53  fax: +34-93-402.13.98
e-mail: xavier@ccit.ub.edu

Treasurer: Enrico Langer
Technical University of Dresden, Institut für Festkörperphysik
Helmholtz Strasse 10, 01062 Dresden, Germany
tel: +49-351-46.33.31.16  fax: +49-351-46.33.34.57
e-mail: langer@physik.tu-dresden.de

Secretary: Fernanda Guimarães
Laboratório Nacional de Energia e Geologia, I.P., Laboratório Ciência e Tecnologia Mineral
Rue da Amieira, P.O. Box 1089, 4466-956 S. Mamede de Infesta, Portugal
tel: +351-22-040.00.41  fax: +351-22-951.40.40
e-mail: fernanda.guimaraes@lneg.pt

Education officer: Stuart L. Kearns
University of Bristol, School of Earth Sciences
Queen’s Road, Bristol BS8 1RJ, Great Britain
tel: +44-117-331.50.04  fax: +44-117-925.33.85
e-mail: stuart.kearns@bristol.ac.uk

Communication officer: Philipp Pöml
European Commission, JRC Directorate G - Nuclear Safety and Security
P.O. Box 2340, 76125 Karlsruhe, Germany
tel: +49-7247-95.18.67  fax: +49-7247-95.19.98.67
e-mail: philipp.poeml@ec.europa.eu
Members:

François Brisset
Université Paris-Sud XI, Institut de Chimie Moléculaire et des Matières d’Orsay
15, rue Georges Clémenceau, bât. 410, 91405 Orsay Cedex, France
tel: +33-1-69.15.54.30  fax: +33-1-69.15.47.97
e-mail: francois.brisset@u-psud.fr

Miran Čeh
Jozef Stefan Institute, Dept. Nanostructured Materials, Centre for Electron Microscopy
Jamova cesta 39, 1000 Ljubljana, Slovenia
tel: +386-1-477.33.41  fax: +386-1-477.32.21
e-mail: miran.ceh@ijs.si

Hans Dijkstra
Thermo Fisher Scientific BV
Takkebijsters 1, 4817 BL Breda, The Netherlands
tel: +31-76-572.48.40  fax: +31-76-581.09.61
e-mail: hans.dijkstra@thermofisher.com

Ery C. Hughes (student representative)
30 Spinney Lane, Welwyn AL6 9TF, Great Britain
tel: +44-7906-11.19.45  fax: +44-117-925.33.85
e-mail: ery.c.hughes@gmail.com

Silvia Richter
R.W.T.H. Aachen, Gemeinschaftslabor für Elekronenmikroskopie (GFE)
Ahornstrasse 55, 52074 Aachen, Germany
tel: +49-241-8052.43.48  fax: +49-241-802.23.13
e-mail: richter@gfe.rwth-aachen.de

Bjørn Eske Sørensen
Norwegian University of Technology and Science (NTNU), Department of Geoscience and Petroleum
Sem Seelandsveg 1, NO-7491, Trondheim, Norway
tel: +47-73-59.68.33
e-mail: bjorn.sorensen@ntnu.no

Giovanni Valdrè
Università di Bologna, Dipto. Scienze Biologiche, Geologiche e Ambientali
Piazza di Porta San Donato 1, 40126 Bologna, Italy
tel: +39-051-209.49.43  fax: +39-051-209.49.04
e-mail: giovanni.valdre@unibo.it

Luc Van't dack
University of Antwerp, Department of Chemistry, Research group PLASMANT
Campus Drie Eiken, Universiteitsplein 1, 2610 Antwerpen-Wilrijk, Belgium
tel: +32-3-265.23.43  fax: +32-3-265.23.43
e-mail: luc.vantdack@uantwerpen.be

Jack Vermeulen (sustaining member representative)
Micro to Nano
Wateringweg 79, 2031 EK Haarlem, The Netherlands
tel: +31-85-201.31.55
e-mail: jack.vermeulen@microtonano.com
**EMAS Honorary members**

