

Program Overview

	Sunday, 18.09.2022	Monday, 19.09.2022	Tuesday, 20.09.2022	Wednesday, 21.09.2022
08:30 AM		Opening	Beng Hau Tan "How surface nanobubbles survive: from experiments to theory"	Wei Wang "Imaging Single Surface Nanobubbles with Advanced Optical Microscopy"
		Stephan D. Evans "Lipid Coated Nanobubbles as Theragnostic Agents: from Theory to Application"		
09:00 AM		Nanobubbles Production I	Fundamentals and Theory of Nanobubbles II	Nucleation
10:00 AM		Coffee Break	Coffee Break	Coffee Break
		Hans-Jürgen Butt "Interaction of drops and bubbles with nano- and microstructured surfaces"	Detlef Lohse "Physicochemical hydrodynamics of a plasmonic bubble in a binary liquid: Nucleation and bouncing"	Applications: Biology and Medicine II
11:00 AM				
		Nanobubbles Production II	Applications: Biology and Medicine I	Lunch
12:00 AM				
		Lunch	Lunch	Applications in Engineering and Process Techniques II
01:00 PM				
		Molecular Dynamics	Measurement of Nanobubbles: Methods & Techniques	Coffee Break
02:00 PM				
		Verasonics Coffee Break	Coffee Break	Nano- and Microdroplets and Microbubbles
03:00 PM				
		Xuehua Zhang "Formation and Location of H ₂ Microbubbles from a Surface Nanodroplet Reaction"	Valeria Molinero "Electrochemically Generated Nanobubbles"	Closing
04:00 PM				
		Fundamentals and Theory of Nanobubbles I	Applications in Engineering and Process Techniques I	
05:00 PM	Welcoming Reception			
		Postersession	Group Photo	
06:00 PM				
07:00 PM			Galadinner (Haus des Handwerks)	

Social program: 15 €

For registered persons

Monday, 19.09.2022
2:00 PM

Visit of the Magdeburg Cathedral and "Green Citadel" (Hundertwasserhaus), Meeting point is in front of the Mark Fortress at 1.15 PM or at the north entrance of the cathedral (Domplatz) at 2:00 PM

Conference Agenda NANOBUBBLE 2022

Date: Sunday, 18/Sept/2022

5:00 PM - **Welcoming Reception**

7:00 PM Location: **Festung Mark**

Date: Monday, 19/Sept/2022

8:30 AM **Opening**

Location: **Festung Mark**

8:45 AM **Stephan D. Evans**

Lipid Coated Nanobubbles as Theragnostic Agents: from Theory to Application

Stephen D. Evans

Nanobubble production I

9:30 AM **The Controllable Formation of Nanobubbles and Nanodroplets on Nanopatterned Structures**

online Lijuan Zhang, Limin Zhou, Shuo Wang, Jun Hu

9:45 AM **Extrusion: A new method for rapid formulation of high-yield, monodisperse nanobubbles**

Claire Council, Eric Abenojar, Reshani Perera, Agata Exner

10:00 AM **Coffee Break**

10:30 AM **Hans-Jürgen Butt**

Interaction of drops and bubbles with nano- and microstructured surfaces

Hans-Jürgen Butt

Nanobubble production II

11:15 AM **Generation of bulk nanobubbles in pure alcohol**

Harsh Sharma, Neelkanth Nirmalkar

11:30 AM **Diameter Dependence of CO₂ Ultra Fine Bubble between Zeta Potential and Water Ions**

Yoshikatsu Ueda, Seina Ozeki, Tetsuji Okuda, Yomei Tokuda

11:45 AM **Formation and stability of nanobubbles and pre-nucleation clusters during ultrasonic treatment of hard and soft water**

Eavan Fitzgerald, Sruthy Poullose, Michael Coey

12:00 PM **Laser Induced Nanobubbles: Characterization Methods and Future Perspectives**

