

85th IUVSTA Workshop

on

“Nanoporous Materials for Green Energy Conversion and Storage”

14 – 19 October 2018, Schloss Seggau, Austria

Sponsored by the IUVSTA Surface Engineering Division

1. Scientific Report

The 85th IUVSTA Workshop was held in the wine region of southern Styria in Austria between 14 and 19 October 2018. It attracted 31 attendees from 12 countries (see the attached list of participants). The workshop was organized by the IUVSTA Surface Engineering Division, with support from the Applied Surface Science, Nanometer Structures, Surface Science, and Thin Films Divisions. The workshop venue was Schloss Seggau, the seat of the Styrian Bishopric until 1786 and the summer residence of its Bishops until the mid-20th century, located on a hill near the tiny village Leibnitz, about 35 km from Graz. This secluded location offering meeting rooms, accommodation and meals for the workshop attendees guaranteed an event, in which intensive interaction took place.

The workshop addressed all issues and challenges encountered in the implementation of nanoporous materials, such as carbons, metals, polymers, metal-organic frameworks, and novel composites, for energy conversion and storage purposes combined with a minimal carbon footprint for the environment. The workshop was focused mainly on the synthesis, characterization and performance evaluation of such materials in emerging fields such as:

- Conversion of energy into different forms using currently available green technologies, including solar cells and fuel cells.
- Electrochemical energy storage using batteries, supercapacitors and hybrid technologies.
- Production and storage of highly-dense and environmental friendly gases such as hydrogen.

Other topics showing a significant environmental importance were covered as well including the key role of nanoporous materials in catalysis, gas separation, water adsorption and even fusion energy. For all topics, both experimental and theoretical aspects were presented by experts. Attention was given to the influence of the porosity (specific surface area, specific pore volume, pore size distribution, etc.) and surface chemistry properties (functionalities, dopants, etc.) of nanoporous materials on the overall performance towards such energy-related applications.

The workshop had an active duration of four and a half days and included in total 27 scientific presentations from invited and contributed speakers, a mini poster session (4 posters) and a tutorial on scientific writing given by Prof. Christian Mitterer (Montanuniversität Leoben, Austria) and Prof. Claus Rebholz (University of Cyprus, Cyprus). In addition, Prof. Christian Mitterer presented an overview on the IUVSTA and its activities during the workshop's welcome note on Monday morning. The program was also complemented by social activities to stimulate discussions between participants, including a welcome reception on Sunday evening, a wine tasting experience in the 300 years old wine cellar of the castle on Tuesday evening and a guided tour to the historic Seggau Castle on Thursday evening. The main scope of the workshop was to bring together scientists and researchers working in different areas related to nanoporous materials, to stimulate discussions and to create synergies. More specifically, 17 leading scientists from Austria, Czech Republic, Cyprus, Germany, France, Serbia, Spain, U.A.E., U.K., and Taiwan accepted invitations to present their recent achievements in this rapidly growing field (see attached list of invited speakers and titles of their presentations). Additional 12 attendees presented their work in contributed talks and poster presentations. Ample time was planned and used for discussions during these presentations. The scientific program of the workshop was developed by the members of the scientific committee, including Prof. Christian Mitterer, Dr. Nikolaos Kostoglou (Montanuniversität Leoben, Austria), Prof. Claus Rebholz and Dr. Biljana Babic (University of Belgrade Serbia). Local organization was done by Prof. Christian Mitterer and Dr. Nikolaos Kostoglou (website, program and abstract book, budget, contracts for accommodation, meals and social activities). Additional support was provided by the Austrian Vacuum Society, the Montanuniversität Leoben and the Materials Center Leoben. The scientific program of the workshop can also be found in the following pages. The individual sessions were moderated by selected experts on the particular topics.

The IUVSTA funds for the 85th IUVSTA Workshop on "Nanoporous Materials for Green Energy Conversion and Storage" of 6000 Euros were completely used to cover the costs for workshop registration, accommodation and meals for most of the invited speakers, as specified in detail in the financial report. The overall workshop budget was break-even.

