



SILENCE
Network



SWINTH-2024

17 – 20 June | Dresden, Germany

CONFERENCE PROGRAM



CO-ORGANIZED BY

OECD/NEA CSNI/WGAMA

OECD Nuclear Energy Agency (NEA) – Committee for the Safety of Nuclear Installations (CSNI) – Working Group on the Analysis and Management of Accidents (WGAMA)

https://www.oecd-nea.org/jcms/pl_23462



SILENCE Network

Significant Light & Heavy Water Reactor Thermal-Hydraulic Experiments Network for the Consistent Exploitation of the Data

<http://www.nineeng.org/silence/>



LOCAL HOSTING AND ORGANIZATION BY

Helmholtz-Zentrum Dresden-Rossendorf (HZDR)

www.hzdr.de



CONFERENCE SECRETARIAT & CONTACT

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E-Mail: info@swinth2024.org

www.kit-group.org/de/office-dresden/



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WELCOME



Dear attendees of the SWINTH-2024 Specialist Workshop on Advanced Instrumentation and Measurement Techniques for Nuclear Reactor Thermal-Hydraulics and Severe Accidents,

It is a pleasure to welcome you to Dresden, the capital of the Free State of Saxony in the heart of Europe. I am particularly pleased that, after a number of years and a disturbing global pandemic, we are able to meet again to discuss the latest advances in this exciting and rapidly evolving field of science and technology. Following previous events such as SWINTH-2016 and SWINTH-2019, both held in Livorno, Italy, and the OECD/NEA Specialist Workshop SAMMI-2020, hosted online from Tokai, Japan, we are delighted that this workshop will again bring together so many experts and young scientists from all over the world. We are grateful for the co-hosting of this event by the Organisation for Economic Co-operation and Development / Nuclear Energy Agency - Committee on the Safety of Nuclear Installations / Working Group on Accident Analysis and Management (OECD/NEA CSNI/WGAMA) and the Significant Light & Heavy Water Reactor Thermal-Hydraulic Experiments Network for the Consistent Exploitation of the Data (SILENCE).

The Scientific Committee, the Organising Committee as well as the local organisers of SWINTH-2024 have done a great job to make this event a true success. Please enjoy a good time with fruitful discussions, new ideas and partners for co-operation and breathe in the spirit of this beautiful city that welcomes you with all its cultural, architectural and natural attractions and beauties. Finally, we hope that our Tuscany-style hotel will bring back some positive memories of previous SWINTH events held in the Mediterranean.

Uwe Hampel

General Chair, Helmholtz-Zentrum Dresden-Rossendorf (HZDR), Institute of Fluid Dynamics, Head Experimental Thermal Fluid Dynamics, Dresden, Germany



Joy Rempe

Rempe and Associates, LLC, USA

Talk: Fukushima Daiichi: Interim Insights, Lessons Learned, and Safety Enhancements

PL1, Tuesday, 18 June, 2024, 9:20 - 10:20

Dr. Joy Rempe has over 35 years' experience in the areas of reactor safety and instrumentation performance. Prior to retiring as a Laboratory Fellow at the Idaho National Laboratory (INL), she founded an instrumentation development and deployment laboratory, which supported irradiation testing in U.S. and international facilities. During her tenure at INL, she also led numerous severe accident research efforts for U.S. and international organizations, including post-accident inspection and analysis efforts to support the Three Mile Island Unit 2 Vessel Investigation Program and efforts to investigate in-vessel retention in advanced light water reactors. As Principal of Rempe and Associates, LLC, Dr. Rempe provides consulting assistance to U.S. and international organizations. Since 2014, she has served as the technical lead for the U.S. Department of Energy (DOE) led Forensics Effort to learn from examination information obtained from the affected reactors at Fukushima Daiichi. Dr. Rempe has authored or co-authored over 400 peer-reviewed journal publications, book chapters, technical reports, peer-reviewed conference papers, and invited presentations on reactor safety, severe accident phenomena, high temperature testing, and in-pile instrumentation. She is an inventor/co-inventor of four patents (one patent winning an R&D 100 award). She currently serves as Program Review Group Chair of the OECD Fukushima Daiichi Nuclear Power Station Accident Information Collection and Evaluation (FACE) Project. Between 2010 and 2023, she was a member of the U.S. NRC Advisory Committee on Reactor Safeguards (serving as Chairman in 2022 and 2023). Between 2013 and 2019, she served as a member, and ultimately co-chair, of the DOE Nuclear Energy Advisory Committee. She holds MS and PhD degrees in Nuclear Engineering from the Massachusetts Institute of Technology and a BS degree in Nuclear Engineering from the University of Missouri – Rolla.



Annalisa Manera

ETH Zurich, Laboratory of Nuclear Safety and Multiphase Flows, Zurich, Switzerland

Talk: Development and application of advanced, high-resolution instrumentation for single and multiphase flows

PL 2, Wednesday, 19 June, 2024, 9:00 - 9:50

Dr. Manera is Professor of Nuclear Safety and Multi-Phase Flows at ETH Zurich since July 2021 and Head of the Experimental and Computational Multiphase Flow Group at the Paul Scherrer Institute. She is the recipient of the ANS Bal-Raj Sehgal Memorial Award (2022) and the US Department of Energy CASL Director's award (2016). She is also a Fellow of the American Nuclear Society. Between 2011 and 2021 she was Professor in the Nuclear Engineering Department of the University of Michigan. Her research group focuses on the development and application of high-resolution instrumentation for multiphase flow and on the development and application of multi-scale and multi-physics high-fidelity computational tools. Applications of her research range from large water-cooled reactors, to small modular reactors and micro-reactors. She holds a M.Sc. in Nuclear Engineering from the University of Pisa and a Ph.D. in Nuclear Engineering from the Delft University of Technology.



Catalina Anghel

Canadian Nuclear Laboratories, Canada

Talk: Overview of artificial intelligence (AI) and machine learning (ML) in nuclear engineering
PL3, Wednesday, 19 June, 2024, 13:30 - 14:20

Catalina Anghel heads the Codes and Algorithms section at Canadian Nuclear Laboratories, which implements and develops algorithms for a variety of applications, including advanced reactor and fuel cycle modelling, atmospheric transport of radionuclides, machine learning methods for anomalous event prediction, and statistical analysis of experiments and data. Her background is in mathematics and she is a subject matter expert on data analytics and machine learning at CNL. She is currently leading the computational component of two multi-year projects.