Juan Manuel Rosselló, Claus-Dieter Ohl

12:15 PM **Predicting nucleation in real fluids**

Francesco Magaletti, Mirko Gallo, Carlo Massimo Casciola

12:30 PM -
1:30 PM **Lunch**

Gallery "Bubbles" Location: Festung Mark Kanonengang

Conference Agenda NANOUBBLE 2022

Date: Monday, 19/Sept/2022

Molecular Dynamics

- 1:30 PM **Molecular dynamics analysis of interfacial tensions of surface nanobubbles: mechanical and thermodynamic approaches**
Hideaki Teshima, Hiroki Kusudo, Carlos Bistafa, Yasutaka Yamaguchi
- 1:45 PM **Synergy between Surface Nanobubbles and the Interfacial Gas Enrichment Layer: A Molecular Dynamics Study**
Binu Varghese, Sarith P Sathian
- 2:00 PM **Anomalous thermal effects in oscillating bulk nanobubbles**
Duncan Dockar, Livio Gibelli, Matthew Borg
- 2:15 PM **Investigating Gas Cluster in Water without Pinning Ions Using Molecular Dynamics Simulation**
Tsu-Hsu Yen
- 2:30 PM **Cavitation in lipid bilayers poses strict negative pressure stability limit in biological liquids**
Matej Kanduc, Emanuel Schenck, Philip Loche, Steven Jansen, Jochen Schenk, Roland Netz

Verasonics Coffee Break

2:45 PM Presentation by Verasonics

Xuehua Zhang

Formation and Location of H₂ Microbubbles from a Surface Nanodroplet Reaction
Xuehua Zhang

Fundamentals and Theory of Nanobubbles

- 4:15 PM **Effect of Dissolved Salt on Nanobubbles**
Kalyani Agarwal, Neelkanth Nirmalkar
- 4:30 PM **Ion adsorption stabilizes bulk nanobubbles**
online Mingbo Li, Xiaotong Ma, Patricia Pfeiffer, Julian Eisener, Claus-Dieter Ohl, Chao Sun
- 4:45 PM **Responses of surface micro- and nanobubbles to strong shear flows and acoustic waves**
online Zibo Ren, Shuhong Liu, Beng Hau Tan, Zhigang Zuo, Claus-Dieter Ohl
- 5:00 PM **Acoustic and Hydrodynamic Cavitation Models using a Novel Reduced-Order Gas Pressure Law for Micro/Nanobubbles and their Applications**
Can F. Delale, Erkan Ayder, Senay Pasinlioglu, Mehmet Kaya, Ugurcan Morkoyun
- 5:15 PM **Viscous and capillary effects on the dynamics of sub-micron bubbles attached to walls**
online Mandeep Saini, Daniel Fuster

5:30 PM - 7:00 PM Poster Session (incl. short presentations and refreshments)

Location: Festung Mark

Conference Agenda NANOBUBBLE 2022

Date: Monday 19/Sept/2022

5:30 PM - 7:00 PM

Poster Pitches

Nanobending of the microscopic gas-liquid interface on the solid surface and its potential impact on the nanobubble profile

Jinming Zhang, Wei Ding, Uwe Hampel

The fate of bulk nanobubbles under gasdissolution

Hongguang Zhang, Shan Chen, Zhenjiang Guo, Xianren Zhang

On the Effect of fluid temperature variations in the generation of hydrodynamic cavitating flow patterns on chip

Farzad Rokhsar Talabazar, Araz Sheibani Aghdam, Ali Koşar, Morteza Ghorbani

The Hydrodynamic on Chip Concept in Household Appliances

Seyedali Seyedmirzaei Sarraf, Mohammadamin Maleki, Farzad Rokhsar Talabazar, Araz Sheibani Aghdam, Kübra Çalışır, Ehsan Tuzcuoğlu, Morteza Ghorbani

Growth and Dynamics of H₂ bubbles at microelectrodes

Aleksandr Bashkatov, Syed Sahil Hossain, Gerd Mutschke, Kerstin Eckert

Interaction & stability of nanobubbles and pre-nucleation clusters during ultrasonic treatment of hard & soft water

Eavan Fitzgerald, J.M.D. Coey

A new hydrodynamic generator for bulk nanobubbles production; characterization and evaluation of properties and applications

E.P. Favvas, A.A. Sapalidis, D.S. Karousos, E. Patounas, G.Z. Kyzas, V. Koutsos, A. Ch. Mitropoulos

Nanobubbles influence on membrane separation processes

Jarosław Kupiec, Andrzej Mróz

Experimental investigation into the effect of ultrafine bubbles on interaction between bubble clusters and an acrylic wall under sound field

Shusuke Toriumi, Toshihiko Sugiura

online

Nanostructure-dependent nanobubble drag reduction on NiTi self-adaption surface

Yan Lu, Chao Wang

online

rtPA-loaded targeted nanobubbles as a new thrombus-specific thrombolytic strategy

