



Conference Programme

Helsinki

28–31 May 2024

**From Forests
to Heritage
Conference 2024**

Front cover and page 8 photos of Myllymäki farmstead / Livady Architects.
Back cover drawing: A drying barn in Myllymäki / Livady Architects.

Contents

4 INTRODUCTION

- 5 From Forests to Heritage
- 6 Foreword
- 7 Conference venue

9 PROGRAMME

- 10 Programme at a glance
- 12 Keynote speaker: Marta Domínguez Delmás
- 14 Detailed programme

28 ABSTRACTS

90 POSTERS

96 MAPS

- 97 Pre- and post-conference excursions
- 98 Otaniemi – Helsinki centre metro connection
- 98 Otaniemi, Espoo
- 99 Helsinki
- 100 Suomenlinna and conference venue

101 PUBLIC TRANSPORT AND FERRY TRAFFIC IN HELSINKI

- 102 HSL area and zones
- 103 HSL tickets
- 104 Alternative: FRS Finland waterbus to Suomenlinna

INTRODUCTION

FROM FORESTS TO HERITAGE

Helsinki, Suomenlinna Sea Fortress, 28–31 May 2024

Aalto University
University of Eastern Finland
The Governing Body of Suomenlinna
Finnish Heritage Agency
Livady Architects

Organising Committee

Panu Savolainen (head), panu.savolainen@aalto.fi / Aalto University
Tuomas Aakala / University of Eastern Finland
Liisa Seppänen / Aalto University
Miia Perkkiö / The Governing Body of Suomenlinna
Marko Huttunen / Livady Architects
Jouni Taivainen / Finnish Heritage Agency
Pekka Heikkinen / Aalto University
Mia Puranen, Conference coordinator, mia.puranen@livady.fi

Maija Kenttämies, Conference assistant
Eeva Hemming, Conference assistant
Minni Auranen, Conference assistant
Sini Hintsala, Conference assistant
Tytti Rajainmäki, Conference assistant

Keynote Speaker

Marta Domínguez Delmás

Music at the opening

Jean Sibelius: *The Spruce* (op. 75 nr. 5)
Panu Savolainen, pianist

Music at Conference Dinner

Jukka Nykänen & Oskari Nokso-Koivisto: *Improvisation (Suurtaidetta)*
Oskari Nokso-Koivisto, baritone
Jukka Nykänen, pianist

FOREWORD

The From Forests to Heritage Conference in Helsinki continues the recently established “tradition”, which started in Amsterdam 2022, bringing together scholars from various disciplines studying trees and cultural heritage. It’s a pleasure to organize this conference for the second time here in Finland, and again join such a rich and transdisciplinary covering of scholars from humanities, crafts, natural sciences, and social sciences, *inter alia*.

Finland and Suomenlinna are excellent locations for hosting this conference. A conference excursion can be organized to a very old forest quite near to Helsinki, there is a lot of built cultural heritage from wood, and wood is also extensively used in contemporary architecture, again nowadays. The location where we are, Suomenlinna, is the centre of Finland’s historical shipbuilding. Additionally, the rocky Gulf of Finland, where historical shipwrecks are well-preserved in optimal conditions, is a treasure of underwater archaeology in the world.

This Conference Programme contains all the practical information related to the conference, the schedule, and the abstracts of the oral presentations.



Very many parties deserve special thanks for making this conference happen. Thanks to the members of the organising committee for their great help in planning and organising various stages. Also deserving thanks are the conference assistants, and especially the conference coordinator Mia Puranen. Naturally, thanks go to the initiators of the conference tradition in Amsterdam in 2022, Marta Domínguez Delmás, Aoife Daly and Kristof Haneca. Thanks to Federation of Finnish Learned Societies for economic support for organizing the conference.

We are very much looking forward to welcoming you and to spending some wonderful days together in the abundant light of Finnish spring in Helsinki and Suomenlinna Sea Fortress!

Panu Savolainen
Head of the Organising Committee

From Forests to Heritage 2024
Conference in Helsinki

CONFERENCE VENUE

Tenaille von Fersen
Suomenlinna B 17 C
00190 Helsinki



Approaching the conference venue in Suomenlinna, on Susisaari island. Photo: FFtH.



Conference venue Tenaille von Fersen. Photo: FFtH.



The renovated banquet hall is located in the old granary of the fortification's bakery, built in 1775. Photo: The Governing Body of Suomenlinna.



Poster exhibition space at Tenaille von Fersen. Photo: The Governing Body of Suomenlinna.



PROGRAMME

PROGRAMME AT A GLANCE

Monday, 27 May 2024

9:00–ca. 18:30

Pre-conference excursion to Myllymäki farmstead and Liesjärvi National Park (Preregistration required)

Tuesday, 28 May 2024

18:00–21:00

Registration and icebreaker & sauna option at Otaniemi Aalto University campus in Espoo

Wednesday, 29 May 2024

Suomenlinna Sea Fortress, Tenaille von Fersen

8:30–	Registration
9:15–9:30	Introductory words by conference organisers
9:30–10:30	Keynote: Marta Domínguez Delmás
10:30–11:00	Coffee break
11:00–12:30	Session 1
12:30–13:30	Lunch
13:30–15:00	Session 2
15:00–15:30	Coffee break
15:30–16:45	Session 3
17:00–18:30	Poster dating with sparkling
18:30–19:30	Guided tour in Suomenlinna

Thursday, 30 May 2024

Suomenlinna Sea Fortress, Tenaille von Fersen

8:30–	Registration
9:00–10:30	Session 4
10:30–11:00	Coffee break
11:00–12:30	Session 5
12:30–13:30	Lunch
13:30–15:00	Session 6
15:00–15:30	Coffee break
15:30–16:45	Session 7
19:00–00:00	Conference dinner at restaurant Korjaamo, Kulmasali (Preregistration required)

Friday, 31 May 2024

Suomenlinna Sea Fortress, Tenaille von Fersen

8:30–	Registration
9:00–10:30	Session 8
10:30–11:00	Coffee break
11:00–12:30	Session 9
12:30–13:30	Lunch
13:30–15:00	Session 10
15:00–15:30	Coffee break
15:30–16:30	Session 11
16:30–17:00	Closing and farewell

Saturday, 1 June 2024

9:00–18:00

Post-conference excursion to Verla old paper mill (UNESCO World Heritage Site) (Preregistration required)

11:00–12:00

Post-conference guided tour to Pikku-Finlandia. Guide: Jaakko Torvinen, architect of the building

Please note that some events require a separate registration. These events are marked in green.

Monday 27th May	Tuesday 28th May	Wednesday 29th May	Thursday 30th May	Friday 31st May	Saturday 1st June
9–18:30 Pre-conference excursion to Myllymäki farmstead and Liesjärvi National Park	Aalto University campus at Otaniemi 18–21 Registration Icebreaker & Sauna option at Otaniemi Aalto University campus	Suomenlinna sea fortress 9:15–10:30 Welcome & keynote Coffee break 11:00–12:30 Session 1 Lunch 13:30–15:00 Session 2 Coffee break 15:30–16:45 Session 3 Poster dating and sparkling Guided tour in Suomenlinna	Suomenlinna sea fortress 9:00–10:30 Session 4 Coffee break 11:00–12:30 Session 5 Lunch 13:30–15:00 Session 6 Coffee break 15:30–16:45 Session 7 19:30–00 Conference dinner at Restaurant Korjaamo	Suomenlinna sea fortress 9:00–10:30 Session 8 Coffee break 11:00–12:30 Session 9 Lunch 13:30–15:00 Session 10 Coffee break 15:30–16:30 Session 11 Closing and farewell	9–18 Post-conference excursion to Verla old paper mill (UNESCO world heritage site) or guided tour at Pikku-Finlandia 11–12

KEYNOTE SPEAKER: Marta Domínguez Delmás

Dr. Marta Domínguez Delmás is a tree-ring scientist with a multidisciplinary background in Forestry (BSc, MSc) and Cultural Heritage (MA, PhD), and over 20 years of experience researching living trees, (pre)historic wood from archaeological sites, historic buildings, shipwrecks, and art objects. Her speciality is the study of tree rings in wood from the cultural heritage to find out the date and provenance of the wood, and when possible, of the objects. Her research interests focus on how humans have used, managed, and traded timber resources in different periods, the improvement of methods to pin-point the provenance of historic timber and the development of non-invasive techniques to study tree-rings in works of art. She has worked on several international multidisciplinary projects, leading four of them as Principal Investigator. She has made important contributions to the field of dendroarchaeology, developing reference datasets for northern and central Europe and the Iberian Peninsula, exploring the use of biochemical screening and strontium isotopes for wood provenancing, and promoting



the use of dendrochronology to study wooden cultural heritage in different parts of the world. Her research has demonstrated the power of combining archival sources with tree-ring research to gain knowledge about historical sites, ancient forestry practices, and environmental dynamics, further advancing knowledge by implementing multidisciplinary approaches. Currently she works as a Senior Scientist at Naturalis Biodiversity Center in Leiden (the Netherlands), which hosts the second largest wood collection in the world besides numerous ethnographic collections.

Keynote presentation by Marta Domínguez Delmás:

Wood culture unveiled: writing the biographies of forests, objects, and peoples

Affiliations: Cultural Heritage Agency of the Netherlands,
Naturalis Biodiversity Center of the Netherlands
Time: Wednesday, 29 May 2024 at 9:30–10:30
Location: Tenaille von Fersen, Suomenlinna Sea Fortress, Helsinki

Wood has been an indispensable raw material for the development of civilisations and cultures since ancient times. Woodlands provided fuel, construction timber and wood for domestic utensils and artefacts. When they were lacking nearby, or were not accessible due to regulations, or could not provide the required timber product, timber was sought further afield. The exploitation of woodlands by humans shaped landscapes and biodiversity in ways that we are only beginning to comprehend.

This keynote examines the intricate extent of wood culture, from the selection of trees for construction in Early-Neolithic pile-dwelling sites, to the stories encapsulated in wooden artefacts, the luxury commodities reflecting social status and the fashion

of the time, the timber trade, and the forestry practices that have shaped current landscapes. Historic forests, wooden artefacts, structures and timbers not only represent tangible heritage of specific historical contexts, but also embody intangible cultural practices that have been passed on through generations. The stories embedded within them can only be uncovered through interdisciplinary studies. Our research unveils the biographies of forests, objects, and peoples, and is an essential step for heritage preservation and sustainable resource management. Furthermore, it contributes to a deeper appreciation of the cultural significance of wood in our collective history, enhancing its relevance for our future.

DETAILED PROGRAMME

Monday, 27 May 2024

9:00–18:00 Pre-conference excursion to Myllymäki farmstead and Liesjärvi National Park (pre-registration required)

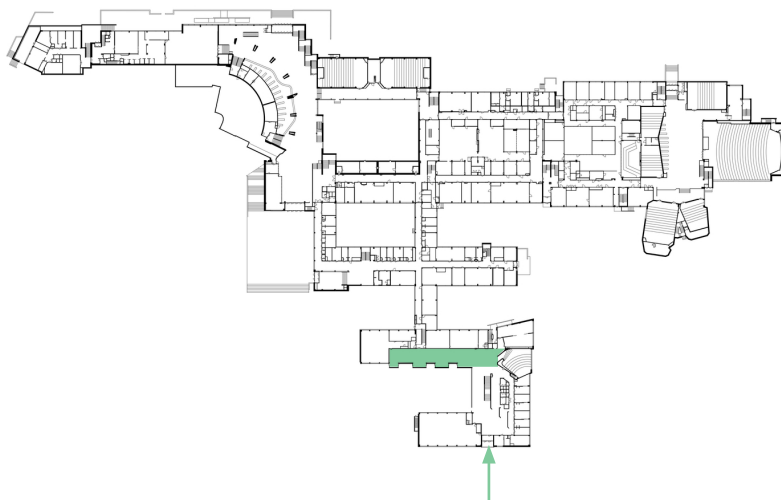


Myllymäki farmstead, Nummi-Pusula. Photo: Livady Architects.