2. Invited Speakers (in alphabetical order)

- **Heinz Amenitsch** (Graz University of Technology, Austria,
"Insights into nanoporous materials revealed with small angle scattering")
- **Biljana Babic** (University of Belgrade, Serbia)
"How are traditional and up-to-date carbon materials made? Part II"

- **Samuel Bernard** (CNRS, Université Limoges, France)
“Polymer-derived mesoporous ceramics in nitride systems as catalyst supports and co-catalysts for hydrogen evolution reactions”
- **Marina Enterría** (CIC Energigune, Spain)
“Nanostructured porous carbons for electrochemical energy storage”
- **Michael Hirscher** (Max Planck Institute for Intelligent Systems, Stuttgart, Germany)
“Nanoporous materials for hydrogen storage”
- **Ana Kalijadis** (University of Belgrade, Serbia)
“How are traditional and up-to-date carbon materials made? Part I”
- **Thomas Kienberger** (Montanuniversität Leoben, Austria)
“Energy-storages - a critical system component in energy transitions”
- **Nikolaos Kostoglou** (Montanuniversität Leoben, Austria)
“Nanoporous carbon-based materials for energy and environmental applications”
- **Guillaume Maurin** (Université Montpellier, France)
“Computational-guided discovery of MOFs towards energy and environmental-related applications”
- **Christian Mitterer** (Montanuniversität Leoben, Austria) & **Claus Rebholz** (University of Cyprus, Cyprus)
“Tutorial on scientific writing”
- **Oskar Paris** (Montanuniversität Leoben, Austria)
“In-situ small angle scattering from nanoporous materials for actuation and energy applications”
- **Kyriaki Polychronopoulou** (Khalifa University of Science & Technology, UAE)
“Catalytic materials for the steam reforming of hydroxy-containing hydrocarbons towards hydrogen production”
- **Claus Rebholz** (University of Cyprus, Cyprus)
“Nanoheaters – miniature matches for thermal actuation”
- **Volker Schmidt** (University of Ulm, Germany)
“Stochastic microstructure modeling of aggregated particle systems in hierarchically structured electrodes”
- **Werner Sitte** (Montanuniversität Leoben, Austria)
“Porous electrodes for solid oxide fuel and electrolysis cells”
- **Matthias Thommes** (Friedrich Alexander University of Erlangen-Nuremberg, Germany)
“Recent advances in the physisorption characterization of hierarchically structured nanoporous materials”

- **Valeska Ting** (University of Bristol, UK)
“Filling the void: Investigations into extremely high densities of hydrogen in nanoporous carbon materials”
- **Cheng-Yu Wang** (National Chiao Tung University, Taiwan)
Hydrogen storage in the composite of chemical hydride and metal-organic frameworks

3. Workshop Program

- **Sunday 14 October, 2018:**
 - Registration (17:00-19:00)
 - Welcome Reception (19:00-21:00)

- **Monday 15 October, 2018:**
 - Registration (8:00-08:30)

Time	Authors	Title
07:00-08:30	Breakfast	
08:30-09:00	Claus Rebholz (University of Cyprus, Cyprus), Christian Mitterer, Nikolaos Kostoglou (Montanuniversität Leoben, Austria)	Welcome note, introduction to IUVSTA and workshop program
09:00-10:00	Thomas Kienberger , Benjamin Böckl, Christoph Sejkora (Montanuniversität Leoben, Austria)	Energy-storages - a critical system component in energy transitions
10:00-10:30	Eva-Maria Steyskal , Michael Seidl, Roland Würschum (Graz University of Technology, Austria)	Formation of nanoporous metals by electrochemical dealloying analyzed by in-situ resistometry
10:30-11:00	Coffee break	
11:00-12:00	Matthias Thommes (Friedrich Alexander University of Erlangen-Nuremberg, Germany)	Recent advances in the physisorption characterization of hierarchically structured nanoporous materials
12:00-13:30	Lunch break	
13:30-14:30	Ana Kalijadis , Biljana Babic (University of Belgrade, Serbia)	How are traditional and up-to-date carbon materials made? (Part I)
14:30-15:30	Biljana Babic , Ana Kalijadis (University of Belgrade, Serbia)	How are traditional and up-to-date carbon materials made? (Part II)
15:30-16:00	Coffee break	
16:00-17:00	Poster session*	
18:00-19:30	Dinner	