Bodo Mickan

Physikalisch-Technische Bundesanstalt, Braunschweig, Germany

Talk: On the uncertainties of values determined in complex systems: A metrological perspective

PL4, Thursday, 20 June, 2024, 9:00 - 9:50

Dr. Bodo Mickan studied Electrical Engineering at the University of Rostock and got his graduate engineer (Diplom Ingenieur) in 1993. Since May 1994 he has been employee of PTB. He started with research work in the field of fluid mechanics investigation installation effects on gas meters and the efficiency of flow straighteners. Based on this work he got his Ph.D. in 1998. From 1999 Bodo is working in the department for gas flow measurement and became the head of the working group for high pressure gas in 2007. In this position, he is responsible for the realization of the unit cubic meter with primary standards and the dissemination of the unit. In the international cooperation of the national metrology institutes, Bodo is the chairman of the Working Group for Fluid Flow at the BIPM. With beginning of 2023, he is also head of working group "Gas Meters" at PTB.

SPONSORS & PARTNERS

The organizing committee would like to thank our sponsors and exhibitors for the support of the workshop! Our exhibitors look forward to seeing you at their stands in the workshop foyer during the breaks!

EXHIBITOR

A2 Photonic Sensors

Grenoble Cedex, France



HZDR Innovation GmbH

Dresden, Germany



Westinghouse Electric Sweden

Västerås, Sweden



FURTHER SPONSOR

Deutsche Forschungsgemeinschaft (DFG)

German Research Foundation

Bonn, Germany



VENUE

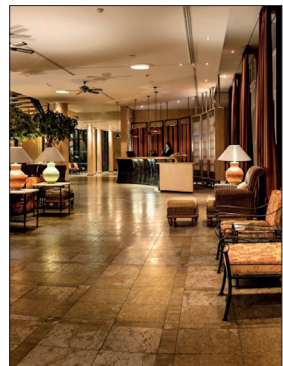
The workshop will be held at the Hotel Elbflorenz, situated just a 10-minute walk from the city centre and Dresden's historic Old Town.

Hotel Elbflorenz

Rosenstraße 36

01067 Dresden

Germany



ABSTRACTS AND FULL PAPERS OF SWINTH-2024

Each registered delegate will receive a USB flash drive during registration.

BANKING AND CURRENCY EXCHANGE

Euro is the official currency. Opening times differ from one bank to the next, with most open weekdays from 9 am to 4 pm. Most bank branches have cash machines (ATMs) that allow you to withdraw cash and get bank statements 24 hours/day.

CERTIFICATE OF ATTENDANCE

The certificate of attendance will be sent electronically to all delegates after the end of SWINTH-2024

COFFEE BREAKS AND LUNCHES

During all morning and afternoon breaks, coffee, tea, and refreshments will be served in the workshop foyer. Light lunch will be provided in the restaurant.

DISCLAIMER

The organizers are not liable for damages and/or losses of any kind which may be incurred by the workshop delegates or by any other individuals accompanying them, both during the official activities as well as going to/from the workshop. Delegates are responsible for their own safety and belongings.

EMERGENCY TELEPHONE NUMBERS

Calls to 112 are free of charge and can be made from a landline, pay phone or mobile phone, even without a SIM card. Dialling the number will direct you to an operator who will notify the appropriate service, typically the local fire and rescue service. It can be used for any life-threatening situation, including serious medical problems, fire-related incidents, crimes and life-threatening situations. You can also call an ambulance through this number. In addition to German, calls can be answered in English.

INTERNET

Public Wi-Fi is available for the participants of the SWINTH-2024 workshop free of charge. Please take the Wi-Fi access code from the information at the registration desk.

NAME BADGE

Congress badges need to be picked up onsite at the registration desk upon arrival. All participants must wear the badge visibly at any time on-site at the venue.

GOOD TO KNOW

OFFICIAL LANGUAGE

The workshop language is English.

Registration Opening hours	Monday,	June 17, 2024	16h 00 –20h 00
	Tuesday,	June 18, 2024	08h 00 –16h 00
	Wednesday,	June 19, 2024	08h 30 –16h 00
	Thursday,	June 20, 2024	08h 30 –15h 00

In order to comply with the regulations of the organizer HZDR, we ask for your understanding that we require proof of participation on site each day. Therefore, we will scan the name badges of the participants every morning upon arrival on each workshop day and thank you for your understanding.

SPEAKER INFORMATION

Please check date, time and room of your contribution at the scientific program. Please prepare your presentations in MS Powerpoint (.ppt or .pptx), Adobe Acrobat (pdf), or pezi, format 16:9. Please take care that special fonts/characters and videos are properly integrated.

Bring a copy of your presentation on a USB flash drive to the session room as early as possible, at the latest during the break immediately preceding your session so that it can be uploaded onto the central computer system to ensure a smooth change over between speakers. A technician will be available to assist you with the upload.

It is not possible to use your own notebook or any other file format for the presentations.

TIME ZONE

The time zone in Germany is Central European Summer Time (UTC+02:00) at the time of the workshop.

SCHEDULE – MONDAY 17 JUNE, 2024

FOYER

8:30	
9:00	
9:30	
10:00	
10:30	
11:00	
11:30	
12:00	
12:30	
13:00	
13:30	
14:00	
14:30	
15:00	
15:30	
16:00	16:00 - 18:00 Registration
16:30	
17:00	
17:30	
18:00	18:00 - 20:00 Welcome Reception
18:30	
19:00	
19:30	
20:00	

SCHEDULE – TUESDAY 18 JUNE, 2024

	GALILEI	MEDICI / MACHIAVELLI
8:30		
9:00	09:00 - 09:20 Opening	
9:30	09:20 - 10:20 PL1 – Fukushima Daiichi: Interim insights, lessons learned, and safety enhancements	
10:00	10:20 - 10:40 EP1 – Exhibitor Pitches 1	
10:30	Coffee Break and Exhibition Viewing	
11:00	11:10 - 12:30 S1 – Severe accident management and phenomena investigation 1	11:10 - 12:30 T1 – Thermal hydraulics of nuclear reactors: Separate and integral effect tests 1
11:30		
12:00		
12:30	Lunch	
13:00		
13:30	13:30 - 15:30 E1 – Experiments for the investigation of fundamental t/h phenomena and generation of CFD-grade data 1	13:30 - 15:30 A1 – Advanced instrumentation, data handling, machine learning, artificial intelligence methods 1
14:00		
14:30		
15:00		
15:30	Coffee Break and Exhibition Viewing	
16:00	16:00 - 17:20 E2 – Experiments for the investigation of fundamental t/h phenomena and generation of CFD-grade data 2	16:00 - 17:20 A2 – Advanced instrumentation, data handling, machine learning, artificial intelligence methods 2
16:30		
17:00		
17:30		
18:00		
19:00		
19:30		
20:00		
21:00		
22:00		
23:00		