Tuesday, 28 May 2024

18:00–21:00 Registration and icebreaker at Otaniemi Aalto University campus, Aalto University Undergraduate Center, "Beta SPACE gallery", Otakaari 1 X, Espoo (the lobby of the old Department of Architecture).

Afterwards option for seaside sauna at student union sauna "Rantasauna" behind Jämeräntaival 5. A 10-minute walk.



Entrance Otakaari 1 X

Aalto University Undergraduate Center in Otaniemi
"Beta SPACE gallery" (old Department of Architecture, lobby)
Otakaari 1 X, Espoo.

See also section "Maps" in the end of this booklet.

Wednesday, 29 May 2024

Suomenlinna, Tenaille von Fersen

8:30–	Registration		
9:15–9:30		Chair: Panu Savolainen	Introductory words by conference organisers
9:30–10:30	Keynote	Marta Domínguez Delmás	Wood culture unveiled: writing the biographies of forests, objects, and peoples
10:30–11:00	Coffee break		
11:00–12:30	Session 1	Chair: Marko Huttunen	
11:00–11:15	S1-001	Bettina Ebert, Torbjørn Bjelland,	What's in a hole? Medieval wooden scaffolding remains provide new insights into cathedral construction
11:15–11:30	S1-002	Mari-Sohvi Miettinen	"Yesterday I came here to live". Finnish wilderness cottages in the continuum of living off the grid in post-human era
11:30–11:45	S1-003	Pascal Fraiture, Christophe Maggi, Vincent Labbas	The <i>Altarpiece of the Virgin</i> in the Chapel of the Lords of Boussu (BE): insights into wood supplying strategies (<i>Quercus</i> spp.)
11:45–12:00	S1-004	Francesco Augelli	The "Cassarini-Cavazza" mansion timber floors consolidation. An example of minimal conservation intervention
12:00–12:15	S1-005	Martijn Remmen	The conservation of the Hobé carpentry presents a unique opportunity to not only preserve a valuable and beautiful artifact but also to engage in a thoughtful process of ethical use of materials
12:15–12:30	S1-006	Piotr Mańkowski, Wojciech Połec, Joanna Wyleżalek, Iwona Błaszczak	Traditional woodworking in craft workshops in Poland
12:30–13:30	Lunch		

Wednesday, 29 May 2024

Suomenlinna, Tenaille von Fersen

13:30–15:00	Session 2	Chair: Tuomas Aakala	
13:30–13:45	S2-001	Martin Bridge	Dendrochronology and the Stratfire Project
13:45–14:00	S2-002	Sjoerd van Daalen, Paul Borghaerts, Mukund Palat Rao	Longleaf Pine in the Low Countries
14:00–14:15	S2-003	Aoife Daly, Søren Sindbæk, Claus Feveile	Oak use in 7th and 8th Century Ribe – local and exotic wood in Denmark's earliest town
14:15–14:30	S2-004	Alessia D'Auria, Stefania Siano, Lucia Vanacore, Gaetano Di Pasquale	<i>Materia and Lignum</i> (timber and wood) at Herculaneum (southern Italy): the relationship between man, wood and forest 2000 years ago
14:30–14:45	S2-005	Karl-Magnus Melin, Linda Lindblad, Anton Hansson, Hans Linderson	A diverse use of wood species in Medieval Swedish and Danish church buildings
14:45–15:00	S2-006	Tomas Tomaszek	Wooden heritage in the borderlands of Poland and Ukraine – current conditions and issues of conservation
15:00–15:30	Coffee break		

Wednesday, 29 May 2024

Suomenlinna, Tenaille von Fersen

15:30–16:45 Session 3		Chair: Liisa Seppänen	
15:30–15:45	S3-001	Satu Koivisto, Harry K. Robson, Bente Philippsen, Ulrich Schmölcke, Terje Stafseth, Marie Brinch, Daniel Groß	Wattling for fish – Stone Age fishing with stationary wooden structures in southern Scandinavia c. 6500–1800 cal BCE
15:45–16:00	S3-002	Michael Grabner, Veronika Kotradyová, Kerstin Kowarik, Daniel Brandner, Hans Reschreiter	Overgrown stumps. Prehistoric knowledge – alive in Slovakia
16:00–16:15	S3-003	Oliver Nelle	Prehistoric woodlands and timber exploitation for house building: lake dwellings in the northern alpine foreland in SW-Germany
16:15–16:30	S3-004	Elisa Ahverdov, Tuomas Aakala, Mikael Holmström, Mikko Huhtamies, Kari Hyttinen, Yann Irissou, Minna Koivikko, Pekka Niemelä, Juha Siitonen	Exploring the Hahtiperä Shipwreck: A Multi-Method Study from Historical Records to Insect Marking
16:30–16:45	S3-005	Minna Koivikko	Wrecks in Peace, the Underwater Cultural Heritage of Suomenlinna
17:00–18:30 Poster dating with sparkling			
18:30–19:30 Guided tour in Suomenlinna			

Thursday, 30 May 2024

Suomenlinna, Tenaille von Fersen

8:30–	Registration		
9:00–10:30	Session 4	Chair: Tuomas Aakala	
9:00–9:15	S4-001	Neil J. Loader, Elina Sahlstedt, Darren Davies, Katja T. Rinne, Danny McCarroll, Giles Young	Stable isotope dendrochronology using laser-ablation mass spectrometry
9:15–9:30	S4-002	Kristof Haneca, Neil J. Loader, Darren Davies, Danny McCarroll, Vincent Debonne	Oxygen isotopes crossing the North Sea. Teleconnections, a roof and a painting
9:30–9:45	S4-003	David Brown	Dendrochronological Dating of Baltic Timbers found in Ireland
9:45–10:00	S4-004	Bernhard Muigg	Silvicultural Heritage: Detecting historical coppice-with-standards forest management from dendroarchaeological sources
10:00–10:15	S4-005	Alar Läänelaid, Kristina Sohar, Alar Nurkse	Provenance of oaks in some painting panels in Estonia and Finland
10:15–10:30	S4-006	Sofie Diericx, Siska Genbrugge, Hans Beeckman, Wannes Hubau, Jan Van den Bulcke	Wood species identification using X-ray μ CT scanning: a multi-resolution comparative study
10:30–11:00	Coffee break		

Thursday, 30 May 2024

Suomenlinna, Tenaille von Fersen

11:00–12:30	Session 5	Chair: Panu Savolainen	
11:00–11:15	S5-001	Christiane Hemker	What wood can tell us about medieval silver mining
11:15–11:30	S5-002	Grit Neubauer	The underground forest
11:30–11:45	S5-003	Marja Ahola, Tiina Äikäs	Making special pine trees: A site biographical approach to Yliskylä sacred pine (southern Finland) and the hanging tree of Taavetti Lukkarinen (Northern Finland)
11:45–12:00	S5-004	Lars Östlund	Sacred trees in Sami forests of northernmost Sweden
12:00–12:15	S5-005	R. Mohanapriya, E. Prema P. Velraj	Wood Diplomacy: Unveiling the Cultural Legacy between India and Myanmar (Burma)
12:15–12:30	S5-006	Anthony Höete, Dean Sully, Guy Mannes-Abbott, Merry Chow	The Indigenous Urban Forest
12:30–13:30	Lunch		

Thursday, 30 May 2024

Suomenlinna, Tenaille von Fersen

13:30–15:00 Session 6		Chair: Liisa Seppänen	
13:30–13:45	S6-001	Coralie Mills	Revealing the cultural histories of Scottish wooded landscapes
13:45–14:00	S6-002	Nuria Romero Vidal	From cabinets to the tropical forests. Tracing human-tree interactions in the Isthmo-Colombian area through woodcarvings multidisciplinary research
14:00–14:15	S6-003	Luigi Hermanin	Foundational criteria to create “Historical Reserve Forest Area”: a study of the Casentino fir and the ancient wooden load-bearing structures in the area of Florence
14:15–14:30	S6-004	Julia Weidemüller	Let’s talk archives
14:30–14:45	S6-005	Gretel Boswijk	Loaded up and sailed away: where did the kauri go?
14:45–15:00	S6-006	Virpi Kaukio	Museum as a Mediator of the Living Cultural Heritage of the Forest Relationship
15:00–15:30 Coffee break			

Thursday, 30 May 2024

Suomenlinna, Tenaille von Fersen

15:30–16:45 Session 7		Chair: Marko Huttunen	
15:30–15:45	S7-001	Géraldine Brun	The quality of traditional wood claddings: a comparison between expectations and observations in Sweden and France
15:45–16:00	S7-002	Nasim Shiasi	Reviving Wooden Heritage: Challenges, Methods, and Critique of Safavid Palaces' Restoration
16:00–16:15	S7-003	Crystal Hollis	Deliberate Damage: A Look at Burn Marks in Churches
16:15–16:30	S7-004	Mauro Bernabei, Ilaria Stefani, Samuele Caciagli, Francesca Mannucci, Nicola Macchioni	Historic timber structures: identification, provenance and dating of the roof of a Renaissance masterpiece, the Florence cathedral
16:30–16:45	S7-005	Jay Thakkar	The Indigenous Kath-Khuni Construction System of the Himalayas

Korjaamo, Kulmasali, Helsinki

19:00–00:00	Conference dinner at restaurant Korjaamo, Kulmasali, Töölönkatu 51 B, Helsinki (preregistration required, no dress code). Korjaamo can be reached by HSL tram 4, closest stop: "Töölön halli".
-------------	---

Friday, 31 May 2024

Suomenlinna, Tenaille von Fersen

8:30–	Registration		
9:00–10:30	Session 8	Chair: Liisa Seppänen	
9:00–9:15	S8-001	Iida Kalakoski, Riina Sirén	The Status of Wood in the Finnish Architectural Heritage
9:15–9:30	S8-002	Reetta Karhunkorva, Tuulikki Halla, Jaana Laine	The Heritage(s) of Human-Forest Relationships (HFR)
9:30–9:45	S8-003	Mats Almlöf	Quality wood and how to secure access quality wood in the future
9:45–10:00	S8-004	Toms Kokins	Sweden's Timber Empire. Architectural perspectives on transnational timber industry's impact on the landscapes of ecology, economy and culture. Case of Swedish forests in Latvia
10:00–10:15	S8-005	Panu Savolainen	Project Medieval timber structures in Finland
10:15–10:30	Conferenc proceeding info		
10:30–11:00	Coffee break		

Friday, 31 May 2024

11:00–12:30	Session 9	Chair: Tuomas Aakala	
11:00–11:15	S9-001	Anne Crone, Coralie Mills	Home and away; the dendrochronology of pine in Scottish buildings
11:15–11:30	S9-002	Māris Zunde	Dendrochronological dating of historical timber structures in Latvia
11:30–11:45	S9-003	Brita Lorentzen	Tree-Rings and ‘Holistic’ Heritage Science: Intersecting Byzantine-Medieval Art, Architectural, and Environmental Histories from Cyprus
11:45–12:00	S9-004	Gabriel Pereira	Fuelling the mo(nu)ment: wood supply during the Renaissance reformation of the Convent of Christ (Portugal)
12:00–12:15	S9-005	Sogbesan Oluwatoyin, Kenneth E. Aidelojie	Wooden element in the Yoruba cultural heritage: Documecase of Alaafins palace of Oyo town
12:15–12:30	S9-006	Kirsten Weterings, Sven Dupré, Marta Domínguez- Delmàs	From Panel Maker to Painter’s Workshop: Signed and Dated Panels from the Same Tree in the Seventeenth-Century Low Countries
12:30–13:30	Lunch		

