WORKSHOP PROGRAM

MONDAY 6 MARCH 2017

9:30 - 10:30	Opening by **Prof.dr. Nico Sommerdijk**	STW 2.91
	TEM in Soft Materials Science	
10:30 - 10:45	Break	
10:45 - 12:30	Lecture by **Dr. Maarten Wirix**	STW 2.91
	Principles and technical applications of Cryo-TEM	
12:30 - 13:30	Lunch	STO 2.30
13:30 - 17:00	Instruction Cryo-TEM	STW 0.13

TUESDAY 7 MARCH 2017

9:30 - 12:30	Hands on: Cryo-TEM	STW 0.13
12:30 - 13:30	Lunch	STO 2.30
13:30 - 17:00	Hands on: Cryo-TEM	STW 0.13

WEDNESDAY 8 MARCH 2017

9:30 - 10:30	Lecture by **Dr. Heiner Friedrich**	STW 2.91
	Electron Tomography: sample preparation and data acquisition	
10:30 - 10:45	Break	
10:45 - 12:30	Demonstration: Tomography	STW 0.13
12:30 - 13:30	Lunch	STO 2.30
13:30 - 17:00	Hands on: Tomography	STW 0.13
19:00	Dinner in town	

THURSDAY 9 MARCH 2017

9:30 - 10:30	Lecture by **Dr. Maarten Wirix**	STW 2.91
	Electron Tomography Reconstruction	
10:30 - 10:45	Break	
10:45 - 12:00	Tutorial by **Dr. Karthikeyan Gnanasekaran**	STO 2.17
	3D reconstruction in IMOD	
12:00 - 13:00	Lunch	STO 2.30
13:30 - 17:00	Hands on: Tomography	STW 0.13