SCHEDULE – WEDNESDAY 19 JUNE, 2024

	GALILEI	MEDICI / MACHIAVELLI
8:30		
9:00	09:00 - 09:50	
9:30	PL2 – Development and application of advanced, high-resolution instrumentation for single and multiphase flows	
10:00	10:00 - 10:40	10:00 - 10:40
10:30	S2 – Severe accident management and phenomena investigation 2	E3 – Experiments for the investigation of fundamental t/h phenomena and generation of CFD-grade data 3
11:00	Coffee Break and Exhibition Viewing	
11:30	11:10 - 12:30	11:10 - 12:30
12:00	S3 – Severe accident management and phenomena investigation 3	E4 – Experiments for the investigation of fundamental t/h phenomena and generation of CFD-grade data 4
12:30	Lunch	
13:00		
13:30	13:30 - 14:20	
14:00	PL3 – Overview of artificial intelligence (AI) and machine learning (ML) in nuclear engineering	
14:30	14:30 - 15:30	14:30 - 15:30
15:00	E5 – Experiments for the investigation of fundamental t/h phenomena and generation of CFD-grade data 5	A3 – Advanced instrumentation, data handling, machine learning, artificial intelligence methods 3
15:30	Coffee Break and Exhibition Viewing	
16:00	16:00 - 17:00	16:00 - 17:00
16:30	E6 – Experiments for the investigation of fundamental t/h phenomena and generation of CFD-grade data 6	A4 – Advanced instrumentation, data handling, machine learning, artificial intelligence methods 4
17:00		
17:30		
18:00		
19:00		
19:30		
20:00	19:30 - 23:00 Workshop Dinner	
21:00		
22:00		
23:00		

SCHEDULE – THURSDAY 20 JUNE, 2024

	GALILEI	MEDICI / MACHIAVELLI
8:30		
9:00	09:00 - 09:50 PL4 – On the uncertainties of values determined in complex systems: A metrological perspective	
9:30		
10:00	10:00 - 10:40 S4 – Severe accident management and phenomena investigation 4	10:00 - 10:40 A5 – Advanced instrumentation, data handling, machine learning, artificial intelligence methods 5
10:30		
11:00	Coffee Break and Exhibition Viewing	
11:30	11:10 - 12:30 S5 – Severe accident management and phenomena investigation 5	11:10 - 12:30 T2 – Thermal hydraulics of nuclear reactors: Separate and integral effect tests 2
12:00		
12:30	Lunch	
13:00		
13:30	13:30 - 14:30 Panel Session: Code need of new experimental data	
14:00		
14:30	14:30 - 15:30 Workshop Summary	
15:00		
15:30		
16:00		
16:30		
17:00	17:00 - 19:00 Guided tour of historic Dresden	
17:30		
18:00		
18:30		
19:00		
19:30		
20:00		

SCHEDULE – FRIDAY 21 JUNE, 2024

8:30	
9:00	08:45 - 18:30 Excursion HZDR and Post Workshop Tour to "Saxon Switzerland"
10:00	
11:00	
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19:00	
20:00	



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SCIENTIFIC PROGRAM – MONDAY 17 JUNE, 2024

MONDAY 17 JUNE, 2024

16:00 – 18:00
REGISTRATION

FOYER

18:00 – 20:00
WELCOME RECEPTION

RESTAURANT

TUESDAY 18 JUNE, 2024

9:00 – 9:15
OPENING

GALILEI

9:20 – 10:20
PLENARY LECTURE 1

GALILEI

Chair: Sanjeev Gupta (Becker Technologies GmbH, Germany)

9:20 PL1-01 **Fukushima Daiichi: Interim insights, lessons learned, and safety enhancements**

J. Rempe¹, M. Farmer², D. Marksberry³, D. Peko⁴

¹Rempe and Associates, LLC, Idaho Falls, United States of America

²Argonne National Laboratory, Lemont, United States of America

³U.S. Nuclear Regulatory Commission, Washington, D.C., United States of America

⁴U.S. Department of Energy, Washington, D.C., United States of America

10:20 – 10:40
EXHIBITOR PITCHES

GALILEI

10:40 – 11:10
COFFEE BREAK AND EXHIBITION VIEWING

FOYER

SCIENTIFIC PROGRAM – TUESDAY 18 JUNE, 2024

11:10 – 12:30

GALILEI

SEVERE ACCIDENT MANAGEMENT AND PHENOMENA INVESTIGATION 1

Chairs:

Domenico Paladino (Paul Scherrer Institut, Switzerland)
Sanjeev Gupta (Becker Technologies GmbH, Germany)

11:10 S1-01 Instrumentation for gaseous iodine pool scrubbing studies

T. Kärkelä¹, M. Freitag², **S. Gupta**², G. Langrock³, P. Nerisson⁴,
T. Kanai⁵, Y. Ishikawa⁶

¹VTT Technical Research Centre of Finland Ltd, Espoo, Finland

²Becker Technologies GmbH, Eschborn, Germany

³Framatome GmbH, Germany

⁴Institut de Radioprotection et de Sûreté Nucléaire (IRSN),
Cadarache, France

⁵Central Research Institute of Electric Power Industry (CRIEPI),
Japan, Japan

⁶RASA Industries Ltd, Japan, Japan

11:30 S1-02 Aerosol retention measurements with wire-mesh sensors: an experimental and computational approach

A. R. Perez¹, T. Lind¹, A. Manera^{2,1}, V. Petrov^{2,1}, H.-M. Prasser²

¹PSI, LRT/NES, 5232 Villigen, Aargau, Switzerland

²ETH, D-MAVT, 8092 Zürich, Zürich, Switzerland

11:50 S1-03 Instrumentation for sodium fast reactor severe accident experiments

C. Journeau¹, T. Blanchet², G. Blévin¹, O. Braillard¹, G. de Izarra¹,
F. Charollais¹, J. Delacroix¹, N. Estre¹, M. Johnson³, Y. Lejail¹, S.
Lusso¹, L. Maurin², B. Morrassano¹, F. Payot¹, F. Rey¹

¹CEA, IRESNE, Cadarache, France

²CEA, LIST, Saclay, France

³Scalian, SCALIAN Lab, Labege, France

12:10 S1-04 Fiber-coupled nuclearized Raman probe for remote gas monitoring in nuclear containment: Proof-of-concept for H2-risk management of design & beyond-design accidents

S. Magne¹, M. Leroy¹, A. Bentaib², E. Porcheron³, E. Studer⁴, N.
Chaumeix⁵, J. Dhote⁶, A. Ruffien-Ciszak⁶

¹CEA List, DIN/SMCD/LSPM, Palaiseau, France

²IRSN, PSN-RES/SAG, Fontenay-aux-roses, France

³IRSN, PSN-RES/SCA, Saclay, France

⁴CEA, DES/ISAS/DM2S/STMF/LAMF, Gif-sur-Yvette, France

⁵CNRS, Institut ICARE, Orléans, France

⁶ARCYS, Blagnac, France

SCIENTIFIC PROGRAM – TUESDAY 18 JUNE, 2024

11:10 – 12:30

MEDICI/MACCHIAVELLI

THERMAL HYDRAULICS OF NUCLEAR REACTORS: SEPARATE AND INTEGRAL EFFECT TESTS 1

Chairs:

Lionel Rossi (CEA, France)

Klaus Umminger (SILENCE, Germany)

11:10 T1-01 **An overview of the EMBLA single-phase pressure drop loop**

F. Waldemarsson, M. Andersson, R. Enlund

Westinghouse Electric Sweden AB, Västerås, Sweden

11:30 T1-02 **Simulation of a SMR natural cooling circuit by the mass transfer system**

S.S. Yoon, **B.J. Chung**

Kyung Hee University, Department of Nuclear Engineering, Yongin, Republic of Korea

11:50 T1-03 **Design of the experimental setup for investigation of transient two-phase flows in LWR operating conditions**

A. Kipiela, H. Li, J.-M. Le Corre, P. Kudinov, D. Grishchenko

KTH Royal Institute of Technology, Nuclear Engineering, Stockholm, Sweden

12:10 T1-04 **Validation of cupid code against SIRIUS-3D rod bundle test and design of a new rod bundle test**

B.G. Jeon¹, J.R. Lee¹, S.-K. Moon¹, H.-S. Choi¹, H. Park², S. Kim¹

¹Korea Atomic Energy Research Institute, Reactor System Safety Research Division, Daejeon, Republic of Korea

²Seoul National University, Department of Mechanical Engineering, Seoul, Republic of Korea

12:30 – 13:30

RESTAURANT

LUNCH

SCIENTIFIC PROGRAM – TUESDAY 18 JUNE, 2024

13:30 – 15:30

GALILEI

EXPERIMENTS FOR THE INVESTIGATION OF FUNDAMENTAL T/H PHENOMENA AND GENERATION OF CFD-GRADE DATA 1

Chairs: Hyoung Kyu Cho (Seoul National University, Republic of Korea)
Dominique Bestion (SILENCE, France)

13:30 E1-01 An experimental investigation of boiling two-phase flow in a 3 X 3 vertical rod bundle

S. Taş, S. Boden, R. Franz, U. Hampel

Helmholtz-Zentrum Dresden-Rossendorf, Institute of Fluid Dynamics, Dresden, Germany

13:50 E1-02 Investigation of local bubble parameters in a pressurized annulus channel under the subcooled boiling flow

J. Moon, D. Jeong, D. Lim, **J. Bak**, L. D. Manh, Y. Ko, B. Yun

Pusan National University, School of Mechanical Engineering, Pusan, Republic of Korea

14:10 E1-03 Experimental investigation of the interfacial area concentration of narrow rectangular channel based on the wire-mesh conductivity scanning

Y. Yang, **J. Xiong**

Shanghai Jiao Tong University, School of Nuclear Science and Engineering, Shanghai, China

14:30 E1-04 Stochastic characteristic study of three-dimensional bubble trajectory in two-phase flow using Monte Carlo method

L. Zhu, L. Liu, W. Zhou, L. Zhang, Q. Lian, S. Tang, L. Pan

Chongqing University, Department of Nuclear Engineering and Technology, Chongqing, China

14:50 E1-05 Bubbly flow around an obstacle – experiments with ultra-fast X-ray tomography and CFD code development

U. Hampel^{1,2}, S. Taş¹, F. Barthel¹, M. Neumann-Kipping¹

¹Helmholtz-Zentrum Dresden-Rossendorf, Institute of Fluid Dynamics, Dresden, Germany

²Technische Universität Dresden, Institute of Power Engineering, Dresden, Germany

SCIENTIFIC PROGRAM – TUESDAY 18 JUNE, 2024

15:10 **E1-06** **Void oscillations of forced convection boiling on a simulated offshore floating plant**
Y. Ikeda, S. Ueda, T. Arai, R. Okawa, K. Shirakawa, M. Furuya, A. Ui
Central Research Institute of Electric Power Industry, Energy Transformation Research Laboratory, Kanagawa, Japan

13:30 – 15:30 **MEDICI/MACCHIAVELLI**
ADVANCED INSTRUMENTATION, DATA HANDLING, MACHINE LEARNING, ARTIFICIAL INTELLIGENCE METHODS 1

Chairs: Uwe Hampel (Helmholtz-Zentrum Dresden-Rossendorf, Institute of Fluid Dynamics, Germany)
Annalisa Manera (ETH Zürich, Switzerland)

13:30 **A1-01** **Inductive bubble detection for liquid sodium**
T. Wondrak, L. Krause, M. Sieger, S. Eckert
Helmholtz-Zentrum Dresden - Rossendorf, Magnetohydrodynamics, Dresden, Germany

13:50 **A1-02** **Liquid film visualisation for high-pressure steam condensation in an inclined tube using X-ray tomography**
S. Boden¹, A. Bieberle¹, U. Hampel^{1,2}
¹Helmholtz-Zentrum Dresden - Rossendorf, Institute of Fluid Dynamics, Dresden, Germany
²Technische Universität Dresden, Chair of Imaging Techniques in Energy and Process Engineering, Dresden, Germany

14:10 **A1-03** **On uncertainty of strain-compensated and high-definition optic fiber temperature measurements in passive containment cooling system pool's transient environment**
E. Hujala, **L. Pyy**, J. Telkkä, E. Kotro, A. Räsänen, J. Hyvärinen
Lappeenranta-Lahti University of Technology LUT, School of Energy Systems, Lappeenranta, Finland

14:30 **A1-04** **Experimental qualification of a PIV and two-dye LIF temperature field measurement system with the "filling box" experiment in liquid flow**
V. Helfer¹, B. Cariteau¹, P. Fillion¹, A. Toutant²
¹CEA, Service de Thermo-hydraulique et de Mécanique des Fluides, Gif-sur-Yvette, France
²PROMES-CNRS, Perpignan, France

SCIENTIFIC PROGRAM – TUESDAY 18 JUNE, 2024

14:50 **A1-05** **Fundamental research on a new water level measurement method using clamp-on ultrasonic transducers**

K. Kikuchi¹, T. Suzuki², N. Shoji³, H. Kikura¹

¹Tokyo Institute of Technology, Laboratory for Zero-Carbon Energy, Meguro-ku, Japan

²Tokyo Electric Power Company, Tokyo, Japan

³Muroran Institute of Technology, Department of Engineering, Muroran, Japan

15:10 **A1-06** **PLIF technology and its application in researches of nuclear reactor thermal-hydraulics**

S. Gao, S. Qiao, D. Li, R. Tian, **S. Tan**

Harbin Engineering University, Heilongjiang Provincial Key Laboratory of Nuclear Power System & Equipment, Harbin, China

15:30 – 16:00

FOYER

COFFEE BREAK AND EXHIBITION VIEWING

16:00 – 17:20

GALILEI

EXPERIMENTS FOR THE INVESTIGATION OF FUNDAMENTAL T/H PHENOMENA AND GENERATION OF CFD-GRADE DATA 2

Chairs:

Hyungdae Kim (Kyung Hee University, Nuclear Engineering, Republic of Korea)

Dominique Bestion (SILENCE, France)

16:00 **E2-01**

Towards simultaneous measurements of 3D velocity and pressure within rods bundle

P. Bresson¹, N. Turankok³, V. Biscay¹, F. Lamadie², T. Lohez¹, **L. Rossi**¹

¹CEA, CEA, DES, IRESNE, DTN, Cadarache, France

²CEA, CEA, DES, ISEC, DMRC, Univ Montpellier, Marcoule, France

³FRAMATOME, DTI Centre Technique - Le Creusot, Le creusot, France

SCIENTIFIC PROGRAM – TUESDAY 18 JUNE, 2024

- 16:20** **E2-02** **Numerical study on heat transfer and flow characteristics of helium-xenon mixtures in micro rectangular channel**
C. Kang¹, M. G. Fan¹, R. Zhang², K. Z. Li¹, B. X. Zeng¹
¹Harbin Engineering University, College of Nuclear Science and Technology, Harbin, China
²China Nuclear Power Technology Research Institute Co.,Ltd, Shenzhen, China
- 16:40** **E2-03** **Non-uniform flows through a 8x34 PWR-type rod bundle: PIV and pressure drop measurements**
C. Melin, B. Cariteau, P. Fillion
Université Paris-Saclay, CEA, Service de Thermo-hydraulique et de Mécanique des Fluides, Gif-Sur-Yvette, France
- 17:00** **E2-04** **Optical techniques for near-wall phenomena in nucleate boiling**
C. Tecchio¹, B. Cariteau¹, G. Zalczer², S. Vassant², V. Nikolayev², P. Roca i Cabarrocas³, P. Bulkin³, J. Charliac³
¹Université Paris-Saclay, CEA, STMF, Gif-sur-Yvette Cedex, France
²Université Paris-Saclay, CEA, SPEC, CNRS, Gif-sur-Yvette Cedex, France
³Institut Polytechnique de Paris, Ecole Polytechnique, LPICM, CNRS, Palaiseau, France

16:00 – 17:20

MEDICI/MACCHIAVELLI

ADVANCED INSTRUMENTATION, DATA HANDLING, MACHINE LEARNING, ARTIFICIAL INTELLIGENCE METHODS 2

Chairs:

Stephan Boden (Helmholtz-Zentrum Dresden - Rossendorf, Institute of Fluid Dynamics, Dresden, Germany)
Annalisa Manera (ETH Zürich, Switzerland)

16:00 **A2-01**

Development of a thermal anemometry grid sensor for steam-water two-phase flow

S. Valupadasu¹, E. Schleicher², U. Hampel^{1,2}

¹Technische Universität Dresden, Chair of Imaging Techniques and Process Engineering, Institute of Power Engineering, Dresden, Germany

²Helmholtz-Zentrum Dresden-Rossendorf, Department of Experimental Thermal Fluid Dynamics, Institute of Fluid Dynamics, Dresden, Germany

SCIENTIFIC PROGRAM – WEDNESDAY 19 JUNE, 2024

- 16:20** **A2-02** **Gas bubble detection and segmentation using a machine learning approach leveraging semi-supervised training**
J. Schäfer¹, S. Taş¹, U. Hampel^{1, 2}
¹Helmholtz-Zentrum Dresden-Rossendorf, Experimental Thermal Fluid Dynamics, Dresden, Germany
²TU Dresden, Chair of Imaging Techniques in Energy and Process Engineering, Dresden, Germany
- 17:00** **A2-04** **Critical heat flux detection and temperature profile measurement with OFDR in a carbon dioxide cooled tube at high subcritical pressures.**
J. D. Bronik, M. Buck, J. Starflinger
University of Stuttgart, Institute of Nuclear Technology and Energy Systems, Stuttgart, Germany

WEDNESDAY 19 JUNE, 2024

9:00 – 9:50

GALILEI

PLENARY LECTURE 2

Chair: Dominique Bestion (SILENCE, France)

9:00

PL2-01

Development and application of advanced, high-resolution instrumentation for single and multiphase flows

A. Manera

ETH Zurich, Laboratory of Nuclear Safety and Multiphase Flows, Zurich, Switzerland

10:00 – 10:40

GALILEI

SEVERE ACCIDENT MANAGEMENT AND PHENOMENA INVESTIGATION 2

Chairs: Markus Beilmann (OECD, Nuclear Energy Agency, France)
Sanjeev Gupta (Becker Technologies GmbH, Germany)

10:00

S2-01

Cooperative nuclear safety research activities at the Nuclear Energy Agency (NEA) in response to the Fukushima-Daiichi accident

Y. Kumagai, D. Jacquemain, M. Beilmann

OECD, Nuclear Energy Agency, Paris, France

SCIENTIFIC PROGRAM – WEDNESDAY 19 JUNE, 2024

10:20 S2-02 Optimizing filtered containment vent system performance for CANDU reactors
M. Shawkat
Canadian Nuclear Safety Commission, Reactor Behaviour Division, Ottawa, Ontario, Canada

**10:00 – 10:40 MEDICI/MACCHIAVELLI
EXPERIMENTS FOR THE INVESTIGATION OF FUNDAMENTAL T/H PHENOMENA
AND GENERATION OF CFD-GRADE DATA 3**

Chairs: Jean-Marie Le Corre (Westinghouse Electric Sweden AB, Sweden)
Dominique Bestion (SILENCE, France)

10:00 E3-01 High fidelity PIV measurements of turbulent flow in reactor pressure vessel assisted by high-precision matched index of refraction technique
W. Qu, J. Xiong
Shanghai Jiao Tong University, Mechanical Engineering, Shanghai, China

10:20 E3-02 Anomaly detection technique based on acoustic measurement for sodium-cooled fast reactor
K. Aizawa¹, A. Kato¹, Y. Ueki²
¹Japan Atomic Energy Agency, Sector of Fast Reactor and Advanced Reactor Research and Development, Oarai, Japan
²Tokyo University of Science, Faculty of Advanced Engineering, Katsushika, Japan

**10:40 – 11:10
COFFEE BREAK AND EXHIBITION VIEWING**

FOYER

SCIENTIFIC PROGRAM – WEDNESDAY 19 JUNE, 2024

11:10 – 12:30

GALILEI

SEVERE ACCIDENT MANAGEMENT AND PHENOMENA INVESTIGATION 3

Chairs:

Markus Beilmann (OECD, Nuclear Energy Agency, France)
Sanjeev Gupta (Becker Technologies GmbH, Germany)

11:10 S3-01 **Do we need radiation for pertinent experiments on containment iodine behavior at an accident?**

A. Rydl¹, C. Wren²

¹INSET, Praha, Czech Republic

²McMaster University, Department of Engineering Physics, Ontario, Canada

11:30 S3-02 **Automated in-situ gamma spectrometry characterization air sampling device for post accident plume tracking**