Friday, 31 May 2024

13:30–15:00	Session 10	Chair: Panu Savolainen	
13:30–13:45	S10-001	Vincent Debonne, Kristof Haneca	Tree-ring based chronologies of brick architecture and historical building materials in Flanders, Belgium
13:45–14:00	S10-002	Katri Vuola	Form Follows the Material? Reflections on the Wood Use in the Ecclesiastical Sculptures in the 14th and 15th Centuries in Finland
14:00–14:15	S10-003	Rafał Boguszewski, Małgorzata Herudzińska	The Economics of Tradition: Valuing Traditional Wood-working Skills in the Modern Market
14:15–14:30	S10-004	Tuomas Aakala, Niko Kulha, Timo Kuuluvainen	Human impact on forests of early twentieth century Finland
14:30–14:45	S10-005	Philip Chambers	Forest meaning-making through geocache creation
14:45–15:00	S10-006	Elisabeth Wächter, Sebastian Nemestothy, Michael Grabner	Was fir wood favoured as construction timber?
15:00–15:30	Coffee break		

Friday, 31 May 2024

15:30–16:30	Session 11	Chair: Marko Huttunen	
15:30–15:45	S11-001	Liisa Kunnas, Heidi Henriikka Mäkelä	From the forest's cover: Ancientness and otherness in forests from archaeological and folkloristic viewpoints
15:45–16:00	S11-002	Laura Berger, Kristo Vesikansa, Philip Tidwell	From forests to buildings to heritage – The standardized houses of Puutalo
16:00–16:15	S11-003	Rasa Bertašiūtė	Traditional Carpentry: Craft or Art?
16:15–16:30	S11-004	Mattias Hallgren	Swedish hollow post wind- mills. An endangered type of windmill
16:30–17:00	Closing and farewell		

Saturday, 1 June 2024

9:00–18:00 **Post-conference excursion to Verla Mill Museum (old paper mill, UNESCO World Heritage Site)**
(preregistration required, info per email to the participants)

OR

11:00–12:00 **Post-conference guided tour to Pikku-Finlandia**
Guide: Jaakko Torvinen, architect of the building.
No registration required.
Address and meeting point: Karamzininranta 4, Helsinki,
on the eastern side of the Finlandia Hall



Verla groundwood and board mill museum, Kouvola. Photo: wikipedia.org.



Pikku-Finlandia, Helsinki. Photo: FFtH.

ABSTRACTS

What's in a hole? Medieval wooden scaffolding remains provide new insights into cathedral construction

Bettina Ebert , Torbjørg Bjelland

Museum of Archaeology, University of Stavanger, Norway

S1-001

Stavanger cathedral is a medieval stone building that is currently undergoing major conservation and restoration. The cathedral is Norway's best-preserved and most authentic medieval stone cathedral. Located in southwestern Norway, the cathedral was constructed in the first quarter of the 12th century using rubblestone for the underlying masonry and soapstone for ashlar and decorative elements. A fire in 1272 resulted in a subsequent Gothic building phase, and the cathedral consequently consists of a combination of Romanesque nave and Gothic choir.

During recent masonry work in conjunction with the cathedral's ongoing restoration, a number of hitherto unknown holes in the rubblestone walls were uncovered in the Gothic building sections. These were identified as so-called putlog holes linked to the construction of the cathedral in the medieval period. The holes resulted from the use of a putlog scaffold, and remnants of wooden beams for the scaffolding were found

in all of the putlog holes, though in varying states of preservation. These wooden beams and remnants of beams were radiocarbon-dated to the medieval period, and the wood species identified as pine. The results provide information on the different construction phases of Stavanger cathedral and contribute to creating a timeline for the Romanesque and Gothic construction periods, as well as shedding light on the use of timber in medieval stone construction processes.

“Yesterday I came here to live.” Finnish wilderness cabins in the continuum of dwelling as knowing in post-human era

Mari-Sohvi Miettinen
University of Tampere

S5-002

The idea of living in a modest, remote dwelling apart from urban problems is of old origin. Long before the times of digitalisation and the ever-growing dependence on technology, inhabiting a cabin in the lap of nature has been a way for seeking connection with one's surroundings and a simpler, more authentic life.

Despite of nostalgia and romantic visions of ascetism, cabins are not free of the everyday metabolism our living requires. Seasons, weather, and other species, as well as the bodily dimensions of everyday household chores, are strongly present and tangible. Cabins force us to face the existence of infrastructures we use, understand the nature of the very place we inhabit, and reflect our relationship with the surrounding society. Cabins are not just a scene to philosophize – inhabiting them is a way of knowing itself.

As the contemporary conveniences – and therefore issues – are slowly reaching out towards private-owned cottages, Finnish wilder-

ness cabins (autiotupa) provide a possibility for off-the-grid living. This research studies the tradition of dwelling in a modest cabin as a form of philosophy and reflects how living in Finnish wilderness cabins could be placed as a part of this continuum. In history, the cabin has been utilised for retirement and cultivation of a single individual. In post-human era, cabins can be seen as potential vehicles for a collective shift towards co-existence with the more than human world.

The narrative literature review, scoping literature from the fields of environmental philosophy and sociology and architecture, will work as a base for doctoral research in the field of architecture, studying how experiences of dwelling Finnish wilderness cabins can help us to redefine new, reasonable standards of living.

The Altarpiece of the Virgin in the Chapel of the Lords of Boussu (BE): insights into wood supplying strategies (*Quercus* spp.)

Fraiture P.¹, Maggi C.¹, Labbas V.^{1,2}

¹ Royal Institute for Cultural Heritage, Brussels, BE (KIK-IRPA)

² University of Liège, BE (ULiège)

S1-003

In 2020–2021, the KIK-IRPA laboratory of dendrochronology studied the roof frame of the Chapel of the Lords of Boussu (Belgium), housing the finest collection of Renaissance mausoleums in Belgium. The aim of our dendro-archaeological analysis was to determine the authenticity of its construction because of its strange asymmetry with the church St. Gery to which it is appended. The study revealed it is original and that the trees were felled in autumn-winter 1480-1481. Interestingly, this dating was mainly obtained by chronologies from works of art collected in our KIK-IRPA dataset.

In 2022-2023, the sculpted Altarpiece of the Virgin, conserved in this chapel and attributed to the Brussels 16th-century workshop of Pasquier Borman (unknown commissioner), was analysed during its study and conservation treatment at the KIK-IRPA polychrome wood sculpture studio, under the supervision of Dr. E. Mercier. Dendrochronological comparisons brought to light that planks from the architectural decoration,

small decorative figurines and some of the main sculptures could come from a single tree (last ring, without sapwood: 1486).

It was also intriguing to note that one of the highest t-values for dating the altarpiece was given by the dendro-data from the chapel's framework. This raised then the question of the possible links between the commissions of the two structures, the chapel and the altar.

In this presentation, we propose to consider these results from the angle of wood procurement strategies and resource economics, e.g., in terms of quality of the oak used, woodworking techniques, dimensions of the timbers, provenance, with an underlying issue on the identification of wooden pieces coming from the same tree.

The “Cassarini-Cavazza” Mansion Timber Floors Consolidation. An Example of Minimal Intervention.

Francesco Augelli

Observatory for Conservation of Wood Works,
Politecnico di Milano - DASTU

S1-004

Conservation theory and practice adhere to several main principles, including Authenticity, Compatibility, Durability, Distinctness, Minimal Intervention, and Reversibility.

This paper focuses on minimal and reversible intervention while ensuring adherence to other principles during the design and intervention phases.

The principle of minimal intervention traces back to John Ruskin, with numerous 19th and 20th-century theorists in Italy and Northern Europe subsequently applying it to monument and historical building conservation.

The Venice Charter of 1964, in its 15th article, emphasises using the least material necessary for integration to ensure monument conservation and form reinstatement.

Various international documents, such as the ICOMOS Charter and the Principles for the Conservation, underscore the importance of minimal intervention in architectural and cultural heritage restoration.

These documents advocate for interventions proportionate to safety objectives, minimising harm to heritage values while ensuring durability.

Moreover and specifically, the ICOMOS International Scientific Committee for the Principles for the

Conservation of Wooden Built Heritage advocates for minimal interventions and impacts, particularly emphasising structural stability and cultural significance preservation.

The case study involves the Cassarini-Cavazza mansion in Lombardy, Italy. The mansion, likely from the late 18th century in Rococo style, exhibits typical architectural features of the period. However, its attic floors, composed of wooden beams and earth mortar, displayed structural issues such as bending and cracking ceiling plaster due to various factors, including heavy materials layered up, low timber quality, and insect damage. Rather than opting for a complete replacement with expensive iron-concrete slabs, as proposed by the construction companies, a lighter, faster, and more cost-effective intervention was proposed. This involved reinforcing the problematic beams using thin iron strands anchored to sound timbers or walls.

This intervention resolved structural issues and balanced the client's need for a quick and cost-effective solution with the conservationists' goal of preserving authenticity and cultural heritage.

The approach ensures compatibility, reversibility, and adherence to conservation principles.

The conservation of the Hobé carpentry presents a unique opportunity to not only preserve a valuable and beautiful artifact but also to engage in a thoughtful process of ethical use of materials

Martijn Remmen
Remmen BV

S1-005

The carpentry was designed and executed by the workshop of George Hobé in Bilinga wood, and was commissioned by Leopold II in 1897. It was originally conceived as an interior ensemble for the 'Colonial Palace' of the Brussels international exhibition of 1897. This carpentry takes an important place in the Belgian Art Nouveau, as it is one of the few remaining examples of the rare 'Congo style' subgenre.

In 1979-1981 the object was dismantled, to be reconstructed as an outside sculpture in the courtyard of the palace. After 40 years in exterior conditions, it was heavily degraded and was only recently dismantled for conservation purposes. The study of tool traces and technical details of 650 pieces gave us the opportunity to distinguish original parts from earlier reconstructions. Some hypothesis on the woodworking industry in the colonial years of Congo and the late 19th century Brussels carpentry tradition can be made.

By carefully considering the historical and technical context, involving diverse methodologies by an inter-professional team, and approaching the future conservation with sensitivity, it is possible to reevaluate and reframe the object within a contemporary context. Ensuring that the process is transparent and that the public is adequately informed can help to manage potential controversies regarding the colonial nature of this masterpiece. Is decolonisation through conservation a valid option?

Traditional woodworking in craft workshops in Poland

Piotr Mańkowski, Wojciech Połeć,
Joanna Wyleżalek, Iwona Błaszczak
Warsaw University of Life Sciences SGGW

S1-006

This paper is based on a qualitative study conducted with twenty craftsmen who continue and recreate traditional forms of production related to the processing and use of objects and devices made of wood. The publication was created as part of the project "(Non-)disappearing professions, skills and customs in rural communities, Mazovia and Eastern Poland".

We try to show how many, at first glance non-obvious, crafts were related to woodworking, as well as how many crafts were related to products and devices made of wood. Woodworking tools were and often still are made of wood (although we also show the role of the blacksmith and other "non-wooden" tools), but wood was traditionally the material from which devices were made for completely different purposes, e.g. windmill equipment, roof coverings, musical instruments and toys.

