

News May 2018

CEM4MAT is a research infrastructure platform in the Stockholm/Uppsala region. The platform has been initiated by three universities and one research institute building on the existing huge expertise in Transmission Electron Microscopy (TEM) in Materials Sciences.



Gunnar Svensson, Project Director, CEM4MAT

CEM4MAT organizes PhD-course in Advanced TEM Spectroscopy and Tomography

The nodes in CEM4MAT have identified a need for advanced PhD-courses in transmission electron microscopy. To fill this gap a 5 hp PhD course is given during April-June 2018. The aim of the course is threefold: (i) to provide PhD students in the Stockholm-Uppsala region with deeper theoretical and practical knowledge in spectroscopic and tomographic techniques in the transmission electron microscope (TEM), (ii) to build a community of TEM-users in the region, and (iii) to maximize the usability of the newly acquired TEMs in UU and SU. The course is given by expert



scientists in different fields of electron microscopy, spectroscopy, and diffraction working in UU, SU, and KTH. The lectures are being held in the three nodes, i.e., at the Ångströmlab, Arrheniuslab, and Elektrum. A total of six students working within different topics in materials science enrolled in the course (4 UU, 1 SU, 1 KTH). The course was designed in a modular fashion so as to be able to expand it into a TEM school. This can be possible through a collaboration with other TEM courses in the country given by other strong centers, such as those in Lund, Linköping, and Gothenburg.

Workshop on microplastic pollution

On 17th of May CEM4MAT and the EU financed Horizon 2020 project CLAIM arrange a workshop “Ocean micro and macro litter pollution – Problems and solutions” in Elektrum laboratory, Kista, room Ka-Sal C (Sal Sven-Olof Öhrvik).

Program:

- 09:00-09:20 Microplastics and the effects on the marine ecosystem – Marco Faimali, CNR, Italy
- 09:20-09:40 Modelling tools for managing micro and macro litter pollution – Jun She, DMI, Denmark
- 09:40-10:00 Plastics- challenges in reducing marine pollution – Joydeep Dutta, KTH, Sweden
- 10:00-10:20 Current technologies in the market that address micro and macro litter pollution – P.J.H. van Beukering, VU, Netherlands
- 10:20-10:35 Importance of engaging citizen and stakeholders to address marine litter - Iliyana Kuzmova, Pensoft, Bulgaria
- 10:35-10:50 Cleaning Litter by developing and Applying Innovative Methods in european seas – Nikoleta Bellou, HCMR, Greece
- 10:50-11:05 CEM4MAT – Gunnar Svensson, Stockholm University, Sweden
- 11:05-11:25 Structure-Property Relationship Analysis of Industrial Grades of Microfibrillated Cellulose – Anastasiia Riazanova, KTH, Sweden
- 11:25-11:45 Electron Microscopy for particle analysis – Kjell Jansson, Stockholm University, Sweden
- 11:45-12:05 Electron tomography – visualizing materials in 3D – Tom Willhammar, Stockholm University, Sweden
- 12:05-12:20 Measuring on materials and particles in the transmission electron microscope – Klaus Leifer, Uppsala University, Sweden
- 12:20-12:40 Mistra TerraClean – smart materials for clean air and water – Ulrica Edlund, KTH, Sweden

Study visit at Sandvik Coromant

CEM4MAT board and application specialists from SU, UU, KTH, Swerea KIMAB, Vironova and Sandvik Machining Solutions visited the Sandvik Coromant R & D centre in Västberga 16 January 2018. Host was Henrik Strandlund. He and his colleagues presented very interesting examples of research and development made at the site, with a focus on materials characterization using electron microscopy based techniques. The presentations were followed by a lab tour. Guides were former colleagues from the nodes of CEM4MAT now at Sandvik Coromant. After lunch, the CEM4MAT - board had their board meeting in a conference room. The CEM4MAT-board and the application specialists want to express their gratitude to the well-organised study visit and the hospitality from Sandvik Coromant.

Board meeting at KTH Electrum

20 April the board had a meeting hosted by Prof. Joydeep Dutta at KTH. Several things were discussed. We decided to continue our visits with board meetings combined with application specialist visits at different EM-labs. The next combined meeting is planned to be at Sandvik Materials Technology in Sandviken in September this autumn. The board is very thankful for this possibility.

Report from the Inauguration of the new TEM in Lund

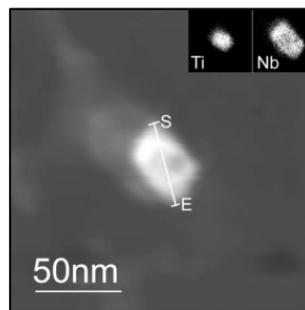
Representatives from several of the CEM4MAT nodes visited the inauguration of the new in situ TEM in Lund 12 april 2018. Gunnar Svensson presented CEM4MAT and the TEM facilities at Stockholm University and Uppsala University and Jonas Weissenrieder the time resolved TEM at KTH Royal Institute for Technology. At the inauguration Gunnar Svensson and Jonas Weissenrieder had a meeting with colleagues from the materials-oriented EM-centers in Lund, Chalmers and Linköping to discuss a joint application for ARTEMI to VR if the possibility is given.

Planned activities 2018

- 17 May: Workshop in Kista.
- 31 May – 1 June: Representatives from CEM4MAT will participate in a TEM Lab management seminar in Trondheim, Norway.
- Visit at Sandvik Materials Technology in Sandviken in September.
- Visit to one of the other material oriented electron microscopy centres in Sweden, e.g. Chalmers, Lund or Linköping.



A new TEM will soon be installed in the Arrhenius laboratory at Stockholm University. The room where it will be placed are slowly appearing in the old chemistry library. The photo shows among others the concrete foundation, the aluminium sheets for the Faradays cage and cables for the field cancellation system. The delivering date for the instrument is planned to the beginning of June.



TEM image of a titanium niobium carbo-nitrate precipitate. EDS-chemical maps are inserted and here it is seen that the core of the particle is rich in titanium while on the outer parts niobium.signal is high. (Image from Fredrik Lindberg, Swerea KIMAB.)

CEM4MAT's Vision

Electron microscopy centre with excellent research infrastructure - open and accessible to all.