***List of Posters:**

Authors	Title
<p>Huan Doan (University of Bristol, UK), Yanan Fang, Bingqing Yao, Zhili Dong, Timothy J. White (Nanyang Technological University, Singapore), Asel Sartbaeva, Ulrich Hintermair (University of Bath, UK), Valeska P. Ting (University of Bristol, UK)</p>	<p>Controlled formation of hierarchical metal–organic frameworks using CO₂-expanded solvent systems</p>
<p>Markus Gößler, Eva-Maria Steyskal (Graz University of Technology, Austria), Heinz Krenn (University of Graz, Austria), Lukas Lühns, Jörg Weissmüller (Hamburg University of Technology, Germany), Roland Würschum (Graz University of Technology, Austria)</p>	<p>Nanoporous metals prepared by alloy corrosion - tuning of electrical, mechanical and magnetical properties</p>
<p>Nikolaos Kostoglou, Christian Koczwara, (Montanuniversität Leoben, Austria), Christian Prehal (Graz University of Technology, Austria), Biljana Babic (University of Belgrade, Serbia), Christos Tampaxis, Georgia Charalambopoulou, Theodore Steriotis (National Center for Scientific Research Demokritos, Greece), Kyriaki Polychronopoulou (Khalifa University of Science and Technology, UAE), Georgios Constantinides (Cyprus University of Technology, Cyprus), Oskar Paris (Montanuniversität Leoben, Austria), Claus Rebholz (University of Cyprus, Cyprus), Christian Mitterer (Montanuniversität Leoben, Austria)</p>	<p>Nanoporous activated carbon cloth for H₂ adsorption, selective CO₂/CH₄ separation and supercapacitor energy storage</p>
<p>Christian Prehal, Aleksej Samojlov, Heinz Amenitsch, Stefan Freunberger (Graz University of Technology, Austria)</p>	<p>Phase evolution in Li-O₂ batteries as seen by in-situ small angle X-ray scattering</p>

- **Tuesday 16 October, 2018:**

Time	Authors	Title
07:00-08:30	Breakfast	
08:30-09:30	Oskar Paris (Montanuniversität Leoben, Austria)	In-situ small angle scattering from nanoporous materials for actuation and energy applications
09:30-10:00	Christian Koczvara (Montanuniversität Leoben, Austria), Christian Prehal (Graz University of Technology, Austria), Simon Rumswinkel, Michael S. Elsässer (Paris Lodron University Salzburg, Austria), Heinz Amenitsch (Graz University of Technology, Austria), Nicola Hüsing (Paris Lodron University Salzburg, Austria), Oskar Paris (Montanuniversität Leoben, Austria)	Hierarchically ordered mesoporous carbon: an ideal model material to investigate supercapacitor-charging behavior
10:00-10:30	Christian Prehal , Aleksej Samojlov, Heinz Amenitsch (Graz University of Technology, Austria), Oskar Paris (Montanuniversität Leoben, Austria), Stefan Freunberger (Graz University of Technology, Austria)	Phase evolution in Li-O ₂ batteries studied by operando small angle X-ray scattering
10:30-11:00	Coffee break	
11:00-12:00	Marina Enterría (CIC Energigune, Spain), José L. Figueiredo (University of Porto, Portugal), Nagore Ortiz-Vitoriano (CIC Energigune, Spain & IKERBASQUE, Spain)	Nanostructured porous carbons for electrochemical energy storage
12:00-13:30	Lunch break	
13:30-14:30	Werner Sitte , Edith Bucher, Christian Berger, Andreas Egger, Nina Schrödl (Montanuniversität Leoben, Austria)	Porous electrodes for solid oxide fuel and electrolysis cells
14:30-15:00	Arlavinda Rezqita (Austrian Institute of Technology, Austria), Fabian Bohrn (Austrian Institute of Technology, & Vienna University of Technology, Austria), Raad Hamid (Austrian Institute of Technology, Austria), Günter Fafilek (Vienna University of Technology, Austria), Corina Täubert (Austrian Institute of Technology, Austria)	Synthesis and electrochemical evaluation of porous Mg-substituted lithium vanadium (III) phosphate as high voltage cathode material for Li-ion batteries
15:00-15:30	Daniel Alegre , Eider Oyarzabal, Francisco Tabares (CIEMAT, Spain)	Micro and nano-porous materials as support of liquid metals for fusion energy
15:30-16:00	Coffee break	
16:00-17:00	Round-table discussion (1): Synthesis & characterization of porous materials	
17:00-18:00	Wine tasting	
18:00-19:30	Dinner	

