Celina Summer School

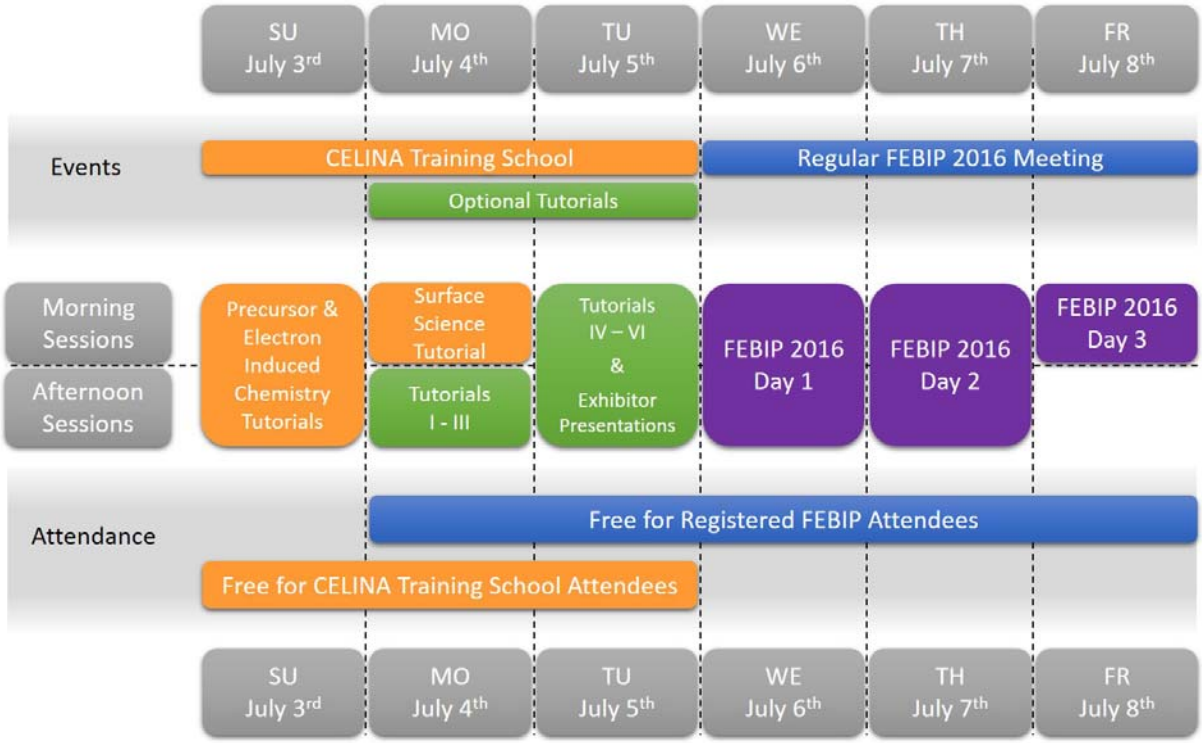
2016

July 3rd – July 5th, Vienna

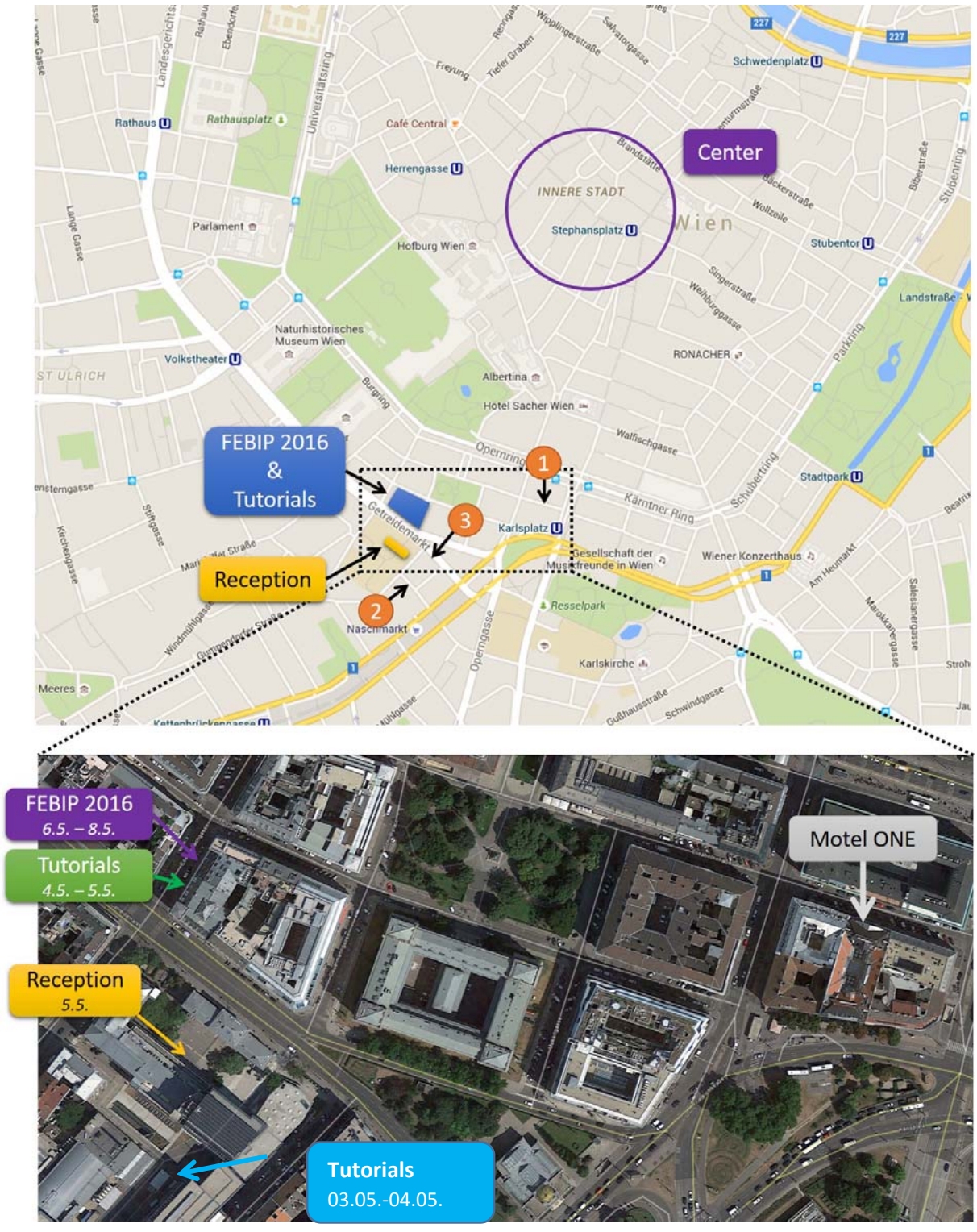
Austria

in collaboration with the FEBIP 2016 tutorials

Graphical Program Overview CELINA Training School; Tutorials and FEBIP workshop



Location Maps



Floor Plan – Getreidemarkt 9

Tutorials: July 3rd and July 4th (morning session) 2016

Meeting point on Sunday at the entrance to the underground car park at Lehargasse

Campus closed for the general public on Sunday:

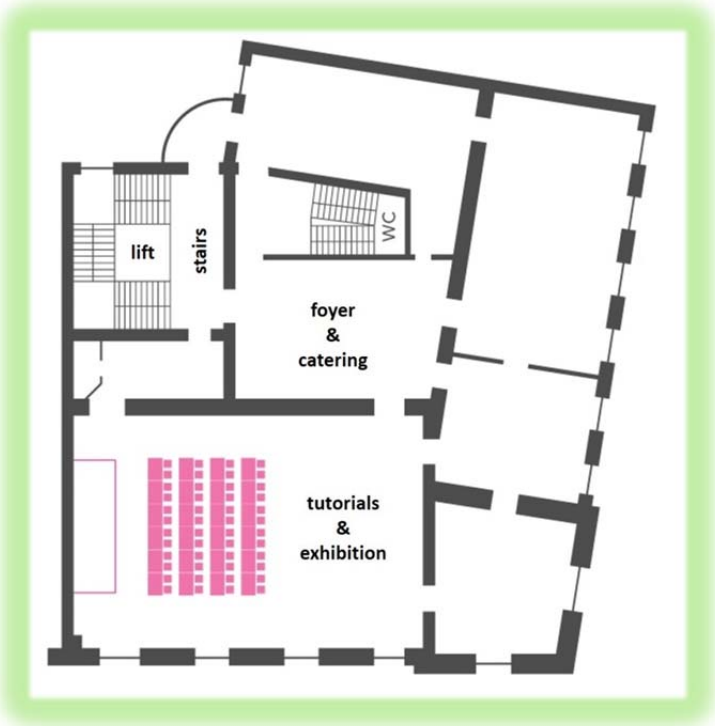
In case of delayed arrival please call Dr. Barth

(telephone number supplied by email)

Seminar room "Lehar 02"

Floor Plan – Palais Eschenbach

Tutorials: July 4th (afternoon) and July 5th 2016



Palais Eschenbach
Eschenbachgasse 11
1010 Wien, Austria

Programm – TUTORIALS

Sunday, July 3rd 2016 TUTORIAL Day 1 *Getreidemarkt 9/ Building BC*	
09:45	Meeting at Lehargasse **(entrance to the underground car park)**
09:45 – 10:00	**Tutorial - Opening**
10:30 – 12:15	**Tutorial I** **Sven Barth** (*Vienna University of Technology , Austria*) Precursor chemistry: synthesis, suitability and handling Synopsis: The lecture will cover different aspects of precursor chemistry and the determination of the general suitability for FEBIP. Prominent examples of typically used precursors and the considerations in regard to their handling procedures will be discussed.
12:15 – 13:45	Lunch break (self-catering; suggestions of eateries nearby will be provided)
13:45 – 15:00	**Tutorial II** **Sven Barth** (*Vienna University of Technology , Austria*) Precursor handling - a practical exercise Synopsis: The safe handling of metalorganic precursors using Schlenk techniques and a glove box will be demonstrated and the participants will train how to use both techniques to do simple, but necessary tasks to ensure the integrity to the precursor species.
15:00 – 15:30	Coffee Break
15:30 – 17:30	**Tutorial III** **Petra Swiderek** (*University of Bremen, Germany*) Fundamentals of electron-precursor interactions Synopsis: This tutorial will introduce participants to the fundamental electron-molecule interactions leading to molecular dissociation and will summarize the current understanding of electron-induced fragmentation of FEBID precursors.