We offered the craftsmen to conduct a film interview that would record the key elements of the process of making wooden products.

We have tried to have an overview of various crafts, taking into account regional traditions, traditional processing methods, as far as possible, and the uniqueness of the craft. We tried to reach craftsmen with extensive experience and long experience in the craft. We have also tried to include people who continue traditional crafts, often using modern woodworking tools. Our interlocutors included people who could be considered custodians of memory, caring for local material culture.

In our study, we documented the state of traditional wood crafts in Poland at the beginning of the twenty-first century.

Dendrochronology and the Stratfire Project

Martin Bridge

Oxford Dendrochronology Laboratory

S2-001

The town of Stratford upon Avon is famous as the home of William Shakespeare, and this has dominated the history and tourism of the town, but the local history society has now started a large project in association with Historic England. By means of high-level building recording and analysis, detailed archival research and dendrochronology, the aim is to establish the extent, scale and nature of the survival and reconstruction of buildings following town fires of 1594 and 1595. For many buildings there is simply no documentary evidence to draw on, and when it does exist it is either confusing or only establishes a date by which rebuilding had taken place. Conversely, it may record fire damage to properties that, from surviving architectural features, appear not to have been entirely rebuilt. Dendrochronological results, including some surprises, will be discussed.

Longleaf Pine in the Low Countries

Sjoerd van Daalen¹, Paul Borghaerts²,
Mukund Palat Rao^{3,4}

¹ Van Daalen Dendrochronologie, Wijhe, the Netherlands

² Borghaerts Houtdatering, Easterein, the Netherlands

³ CREAM, Barcelona (Bellaterra), Spain

⁴ Lamont-Doherty Earth Observatory, Columbia University, NY, USA

S2-002

Among the species used for dendrochronology in the Low Countries, pine from the North American continent represents a small and possibly overlooked subset. Southern Yellow Pine is the collective name for a number of pine species (*Pinus spp.*) of which long leaf pine (*P. Palustris Mill.*) is of prime importance. The wood anatomy of longleaf pine is easily confused with the far more common Scots pine (*Pinus sylvestris L.*). Additionally, longleaf pine did not appear in the Low Countries until relatively recently, meaning it can be found in objects which can be dated through other means than dendrochronology, typically archival sources. In this study we present a chronology for longleaf pine, as well as its distinguishing (wood anatomical) features, application and provenance details to enable further research into the scope of this trans-Atlantic timber trade.

Oak use in 8th Century Ribe – local and exotic wood in Denmark's earliest town

Aoife Daly¹, Søren Sindbæk², Claus Feveile³

¹ dendro.dk, independent dendroarchaeological research laboratory, Copenhagen.

² School of Culture and Society - Centre for Urban Network Evolutions (UrbNet), Aarhus University. ³Museum VEST, Ribe

S2-003

Excavations in Ribe, on the west coast of Jutland, uncovered organic remains from some of the earliest activity recorded in this early Scandinavian town. Wood from the remains of structures from these waterlogged levels represent some of the earliest activity from the site, and extensive analysis of these allowed a detailed examination of the chronology of these structures. This material also allowed insight into timber procurement in this early town at the beginnings of the Viking era. It was decided however, that artefacts of wood, that were designated for conservation, should not be damaged for dendrochronological research. Instead, these artefacts were earmarked for non-invasive (DendroCT) analysis once the conservation was completed.

The resulting dendrochronological results added extra detail to the chronology of these remains, but more significantly, the dendroprovenance analysis of the oaks that these objects were made from demonstrated that some of these were of non-local origin.

In this talk, we will demonstrate that extensive dendroarchaeological analysis can also take account of the sensitivity of wooden heritage objects. In addition, we will of course look at the sources of the non-local objects and how they underscore that this early town was gaining contacts to international markets in the decades around AD 700.

Materia and *Lignum* (timber and wood) at Herculaneum (southern Italy): the relationship between man, wood and forest 2000 years ago

Alessia D'Auria¹, Stefania Siano², Lucia Vanacore¹,
Gaetano Di Pasquale¹

¹ Department of Agricultural Sciences, University of Naples Federico II, Italy

² Archaeological Park of Herculaneum, Italy

S2-004

The Vesuvius eruption of 79 AD was one of the greatest disasters of the Antiquity; it caused widespread destruction all over Campania burying towns and settlements, but, as it is known today, it provides also a complete picture of life in Campania and of the culture of the Roman population in the 1st century AD. Among these, the city of Herculaneum (Naples, southern Italy) is a key site for understanding the relationship between man, tree and forest during the Roman period in a central area of the Roman Empire. The preservation of large amounts of both timber used for roof and floor structures and wood for furniture provided us a unique opportunity to discern the utilisation of specific trees to produce different wood products. These data also shed more light on the forest landscape of the ancient Campania and permit to discuss about the Roman's knowledge of the technological properties of the woods that they used and the possible selection criteria that they followed

in choosing them. Until now the studies have mainly concerned the timber, while the wood for furniture has been less considered. The data show that timber was obtained from softwood (*Abies alba* and *Cupressus sempervirens*); the widespread use of fir suggests its presence in southern Italian forests, even at low altitude, although a far provenance cannot be excluded. On the other hand, until today dendrochronological analysis of *A. alba* not allowed to get an answer to this problem.

A diverse use of wood species in Medieval Swedish and Danish church buildings

Karl-Magnus Melin¹, Linda Lindblad¹,
Anton Hansson², Hans Linderson²

¹ University of Gothenburg

² Lund University

S2-005

In this paper we investigate the diverse use of wood species in the building process and the final constructions in medieval churches. Previous research has concluded, partly based on dendrochronology, that medieval roof constructions in Denmark were exclusively built with oak timber, and that the most common wood species used for the same purpose in medieval Sweden were pine and spruce. Craft scientific research during recent years have led us to question this conclusion. A more holistic research approach has been applied with questions concerning craft, diffusion of technology, silviculture, used wood species and wood qualities. The new approach has led us to use dendrochronology not only to date the constructions. The cooperation between craft researchers and dendrochronologists have become more transdisciplinary than interdisciplinary, as we work together in making sampling strategies, hypotheses and interpretations of the results. One result that we see is

a wide range of wood species used for specific use as shingles, scaffolding and roofing boards.

The findings have also been compared and interpreted with written sources, from the medieval and post medieval periods. We have so far found examples of the use of linden, aspen, beech, birch, juniper, willow and alder. By transdisciplinary cooperation we now can better understand medieval silviculture and preferences for preferred timber in medieval building techniques. In an ongoing project by the Craft Laboratory and the diocese of Växjö the aim is to learn from the historical sources to reintroduce a more diverse use of wood species for economic and regenerative benefits.

Wooden heritage in the borderlands of Poland and Ukraine – current conditions and issues of conservation

Tomasz Tomaszek
Rzeszow University of Technology

S2-006

Following a brief introduction to typology and architecture of historic wooden vernacular sacred architecture in Poland, the paper discusses the current issues on conservation and restoration of historic Greek-Catholic churches remained in this country. Selected examples of these churches, which belonged to the national minorities (Ukrainians) living in Poland before World War II, and which are currently abandoned and ruined, are presented and described. On the basis of the methods used to analyze the condition and state of preservation of these structures, the paper discusses the possible conservation approach to these abandoned wooden churches. The presented approach is a comprehensive model for dealing particularly with the wooden sacred build heritage of south-eastern Poland and has been developed to combine both issue of conservation of the architectural body as well the conservation of polychrome adorning the interiors of temples.

The whole subject is shown from the perspective of the authenticity of a historic wooden building in the specific contextual situation that has been currently observed in Poland. The proposed conservation approach is discussed using a case study of an abandoned wooden Greek-Catholic church in Mięksisz Stary. This temple, dating back to the 17th century, is a particularly interesting example of architecture of Ukrainian provenience which have remained preserved in the borderlands of Poland and Ukraine, and unfortunately is in very advanced state of ruin. The paper is supplemented with a discussion on the issue of restitution of iconostases to wooden Greek-Catholic churches located in Poland.

Wattling for fish – Stone Age fishing with stationary wooden structures in southern Scandinavia c. 6500–1800 cal BCE

Satu Koivisto^{1*}, Harry K. Robson², Bente Philippsen³, Ulrich Schmölcke⁴,
Terje Stafseth⁵, Marie Brinch¹, Daniel Groß¹

¹ Museum Lolland-Falster, Denmark, ² BioArCh, Department of Archaeology, University of York, UK,

³ National Laboratory for Age Determination, University Museum, NTNU, Norway, ⁴ Leibniz Centre for Archaeology, Centre for Baltic and Scandinavian Archaeology (LEIZA-ZBSA), Germany

⁵ Museum of Copenhagen, Denmark, *Corresponding/presenting author: smk@museumlollandfalster.dk

S3-001

The importance of forest resources to the Stone Age populations of Northern Europe has not been comprehensively studied, although wood raw materials provided the basis for life, settlement, mobility and subsistence. In addition to firewood and construction needs, wood was used for a wide range of purposes, for tools, including utensils and weapons, as well as for figurative art and a variety of structural elements. The paucity of research on prehistoric wood materials is due to the limited preservation of organic materials at archaeological sites in dryland contexts, whereas wetlands and submerged environments can preserve wooden remains excellently for thousands of years. Findings in such contexts demonstrate that Mesolithic populations in southern Scandinavia were already using extensive, well-designed and functional wooden fishing structures constructed using a wattle technique as early as 8500 years ago. These easily made, movable, composite and elastic wattle mo-

dules were probably also used for a variety of purposes in settlements and activity areas in dryland areas where their remains have not survived. Interestingly, the use of similar structures in walls, hurdles, vaults and roofs, to name but a few, is well documented in later prehistoric, medieval and historic contexts from Europe and beyond - not to mention modern wattle structures in gardens and fences. In our presentation we will examine the Stone Age origins of the wattling tradition in light of the Mesolithic and Neolithic wooden fishing structures that are well represented in the archaeological record of the western Baltic Sea region, with particular emphasis on recent findings from the Stone Age fishery at Syltholm Fjord on southern Lolland, southeast Denmark.

Overgrown stumps. Prehistoric knowledge – alive in Slovakia

Michael Grabner¹, Veronika Kotradyová², Kerstin Kowarik³, Daniel Brandner⁴, Hans Reschreiter⁵

¹ University of Natural Resources and Life Science, ² University of Bratislava, ³ Austrian Academy of Science,

⁴ Natural History Museum Vienna, ⁵ Independent Researcher

S3-002

Trees (especially fir trees) can have root anastomoses, so trees are linked to each other. If one of these trees was felled, the others keep the stump alive. The still living stump starts to produce a special tissue – comparable to Maser-grain; the fibers grow in three-dimensional spirals. This tissue is called in Slovakian language “svor”. As there is no main direction of the fibers, this tissue is very hard to split or break.

In the Bronze Age (around 1200 BCE) in Hallstatt, Austria, these overgrown stumps were used as filling troughs and buckets in salt mining. In addition to Hallstatt, three other prehistoric sites are known in Italy and Switzerland where overgrown stumps were used as containers. At the prehistoric finds, the bases were attached with wooden nails or strips of skin. The large number of finds in Hallstatt made it possible to prove that this utilisation was part of a forestry system planned over generations.

In Slovakia, at several museums we discovered milking buckets that were and still are made from overgrown stumps of fir trees, as several craftsmen are still active and produce these vessels. Here, the base is inserted into a groove - comparable to a vat. These containers are therefore sealed.