Monica Argenziano, Sara Capolla, Paolo Durigutto, Mario Colucci, Pier Luigi Meroni, Francesco Tedesco, Paolo Macor, Roberta Cavalli

Gallery "Bubbles" Location: Festung Mark Kanonengang

Conference Agenda NANOBUDDLE 2022

Date: Tuesday, 20/Sept/2022

8:30 AM Beng Hau Tan

How surface nanobubbles survive: from experiments to theory

Beng Hau Tan, Hongjie An, Claus-Dieter Ohi

Fundamentals and Theory of Nanobubbles II

9:15 AM On the role of surface charge and surface tension on stabilizing bulk nanobubbles

online Xiaotong Ma, Xuefei Xu, Chao Sun, Mingbo Li

9:30 AM A Diffused Double Layer Model of Bulk Nanobubbles in Aqueous NaCl Solutions

online Hilman Syaeful Alam, Priyono Sutikno, Tubagus Ahmad Fauzi Soelaiman, Anto Tri Sugiarto

9:45 AM Dynamics of bubbles in a graphene liquid cells

Sota Hirokawa, Hideaki Teshima, Pablo Solís Solís Fernández, Hiroki Ago, Qin-yi Li, Koji Takahashi

10:00 AM Coffee Break

10:30 AM Detlef Lohse

Physicochemical hydrodynamics of a plasmonic bubble in a binary liquid: Nucleation and bouncing

Detlef Lohse

Applications: Biology and Medicine

11:15 AM Influence of oxygen and nitrogen nanobubble presence on metabolic activity of animal cell cultures

Karol Ulatowski, Kamil Wierzchowski, Paulina Trzaskowska, Julia Fiuk, Paweł Sobieszuk

11:30 AM Assessing tumoral vascular permeability and nanoparticle extravasation with nanobubble contrast-enhanced ultrasound imaging

Michaela Briana Cooley, Dana Wegierak, Reshani Perera, Eric Abenojar, Youjoung Kim, Michael C Kolios, Agata A. Exner

11:45 AM On the physical mechanisms of the surprising high echogenicity of lipid coated nanobubbles in diagnostic ultrasound

A.J. Sojahrood, Agata A. Exner, Michael C. C., David E. Goertz

12:00 PM -
1:15 PM Lunch

Conference Agenda NANOBUBBLE 2022

Date: Tuesday, 20/Sept/2022

Measurement of Nanobubbles Methods & Techniques

- 1:15 PM **Observation of Mesoscopic Clathrate Structures in Gas-Supersaturated Water with Transmission Electron Microscopy**
Ing-Shouh Hwang, Wei-Hao Hsu
- 1:30 PM **Characterization of Colloidal, Mechanical and Electrochemical Properties of Nanobubbles in Water**
Wen Zhang, Xiaonan Shi, Taha Marhaba
- 1:45 PM **Gaseous and oily nano-objects: With FLIM and AFM from surface to the bulk**
Sergey I. Druzhinin, Holger Schönherr
- 2:00 PM **Direct measurement of the internal pressure of the ultrafine bubble using radioactive nuclei**
Minoru Tanigaki, Takuya Yamakura, Daiju Hayashi, Yoshikatsu Ueda, Akihiro Taniguchi, Yomei Tokuda, Yoshitaka Ohkubo
- 2:15 PM **Differentiation of bubbles, particles and droplets by Holographic Particle Tracking**
Fredrik Eklund, Daniel Midtvedt, Erik Olsén, Benjamin Midtvedt, Jan Swenson, Fredrik Höök
- 2:30 PM **Visualization of plus charged nano-bubble surrounded by electrified nano-belt, using Ultra-high voltage electron microscope: Revealed functions of the plus charged nano-bubble**
Takeshi Ohdaira, Emi Kitakata

2:45 PM **Coffee Break**

3:15 PM **Valeria Molinero**
Electrochemically Generated Nanobubbles
Valeria Molinero

Applications in Engineering and Process Techniques

- 4:00 PM **Surface nanobubbles induce instability of solution-deposited thin films**
Pavel Janda, Hana Tarábková
- 4:15 PM **Nanobubbles on different hydrophobic surfaces and their application in low-rank coal flotation**
Fanfan Zhang, Chunyun Zhu, Yijun Cao, Holger Schönherr
- 4:30 PM **Optical evaluation for ultrafine bubble cleaning of contamination in a flow channel**
Daniel Niehaus, Erica Fujita, Michael Schlüter, Koichi Terasaka
- 4:45 PM **A systematic calibration procedure for bubble dynamics for laser ablation in liquids**
Alexander Bußmann, Stefan Adami, Nikolaus A. Adams
- 5:00 PM **Oxygen nanobubbles for water pollution remediation and ecological restoration**
Gang Pan