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Armigliato †</td>
<td>Bologna (IT)</td>
<td>J.-L. Pouchou</td>
<td>Bénéjacq (FR)</td>
</tr>
<tr>
<td>G.F. Bastin †</td>
<td>Heerlen (NL)</td>
<td>M. Procop</td>
<td>Berlin (DE)</td>
</tr>
<tr>
<td>A. Boekestein</td>
<td>Malden (NL)</td>
<td>S.J.B. Reed</td>
<td>Cambridge (GB)</td>
</tr>
<tr>
<td>R. Castaing †</td>
<td>Orsay (FR)</td>
<td>L. Reimer †</td>
<td>Münster (DE)</td>
</tr>
<tr>
<td>J. Cazaux †</td>
<td>Reims (FR)</td>
<td>R. Rinaldi</td>
<td>Perugia (IT)</td>
</tr>
<tr>
<td>P. Duncumb</td>
<td>Cambridge (GB)</td>
<td>F. Salvat</td>
<td>Barcelona (ES)</td>
</tr>
<tr>
<td>R. Gauvin</td>
<td>Montréal (CA)</td>
<td>P.J. Statham</td>
<td>High Wycombe (GB)</td>
</tr>
<tr>
<td>F. Grillon †</td>
<td>Evry (FR)</td>
<td>L. Van’t dack</td>
<td>Antwerp (BE)</td>
</tr>
<tr>
<td>P. Karduck</td>
<td>Linnich (DE)</td>
<td>C.T. Walker</td>
<td>Swinderby (UK)</td>
</tr>
<tr>
<td>J.L. Lábár</td>
<td>Budapest (HU)</td>
<td>H.W. Werner</td>
<td>Waalre (NL)</td>
</tr>
<tr>
<td>G. Love</td>
<td>Bath (GB)</td>
<td>D.B. Williams</td>
<td>Bethlehem (US)</td>
</tr>
<tr>
<td>R.B. Marinenko</td>
<td>Gaithersburg (US)</td>
<td>A.W. Witmer †</td>
<td>Eindhoven (NL)</td>
</tr>
</tbody>
</table>

**EMAS Medal for Services to the Society**

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>W.A.P. Nicholson</td>
<td>GB</td>
</tr>
<tr>
<td>2003</td>
<td>J. Wernisch</td>
<td>AT</td>
</tr>
<tr>
<td>2008</td>
<td>P.A. von Rosenstiel</td>
<td>DE</td>
</tr>
<tr>
<td>2009</td>
<td>E. Heikinheimo</td>
<td>FI</td>
</tr>
<tr>
<td>2010</td>
<td>R. Gijbels</td>
<td>(BE)</td>
</tr>
<tr>
<td>2011</td>
<td>R. Rinaldi</td>
<td>(IT)</td>
</tr>
<tr>
<td>2013</td>
<td>O. Dugne</td>
<td>(FR)</td>
</tr>
<tr>
<td>2015</td>
<td>L. Van’t dack</td>
<td>(BE)</td>
</tr>
<tr>
<td>Name</td>
<td>Address</td>
<td>Phone</td>
</tr>
<tr>
<td>-----------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Advanced Microbeam, Inc.</td>
<td>4217C Kings Graves Road, P.O. Box 610 OH-44473 Vienna, Ohio</td>
<td>+1-330-394.12.55</td>
</tr>
<tr>
<td>EDAX BV</td>
<td>Ringbaan Noord 103, P.O. Box 4144 5004 JC Tilburg The Netherlands</td>
<td>+31-13-536.40.00</td>
</tr>
<tr>
<td>Agar Scientific Ltd.</td>
<td>M11 Business Link, Parsonage Lane, unit 7 Stansted CM24 8GF Great Britain</td>
<td>+44-1279-81.35.19</td>
</tr>
<tr>
<td>EO Elektronen-Optik-Service GmbH</td>
<td>Zum Lonnenhohl 46 44319 Dortmund Germany</td>
<td>+49-231-722.11.22</td>
</tr>
<tr>
<td>eumeX Instrumentebau GmbH</td>
<td>Haidering 7 65321 Heidenrod Germany</td>
<td>+49-6124-8707</td>
</tr>
<tr>
<td>Cameca SA</td>
<td>29, quai des Grésillons 92622 Gennevilliers Cédex France</td>
<td>+33-1-43.34.62.00</td>
</tr>
<tr>
<td>Carl Zeiss Microscopy GmbH</td>
<td>Carl Zeiss Promenade 10 07745 Jena Germany</td>
<td>+49-3641-64.39.49</td>
</tr>
<tr>
<td>iXRF Systems, Inc.</td>
<td>3019 Alvin DeVane Boulevard, suite 130 TX-78741 Austin, Texas U.S.A.</td>
<td>+1-512-386.61.00</td>
</tr>
</tbody>
</table>
EUROPEAN MICROBEAM ANALYSIS SOCIETY
SUSTAINING MEMBERS