C. M. Graham

Canadian Nuclear Laboratories, Nuclear Safety and Response Analysis, Chalk River, Ontario, Canada

11:50 S3-03 **Measurement of the convective and radiative heat flux during hydrogen deflagrations in containments with varying gas compositions**

K. Dieter, M. Freitag, E. Schmidt, B. von Laufenberg
Becker Technologies GmbH, Eschborn, Germany

12:10 S3-04 **Panda thermal-hydraulics experiments within the OECD/NEA framework for nuclear safety analyses**

D. Paladino¹, R. Kapulla¹, M.-S. Chae¹, S. Arfinengo-del-Carpio²,
C. Gubicagogeascoa-Cuesta², G. Jiménez²

¹Paul Scherrer Institut, VILLIGEN PSI, Aargau, Switzerland

² 2 Universidad Politécnica de Madrid, Madrid, Spain

SCIENTIFIC PROGRAM – WEDNESDAY 19 JUNE, 2024

11:10 – 12:30

MEDICI/MACCHIAVELLI

EXPERIMENTS FOR THE INVESTIGATION OF FUNDAMENTAL T/H PHENOMENA AND GENERATION OF CFD-GRADE DATA 4

Chairs: Jean-Marie Le Corre (Westinghouse Electric Sweden AB, Sweden)
Dominique Bestion (SILENCE, France)

11:10 E4-01 Experimental investigation of the post-dryout heat transfer and droplet behavior with R-134a

N. Rensch, L. Köckert, A. F. Badea, X. Cheng
Karlsruhe Institute of Technology, Institute of Applied Thermofluidics, Karlsruhe, Germany

11:30 E4-02 Experimental investigation on two-phase flow boiling in a vertical rod bundle based on wire mesh sensor and high-speed visualization

H. Xie, Y. Yang, J. Xiong
Shanghai Jiao Tong University, Shanghai, China

11:50 E4-03 Experimental data on heat flux and bubble size distributions in narrow in narrow temperature-controlled annulus

B. Končar, B. Zajec
Jožef Stefan Institute, Reactor Engineering Division, Ljubljana, Slovenia

12:10 E4-04 Experimental evaluation of heat flux partitioning using state-of-the-art visible wavelength light-based imaging techniques

S.R.G. Vadlamudi¹, M. Moiz², A. Srivastava², W. Ding¹, U. Hampel¹
¹Helmholtz-Zentrum Dresden-Rossendorf, Institute of Fluid Dynamics, Dresden, Germany
²Indian Institute of Technology Bombay, Department of Mechanical Engineering, Mumbai, India

12:30 – 13:30
LUNCH

RESTAURANT

SCIENTIFIC PROGRAM – WEDNESDAY 19 JUNE, 2024

13:30 – 14:20

GALILEI

PLENARY LECTURE 3

Chair:

Annalisa Manera (ETH Zürich, Switzerland)

13:30

PL3-01

Overview of artificial intelligence (AI) and machine learning (ML) in nuclear engineering

C. Anghel

Canadian Nuclear Laboratories, Ontario, Canada

14:30 – 15:30

GALILEI

EXPERIMENTS FOR THE INVESTIGATION OF FUNDAMENTAL T/H PHENOMENA AND GENERATION OF CFD-GRADE DATA 5

Chairs:

Jinbiao Xiong (Shanghai Jiao Tong University, China)

Dominique Bestion (SILENCE, France)

14:30

E5-01

Time-resolved PIV measurement of turbulent flow around a cylinder blockage in a narrow rectangular channel

W. Qu, H. Xie, J. Xiong

Shanghai Jiao Tong University, School of Mechanical Engineering, Shanghai, China

14:50

E5-02

Experiment for rolling and heaving motion effects on CHF in annulus channel using R134a

H. Ko¹, G.-W. Kim², C.W. Lee¹, J.-S. Yoo¹, H. Hong¹, J.H. Ku¹, G.-C. Park¹, H.-K. Cho¹

¹Seoul National University, Dep. Of Nuclear Engineering, Seoul, Republic of Korea

²Korea Institute of Nuclear Safety, Daejeon, Republic of Korea

15:10

E5-03

Measurement of void fraction distribution at high pressure in 4x4 simulated fuel bundle for validation of thermal-hydraulics simulation codes

A. Ono, T. Nagatake, S. Uesawa, M. Shibata, H. Yoshida

Japan Atomic Energy Agency, Nuclear Science and Engineering Center, Tokai, Japan

SCIENTIFIC PROGRAM – WEDNESDAY 19 JUNE, 2024

14:30 – 15:30

MEDICI/MACCHIARELLI

ADVANCED INSTRUMENTATION, DATA HANDLING, MACHINE LEARNING,
ARTIFICIAL INTELLIGENCE METHODS 3

Chairs:

Byong Jo Yun (Pusan National University, School of Mechanical Engineering, Republic of Korea)

Annalisa Manera (ETH Zürich, Switzerland)

14:30 A3-01

Fast multichannel X-ray densitometer "RoMuLuS" for two-phase flow pattern identification

F. Barthele¹, S. Boden¹, U. Hampel²

¹HZDR, Institute of Fluid Dynamics, Dresden, Germany

²TU Dresden, Institute of Power Engineering, Dresden, Germany

14:50 A3-02

Evaluation of an array of capacitive humidity sensors for the measurement of humidity profiles in condensation boundary layers

P.-L. Lamure^{1,2}, E. Studer¹, B. Podvin²

¹CEA, ISAS/STMF, Gif-sur-Yvette, France

²Université Paris-Saclay, Laboratoire EM2C, CentraleSupélec, CNRS, Gif-sur-Yvette, France

15:10 A3-03

Two-phase flow sensors signal interpretation using artificial neural-networks

G. Monrós Andreu, R. Martínez-Cuenca, O. Prades, S. Chiva

Universitat Jaume I, Engineering and Mechanical Construction, Castellón, Spain

15:30 – 16:00

FOYER

COFFEE BREAK AND EXHIBITION VIEWING

SCIENTIFIC PROGRAM – WEDNESDAY 19 JUNE, 2024

16:00 – 17:00

GALILEI

EXPERIMENTS FOR THE INVESTIGATION OF FUNDAMENTAL T/H PHENOMENA AND GENERATION OF CFD-GRADE DATA 6

Chairs:

Jinbiao Xiong (Shanghai Jiao Tong University, China)
Dominique Bestion (SILENCE, France)

16:00 E6-01 Critical heat flux for flow boiling of water in a vertical rod bundle at low pressure

N. Wefers

Karlsruhe Institute of Technology, Multiphase Flows / Institute for Thermal Energy Technology and Safety, Karlsruhe, Germany