- **Wednesday 17 October, 2018:**

Time	Authors	Title
07:00-08:30	Breakfast	
08:30-09:30	Heinz Amenitsch (Graz University of Technology, Austria & Austrian SAXS Beamline, Elettra, Italy)	Insights into nanoporous materials revealed with small angle scattering
09:30-10:00	Rashko Rashkov , Vasil Bachvarov, Galin Borisov (Bulgarian Academy of Sciences, Bulgaria)	Multicomponent catalysts containing nonprecious metal for water splitting
10:00-10:30	Jiří Čapek , Šárka Batková, Jiří Houška (University of West Bohemia, Czech Republic), S. Haviar, T. Duchoň (Charles University, Czech Republic), Miloš Krbal (University of Pardubice, Czech Republic)	HiPIMS deposition of Ta-O-N coatings with modified surface by metallic nanoclusters for water splitting application
10:30-11:00	Coffee break	
11:00-12:00	Abhijeet Lale (Université Limoges, France), Umit B, Demirci, (Université Montpellier, France), Samuel Bernard (Université Limoges, France)	Polymer-derived mesoporous ceramics in nitride systems as catalyst supports and co-catalysts for hydrogen evolution reactions
12:00-13:30	Lunch break	
13:30-14:30	Nikolaos D. Charisiou (Western Macedonia University of Applied Sciences, Greece), Kyriaki Polychronopoulou , A. Asif (Khalifa University of Science and Technology, UAE), Maria A. Goula (Western Macedonia University of Applied Sciences, Greece)	Catalytic materials for the steam reforming of hydroxy-containing hydrocarbons towards H ₂ production
14:30-15:30	Guillaume Maurin (CNRS, Université Montpellier, France)	Computational-guided discovery of MOFs towards energy and environmental-related applications
15:30-16:00	Coffee break	
16:00-16:30	Georgia Basina , Dana AlShami, Kyriaki Polychronopoulou, Vasileios Tzitzios (Khalifa University of Science and Technology, UAE), Vaithilingam Balasubramanian (University of Minnesota, USA), Fadi Dawaymeh, Georgios N. Karanikolos, Yasser Al Wahedi (Khalifa University of Science and Technology, UAE)	Hierarchical AlPO ₄ -5 and SAPO-5 microporous molecular sieves with mesoporous connectivity for water sorption applications
16:30-18:00	Christian Mitterer (Montanuniversität Leoben, Austria), Claus Rebholz (University of Cyprus, Cyprus)	Tutorial on scientific writing
18:00-19:30	Dinner	