JEOL Europe BV
Planet II, bldg. B, Leuvenseesteenweg 542
1930 Zaventem
Belgium
tel:  +32-2-720.05.60
fax:  +32-2-720.61.34
www.jeolbenelux.com/

SAMx SA
2 rue Eugène Pottier
78190 Trappes en Yvelines
France
tel:  +33-1-76.78.36.94
fax:  +33-1-30.50.60.96
www.samx.com/

Micro to Nano
Wateringweg 79
2031 EK Haarlem
The Netherlands
tel:  +31-85-201.31.55
www.microtonano.com/

Target-Messtechnik
G.-Hauptmann Strasse 15
48653 Coesfeld-Lette
Germany
tel:  +49-2546-934.49.90
fax:  +49-2546-93.40.94
www.target-messtechnik.de/

NanoMegas sprl
Blvd. Edmond Machtens 79 b22
1080 Molenbeek-Saint-Jean
Belgium
tel:  +32-2-346.56.37
www.nanomegas.com/

Technoorg Linda Ltd.
Ipari Park utca 10
1044 Budapest
Hungary
tel:  36-1-479.06.08
fax:  36-1-322.40.89
www.technoorg.hu/

Oxford Instruments NanoAnalysis
Halifax Road
High Wycombe HP12 3SE
Great Britain
tel:  +44-1494-44.22.55
fax:  +44-1494-52.41.29
www.oxford-instruments.com/

Ted Pella, Inc.
4595 Mountain Lakes Blvd.
CA-96003-1448 Redding, California
U.S.A.
tel:  +1-530-243.22.00 ext. 205
fax:  +1-530-243.37.61
www.tedpella.com/

Probe Software, Inc.
885 Crest Drive
OR-97405 Eugene, Oregon
U.S.A.
tel:  +1-541-343.34.00
fax:  +1-541-485.79.01
www.probesoftware.com/

TESCAN ORSAY HOLDING, a.s.
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62300 Brno
Czech Republic
tel:  +420-5-47.13.04.11
fax:  +420-5-47.13.04.15
www.tescan.cz/
Thermo Fisher Scientific BV
Takkebijsters 1
4817 BL Breda
The Netherlands
tel: +31-76-572.48.40
fax: +31-76-581.09.61
www.thermo.com/microanalysis

York Probe Sources Ltd.
Northminster Business Park, Unit 1C
York YO26 6QU
Great Britain
tel: +44-1904-79.99.00
www.yps-ltd.com/
**International Scientific Committee**

Kurt Aasly                                          Norway
François Brisset                                    France
Maarten Broekmans                                   Norway
Miran Čeh                                           Slovenia
Hans Dijkstra                                       The Netherlands
Kristian Drivenes                                  Norway
Fernanda Guimarães                                  Portugal
Jarle Hjelen                                        Norway
Stuart L. Kearns                                    Great Britain
Enrico Langer                                       Germany
Xavier Llovet                                       Spain
Michael B. Matthews                                 Great Britain
Philipp Pöml                                        Germany
Silvia Richter                                      Germany
Bjørn E. Sørensen (chair)                            Norway
Giovanni Valdrè                                     Italy

**Local Organising Committee**

Wenche Finseth
Morten P. Raanes
Bjørn E. Sørensen (chair)
Luc Van’t dack
**Exhibitors**

- Ametek GmbH, EDAX Business Unit  
  Rudolf-Diesel Strasse 16  
  64331 Weiterstadt, Germany

- Ametek, Cameca Business Unit  
  29 quai des Grésillons  
  92622 Gennevilliers, France

- Bruker Nano GmbH  
  Am Studio 2D  
  12439 Berlin, Germany

- JEOL (Germany) GmbH  
  Gute Änger 30  
  85356 Freising, Germany

- Micro to Nano  
  Wateringweg 79  
  2031 EK Haarlem, The Netherlands

- Probe Software, Inc.  
  885 Crest Drive  
  97405 Eugene, OR, U.S.A.