5:15 PM **Group Photo**

7:00 PM - **Gala Dinner**

11:00 PM Location: **Haus des Handwerks**

Conference Agenda NANOBUBBLE 2022

Date: Wednesday, 21/Sept/2022

8:30 AM **Wei Wang**

online **Imaging Single Surface Nanobubbles with Advanced Optical Microscopy**

Wei Wang

Nucleation

9:15 AM **Thermally assisted Heterogeneous Cavitation through Gas Supersaturation**

Patricia Pfeiffer, Julian Eisener, Hendrik Reese, Mingbo Li, Xiaotong Ma, Chao Sun, Claus-Dieter Ohl

9:30 AM **A Gibbs Free Energy Approach to Nucleation with Gas Contaminants**

Karim Alame

9:45 AM **Bulk nanobubble generation and characterization in ethanol-water mixtures**

Mohit Trivedi, Neelkanth Nirmalkar

10:00 AM **Coffee Break**

Applications: Biology and Medicine II

10:30 AM **Investigation of cultures of *Saccharomyces cerevisiae* in presence of oxygen nanobubbles**

Paweł Sobieszuk, Alicja Strzyżewska, Karol Ulatowski

10:45 AM **Potential Benefit of oxygen nanobubbles for overcoming hypoxic/anoxic conditions (In vitro)**

Sergio M Viafara-Garcia, Juan Pablo Acevedo Cox

11:00 AM **Micro-scale Hydrodynamic Cavitation-enhanced Doxorubicin (DOX) Treatment**

online Ilayda Namli, Zeynep Karavelioglu, Seyedali Seyedmirzaei Sarraf, Sibel Cetinel, Ozlem Kutlu, Morteza Ghorbani, Ali Kosar

11:15 AM **Polysaccharide-shelled nanobubbles: role of polymer/lipid interface on nanostructure and ultrasound-responsive behaviour**

online Monica Argenziano, Anna Scomparin, Roberta Cavalli

11:30 AM **Lipid-shelled Nanobubbles for Therapeutic Delivery**

Damien V. B. Batchelor, Radwa H. Abou-Saleh, Fern Jordan Armistead, Nicola Ingram, Sally A. Peyman, James R. McLaughlan, P. Louise Coletta, Stephen D. Evans

11:45 AM **Mechanisms of Nanobubbles and Soil Interactions in Enhanced Plant Growth**

online Shan Xue, Thu Le, Chuanwu Xi, Taha Marhaba, Wen Zhang

12:00 PM -
1:00 PM **Lunch**

Gallery "Bubbles" Location: Festung Mark Kanonengang

[Date: Wednesday, 21/Sept/2022](#)

Applications in Engineering and Process Techniques II

1:00 PM **Industrial Measurement and Control of Ozone Nanobubble Production**

Dirk Thiele, Todd Hay

1:15 PM **Enhancement of municipal wastewater treatment by use of Micro-Nano-Bubbles**

Andrzej Mróz, Jaroslaw Kupiec

1:30 PM **Comparison efficiency of Ozone and Oxygen Nanobubbles in Degradation of Green Rit Dye**

Priya Koundle, Neelkanth Nirmalkar

1:45 PM **Effect of nanobubbles on particle-bubble-particle interaction and its possible application in froth flotation**

Nilanjan Dutta, Neelkanth Nirmalkar

2:00 PM **An industry example: Prevent embolism in medical devices**

online Daniel Frese, Andreas Nobis, Olivier Marseille, Thomas Willers

2:15 PM **Coffee Break**

Nano- and Microdroplets and Microbubbles

2:45 PM **Nanodroplet deforms soft substrate: Elasticity vs. capillarity**

Binyu Zhao, Elmar Bonaccorso, Longquan Chen, Günter K. Auernhammer

3:00 PM **Towards better understanding of the energy transfer in thermocavitation**