The knowledge of the prehistoric use of the overgrown stumps could no longer be proven historically or currently in the regions where they were found. In Slovakia the knowledge of the sustainable use of these special assortments is still alive.

Prehistoric woodlands and timber exploitation for house building: lake dwellings in the northern alpine foreland in SW-Germany

Oliver Nelle

Tree ring lab Hemmenhofen, Landesamt für Denkmalpflege Baden-Württemberg (State Office for Cultural Heritage Baden-Württemberg)

S3-003

Excellent preservation conditions in lake sediments or peatlands enable a rich legacy of wooden remains, mainly from architectural structures, from the Neolithic to the end of the Bronze Age (and rare cases the beginning of the Iron Age), in the northern Alpine foreland. Many sites are dendrochronologically dated, and investigated for the choice people made of woody taxa to build houses and palisades. This contribution will give a state-of-the-art report on the conclusions we can draw from this rich wooden legacy, concerning wood species usage, the woodland composition, and the dynamics of the interaction of house-builders and the environment, in the region of the Bodensee (Lake Constance) and the Federsee, in SW-Germany.

Exploring the Hahtiperä Shipwreck: A Multi-Method Study from Historical Records to Insect Marking

Elisa Ahverdov¹, Tuomas Aakala², Mikael Holmström, Mikko Huhtamies³, Kari Hyttinen¹, Yann Irissou³, Minna Koivikko¹, Pekka Niemelä⁴, Juha Siitonen⁵

¹Finnish Heritage Agency, ²University of Eastern Finland, ³University of Helsinki, ⁴University of Turku, ⁵Natural Resources Institute Finland

S3-004

The Hahtiperä shipwreck, unearthed in Oulu, Finland in 2019, was initially classified as a barge and dendrochronologically dated back to 1684. A four-frame wide cross-section of the wreck was selected for conservation to preserve a physical piece of evidence of the wreck's unique structure. The other remaining parts were also kept for further examination and documentation. In order to delve deeper into this extraordinary discovery, our multidisciplinary research team aimed to examine its construction history and the wooden materials employed. We collected and dated additional samples from various parts of the wreck and conducted an in-depth examination of its construction in collaboration with a shipwright. Photogrammetry and laser scanning were utilized for documentation, with the objective of assessing their suitability for investigating historical toolmarks and 3D handling of the ship elements.

While the initial dating remained consistent with the expanded findings, our analysis revealed variations in the quality of wood used during the vessel's construction. Moreover, an intriguing 17th-century barge-building system in Northern Finland was unveiled through archival records, painting a distinct narrative of local activities, supported by the study of insect markings on the wood. Together, they shed light on for example the type of selected trees, as well as seasonal timing of felling and building. Beyond contributing to our understanding of construction techniques, these findings offer valuable insights into selecting most productive sampling locations within shipwrecks for dendrochronological dating purposes.

Wrecks in Peace, the Underwater Cultural Heritage of Suomenlinna

Minna Koivikko

Finnish Heritage Agency

S3-005

Suomenlinna, the Sea Fortress, stands as a UNESCO World Heritage site in the Baltic Sea, preserving underwater cultural heritage. Concealed beneath its waters are wooden remains, such as the recycled first ships of the Swedish Archipelago Fleet, transformed into waterbreak structures, and the final remnants of the Russian Baltic Fleet's sailing warships. These submerged treasures offer insights into history. However, how can we encourage them to reveal their stories when these wrecks have lost their identities over time? How can we uncover their biographies?

Suomenlinna hosts an ongoing research project known as 'The End of Glory Days: Biography of the Swedish Wrecks as Blue Heritage of Suomenlinna.' This project is an important component of the international research program 'The Lost Navy: Sweden's 'Blue' Heritage c. 1450-1850,' which aims to document the history of various naval vessels. In

Finland, the primary focus lies on the Archipelago Fleet, with Suomenlinna serving as one of the central home ports. This presentation shares the current state of research, the latest observations, and why it is important to study old warships.

Stable isotope dendrochronology using laser-ablation mass spectrometry

Neil J. Loader¹, Elina Sahlstedt², Darren Davies¹, D. Miles³
Katja T. Rinne-Garmston², Danny McCarroll, Giles Young²

¹ Prifysgol Abertawe/Swansea University,

² Natural Resources Institute Finland, ³ University of Oxford

S4-001

Stable isotope dendrochronology is a developing technique that is widening the range of timber and wooden artefacts that can be dated precisely. Sample preparation currently requires the manual dissection and purification of cellulose from individual tree-rings prior to mass spectrometry and dating. This method works well, but it requires significant expertise and is somewhat time consuming and resource intensive. This means that levels of sample replication rarely match those of conventional dendrochronological surveys.

UV laser ablation isotope ratio mass spectrometry (IRMS) may provide an alternative approach to sample preparation for stable isotope dendrochronology. Rather than dissecting each ring, the laser ablates only a very small amount of wood for analysis. Each analysis takes approximately 15 minutes per ring, so the method may be considered both rapid and essentially non-destructive.

We have successfully tested the performance of the method against samples of known age dated by isotope dendrochronology. Whilst not all sample types appear to be immediately suitable for laser ablation sampling (e.g. heavily degraded/contaminated wood are not currently suitable), initial results would indicate that there is significant scope to refine and further explore this new technology for stable isotope dendrochronology.

Oxygen isotopes crossing the North Sea. Teleconnections, a roof and a painting

Kristof Haneca¹, Neil J. Loader², Darren Davies²,
Danny McCarroll², Vincent Debonne¹

¹ Flanders Heritage Agency, Brussels, Belgium

² Swansea University, Department of Geography, Swansea, UK

S4-002

Long, annually resolved time series of oxygen isotope ratios in tree-ring cellulose provide new opportunities for precise dating of wooden artefacts. Stable oxygen isotope chronologies encapsulate distinct climate-related signals, and can be used to crossdate tree-ring isotope patterns in samples sourced from historical timber constructions and archaeological wood.

The development of a +800-year-long master chronology of stable oxygen isotopes, derived from absolutely dated oak samples originating from historical buildings in the southern United Kingdom, has proven instrumental for advancing stable oxygen isotope tree-ring dating of wooden cultural heritage. While a growing number of case-studies on vernacular architecture and ship timbers underscore the value and relevance of stable isotope chronologies, the geographical extent of their applicability as a master reference for accurate tree-ring dating is yet to be fully tested.

A pilot study analysing timbers from a late 15th-century roof in Bruges (Belgium) successfully dated timbers of known and unknown age using an isotope reference chronologies developed from historical oak timbers from the UK and France. The value of this new dating technique is further demonstrated through the in-depth historical analysis of our results, enabling not only the precise dating of the construction history of Saint-James' Church but also providing additional details on the creation of a panel painting by Gerard David – the eminent painter active in Bruges from 1484 to 1523. The panel painting depicts the church in a background scene, offering a unique artistic perspective on its building history.

Dendrochronological Dating of Baltic Timbers found in Ireland

David Brown

Queen's University Belfast

S4-003

Early dendrochronological research in Ireland focused on the construction of a 7500-year oak tree-ring chronology to provide radiocarbon calibration samples. During the construction of the chronology, quality samples, from buildings and archaeological sites, which could not be dated easily were put aside. Recently, re-examination of the samples provided dates for imported oak timbers into Ireland from America and Western Europe. With the recent construction of the Baltic chronologies by Aoife Daly and Ian Tyers (Daly, A. & Tyers, I., 2022. The sources of Baltic oak. *Journal of Archaeological Science*) dates have been obtained from high quality timbers from high status building in Ireland. This presentation will show the matching quality and possible original location of trees that provided the samples found in Ireland from the Baltic region. It will also examine the possible and most probably correct dating of the panel timbers from Hillsborough Courthouse. This building is one of

the finest examples of Georgian architecture in Ireland. The main part of the building was constructed in 1760 and in 1810 the north wing was added and housed the courthouse. The Baltic panels used in the interior of the courtroom date to the early 1820s.

Silvicultural Heritage: Detecting historical Coppice-with-Standards forest management from dendroarchaeological sources

Bernhard Muigg

Amt für Archäologie Thurgau

S4-004

Medieval societies in Europe had to satisfy an increasing demand for wood by their growing populations. To ensure a sustainable supply with fuelwood and timber in more densely populated regions, the so-called “Coppice-with-Standards” (CWS) management was developed. Superior to simple coppicing, this more complex management system combines fuelwood and timber production in a two-storey forest structure and dates back to the 13th century CE based on the historical record.

CWS can be investigated using dendrochronological methods, as this pre-modern form of forest management affects the radial growth of the overstorey (standards). These cyclical growth reactions are associated with the regular clearance of undergrowth (coppice) and can be identified as short-term increases in radial growth, so-called release effects.

Dendrochronological sampling of actively managed CWS forests with an uninterrupted management tradition in a small region in southern Germany, allowed to extract a CWS growth pattern from the overstorey oaks (*Quercus* sp.). Following a tree-level approach, an average of ca. 4 release events per tree were found, occurring in an interval of ca. 31 years. This growth pattern was,

for the first time in 2020, successfully detected in dendroarchaeological material from southern Germany and north-eastern France and provided evidence as early as the first millennium CE. This indicates that the silvicultural heritage of CWS management dates back way before its first historical evidence.

Possible influences of such historical forest management practices on the reliability of tree-ring based climate reconstructions were investigated in a separate study. Management-induced influences on the climate information in tree rings were clearly found. Their effects, however, can be easily mitigated with sufficient sample replication.

CWS forest management, known as “taillis sous futaie” in French and “Mittelwald” in German, was once widely used in historical Europe, until the declining importance of firewood production and modified concepts in modern forestry had led to the disappearance of CWS forests in many regions by the 20th century. However, the role of this historical forest management practice for pre-industrial societies must not be underestimated. The dendrochronological approach presented should be expanded routinely in studies on archaeological and historical oak wood.

Provenance of oaks in some painting panels in Estonia and Finland

Alar Läänelaid¹, Kristina Sohar¹, Alar Nurkse²

¹ Department of Geography, Institute of Ecology and Earth Sciences, University of Tartu, Estonia

² Art Museum of Estonia, Tallinn, Estonia

S4-005

In the light of new knowledge from dendro-geography (Fraiture 2009; Daly and Tyers 2022), it is possible to specify the regions of origin of so-called Baltic oaks used in painting panels. We analyzed tree-ring series of fourteen oak panels of old paintings in the museums in Estonia and Finland. It appeared that the oaks for making these panels were provenanced from different regions. In seven cases the oaks had grown in the lower Nemunas River region around Klaipeda (Baltic 1 chronology); in two cases the oaks had grown in the region of confluence of Vistula River and its tributaries Bug and Narew near Warsaw (Baltic 2 chronology); and in six cases the oaks had grown in the region of Neris River around Vilnius (Baltic 3 chronology). Together with determining the provenance region of the panel oaks, we establish the relationship of dendrochronological dates of the panels with their provenance. It appeared that the 17th century paintings were made mostly on the oak boards from the Neris

and Nemunas region, while boards for some earlier paintings were provenanced from the Nemunas region and Vistula region eastward from Warsaw. Knowing the location of workshops of the old painters enables to specify their sources of purchasing painting panels. This in turn sheds light on the timber trade in the 16th and 17th centuries in northern Europe.

Wood species identification using X-ray μ CT scanning: a multi-resolution comparative study

Sofie Diericx^{1,2,5}, Siska Genbrugge¹, Hans Beeckman³, Wannes Hubau^{2,3}, Jan Van den Bulcke^{2,5}

¹ Cultural anthropology and history department, Royal Museum for Central Africa, Belgium.