- **Thursday 18 October, 2018:**

Time	Authors	Title
07:00-08:30	Breakfast	
08:30-09:30	Michael Hirscher , Maurice Schlichtenmayer, Rafael Balderas-Xicohténcatl (Max Planck Institute for Intelligent Systems, Germany)	Nanoporous materials for hydrogen storage
09:30-10:00	Thomas Dengg, Maxim N. Popov (Materials Center Leoben, Austria)	Atomistic modeling of hydrogen adsorption in porous carbons
10:00-10:30	Stanislav Haviar , Jiří Čapek, Nirmal Kumar, Šárka Batková (University of West Bohemia, Czech Republic), Filip Dvořák (Charles University, Czech Republic)	Nanocluster-based hydrogen gas sensors (CuO/WO ₃) prepared by advanced magnetron sputtering techniques
10:30-11:00	Coffee break	
11:00-12:00	Valeska Ting (University of Bristol, UK), Mi Tian (University of Bath, UK), Nuno Bimbo (Lancaster University, UK), Anibal J. Ramirez-Cuesta (Oak Ridge National Laboratory, USA), Tim Mays (University of Bath, UK), Lui Terry, Estefani Marchiori (University of Bristol, UK), Dan Reed (University of Birmingham, UK), Simon Bending, Simon Hall (University of Bristol, UK)	Filling the void: Investigations into extremely high densities of hydrogen in nanoporous carbon materials
12:00-14:00	Lunch break	
14:00-15:00	Jing-Yang Chung, Chi-Wei Liao (Feng Chia University, Taiwan), Bor Kae Chang (National Central University, Taiwan), Chen-Yu Wang (National Chiao Tung University, Taiwan)	Hydrogen storage in the composite of chemical hydride and metal-organic frameworks
15:00-15:30	Coffee break	
15:30-16:45	Round-table discussion (2): Application performance & future of porous materials	
17:00-18:00	Guided tour in Seggau Castle	
18:00-19:30	Dinner	

- **Friday 19 October, 2018:**

Time	Authors	Title
07:00-08:30	Breakfast	
08:30-09:30	Volker Schmidt , Matthias Neumann (Ulm University, Germany), Sven E. Wetterauer, Thomas Carraro (Heidenberg University, Germany), Markus Osenberg (TU Berlin, Germany), André Hilger, Ingo Manke (Helmholtz-Zentrum Berlin, Germany), Amalia Wagner, Nicole Bohn, Joachim R. Binder (KIT Karlsruhe, Germany)	Stochastic microstructure modeling of aggregated particle systems
09:30-10:30	Nikolaos Kostoglou , Christian Koczvara, (Montanuniversität Leoben, Austria), Christian Prehal (Graz University of Technology, Austria), Biljana Babic (University of Belgrade, Serbia), Christos Tampaxis, Theodore Steriotis (National Center for Scientific Research Demokritos, Greece), Kyriaki Polychronopoulou (Khalifa University of Science and Technology, UAE), Oskar Paris (Montanuniversität Leoben, Austria), Cheng-Yu Wang (National Chiao Tung University, Taiwan), Claus Rebholz (University of Cyprus, Cyprus), Christian Mitterer (Montanuniversität Leoben, Austria)	Nanoporous carbon-based materials for energy and environmental applications
10:30-11:00	Coffee break	
11:00-12:00	Claus Rebholz (University of Cyprus, Cyprus)	Nanoheaters – miniature matches for thermal actuation
12:00	Christian Mitterer (Montanuniversität Leoben, Austria)	Closing remarks
12:00-13:30	Lunch break	