NordicNano Solutions AB  
Fajansvägen 48  
23840 Oxie, Sweden
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  92622 Gennevilliers, France

- European Commission, JRC Directorate G
  - Nuclear Safety and Security
  P.O. Box 2340
  76125 Karlsruhe, Germany

- Norwegian University of Science and Technology (NTNU)
  Trondheim, Norway

- Probe Software, Inc.
  885 Crest Drive
  97405 Eugene, OR, U.S.A.
## PROGRAMME

### Sunday 19 May 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
</table>
| 09.00 - 13.00 | **Short course: Introduction to EBSD - part I.**  
François Brisset (University of Paris-Sud, Institut de Chimie Moléculaire et des Matériaux d'Orsay, Orsay, France)  
Jarle Hjelen (Norwegian University of Science and Technology (NTNU), Department of Materials Science and Engineering, Trondheim, Norway)  
Bjørn E. Sørensen (Norwegian University of Science and Technology (NTNU), Department of Geoscience and Petroleum, Trondheim, Norway) |
| 14.00 - 18.00 | **Short course: Introduction to quantitative EDS X-ray microanalysis.**  
Stuart L. Kearns (University of Bristol, School of Earth Sciences, Bristol, Great Britain) |
| 14.00 - 18.00 | **Short course: Quantitative compositional mapping by EPMA - An introduction to XMapTools software.**  
Pierre Lanari (University of Bern, Institute of Geological Sciences, Bern, Switzerland) |
| 14.00 - 18.00 | **Short course: Introduction to transmission electron microscopy (TEM).**  
Randi Holmestad (Norwegian University of Science and Technology (NTNU), Department of Physics, Trondheim, Norway) |
<p>| 19.00 - 20.00 | Registration                                                              |
| 20.00 - 22.00 | Informal reception hosted by the International Scientific Committee and the Local Organising Committee |</p>
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.00</td>
<td>Welcome and opening address</td>
<td>Michael B. MATTHEWS (President of EMAS)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bjørn Eske SØRENSEN (EMAS 2019 Workshop chairperson)</td>
</tr>
<tr>
<td>09.15</td>
<td>About the reliability of EBSD measurements: Data enhancement.</td>
<td>Gert NOLZE (Federal Institute for Materials Research and Testing (BAM), Department 5 - Materials Engineering, Berlin, Germany)</td>
</tr>
<tr>
<td>10.00</td>
<td>A dictionary indexing approach for EBSD.</td>
<td>Marc DE GRAEF (Carnegie Mellon University, Materials Science and Engineering Department, Pittsburgh, PA, U.S.A.)</td>
</tr>
<tr>
<td>10.45</td>
<td>Refreshment break / Exhibition visit</td>
<td></td>
</tr>
<tr>
<td>11.15</td>
<td>Presentation by the AMAS President: A multi-platform microanalysis approach to ore mineralogy: Advances and future prospects.</td>
<td>Angus NETTING (University of Adelaide, Adelaide Microscopy, Adelaide, SA, Australia)</td>
</tr>
<tr>
<td>11.45</td>
<td>Presentation by the AMAS Student Award Winner: From experiments to reaction mechanisms: Application of microbeam techniques to understand albisation reactions.</td>
<td>Gan DUAN (Monash University, School of Earth, Atmosphere and Environment, Clayton, VIC, Australia)</td>
</tr>
<tr>
<td>12.00</td>
<td>Lunch break / Exhibition visit</td>
<td></td>
</tr>
<tr>
<td>13.30</td>
<td>Presentation of new equipment and software by the exhibiting companies.</td>
<td>Jan-Pieter VERMEULEN (Micro to Nano, Haarlem, The Netherlands)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Xavier LLOVET (University of Barcelona, Scientific and Technological Centers (CCIT), Barcelona, Spain)</td>
</tr>
<tr>
<td>15.30</td>
<td>Oral presentations of the contributed posters: I.</td>
<td>Philipp PÖML (European Commission, JRC Directorate G - Nuclear Safety and Security, Karlsruhe, Germany)</td>
</tr>
<tr>
<td>16.30</td>
<td>Poster session I / Refreshment break</td>
<td></td>
</tr>
<tr>
<td>17.00</td>
<td>Recent features in EBSD, including new trapezoidal correction for multi-mapping.</td>
<td>Bjørn E. SØRENSEN (Norwegian University of Science and Science (NTNU), Department of Geoscience and Petroleum, Trondheim, Norway)</td>
</tr>
<tr>
<td>17.45</td>
<td>Advances in electron channelling contrast imaging and electron backscatter diffraction for imaging and analysis of structural defects in the scanning electron microscope.</td>
<td>Carol TRAGER-COWAN (University of Strathclyde, Department of Physics, SUPA, Glasgow, Great Britain)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>chairpersons: François BRISSET (University of Paris-Sud, Institut de Chimie Moléculaire et des Matériaux d’Orsay, Orsay, France)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enrico LANGER (Technical University of Dresden, Institute of Solid State Physics, Dresden, Germany)</td>
</tr>
</tbody>
</table>
PROGRAMME