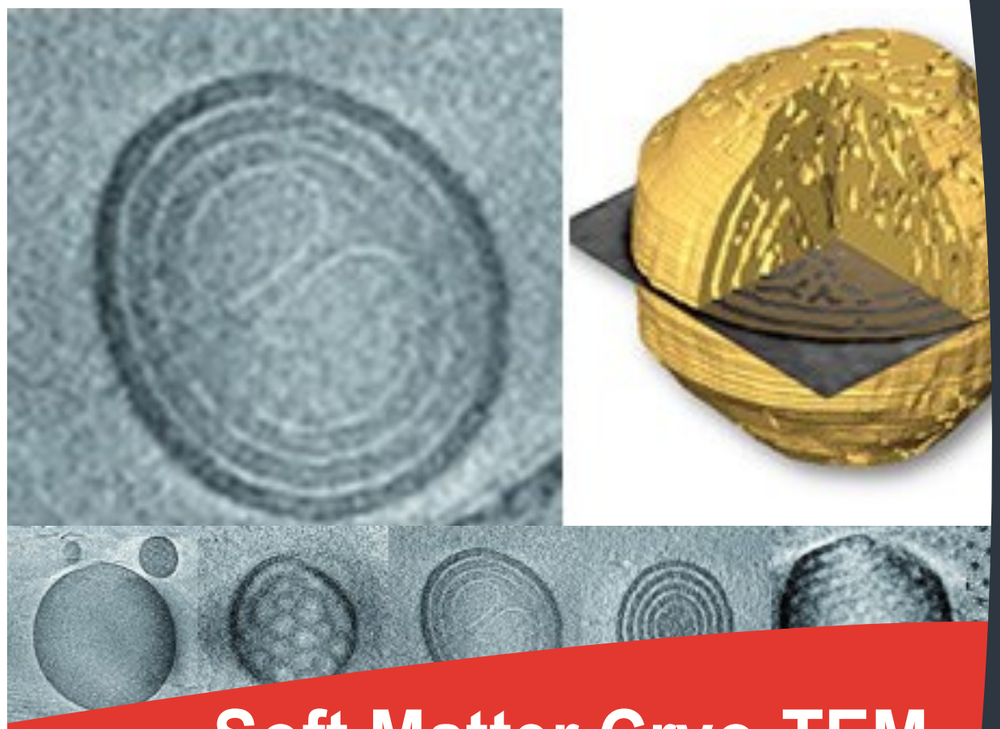
FRIDAY 10 MARCH 2017

9:30 - 9:40	Presentation by Xiaoyue Wang (McMaster University)	STW 2.91
9:40 - 10.40	Lecture by **Dr. Markus Wild**	STW 2.91
	Future plans for electron microscopy	
10:40 - 11:00	Break	
11:00 - 11:45	Lecture by **Prof.dr. Nico Sommerdijk**	STW 2.91
	Cryo-TEM in Materials Science	
11:45 - 12:30	Evaluation / Closing	STW 2.91
12:30 - 13:30	Lunch	STO 2.30
13:30	Departure	

4TU Federation
https://www.4tu.nl/en/contact/

FEI Company
Achtseweg Noord 5
5651 GG Eindhoven
The Netherlands
www.FEI.com

Eindhoven University of Technology
Laboratory of Materials and
Interface Chemistry
Helix Building STO 2.34
Het Kranenveld 14 / P.O. Box 513
5600 MB Eindhoven / The Netherlands
www.chem.tue.nl/smg
www.cryotem.com



Soft Matter Cryo-TEM

5th International Cryo-TEM Workshop
March 6th – March 10th 2017
Eindhoven, the Netherlands

Soft Matter Cryo-TEM

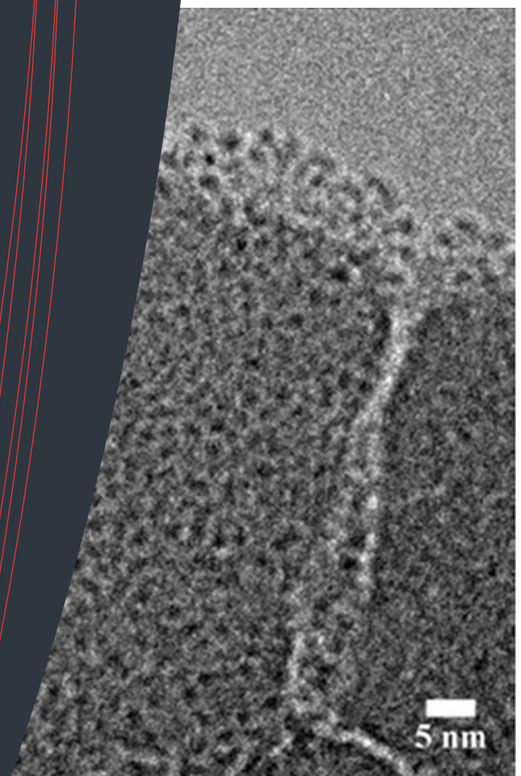
5TH INTERNATIONAL CRYO-TEM WORKSHOP 2017

Advancements in cryo-transmission electron microscopy (cryo-TEM) have made it possible to image objects from biological origin, such as viruses and proteins, now also reaching near atomic resolution. In recent years cryo-TEM is also increasingly used to investigate soft matter of synthetic origin: assemblies of organic (macro) molecules and/or inorganic nanoparticles.

Since almost a decade, Eindhoven University of Technology and FEI company have worked together at the forefront of this new field trying to advance cryo-TEM in materials science, both through developing dedicated microscopes but also through developing advanced tools and methods for sample preparation and imaging. This has allowed us to investigate a variety of soft and hybrid materials in their native hydrated state with nanometer resolution both in two and three dimensions.

Using cryo-TEM and cryo-electron tomography (3D cryo-TEM) we have revealed the structure and morphology of assemblies of surfactants, lipids and (bio)polymers in solution, as well as at interfaces. But cryo-TEM also allows us to study the interactions between organic and inorganic components, e.g. in the mineralization of collagen, generating artificial bone-like materials.