4. List of Attendees (in alphabetical order)

Name*	Institution/Organization
Daniel Alegre	Centre for Energy, Environment and Technology, Spain
Heinz Amenitsch	Graz University of Technology, Austria
Biljana Babic	University of Belgrade, Serbia
Georgia Basina	Khalifa University of Science and Technology, UAE
Samuel Bernard	Université Limoges, France
Jiří Čapek	University of West Bohemia, Czech Republic
Huan Doan	University of Bristol, UK
Marina Enterría	CIC Energigune, Spain
Markus Gößler	Graz University of Technology, Austria
Stanislav Haviar	University of West Bohemia, Czech Republic
Michael Hirscher	Max Planck Institute for Intelligent Systems, Germany
Ana Kalijadis	University of Belgrade, Serbia
Thomas Kienberger	Montanuniversität Leoben, Austria
Christian Koczwar	Montanuniversität Leoben, Austria
Nikolaos Kostoglou	Montanuniversität Leoben, Austria
Guillaume Maurin	Université Montpellier, France
Christian Mitterer	Montanuniversität Leoben, Austria
Nikolas Natter	Montanuniversität Leoben, Austria
Oskar Paris	Montanuniversität Leoben, Austria
Kyriaki Polychronopoulou	Khalifa University of Science and Technology, UAE
Maxim Popov	Materials Center Leoben Forschung GmbH, Austria
Christian Prehal	Graz University of Technology, Austria
Rashko Rashkov	Bulgarian Academy of Sciences, Bulgaria
Claus Rebholz	University of Cyprus, Cyprus
Arlavinda Rezqita	Austrian Institute of Technology GmbH, Austria
Volker Schmidt	Ulm University, Germany
Werner Sitte	Montanuniversität Leoben, Austria
Eva-Maria Steyskal	Graz University of Technology, Austria
Valeska Ting	University of Bristol, UK
Matthias Thommes	Friedrich Alexander University Erlangen-Nürnberg, Germany
Cheng-Yu Wang	National Chiao Tung University, Taiwan



Group photograph of the 85th IUVESTA workshop participants in Schloss Seggau, Austria



Photograph of the 85th IUVESTA workshop organizers (from left to right: Prof. Christian Mitterer, Dr. Biljana Babic, Prof. Claus Rebholz and Dr. Nikolaos Kostoglou)

Budget for the Workshop (14 - 19 October 2018)

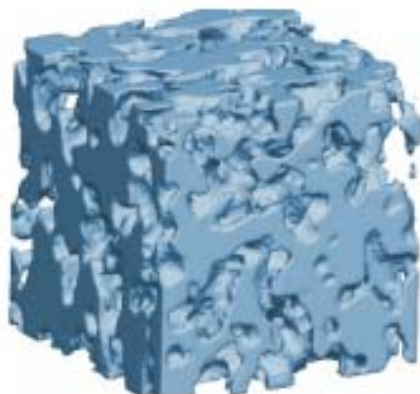
TITLE: 85th IUVSTA Workshop on Nanoporous Materials for Green Energy Conversion and Storage

VENUE: Seggau, Austria

DATE: 14 - 19 October 2018

Income	Unit cost (EUR)	Quantity	Sub-Total (EUR)	Remarks
Registration Fee (per person)	990	16	15 840	16 registered participants
Tutorial Fee	1 500	1	1 500	
IUVSTA funding	6 000	1	6 000	Funding supports for invited speakers
Total (EUR)			23 340	

Expenditures	Unit cost (EUR)	Quantity	Sub-Total (EUR)	Remarks
Flat rate for meeting room and food (5 days per person)	296	31	9 173	Lunch breaks, Dinner breaks, and Coffee breaks
Wine tasting and guided tour to Seggau Castle (per person)	15	28	420	
Hotel rooms (5 nights per invited speaker)	432	15	6 478	
Hotel rooms for all other attendees	432	16	6 912	
Miscellaneous	356	1	356	
Total (EUR)			23 340	



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Nanoporous Materials for
Green Energy Conversion
and Storage

October 14 - 19, 2018
Seggau, Austria

iuvsta85.unileoben.ac.at
iuvsta85@unileoben.ac.at



Nanoporous Materials **for Green Energy Conversion and Storage**

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Sponsored by the International Union of Vacuum Science, Technique and Applications (IU^VSTA)



Aim of the Workshop

- Address issues and challenges regarding the implementation of nanoporous materials for energy conversion and storage purposes combined with a minimal carbon footprint for the environment.
- The workshop is intended to provide a forum and networking venue for scientists, engineers and technologists from academia, government laboratories and industry.