Jelle Schoppink, Frans Segerink, Jose Chavez Alvarez, David Fernandez Rivas

3:15 PM **Electronic structure of ultrafine water cluster deposited on hydrophobic and hydrophilic surfaces explored by soft X-ray emission spectroscopy**

online Yoshihisa Harada, Ayako Kameda, Ralph Ugalino, Naoya Kurahashi, Hisao Kiuchi, Subin Song, Tomohiro Hayashi, Yuki Tabata, Akiyoshi Hirano, Shinsuke Inoue

3:30 PM **Investigation of adhesion behavior between droplet/bubble and mineral surface**

Chunyun Zhu, Fanfan Zhang, Xiahui Gui, Yaowen Xing, Holger Schönherr

3:45 PM -
4:00 PM **Closing**

Gallery "Bubbles" Location: Festung Mark Kanonengang

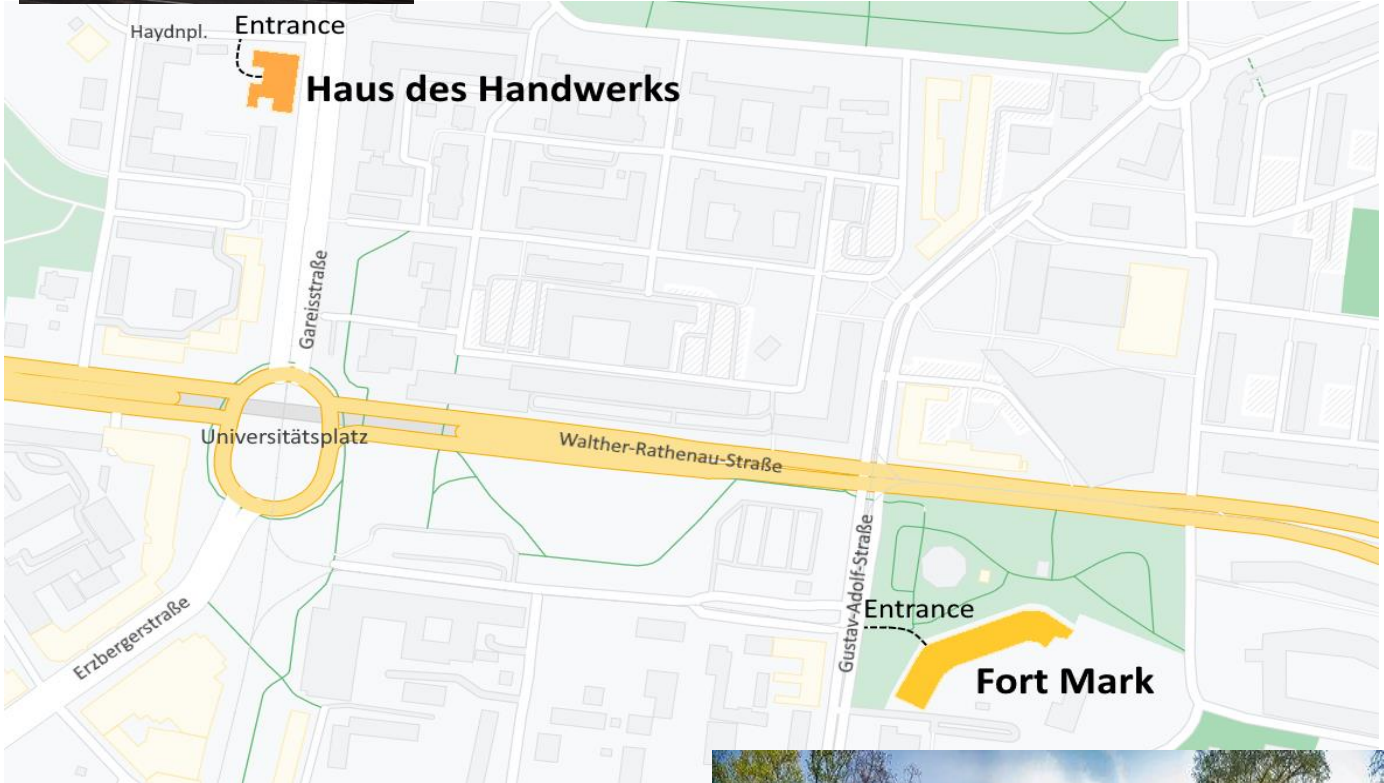


Abstracts

Venue Site Plan



Haus des Handwerks
Gareisstr. 10
39106 Magdeburg



Festung Mark Magdeburg
Hohefortewall 1
39104 Magdeburg