Tuesday 21 May 2019

09.00 : Oral presentations of the contributed posters: II.
    chairperson: Stuart L. KEARNS (University of Bristol, School of Earth Sciences, Bristol, Great Britain)

10.00 : Poster session II / Refreshment break

10.45 : Young scientists' session.
    chairperson: Bjørn Eske SØRENSEN (Norwegian University of Technology and Science (NTNU), Department of Geoscience and Petroleum, Trondheim, Norway)

12.15 : Presentation by the MAS-USA President: Nanodiamonds from Earth to the Cosmos.
    Rhonda STROUD (Naval Research Laboratory, Materials Science and Technology Division, Nanoscale Materials Section, Washington D.C., U.S.A.)

12.45 : Presentation by the MAS-USA Student award winner: Probing the native structure and chemistry of Li-metal batteries by cryo-electron microscopy.
    Michael ZACHMANN (Oak Ridge National Laboratory, Center for Nanophase Materials Sciences, Oak Ridge, TN, U.S.A.)

13.00 : Lunch break / Exhibition visit

    Luke DALY (University of Glasgow, Dept. Geographical and Earth Sciences, Glasgow, Great Britain)

15.15 : EPMA, Raman and XANES applied for the study of oxidation processes in glass.
    Ery C. HUGHES (University of Bristol, School of Earth sciences, Bristol, Great Britain)

16.00 : Refreshment break / Exhibition visit

16.30 : New horizons in quantitative compositional mapping – Analytical conditions and data reduction using XMAPTOOLS.
    Pierre LANARI (University of Bern, Institute of Geological Sciences, Bern, Switzerland)

17.15 : Using complementary micro-analytical techniques to analyse diamond anvil cell experiments.
    Eleonor JENNINGS (University of London, Department of Earth and Planetary Sciences, London, Great Britain)

18.00 : Round-table discussion:
    * Complementary techniques.
    chairpersons: Kurt AASLY (Norwegian University of Science and Science (NTNU), Department of Geoscience and Petroleum, Trondheim, Norway)
    Hans DIJKSTRA (Thermo Fisher Scientific BV, Breda, The Netherlands)
<table>
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<tr>
<th>Time</th>
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<tr>
<td>09.00</td>
<td>Oral presentations of the contributed posters: III.</td>
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<tr>
<td></td>
<td>chairperson: Fernanda GUIMARÃES (Laboratório Nacional de Energia e Geologia, I.P., Laboratório Ciência e Tecnologia Mineral, S. Mamede de Infesta, Portugal)</td>
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<tr>
<td>10.00</td>
<td>Poster session III / Refreshment break</td>
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<tr>
<td>10.45</td>
<td>Upscaling of 2D mineralogical information to 3D volumes for geoscience applications using a multi-scale, multi-modal and multi-dimensional approach. Alan BUTCHER (Geological Survey of Finland (GTK), Geomaterials and Applied Mineralogy, Espoo, Finland)</td>
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<tr>
<td>11.30</td>
<td>Applications of automated mineralogy. Thomas AIGSPERGER (Luleå University of Technology, Div. Geosciences and Environmental Engineering, Luleå, Sweden)</td>
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<tr>
<td>12.15</td>
<td>Round-table discussion: * Automated mineralogy. Maarten A.T.M. BROEKMAN (Geological Survey of Norway, Mineral Resources / Laboratory, Trondheim, Norway)</td>
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<tr>
<td>13.00</td>
<td>Lunch break / Exhibition visit</td>
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<td>14.30</td>
<td>EMAS Annual General Meeting</td>
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<tr>
<td>15.15</td>
<td>A deeper insight into materials: Potentials and limitations of µ XRF. Roald TAGLE (Bruker Nano GmbH, Berlin, Germany)</td>
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<td>16.00</td>
<td>Refreshment / Exhibition visit</td>
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<td>16.30</td>
<td>SI traceable characterisation of nanomaterials by X-ray spectrometry. Burkhard BECKHOFF (Physikalisch-Technische Bundesanstalt (PTB), X-ray Spectrometry, Berlin, Germany)</td>
</tr>
<tr>
<td>17.15</td>
<td>Round-table discussion: * µ-X-ray fluorescence. Silvia RICHTER (RWTH Aachen, Gemeinschaftslabor für Elektronenmikroskopie (GFE), Aachen, Germany)</td>
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<tr>
<td>19.30</td>
<td>Workshop dinner at the Banksalen hall, Trondheim. Awards ceremony.</td>
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### PROGRAMME