With this workshop we want to demonstrate the possibilities of cryo-TEM, and to show you how to use this powerful technique in your own research and in your own laboratory. The workshop is aimed at participants at PhD/post doc level and who are experienced in basic microscopy and who wish to extend their knowledge and practical experience in 2D and/or 3D cryo-imaging. The workshop will consist of **lectures** from experts, but also of extensive practical, hands-on **sessions** where you will be stimulated to investigate **samples from your own research**.

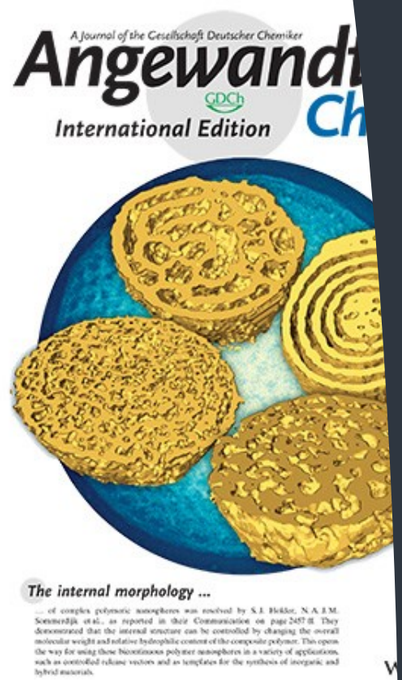


PROGRAM HIGHLIGHTS

- **TEM OF SOFT MATTER: WHY CRYO-TEM?**
- **SAMPLE PREPARATION: VITRIFICATION**
- **LOW DOSE IMAGING**
- **INTERPRETATION OF IMAGES**
- **2D VS 3D TOMOGRAPHY**
- **DATA ACQUISTION**

MICROSCOPY AND SAMPLE PREPARATION

Imaging soft matter poses a number of technical challenges related to the delicate nature of the material of interest, its low contrast in the specimens, in combination with the high vacuum and low temperature requirements for the cryo-TEM process. You will work with our microscope (TitanKrios) optimized for combined resolution and contrast as well as with our vitrification robots (Vitrobot) for efficient and reliable sample preparation.



Visualizing your samples
in their native hydrated state

CRYO-TEM SOLUTIONS

Cryo-TEM will allow you to visualize solution species in their native hydrated state, so without running the risk of introducing artifacts due to staining or drying. By plunge freeze vitrification soft matter samples, are embedded in an amorphous ice layer that fixates and stabilizes them so their structure and morphology can be studied, in principle with nanometer detail. Cryo-TEM routinely uses low-dose protocols to control the exposition of the sample to the electron beam, preventing radiation damage to the generally beam sensitive soft matter.

APPLICATION MANAGEMENT

In recent years, time resolved 2D and 3D Cryo-TEM has led to new insights in a variety of soft matter systems both in aqueous media and organic solvents. You will be shown how the horizon of cryo-TEM can be widened by developing new procedures and exploring the limits of the current sample preparation techniques.

ORGANIZATION

Prof. Nico Sommerdijk - TU/e -
n.sommerdijk@tue.nl
Phone +31 40 247 5870

Dr. Maarten Wirix - FEI Company -
maarten.wirix@fei.com
Phone: +31 (0) 6 23 51 78 51

Ben Lich - FEI Company -
ben.lich@fei.com
Phone: + 31 40 23 56 709

REGISTRATION

The registration fee is **€ 1750,-**
per person, including full program,
lunches and one dinner.
REGISTER on www.cryotem.com
Closure registration 1 February 2017.

WHEN

March 6th — March 10th 2017

WHERE

Eindhoven University of Technology
Chemical Engineering and Chemistry
Materials and Interface Chemistry
Helix Building STW 2.91 / STW 0.13
Het Kranenveld 14 / P.O. Box 513
5600 MB Eindhoven
The Netherlands