16:20 E6-02 Development of measurement method for gas-liquid two-phase flow inside a fuel bundle to obtain code validation data

A. Ono¹, K. Okamoto², Y. Makino³, S. Hosokawa⁴, H. Yoshida¹

¹Japan Atomic Energy Agency, Nuclear Science and Engineering Center, Tokai, Japan

²MHI Nuclear Development Corporation, Nuclear Research & Development Department, Tokai, Japan

³MHI Nuclear Development Corporation, Technology Development and Quality Assurance Department, Tokai, Japan

⁴Kansai University, Faculty of Societal Safety Sciences, Takatsuki, Japan

16:40 E6-03 Effects of sensor arrangement on measurement of two-phase flow interfacial parameters

S. Qiao, F. Wang, J. Ren, R. Wang, S. Tan

Harbin Engineering University, College of Nuclear Science and Technology, Harbin, China

SCIENTIFIC PROGRAM – WEDNESDAY 19 JUNE, 2024

16:00 – 17:00

MEDICI/MACCHIAVELLI

ADVANCED INSTRUMENTATION, DATA HANDLING, MACHINE LEARNING,
ARTIFICIAL INTELLIGENCE METHODS 4

Chairs:

Byong Jo Yun (Pusan National University, School of Mechanical Engineering, Republic of Korea)

Annalisa Manera (ETH Zürich, Switzerland)

16:00 A4-01

Distortion and limitation in measuring microlayer profile at the base of boiling bubble using laser interferometry

J. Choi, H. Kim

Kyung Hee University, Department of Nuclear Engineering, Yongin-si, Republic of Korea

16:20 A4-02

Development of phosphor thermometry technique for high-pressure boiling heat transfer experiment using sputtering and electrophoretic deposition

A. Cho, J. Choi, H. Kim

Kyung Hee University, Department of Nuclear Engineering, Gyeonggi-do, Republic of Korea

16:40 A4-03

Improving image reconstruction for electrical impedance tomography (EIT) using an artificial neural network.

A. A. Saoudi¹, S. Peng¹, M. Darnajou¹, G. Ricciardi³, C. Bellis², V. Audoly⁴

¹The French Alternative Energies and Atomic Energy Commission (CEA), IRESNE/DTN/STCP/LISM, Cadarache, France

²Laboratoire de Mécanique et d'Acoustique, LMA, Marseille, France

³The French Alternative Energies and Atomic Energy Commission (CEA), IRESNE/DTN/STCP/LETH, Cadarache, France

⁴The French Alternative Energies and Atomic Energy Commission (CEA), IRESNE/DER/SESI/LCOS, Cadarache, France

19:30 – 23:00

RESTAURANT ALTE MEISTER

WORKSHOP DINNER

see page 36, Social Program and Tours

SCIENTIFIC PROGRAM – THURSDAY 20 JUNE, 2024

THURSDAY 20 JUNE, 2024

9:00 – 9:50

GALILEI

PLENARY LECTURE 4

Chair: Uwe Hampel (Helmholtz-Zentrum Dresden-Rossendorf, Institute of Fluid Dynamics, Germany)

9:00

PL4-01

On the uncertainties of values determined in complex systems: A metrological perspective

B. Mickan

Physikalisch-Technische Bundesanstalt, Braunschweig, Germany

10:00 – 10:40

GALILEI

SEVERE ACCIDENT MANAGEMENT AND PHENOMENA INVESTIGATION 4

Chairs: Nusret S. Aksan (Switzerland)
Sanjeev Gupta (Becker Technologies GmbH, Germany)

10:00

S4-01

Experiment of aerosol removal by pool scrubbing

T. Kanai, M. Saito

Central Research Institute of Electric Power Industry, Tokyo, Japan

10:20

S4-02

Enhancing analytical capability for the Fukushima Daiichi NPS decommissioning: An international collaboration

T. Kitagaki¹, A. C. Morreale², H. Ikeuchi¹, K. Tanaka¹, S. Koyama¹

¹Japan Atomic Energy Agency, Collaborative Laboratories for Advanced Decommissioning Science, Tokai-mura, Ibaraki, Japan

²Canadian Nuclear Laboratories, Reactor Fleet Sustainability Directorate, Chalk River, Ontario, Canada

SCIENTIFIC PROGRAM – THURSDAY 20 JUNE, 2024

10:00 – 10:40 **MEDICI/MACCHIAVELLI**
ADVANCED INSTRUMENTATION, DATA HANDLING, MACHINE LEARNING, ARTIFICIAL INTELLIGENCE METHODS 5

Chairs: Michael Wagner (Helmholtz-Zentrum Dresden-Rossendorf, Germany)
Annalisa Manera (ETH Zürich, Switzerland)

10:20 **A5-02** **Development of capacitive liquid film sensor for heated rods**

S. Ueda, T. Arai, M. Furuya
Central Research Institute of Electric Power Industry, Energy Transformation Research Laboratory, Yokosuka, Japan

10:40 – 11:10 **FOYER**
COFFEE BREAK AND EXHIBITION VIEWING

11:10 – 12:30 **GALILEI**
SEVERE ACCIDENT MANAGEMENT AND PHENOMENA INVESTIGATION 5

Chairs: Nusret S. Aksan (Switzerland)
Sanjeev Gupta (Becker Technologies GmbH, Germany)

11:10 **S5-01** **Study on measurement method of out-of-pile LOCA swelling and rupture experiment of PWR fuel**

J. Diao, **S. Ji**, Q. Wu, X. Guan, Z. Han
China Institute of Atomic Energy, Engineering and Technology Research Institute, Beijing, China

11:30 **S5-02** **THAI experimental investigations on hydrodynamic aspects and fission products release and retention behaviour in LWR water pools**

S. Gupta
Becker Technologies GmbH, Eschborn, Germany

SCIENTIFIC PROGRAM – THURSDAY 20 JUNE, 2024

11:50 **S5-03** **Muon imaging as a potential diagnostic technique for damaged reactor cores and other problems of nuclear reactor safety**

M. Wagner^{1, 2}, A. Bieberle², U. Hampel^{1, 2}

¹TU Dresden, Chair of Imaging Techniques in Energy and Process Engineering, Dresden, Germany

²Helmholtz-Zentrum Dresden-Rossendorf, Institute of Fluid Dynamics, Dresden, Germany

12:10 **S5-04** **Nuclear instrumentation at the EPR nuclear power plant**

H. Jasper, T. F. Richter, W. Witt

Framatome GmbH, ICNTP, Erlangen, Germany

11:10 – 12:30

MEDICI/MACIHAVELLI

THERMAL HYDRAULICS OF NUCLEAR REACTORS: SEPARATE AND INTEGRAL EFFECT TESTS 2

Chairs:

Sichao Tan (Harbin Engineering University, College of Nuclear Science and Technology, China)

Klaus Umminger (SILENCE, Germany)