Topics

- Synthesis, characterization and application performance evaluation of nanoporous materials in emerging fields such as:
 - Conversion of energy using green technologies, such as solar cells and fuel cells.
 - Electrochemical energy storage using batteries, supercapacitors and hybrid technologies.
 - Production and storage of highly-dense and environmental friendly gases such as hydrogen.
- Other topics showing a environmental importance of nanoporous materials in catalysis, gas separation, water adsorption and fusion energy.

Venue

- Schloss Seggau, a castle close to Graz, Austria, built in the 12th century, now housing a conference site with hotel, Café and a more than 300 years old wine cellar.



85th IUVSTA Workshop program

	Monday 15/10	Tuesday 16/10	Wednesday 17/10	Thursday 18/10	Friday 19/10	
07:00-08:30	Breakfast					
08:30-09:00	Welcome note	Oskar Paris	Heinz Amenitsch	Michael Hirscher	Volker Schmidt	
09:00-09:30	Thomas Kienberger		Rashko Rashkov	Maxim Popov	Nikolaos Kostoglou	
09:30-10:00		Christian Koczwara	Jiří Čapek	Stanislav Haviar		
10:00-10:30	Eva-Maria Steyskal	Christian Prehal				
10:30-11:00	Coffee break					
11:00-11:30	Matthias Thommes	Marina Enterría	Samuel Bernard	Valeska Ting	Claus Rebholz	
11:30-12:00						
12:00-13:30	Lunch break				Closing remarks	
13:30-14:00	Ana Kalijadis	Werner Sitte	Kyriaki Polychronopoulou	free time		
14:00-14:30	Biljana Babic		Arlavinda Rezqita			Guillaume Maurin
14:30-15:00		Daniel Alegre				
15:00-15:30						
15:30-16:00	Coffee break					
16:00-16:30	Poster session	Round-table discussion (1)	Georgia Basina	Round-table discussion (2)		
16:30-17:00		Wine tasting	Tutorial on scientific writing	Guided tour in Seggau Castle		
17:00-17:30						
17:30-18:00						
18:00-19:30	Dinner					

Some numbers from 85th IUVSTA Workshop

Program and attendees

- The **workshop was organized** by Biljana Babic (University of Belgrade, Serbia), Nikolaos Kostoglou (Montanuniversität Leoben, Austria), Christian Mitterer (Montanuniversität Leoben, Austria), Claus Rebholz (University of Cyprus, Nicosia, Cyprus).
- **17 leading scientists** from Austria, Czech Republic, Cyprus, Germany, France, Serbia, Spain, U.A.E., U.K., and Taiwan presented **invited talks**.
- Additional 12 attendees presented their work in **contributed talks and poster presentations**.
- Ample time for **discussions** and **two round table discussions** on synthesis, characterization and application of nanoporous materials, and a **tutorial on scientific writing** stimulated very intense interactions between the attendees.
- Social activities included a wine tasting in the historic wine cellar of the castle and a guided castle tour.
- In addition, ideas for a possible future IUVSTA Workshop, most probably held in Germany, were developed.

Financial breakdown of the 85th IUVSTA Workshop

Income	Unit cost (EUR)	Quantity	Sub-Total (EUR)	Remarks
Registration Fee (per person)	990	16	15.840	16 registered participants
Tutorial Fee	1.500	1	1.500	
IUVSTA funding	6.000	1	6.000	Funding supports for invited speakers
Total (EUR)			23.340	
Expenditures	Unit cost (EUR)	Quantity	Sub-Total (EUR)	Remarks
Flat rate for meeting room and food (5 days per person)	296	31	9.173	Lunch breaks, Dinner breaks, and Coffee breaks
Wine tasting and guided tour to Seggau Castle (per person)	15	28	420	
Hotel rooms (5 nights per invited speaker)	432	15	6.478	
Hotel rooms for all other attendees	432	16	6.912	
Miscellaneous	356	1	356	
Total (EUR)			23.340	

Some impressions from 85th IUVSTA Workshop