² UGent-Woodlab – Laboratory of Wood technology, Ghent University.

³ Wood biology department, Royal Museum for Central Africa, Belgium.

⁴ Radiation Physics Research Group, Ghent University

⁵ UGCT, Ghent University

S4-006

Determining the wood species of an object is of paramount importance for objects of art, both to enable international travel following the CITES guidelines, and to add valuable contextual information about the artefacts. Identification is generally accomplished through destructive sampling, which is especially undesirable when studying valuable cultural objects. X-ray Computed micro-Tomography (μ CT) offers a promising non-destructive alternative, since it allows a detailed, on-invasive visualization of the internal wood structure. When considering X-ray μ CT for identification of a wooden artefact, the question remains which resolution is best to analyse the wood anatomical features. With the aim to explore the possibilities and limitations of the technique, an experiment was set up comparing the scans of 17 wood species at four different resolutions (1 μ m, 3 μ m, 8 μ m and 15 μ m reconstructed voxel size). Using the anatomical descriptions and microscopic photographs on

the Inside Wood Online Database (Wheeler, 2011) as a benchmark, it could be established which of the 163 standardized anatomical features (IAWA, 1989), can be distinguished and/or measured at which resolutions. The resulting overview reflects on the potential of each of the resolutions to lead to a wood identification. Finally, theory is tested against practice, presenting three case-studies of African heritage objects successfully identified using X-ray μ CT.

What wood can tell us about medieval silvermining

Christiane Hemker

Archaeological Heritage Office Saxony

S5-001

15 years ago, mining archaeologists from the Saxony State Office for Archaeology discovered high-medieval silver mines under the town of Dippoldiswalde in the Eastern Ore Mountains. Dendrochronology dates the mines so far between 1170 and 1286. In the mines, archaeologists found a large number of wooden structures and equipment in the mines, still in situ, installed by the miners and carpenters 800 years ago. These include, for example, ventilation and drainage systems, safety structures for shafts, galleries and adits, working platforms and ladders and winches for transporting the miners in and out and the silver ore out of the mines. Due to the constant humid, anaerobic climate underground, the mining timbers are so well preserved that for the first time in European mining archaeology it is possible to reconstruct the operation processes of a high-medieval ore mine. Other contemporary sources, such as written documents or pictorial sketches or paintings, which could provide information on this, do

not exist for this period. The method of documenting the complex spatial geometry of the mines is being continuously developed by the Saxon mining archaeologists and is currently being effectively supported by SFM (structure for motion), which also enables reconstructions in 3D. The uniqueness of the Dippoldiswalde mines and the results of the ongoing archaeological and complementary scientific research have contributed significantly to the silver mines being inscribed as part of the UNESCO World Heritage Site "Ore Mountains Mining Region" in 2019. A comprehensive publication is planned for autumn 2024.

The underground forest

Grit Neubauer

Dresden University of Technology, Department of Forest Sciences, Chair of Forest Growth and Woody Biomass Production

S5-002

The high-medieval mines of Dippoldiswalde, a town in the eastern Ore Mountains in Saxony, Germany, are unique in Europe. Archaeologists from the Archaeological Heritage Office of Saxony have documented and recovered a large number of very well-preserved pit timbers from the shafts and galleries dating from the mid-12th to the late 13th century. These timbers not only provide a fascinating insight into 800-year-old mines, but also a snapshot of past forest composition.

Anatomical and dendrochronological examinations of more than 2,000 excavated timbers tell us what kind of forest the miners found when they arrived in Dippoldiswalde in the mid-12th century. This is because the miners used different types of wood for their underground constructions. Furthermore, they allow us to reconstruct how forest composition and land use changed during 100 years of intensive mining exploitation. The original beech-fir forest has given way to an open landscape

with a partly sparse spruce-fir forest. Open areas have been colonised by pioneer species. Insights from the ‘underground forest’ will be highlighted.

Making special pine trees: A site biographical approach to Yliskylä sacred pine (southern Finland) and the hanging tree of Taavetti Lukkarinen (Northern Finland)

Marja Ahola , Tiina Äikäs
University of Oulu

S5-003

The pine tree (*Pinus sylvestris*) is the most common tree species in Finland. Indeed, over 40% of Finland's forests consist of these evergreens, which can live up to 400 years. Although pine is commonly encountered almost everywhere in Finland, every now and then, some pine individuals have received special attention, for example, as a sacred tree or as a place of commemoration. In this paper, we explore two special pine trees: the Yliskylä sacred pine (Southern Finland) and the hanging tree of Taavetti Lukkarinen (Northern Finland). By adopting a site-biographical approach – an approach that includes all the activities, changes, and phases of use and reuse of a specific site along with all meanings that are attached to it – we explore 1) how the cultural processes of heritage-making have taken place in the case of these pine trees, and 2) what kinds of actors can be detected within the heritage-making process.

Sacred trees in Sami forests of northernmost Sweden

Lars Östlund

Swedish University of Agricultural Sciences , Umeå

S5-004

Cultural landscapes in northern boreal forests contain rare culturally modified trees (CMT's) with important practical, social or religious significance. Scots pine (*Pinus sylvestris* L.) trees are of special significance for the Sami people since they provided food for people, food for the reindeer and constituted the cultural landscape. In this presentation, I focus on culturally modified trees in old-growth Scots pine forests and interpret them to explain the significance of such trees in forested Sámi cultural landscapes. We have investigated and documented trees with different marks in protected and managed forests in northernmost Sweden for a long time. We have used dendrochronological methods to date trees and the marks on trees, archaeological methods and historical records to interpret the landscape and historical context of forests and trees. In our research we have analysed CMT's which show boundaries, paths, markings of places with special significance and sacred trees.

Each such tree provide a unique window into the past of Sami history. Due to current intensive forestry, culturally modified trees are being destroyed at an alarming rate and the forest landscape is deprived of their significance as the bearers of culture and history. Therefore, there is an urgent need that all remaining trees with cultural marks should be documented, interpreted and protected regardless of where they are located.

Wood Diplomacy and Sustainable Management: the Cultural Legacy of Burma Teak in Chettinad Architecture

R. Mohanapriya¹, E. Prema²

¹ Dr. M.G.R. Educational and Research Institute, Chennai, Tamilnadu

² VIT School of Law, Vellore Institute of Technology Chennai, Tamil Nadu, India

S5-005

This research explores the concept of “Wood Diplomacy” through the lens of Burma teak’s cultural legacy in heritage architecture, particularly focusing on the Chettinad homes of the Nattukottai Chettiars in Tamil Nadu, India. By investigating Burma teak’s colonial history and sustainable management practices, this study underscores the intertwining of culture and the diplomatic, economic, and environmental dimensions of teak trade. Architectural elements such as doors, windows, pillars, and ornate details made of Burma teak exemplify its contribution to the grandeur of architecture. Through a methodology combining analytical, historical, and empirical approaches, including field visits and interviews in the Chettinadu region, this research reveals the importance of sustainable management practices while introducing the concept of cultural diplomacy

in heritage preservation. The study ultimately highlights the ecological, cultural, and economic significance of Burma Teak, advocating its preservation as a testament to maritime trade and cultural craftsmanship.

The Indigenous Urban Forest

Anthony Hōete¹, Dean Sully²,
Guy Mannes-Abbott², Merry Chow²

¹ University Of Auckland, ² University College London,

S5-006

In the Māori creation myth, the world comes into being as Tāne (god of the forest) separates the earth from the sky with trees. The forest cleaves earth from sky, letting light shine forth into the world. While the Anthropocene may illuminate a new era for Western disciplinary practices, for many indigenous peoples, it presents a familiar return to their more-than-human traditional worlds. By centring indigenous worlds, we have an opportunity to decentre western disciplinary practice and localise the Anthropocene. However, utilizing the abstracted products of localised indigenous knowledge to perturb authorised Western discourse, makes concepts such as 'more-than-human' part of the ongoing violence of colonial practices. Collaborative research between the architecture and archaeology departments of the University of Auckland and University College London seeks to address this by investigating the city's future as an urban forest, by exploring what it means to inhabit te ao ngahere, the Māori forest world.

The oppositional duality of the city as culture and the forest as nature is undermined in the knowledge that the average forest cover in the world's

cities is 27%. London has almost twice the tree canopy cover of the rest of England. The desire to increase tree canopy by foresting London as the London Urban Forest, is a response to both the causes and consequences of the Anthropocene. Forest cities are vastly different places to dwell in than densely built-environment where people primarily engage in non-agricultural tasks. If this is a city, then there are no Māori cities. The Māori settlement is not an aggregation of buildings, but a landscape fabricated through Whakawhānau, the nurturing and affirmation of cultural and spiritual relationships across varying temporal and local scales sustained by tikanga (customs), kawa (protocols), and kaupapa.

The transformative process of localising the Anthropocene disrupts the ontological reality of abstracted universalised common-sense worlds, such as: city, forest, indigenous, and western. This speculative science/art worlding attempts to inform how humans might inhabit the future city as a forest by entangling the London Urban Forest with the Māori forest world. This requires negotiating the line between appropriation and honouring localised indigenous knowledge.

Revealing the cultural histories of Scottish wooded landscapes

Coralie M Mills

Dendrochronicle

& University of St Andrews

S6-001

Scotland is a focus for the ecological restoration and expansion of woodland cover, with the potential benefits for nature and climate usually taking centre stage. However, interest is rising amongst some of the organisations undertaking such woodland restoration in revealing and sharing the cultural histories of the landscape in which they work. This presentation will explore the potential benefits of so doing using a range of Scottish case studies to illustrate the approach and outcomes. Uncovering those wooded landscape histories is a complex multi-disciplinary task, involving many strands of evidence. Such a project often deploys field survey of tree-species and tree-forms, dendrochronology, historic maps, placenames, documentary records, historic images and local knowledge, and also draws on any other relevant research including palaeoecological records for the longer timescale. The case studies reveal unique trajectories of change at every location, yet with an often-un-

derlying connection in the historic depopulation of the land and the rich cultural evidence left behind in their relatively undisturbed wooded landscapes.

The presentation poses, and seeks to answer, three big questions:

- Is the past relevant to ecological restoration?
- Does the human past matter in woodland restoration?
- What are the benefits of including cultural histories?

From cabinets to the tropical forests. Tracing human-tree interactions in the Isthmo-Colombian area through woodcarvings multidisciplinary research.

Nuria Romero Vidal

University of Santiago de Compostela

S6-002

Wooden material culture has often been overlooked in ethnographic and archaeological collections in favor of other materials. However, the study of plant crafts provides crucial information about people, their skills, technological know-how, botanical knowledge, and even about objects' agency and symbolism.

Technical and cultural features, raw material selection, and provenance in present crafts were compared in this research with historical objects to determine socio-ecological links through wooden carvings. Here, we present the multidisciplinary approach used, which combined the museum work with ethnographic fieldwork with the present-day Gunadule communities. In this way, a call is made for deeper involvement of indigenous communities in the revision of their decontextualized heritage and a vindication of the study of these forgotten objects. In situ revision of the carvings and the wood assignment is crucial to reconstructing the path from the object to the

tree, adopting more decolonial approaches, since in many cases, the importance of wood itself has frequently been overlooked, prioritizing particularities or aesthetic criteria, forgetting the value of the materiality of the tree itself. In this journey from museum repositories to tropical forests, new insights are presented on how we can approach the management of tree resources in places of great biodiversity, both in the past and present.