**Thursday 23 May 2019**

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<th>Time</th>
<th>Session</th>
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<td>09:00</td>
<td><strong>Recent progresses in soft X-ray emission spectroscopy.</strong>&lt;br&gt;Masami TERAUCHI (Tohoku University, Inst. Multidisciplinary Research for Advanced Materials, Sendai, Japan)</td>
</tr>
<tr>
<td>09.45</td>
<td><strong>Spatial resolution limits of EPMA.</strong>&lt;br&gt;Ben BUSE (University of Bristol, School of Earth Sciences, Bristol, Great Britain)</td>
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<tr>
<td>10:30</td>
<td>Contribution by a Honorary Membership recipient.</td>
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<td>10.50</td>
<td>Refreshment break</td>
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<tr>
<td>11.10</td>
<td><strong>Development and validation of standardless and standards-based X-ray microanalysis.</strong>&lt;br&gt;Philippe T. PINARD (Oxford Instruments NanoAnalysis Ltd., High Wycombe, Great Britain)</td>
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<tr>
<td>11.55</td>
<td><strong>U-Th-Pb\textsubscript{total} dating of REE-phosphate by electron microprobe: Review and progress.</strong>&lt;br&gt;Julien M. ALLAZ (Eidgenössische Technische Hochschule, Institut für Geochemie und Petrologie, Zürich, Switzerland)</td>
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<tr>
<td>12.40</td>
<td>Round-table discussion:&lt;br&gt;* <strong>Electron probe microanalysis (EPMA)</strong>&lt;br&gt;chairpersons: Kristian DRIVENES (Norwegian University of Technology and Science (NTNU), Department of Geoscience and Petroleum, Trondheim, Norway)&lt;br&gt;Xavier LLOVET (University of Barcelona, Scientific and Technological Centers (CCIT), Barcelona, Spain)</td>
</tr>
<tr>
<td>13.40</td>
<td>Concluding remarks</td>
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13.30 - 15.30 : Presentation of new equipment and software by the exhibiting companies.

chairpersons: Jan-Pieter VERMEULEN (Micro to Nano, Haarlem, The Netherlands)
Xavier LLOVET (University of Barcelona, Centres Científics i Tecnològics (CCiT), Barcelona, Spain)

- EM-Tec sample holders - Interface between sample and instrument.
  Jack VERMEULEN (Micro to Nano, Haarlem, The Netherlands)

- The APEX of EDS and EBSD data collection and analysis.
  René DE KLOE (Ametek BV, EDAX Business Unit, Tilburg, The Netherlands)

- Presentation of the new SXFive-TACTIS electron probe microanalyser.
  Anne-Sophie ROBBES (Ametek, CAMECA Business Unit, Gennevilliers, France)

- Probe Software: How to improve sensitivity, accuracy and throughput in your laboratory.
  Anette VON DER HANDT. (for: Probe Software, Inc., Eugene, OR, U.S.A.)