Monday, July 4th 2016 TUTORIAL Day 2 *Getreidemarkt 9; Lehar02 / Palais Eschenbach*	
09:45 – 10:00	**Tutorial - Opening**
10:00 – 12:00	**Tutorial IV** **Petra Swiderek** (*University of Bremen, Germany*) Chemical processes in deposit formation Synopsis: A wide range of different chemical reactions is involved in the formation of deposits in FEBID. This includes beside electron-driven processes thermal and catalytic reactions. These and surface science tools to investigate them will be discussed.
12:00 – 13:00	Lunch break (self-catering) / Get Together (Palais Elschenbach)
13:00 – 14:30	**Tutorial V** **Milos Toth** (*University of Technology Sydney, Australia*) Modelling FEBIP Processes – Module I Synopsis: This tutorial will provide a step-by-step guide to public domain software for modelling of FEBIP. It is intended for researchers who need tools for helping interpret experimental data, and to design application-specific FEBIP methods and precursor molecules. Prior knowledge of FEBIP modelling is not required.
14:30 – 15:00	Coffee Break
15:00 – 16:30	**Tutorial VI** **Milos Toth** (*University of Technology Sydney, Australia*) Modelling FEBIP Processes – Module II
16:30 – 17:00	Coffee Break
17:00 – 18:00	**Tutorial VII** **Ivo Utke** (*Empa Thun, Switzerland*) Simulating Gas Flux with the GIS Simulator @ Empa Synopsis: We will present the use of a free-ware Monte Carlo based simulation program developed at Empa which calculates the distribution of gas molecules leaving a capillary and impinging on a substrate.
18:00 – 18:30	**Podium Discussion**

Tuesday, July 5th 2016 TUTORIAL Day 3 *Palais Eschenbach*	
8:00 – 8:15	Get Together
8:15 – 8:30	**Tutorial - Opening**
8:30 – 9:00	*Exhibitor Contribution* **To be announced** (*JEOL GmbH, Germany*) To be announced
9:00 – 10:15	**Tutorial VIII** **Hans J.L. Mulders** *(FEI Electron Optics Eindhoven, The Netherlands)* Technical Setup of FEBIP Instrumentation Synopsis: FEBIP experiments have a very wide parameter space. Some, such as vacuum and cleanliness, play a more important role. For consistent results it is important to apply best instrument practices and review / evaluate methods such as EDX in more detail.
10:15 – 10:45	Coffee Break
10:45 – 11:15	*Exhibitor Contribution* **Frank Nouvertne** (*RAITH GmbH, Germany*) Device Optimization by Smart Nanopatterning Strategies using Focused Electrons and Ions
11:15 – 12:30	**Tutorial IX** **Harald Plank** (*Graz University of Technology, Austria*) Patterning Procedures and their Consequences Synopsis: In this second tutorial the focus lies on the patterning details as they can strongly influence final morphologies as well as functionalities. This lecture starts with basic details such as pixel dwell times and point to point distances followed by patterning sequences and finally sheds light on the pathway to true 3D nano-printing.
12:30 – 13:30	Lunch Break (buffet provided at the tutorial location)
13:30 – 14:00	*Exhibitor Contribution* **Marcel Winhold** (*GETec Microscopy GmbH, Austria*) The AFSEM™ - Correlative *in-situ* Analysis of Nanostructured (FEBID) Materials
14:00 – 14:30	*Exhibitor Contribution* **Lars Kautschor** (*Carl Zeiss Microscopy, Germany*) Towards Sub-10 nm Nanofabrication of Plasmonic and Graphene Devices using Multiple Ion Beams
14:30 – 15:00	Coffee Break

15:00 – 15:30	*Exhibitor Contribution* **Andrew J. Smith** (Kleindiek, Germany) A Compact and Versatile Gas Injection System and Applications for IBID Combined with *in-situ* Nanoprobing in Circuit Edit
15:30 – 16:45	**Tutorial X** **Philip D. Rack** (*University of Tennessee & Oak Ridge National Laboratory, USA*) Overview of Purification Strategies for Electron Beam Induced Deposition Synopsis: In this tutorial we will overview different purification strategies and try to capture the various contributions made by researchers across the world and attempt to establish a current state of the art and present pros and cons of each technique. Finally, we will elaborate some specific work our group is working on to solve the FEBID purity issues which include laser-assisted and electron stimulated reactions.
16:45 – 18:00	**Coffee Break & Exhibition**
18:00 – 20:30	**Social Event I**
18:00 – 20:30	Opening Reception (*TU the Sky Lounge*) for FEBIP workshop