Foundational criteria to create “Historical Reserve Forest Area”: a study of the Casentino fir and the ancient wooden load-bearing structures in the area of Florence

Luigi Hermanin
University of Florence

S6-003

The area of Florence (Italy) is known for hosting many significant buildings from the point of view of cultural heritage. A number of them were built even before the Renaissance using beams from fir (*Abies alba*) forests of the Apennine mountain, some of which are now part of “Foreste Casentinesi” National Park.

The need of wooden elements of appropriate dimensions for the renovation of the buildings mentioned above guided our research. The study aimed to identify dendrometric and qualitative parameters of standing fir trees, assessing their potential for use as load-bearing beams in ancient structures within of cultural heritage value. Through field research on fir forests aged 80-150 years that have been managed as even-aged high forest stands, we developed a double-entry table using dendrometric prototype approach. This table is based on full height and diameter at 1.3m. It provides information on the useful length of the log and the maximum size of the squared edge beam, tailored to the desired length

of the structural product. A visual strength grading approach has been implemented for assess the quality of standing trees, following certain criteria outlined in the Italian visual grading rule UNI 11035-1:2022.

Our work aims to establish the foundational criteria to create “Historical Reserve Forest Areas”, to be adopted for the forests mentioned above and to similar ones. This includes the possibility to establish criteria suitable for managing forests of different species that can produce large-scale load-bearing wooden elements, as requested by articles 13 and 14 of the ICOMOS International Wood Committee (IIWC).

Dendroarchaeological material, once removed from anaerobic conditions, is a ticking time bomb. The decay process of the organic material, which has been suspended for centuries or even millennia, resumes in the moment of excavation. At the same time, this material holds significant research value not only for archaeology or dendrochronological dating, but also for forest ecology, climate history or other scientific inquiries. Obtaining data, such as tree ring width, is not enough; it is best to archive the entire piece of wood for future investigations.

This is where the problems start, because there are no adequate or affordable methods for restoring the wood to a condition that approximates the previous state of conservation. The few dendroarchaeological laboratories are generally not associated with large institutions. Large-scale, preferably air-conditioned archives are still a distant prospect. There is often a lack of time or space, and usually a shortage of funds or

staff to manage archiving. In addition to research or everyday work, there is little time left for this task.

In this talk, the archive of the Bavarian State Office of Heritage Conservation (BLfD – Bayerisches Landesamt für Denkmalpflege) will be introduced. With around 60,000 preserved samples of different types of wood from the last 12,000 years, it is one of the major archives in Germany. During the last 30 years, samples have been systematically preserved and archived. Objectives, as well as problems, prospects and ideas of possible collaboration, will be addressed. Hopefully this leads to a discussion in a panel of experts.

Loaded up and sailed away: where did the kauri go?

Gretel Boswijk

School of Environment, University of Auckland

S6-005

The expansion of colonial powers into Oceania in the late 18th century and across the 19th century had a transformative effect on the environment as region was connected into a global capitalist system. In Aotearoa New Zealand, a commercial trade in native timber species, particularly kauri (*Agathis australis*) emerged in the 1820s and 1830s when Māori and Pakeha supplied timber to the British colonies in Australia. From the mid-1800s, kauri became an important resource to the new British colony both as a means to build new settlement and to the developing settler economy. Kauri was exported around New Zealand, across the Tasman Sea to Australia, and to other, more distant, markets such as America, China, and the United Kingdom. By the early 20th century, the trade was in decline as most of the accessible old-growth forest had been cut out and dispersed, largely in the form of logs, baulk, flitches, sawn timber, and joinery. Using published shipping reports and by following the voyages of ships such as *Aratapu*, *Clansman*, and *Magellan Cloud*, this

paper takes a closer look at this dispersal. It asks, once the timber was loaded up and sailed away, where did it go? For what purpose? And what did the ships bring back to NZ on their return voyages? Addressing these questions helps situate kauri within the global movement of timber during the 19th century from new and old-World sources. It contributes to forest histories of New Zealand and discussion of the environmental impacts of colonialism in Oceania. Finally, the identification of important destinations may promote or aid recognition of New Zealand kauri in offshore contexts.

Museum as a Mediator of the Living Cultural Heritage of the Forest Relationship

Virpi Kaukio

University of Eastern Finland

S6-006

The relationship with the forest is an intangible cultural heritage that museums can play a special role in studying, documenting and communicating to communities. Because a museum can operate spatially and three-dimensionally, activating all the senses, its means of presentation are more responsive to individual and community experience and live cultural heritage as a process. In this sense, the museum can be a socially influential agent, democratically involving citizens in the forest debate.

The presentation is part of The Museum as a Forum for Experiential Publishing of Research -project (UEF, Kone Foundation 2024–2025). The study focuses on ways to make visible information or research processes that are challenging or impossible to publish through traditional scientific publishing channels. It examines experiential or so-called tacit knowledge, which is difficult to verbalize and conceptualize, from the perspective of aesthetics and sensory research. This requires an open-minded reflection on the nature of knowledge and the kind of intangible cultural heritage it produces.

The mires are an essential part of the Finnish forest landscape. One third of Finland's land area is mire and peatland. Alongside the long-established resource use of mires, the 21st century has seen the emergence of new types of experiential, communal and ecological well-being uses. For example, in addition to traditional outdoor activities such as hiking and berry picking, there are playful team sports and artworks that comment on the ecological value of the mires. The intangible cultural heritage associated with them will serve as an example material for this presentation. The living cultural heritage of mires is produced in the mires. However, it can be recorded and communicated in the community through various events and exhibitions, including the museum context. The diverse representations of mire experience play an important role in the formation of a cultural relationship with the forest. Through representations, cultural heritage values can be brought into the debate and their significance for the community can be made visible.

The quality of traditional wood claddings: a comparison between expectations and observations in Sweden and France

Géraldine Brun
Gothenburg University

S7-001

Wood cladding is a popular architectural feature which has a long tradition in Sweden and in Champagne in France. In these locations today, modern claddings of modified wood or imported species are coexisting with locally produced ones sometimes several hundred years old. This raises the question: what quality of wood is concretely required for cladding purposes? To answer that question, I attempt to grasp traditional wood crafting knowledge through observations of preserved claddings, discussion with professionals working with wooden heritage, and literature review.

In Sweden, the authors and craftsperson seem unanimous: boards of Pine heartwood with high density, high extractive content, and standing growth rings are durable and perform well as cladding. While this is probably true, field observations show that other wood qualities can be suitable for cladding purposes. For example, the East façade of Kvibergsnäs stable in Gothenburg is partly clad with Pine wood of low density

sawn far from the pith and thus with almost tangential growth rings. Dated from the late 18th century, those vertical boards with decorative profile and red Falu paint diverge from recognized standards of high quality but perform well as aesthetic and protective layer.

In Champagne, the claddings covering the exposed sides of wattle and daub houses were made of wood from deciduous trees until recently. While the shingles of chestnut and split clapboards of oak can be expected to last long, the thin sawn boards of black alder, a species considered non-durable (EN350:2016), seem a surprising cladding solution. Yet, black alder has the potential to perform naturally well as cladding for fifty years, which is the time it takes for the tree to be mature and happens to match the longest commercial warranty of modified wood (Brun, 2023).

Reviving Wooden Heritage: Challenges, Methods, and Critique of Safavid Palaces' Restoration

Nasim Shiasi

Sapienza University of Rome

S7-002

As an organic material, wood has played a pivotal role in construction, architectural decoration, and various devices throughout human history. This extensive use of wood has given rise to a rich wooden heritage valued for its functional and aesthetic contributions. However, wood's vulnerability to environmental factors necessitates safeguarding this heritage.

In certain countries, including Iran, where wood resources are comparatively scarce, we witness remarkable artistic expressions in both architectural designs and wooden embellishments. The Safavid era, in particular, represents the pinnacle of wood utilization in historical construction, marked by the masterful integration of wood into structural and ornamental aspects of architecture.

This research focuses on Safavid palaces, delving into their wooden heritage's intricacies and the restoration challenges. The study introduces the wooden structural components and decorations within these palaces, elucidates their implementation methods, and highlights the damages incurred over centuries. A crucial aspect of the research is investigating restoration methods employed by Italian experts in the mid-20th century. These experts pioneered the scientific restoration of

wooden structures and decorations, introducing innovative approaches.

The study examines the extent of Italian interventions in wooden components and evaluates whether they prioritized historical authenticity or leaned toward structural reinforcement. These assessments are conducted within a descriptive-analytical framework, emphasizing a critical perspective. The research leverages archival documents from the mid-20th century to the present and on-site visits, field surveys, as well as interviews with restoration specialists to provide a comprehensive analysis.

Notably, this research carries global significance, with the potential to inform and inspire similar wooden heritage restoration efforts in various regions. It underscores the importance of striking a balance between restoration and historical authenticity internationally. The preservation of wooden heritage, while essential, necessitates meticulous study, rigorous testing, precision, and dedicated time. Ultimately, this research contributes to the preservation of Iran's wooden heritage and the global discourse on wooden heritage restoration, emphasizing the need for a careful and balanced approach to ensure the enduring legacy of these cultural treasures.

Deliberate Damage: A Look at Burn Marks in Churches

Crystal Hollis
University of Exeter

S7-003

Wood has historically served multiple purposes in historic churches. It has been used as a construction material as well as an artistic material in these spaces. In English parish churches, wood was often used to create screens, doors, monuments, statues, benches, and decorations. Over time, wooden galleries and pews were also added to these spaces which created and reinforced hierarchies and transformed how churches were used. While some of these wooden creations were destroyed over time, many have survived in churches and offer insight into the use and importance of wood to medieval and early modern parishes.

Upon closer inspection of surviving medieval and early modern woodwork in ecclesiastical and vernacular spaces, it can be observed that a variety of surfaces and furnishings feature intentional burn marks. These burn marks sometimes appear alone or in groupings and are shaped like teardrops or candle flames. There has been widespread

speculation regarding these marks made on wood and their purposes in recent years, and often these marks are considered to be protective in nature. This paper will explore different groupings of these marks and attempt to offer insight into their role in medieval and early modern culture. By observing these marks on both simple furnishings and elaborate wooden pieces of art, it is hoped that a more thorough understanding of how people used these marks to interact with wooden objects and pieces of architecture can be established.

Historic timber structures: identification, provenance and dating of the roof of a Renaissance masterpiece, the Florence cathedral

Mauro Bernabei¹, Ilaria Stefani², Samuele Caciagli²,
Francesca Mannucci, Nicola Macchioni¹

¹ CNR Italy, ² University of Florence,

S7-004

The cathedral of Florence characterizes the skyline of the city of Florence, thanks to its dome, the largest masonry vault in the world designed by Filippo Brunelleschi. The building, whose construction lasted from 1297 to 1436, is entirely in masonry, lined outside by polychrome marble. However, the wooden structures are not lacking and in particular constitute the load-bearing structures of the roof.

During the period 2019-2021 the timber structures supporting the cover of the nave and the two side aisles were assessed following the methodologies described in the European standard EN 17121:2019.

It appears that the construction of the roofing is subsequent to the consecration of the church, but it is not certain, nor is it known whether any other restoration work was carried out over the centuries. The diagnostic work was accompanied by a dendrochronological investigation aimed at dating the truss elements of the three structures. The study of the archives has made it possible to

find out which forests the construction site owned and the detail of the felling and transport of timber sent to the city for the construction of the building. This contribution aims to show the main results obtained through a comparison of the results of scientific analyses with information from the archives.