- Bruker microanalysis product presentation.
  Michael ANDERSSON (Bruker Nordic AB, Solna, Sweden)

- Analytical application of Soft X-ray emission spectroscopy (SXES).
  Serguei MATVEEV (JEOL (Germany) GmbH, Freising, Germany)

- Powering the future of 3D materials characterisation using Xe FIB.
  Jiri DLUHOS (TESCAN ORSAY HOLDING a.s., Brno, Czech Republic)
15.30 - 16.30 : Oral presentations of the contributed posters: I.

chairperson: Philipp PÖML (European Commission, JRC Directorate G - Nuclear Safety and Security, Karlsruhe, Germany)

- Processing and indexing of electron backscatter patterns using open source software.  
  H.W. Ånes, J. Hjelen, A.T.J. van Helvoort and K. Marthinsen

- EBSD-like orientation mapping in TEM - New possibilities.  
  M. Bieda-Niemiec, K. Kudłacz, A. Jarzębska, S. Boczkal, P. Koprowski, M. Faryna and  
  K. Sztwiertnia

- 3D-EBSD analysis of grain boundary structures in copper and aluminium deformed by  
  channel die pressing.  
  P. Bobrowski and A. Tarasek

- Austenite-ferrite transformation of AISI 430 ferritic stainless steel during its  
  manufacturing.  
  I. Collado Garcia, A. Núñez Galindo, A. Ruiz Flores, J.F. Almagro Bello and J. Botana

- Characterisation of super duplex stainless steel by optimisation of EBSD parameters.  
  M. Haukali, I. Westermann, M. Karlsen, Y. Yu, R. de Kloe and J. Hjelen

- Using ECCI and EBSD to study the microstructure of hardmetals.  
  B.M. Jablon, K. Mingard, G. Naresh-Kumar and C. Trager-Cowan

- Analysis of the polycrystalline microstructure of Al 3at%Mg 0.2at%Sc alloy by 3D-EBSD.  
  J. Kopeček, L. Klimša, J. Staněk, F. Seifl, V. Beneš, D. Westhoff, L. Petrich, C.E. Krill III and  
  V. Schmidt

- Strain analysis and twin domains in Phalaborwa baddeleyite characterised by EBSD,  
  RTKD and TEM.  
  M.E. Lee, W.E. Goosen and J.H. O’Connell

- Evolution of crystalline orientations in the production of ferritic stainless steel.  
  A. Núñez Galindo, I. Collado, D.L. Sales and J.F. Almagro Bello

- EBSD investigations applied to characterise the crystallographic relationships at the  
  interfaces of biocomposite mollusc shells.  
  M. Strag, M. Bieda-Niemiec, K. Berent, K. Nalepka, A. Jarzębska, A.G. Checa and K. Sztwiertnia
09.00 - 10.00 : Oral presentations of the contributed posters: II.

chairperson: Stuart L. KEARNS (University of Bristol, School of Earth Sciences, Bristol, Great Britain)

- Application of the adjoint method in gradient-based optimisation to the M1-model in electron beam microanalysis.
  T. Claus, J. Bünger, S. Richter and M. Torrilhon

- Characterisation of magmatic-hydrothermal tourmaline from the Land’s End granite - Going from metres to micrometres.
  K. Drivenes, W. Brownscombe, R.B. Larsen, R. Seltmann, J. Spratt and B.E. Sørensen

- Analysis of light elements in carbon-coated samples using soft X-ray emission spectrometry: First results on lithium and boron.
  S. Goldmann and C. Wöhrl

- Matlab-based algorithm associated with the CAMECA SX100 electron microprobe for fast and precise (re-)exploration and re-measurement of documented samples.
  J. Haifler and R. Škoda

- Molybdenum homogenisation in γ-U(Mo) alloy atomized particles.
  X. Iltis, V. Klosek, R. Belin, K. Hanifi, E. Suard, J. Drnec and H. Palancher

- Silicon drift detector incorporated into a wavelength-dispersive X-ray spectrometer (SD-WDS) – Allowing bremsstrahlung determination by theoretical calculation.
  K. Moran and R. Wuhrer

- XRD and EPMA characterisation of serpentinite from Tuscany (Italy).
  A.P. Santo, E. Pecchioni and C.A. Garzonio

- Calibration device for accurate current measurement on a CAMECA SX100 EPM.
  B. Vos and A. Leenaers