11:10 **T2-01** **Experimental investigation of the internal structure of boiling two-phase water flow under LWR core operating conditions**

J.-M. Le Corre^{1, 2}, H. Li¹, D. Grishchenko¹, A. Kipiela¹, M. Persson¹, H. Anglart¹

¹Royal Institute of Technology, Division of Nuclear Engineering, Stockholm, Sweden

²Westinghouse Electric Sweden AB, Fuel Innovation, Västerås, Sweden

11:30 **T2-02** **Analysis of SBO test of ACME based on cosTRANS sSOFTWARE**

X. Kong, H. Yu, B. Luo, H. Sha, Z. Meng

SPICRI (State Power Investment Corporation Research Institute), Nuclear Energy and Technology Research Institute, Beijing, China

11:50 **T2-03** **Introduction of heat transfer test post-CHF in reactor core during LBLOCA blowdown and refill stage**

H. Yu, T. Huang, F. Yang, X. Kong

SPICRI (State Power Investment Corporation Research Institute), Nuclear Energy and Technology Research Institute, Beijing, China

SCIENTIFIC PROGRAM – THURSDAY 20 JUNE, 2024

12:10 **T2-04** **Analysis of the PCCS water film coverage reduction test with cosCONT**
Y. Yang, Y. Chen, J. Li, D. Yang
SPICRI (State Power Investment Corporation Research Institute),
Nuclear Energy And Nuclear Technology Research Institute, Beijing, China

12:30 – 13:30
LUNCH

RESTAURANT

13:30 – 14:30

GALILEI

PANEL SESSION: CODE NEED OF NEW EXPERIMENTAL DATA

Chairs: Jean-Marie Le Corre (Westinghouse Electric Sweden AB, Sweden)
 Dominique Bestion (SILENCE, France)

14:30 – 15:30

GALILEI

WORKSHOP SUMMARY

Chair: Sanjeev Gupta (Becker Technologies GmbH, Germany)

17:00 – 19:00

CITY CENTER

GUIDED TOUR OF HISTORIC DRESDEN
see page 36, Social Program and Tours

SCIENTIFIC PROGRAM – FRIDAY 21 JUNE, 2024

FRIDAY 21 JUNE, 2024

9:00 – 18:30

EXCURSION HZDR AND POST WORKSHOP TOUR TO "SAXON SWITZERLAND"

Meeting time / point:

08:45

in the hotel lobby of the Hotel Elbflorenz
(Workshop Venue)
see page 37, Social Program and Tours

Visit of TOPFLOW - Transient Two Phase FlowTest Facility

Visit of DRESDYN - The DREsden Sodium facility for DYNamo and thermohydraulic studies

Tour to Saxon Switzerland

SOCIAL PROGRAM

Welcome Reception

It has become a nice and proven tradition that all participants, speakers and exhibitors celebrate a reunion together on the evening before the workshop starts.

We invite everyone to celebrate the opening of the SWINTH-2024 workshop with a cool drink and local snacks, to see colleagues again or to make new contacts.

Meeting Time: Monday, June 17, 2024 | 18:00-20:00
Meeting Place: Workshop Venue Hotel Elbflorenz, ground floor

Workshop Dinner

After two intense workshop days and before the last day dawns, it's time to celebrate! The SWINTH-2024 workshop dinner will take place in the historic heart of Dresden, in the Alte Meister restaurant. The restaurant is located next to the Old Masters Gallery on the outside of the Zwinger. You sit on the idyllic terrace with a view of the Semper Opera House and Theaterplatz, watched over by Carl Maria von Weber on his pedestal. In bad weather, enjoy the ambiance of the historic French Pavilion with access to the Nymphenbad, an opulent Baroque fountain complex. Spend a wonderful evening in a relaxed atmosphere with delicious dishes.

Meeting Time: Wednesday, June 19, 2024 | 19:30-23:00
Meeting Place: Alte Meister – Café & Restaurant
Theaterplatz 1a, 01067 Dresden

Guided Tour of Historic Dresden

After the end of the workshop we offer you a guided tour of historic Dresden. Dresden's historic city centre with its baroque flair is famous beyond the frontiers of Germany. It is part of the Dresden Elbe Valley, which is recognized as world heritage site since 2004, and captivates millions of visitors every year. You will discover the city by foot, walking around the Theater place with its unique ensemble of Semper Opera House, Zwinger, and the bordering Residential Castle, over the Brühl Terrace, also called „Europe's balcony“, to the Cathedral, the Procession of Princes – a 101-metres-long wall painting on 20.000 tiles of Meissen porcelain – and to the Church of our Ladies. A guide will lead you in English through the baroque city. The tour ends around 7 pm, so you can have a look for a nice dinner location after the tour.

Meeting Time: Thursday, June 20, 2024 | 17:00-19:00
Meeting Point: King Johann's equestrian statue at the Theatre Square,
Theaterplatz, 01067 Dresden
Costs: 20.00 EUR per person, only with prior booking. Please ask at
the registration desk for available tickets.

Excursion HZDR and Post Workshop Tour to "Saxon Switzerland"

The bus brings you first to the Helmholtz-Zentrum Dresden-Rossendorf (HZDR). Here you have the opportunity to visit the thermohydraulic test facilities.

After your tour of the HZDR we continue the bus ride to the Elbe sandstone highlands, also called „Saxon Switzerland,„. During our stop at the world-famous Bastei, which is located on the highest rock in the Elbe Sandstone Mountains, you will be rewarded with a breathtaking view of the Elbe valley and the surrounding rock formations. Seats have been reserved for lunch in the Bastei Restaurant with a phantastic view.

The bus takes you to Königstein at the river the Elbe, where you continue your journey on the Elbe steamer to Pirna through the fairytale landscape of the national park – a „pure nature experience“.

From the Elbe River, Königstein presents an imposing picture: the town stretches up the valley of the Biela River for several kilometers. High above towers the landmark – the Königstein Fortress. Due to the military impregnability of the Königstein, Saxon electors and kings sought refuge behind the thick walls in troubled times and stored art treasures and the state treasure here. In addition, because of its scenic location, the Königstein was a popular place for sumptuous festivities of the court. Later it served as a feared state prison of Saxony. The bus will return you from Pirna to Dresden, passing the impressive castles on the Elbe, embedded in the vineyards of the Elbe Valley. The tour ends around 6:30 pm.

Meeting time / point: 08:45 in the hotel lobby of the Hotel Elbflorenz
(Workshop Venue)

Costs 99 EUR per Person, only with prior booking, please ask at the registration desk for free places
Price includes bus, tickets for ship, guide, plate meal for lunch, entrance fees. Food and drinks during the river cruise and drinks for lunch are NOT included.

Please note that it is a full day tour and it is NOT possible to end the tour earlier, as the research center and the other destinations are NOT in the center of Dresden!

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Dresden - Rossendorf, Dresden, Germany

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