- Electron probe microanalysis of non-safety tested and safety tested irradiated TRISO AGR-2 nuclear fuel.
  K.E. Wright and I. Van Rooyen
10.45 - 12.15: Young Scientists’ Session.

chairperson: Bjørn Eske SØRENSEN (Norwegian University of Technology and Science (NTNU), Department of Geoscience and Petroleum, Trondheim, Norway)

- Local tetragonality of martensite investigated by EBSD.
  Grzegorz Cios, A. Winkelmann, G. Nolze, T. Tokarski and P. Bała (AGH - University of Science and Technology, Krakow, Poland)

- Austenite-ferrite transformation of AISI 430 ferritic stainless steel during its manufacturing.
  Irene Collado Garcia, A. Núñez Galindo, A. Ruiz Flores, J.F. Almagro Bello and J. Botana (University of Cádiz, Laboratorio de Corrosión y Protección, ESI, Puerto Real, Spain)

- Identification of crystal structures and elemental composition of reactive air-brazed Ba$_{0.5}$Sr$_{0.5}$Co$_{0.8}$Fe$_{0.2}$O$_3$-$\Delta$-Ag-14CuO joints by EBSD, EPMA and analytical TEM.

- In situ SEM study of lithium metal batteries.
  Maryam Golozar, H. Demers, R. Gauvin and K. Zaghib (McGill University, Department of Mining and Materials Engineering, Montreal, Québec, Canada)

- Analysis of oxide scales on oxidised AISI 441 ferritic stainless steel catalyst support by scanning electron microscopy.
  Pablo Navarro Vicente, A. Nuñez Galindo, J.F. Almagro Bello and J.A. Odriozola (Acerinox S.A., Departamento I+D+I, Los Barrios, Spain)

- Automated orientation imaging and phase mapping in the TEM: Detection limits for reliable martensite identification in steel.
  Jonas Werner and T.E. Weirich (RWTH Aachen, Central Facility for Electron Microscopy, Aachen, Germany)
09.00 - 10.00 : Oral presentations of the contributed posters: III.

chairperson: Fernanda GUIMARAES (Laboratório Nacional de Energia e Geologia, I.P., Laboratório Ciência e Tecnologia Mineral, S. Mamede de Infesta, Portugal)

- Ga FIB/TOF-SIMS analysis of lithium materials.
  S. Bessette, M. Golozar, P. Hovington, R. Gauvin and K. Zaghib

- Versatility of X-ray microanalysis in examinations of forensic cases.
  Z. Brożek-Mucha

- An X-ray micro-fluorescence spectrometry analysis for determination of bromine content in alkaline rocks.
  C.F. Faranda, I. Di Carlo, B. Scaillet and J. Andujar

- Characterisation of Li-ion batteries by combined LM, CT, EDS, WDS and SIMS using helium-ion microscopy (Carl Zeiss Orion).
  U. Golla-Schindler, F. Khanom, D. Zeibig, A. Casares, P. Gnauck, T. Bernthaler and G. Schneider

- Measurement of elemental composition of FeNi and SiGe alloy thin films by EPMA and µ-XRF.
  V.-D. Hodoroaba, R. Terborg, S. Boehm and K.J. Kim

- Characterisation of precipitates in a 12 % Cr tempered martensite ferritic steel.
  G. Marx, W.E. Goosen and J.E. Westraadt

- Characterisation of carbide-reinforced composite surface layers on a ductile cast iron.
  K. Matus and D. Janicki

- Characterising nanowire arrays by computer vision based on SEM images.
  A.B. Mosberg, D. Ren, S. Myklebost, H. Weman, B.-O. Fimland and A. van Helvoort

- TEM characterisation and Raman spectroscopy of vitrinite.

- TEM studies on Fe-Co-B soft magnetic melt spun ribbons.
  A. Wojcik, W. Maziarz, M. Kowalczyk, J. Ferenc, P. Zackiewicz and A. Kolano-Burian
X-ray mapping of exsolved Fe-Ti oxide from a nepheline syenite (Ontario, Canada). Fine-scale spatial features can be discerned, revealing precise and accurate elemental distribution.

Benchmark analytical performance in complex Mo-Ni-Re ternary alloys thanks to:
- High reproducibility, high sensitivity WDS
- High resolution imaging
- Low electron beam energy for accurate quantitative analysis of small phases

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