The Indigenous Kath-Khuni Construction System of the Himalayas: Continuity and Relevance of Local Building Crafts in Current Times

Jay Thakkar

Faculty of Design, CEPT University, India

S7-005

Kath-khuni is the indigenous building construction system in Himachal Pradesh that utilizes local wood, stone, hand-made tools and limited-use power-driven technology. It has been developed over generations, guided by knowledge of geography, climatic conditions, and socio-cultural practices of the region. Kath-khuni construction system is earthquake-resilient due to the non-rigid wooden framework and stones without cementing mortar and responds efficiently to the frequent seismic tremors in the area. The houses are energy-efficient with a cube-shaped design, south-facing orientation, and balconies. Livestock on the ground floor warms up the upper floor. Local materials, simple tools, and reuse of materials make it time and resource-efficient. Low maintenance due to easy repair and reuse of materials. The houses integrate with nature with gaushala, honeybee niches, and planting trees.

The construction of kath-khuni structures relied heavily on the skills

of families of carpenters known as mistris. These families often associated themselves with Vishwakarma, the 'universal architect.' The mistris acquired knowledge and skills from generation to generation through an oral and empirical tradition, working as apprentices for several years. However, the rapid introduction of industrial materials and new construction technologies ushered in an out-of-context architecture that did not respect indigenous construction, leading to a break in traditional knowledge transfer.

The paper aims to highlight the significance of the indigenous building tradition of Kath-khuni in two aspects. Firstly, it aims to express the relevance of the sustainability principles of this system in the current context. Secondly, it aims to explore the role of craftspeople in ensuring the continuity of this local construction system.

The Material Otherness. The Status of Wood in the Finnish Architectural Heritage

Iida Kalakoski, Riina Sirén
University of Tampere

S8-001

For a long time, the wooden heritage was disregarded in the international conservation guidelines and in the UNESCO World Heritage List. This study analyses this stigma through the concept of “otherness” since the qualities of wood are often compared with the qualities of stone, brick, or concrete. In Finnish context, the stigma is both endemic and adapted from other countries, in which the architectural heritage is mainly built of stone and brick. Differences in the building materials and traditions have resulted in intuitive comparison between different building cultures. In search for the cause of this contempt, the article identifies the disdain of wood being related to its material performance, the local building tradition, and the subsequent connotations expressed by Finnish heritage professionals. The second part of the article examines the notion of otherness through international guidelines on built heritage and building conservation. The guidelines are elected in accordance with their topic and the

impact in the Finnish built heritage discourse, inferred from above-mentioned material. The last part studies the influences of the wood’s necessity of regular maintenance on the appreciation of the material.

The Heritage(s) of Human-Forest Relationships (HFR)

Reetta Karhunkorva¹, Tuulikki Halla², Jaana Laine³

¹ Social and Cultural Encounters, Philosophical Faculty, University of Eastern Finland & Finnish Forest Museum Lusto,

² Forests and Bioresources, Faculty of Science and Forestry, University of Eastern Finland, ³ LUT University

S8-002

The ways individuals and societies value forests and forest-based practices and objects are manifested in their relationships with the forests. They are also reflected in the forest-related cultural heritage which is the chosen, particularly valued part of culture that we want to pass on to future generations. Forest cultural heritage is both intangible and tangible. In addition to tangible objects and monuments, cultural heritage is also intangible meanings, values and practices that are transmitted intergenerationally.

In Finland, the relationship between people and forests was included in the National List of Intangible Cultural Heritage (2017) thus making this living forest cultural heritage and its interaction in society more visible and influential. Furthermore, human-forest relationships can be seen as essential to heritage futures (Siivonen 2018) which have a role in creating cultural sustainability transformation (Paasikoski et al. 2022).

The HFR concept and novel forest related human scientific research provide conceptual tools and diverse methodologies to identify and depict forest-related meaning-making (Halla et al., 2023; Apajalahti et al., 2022). During the past years, many developments applying the HFR concept and humanistic approaches have taken place in Finland. Researchers are networked and established scientific society with its various international activities have studied HFRs of various stakeholders and have popularized research results and disseminated them in university teaching.

In this presentation, we will discuss the diverse heritages related to forests through the concept and research on human-forest relationships.

Quality wood and how to secure access quality wood in the future

Mats Almlöf

The Woodbank, Icomos International Wood Committée, Sweden

S8-003

What's it about

Our projects is focusing on the quality wood as it's getting difficult to find the right material for this. We are experience a growing problem in getting the wood, specially the high quality wood for parts of repair of our cultural heritage buildings. The problems can be narrowed down to two issues;

Climate change and deforestation would be the biggest threats that we have to solve.

Method

We have a group of skilled people from most areas involving wood. The project is including Sweden and Norway, which is a pilot to get a system on the supply chain of wood for our cultural heritage in the future. We have to make sure that we will be able to continue with the wooden restorations and that the traditional craftsmen today start to apply the old way of thinking as the craftsmen used think In the old days, "*The right wood for the right part – good enough for what's it's for*".

This is an ongoing project on-and

off since approximately 5 years and we start full time in this summer.

Result

When we have built the structure for our area, it would be possible for other countries, with modification and start working in other country.

Who

Through my work as a traditional craftsman (specialized in wood and paint) since a couple of decades, with the last 6 years at the open-air museum Jamtli, to build a program with courses, cooperation with universities and schools (students and apprenticeship), private DIY, lectures etc.

I've been working internationally with different projects and right now planning a hands-on workshop in Istanbul next year and Japan 2026 with a colleague in England, Vincent Reed with ICOMOS and Icomos International Wood Committee.

Assisting carpenter is Eirik Ulvan from Norway with extensive experience.

Sweden's Timber Empire. Architectural perspectives on transnational timber industry's impact on the landscapes of ecology, economy and culture. Case of Swedish forests in Latvia

Toms Kokins

Umeå School of Architecture

S8-004

This project introduces the Swedish Timber Empire, a conceptual understanding of the extent of Swedish-owned forests beyond the current geographical borders of Sweden. Since the fall of the Iron Curtain, there has been a rapidly expanding procurement by the Swedish forestry companies of forest lands in countries formerly occupied by the Soviet Union. Research conducted by the author has discovered that 12% of privately-owned forest land in Latvia now belongs to Swedish stakeholders.

Just like the Sweden's Empire of 17th century, the contemporary Timber Empire leaves its marks in local landscapes of ecology, economy, and culture that this project is set out to investigate. By exploring the relationship between Sweden and Latvia the project offers a new framework for rethinking (timber) architecture design methods and curriculums considering the transnational interdependency of forests and forest industries. Using mix quantitative and qualitative mapping methods it

aims to produce series of architectural interventions that mediate and articulate the findings of this project.

Project Medieval timber structures in Finland

Panu Savolainen
Aalto University

S8-005

There are almost twenty fully or partially preserved original roof structures in Finland's medieval stone churches. The medieval roof structures (1410–1550) are an outstanding part of architectural heritage of Finland, a source of knowledge about medieval carpentry, still in use as load-bearing structures today.

The purpose of the project is a comprehensive inventory of medieval roof structures in Finland, followed by research. Although the masonry parts and paintings in Finland's medieval stone churches have been explored almost exhaustively, the roof structures have received little attention.

The project examines wooden structures from various perspectives or methodologies, including building archaeology, engineering, architectural history, and carpentry knowledge and work. The researchers in the project have various theoretical and practical backgrounds and use different types of documentation methodology and technology. At a more general level, the project maps

how late medieval innovations in carpentry and roof constructions spread in the Nordic region and were combined with local traditions and carpentry work.

In a scientific sense, the project raises the question of sustainable buildings in the present day. Over five hundred-year-old structures are still in good condition compared to modern buildings with indoor ventilation and durability. This comparison clearly highlights different problem areas in today's industrial construction technology. The project results in scientific articles, an inventory report, a popular science book, a documentary film about the entire research process.

Home and away; the dendrochronology of pine in Scottish buildings

Anne Crone¹, Coralie Mills²

¹ AOC Archaeology Group

² Dendrochronicle

S9-001

Scotland lost much of its woodland cover long before most other European nations. By the late 15th century its lowland woodlands were so depleted that importation had already begun, and throughout the 16th to 19th centuries most building timber, primarily oak and pine, was imported from Scandinavia and the eastern Baltic. Scotland still retained extensive tracts of Scots pine woodland in the Highlands, with tree-ring evidence of its use from the late medieval period, but its wider commercial exploitation became more viable from the 18th century onwards. It has sometimes proved difficult to identify native-grown Scots pine timber by dendrochronology because relatively fast-grown and young timber was often used, making it difficult to cross-date. The dating of native pine has been improved by the development of a network of native pine reference chronologies and of the Blue Intensity (BI) method. This has led to the dating of around 20 native pine structures

from the 15th onwards through the SCOT2K project, including a cluster of dates for many small vernacular buildings around the turn of the 19th century. In this lecture the results of the SCOT2K programme are presented and the parallel story of Scotland's trade in imported pine is told through the dendrochronological analysis of its historic buildings. This traces the changes in source over time, from Norway, to Sweden and finally to the eastern Baltic, to regions like Karelia on the Finnish/Russian border.

Dendrochronological dating of historical timber structures in Latvia

Māris Zunde

Institute of Latvian History, University of Latvia

S9-002

Currently, just one research unit in Latvia is engaged in the dating of historical timber structures and compilation of long-term tree-ring chronologies: the Dendrochronological Laboratory of the Institute of Latvian History, University of Latvia. The laboratory was established in 2004, although activities and research connected with dendro-dating were undertaken at the institute already before this.

So far, the laboratory has dated 245 timber structures on 93 historical sites (buildings, street surfaces, riverbank revetments, water supply systems, etc.). The dated structural timbers were mainly of Scots pine (*Pinus sylvestris* L.) (82%), with smaller amounts of Norway spruce (*Picea abies* (L.) Karst.) (12%) and pedunculate oak (*Quercus robur* L.) (6%). Overall, the tree-ring chronologies for pine cover the period AD 950–2020, the chronologies for spruce spanning the period AD 1526–1834 and the chronologies for oak, AD 919–1731. A fairly large number of dated wooden structures were built in the 13th

century. Considerably fewer are preserved from the 14th century, when construction of masonry buildings began to develop more widely in present-day. Again represented in relatively greater number in Latvia at the present day are wooden structures built in the 16th century and later. However, a considerable number of the pine structural elements were provided from timber formerly floated to present-day Latvia along the River Daugava from the upper Daugava and Dnieper basins, and in smaller amounts even from forests growing in the Volga basin.

Structural remains of the first building phase of Āraiši lake fortress (9th cent. AD) have been also dated through identification of the tree-ring reflecting the rapid increase in the radioactive carbon isotope (14C) in AD 774–775 (the Miyake event).

Tree-Rings and ‘Holistic’ Heritage Science: Intersecting Byzantine-Medieval Art, Architectural, and Environmental Histories from Cyprus

Brita Lorentzen
University of Georgia

S9-003

The forests in the central Troodos Massif of Cyprus have been a valuable timber resource for the East Mediterranean since antiquity. A pivotal shift in human settlement on Cyprus during the 11th–16th centuries AD led to the establishment in the Troodos of several elaborately painted wooden churches, monasteries, and religious-centered communities that transformed the forested montane landscape. These buildings comprise arguably the richest, best-preserved record of Byzantine heritage per-unit-area in the world and include ten churches collectively inscribed on the UNESCO world heritage list.

Despite their significance as a key reference for Byzantine-Medieval art and architecture and their crucial role in transforming a major Mediterranean forested area, an exact timeline for the construction and refurbishment of specific churches and religious artwork, and concomitant evolution of the Troodos forested landscape, has been previously ambiguous and

imprecise. In response, our international and bicomunal Cypriot research team has engaged in a multi-year, ‘holistic’ heritage science investigation of the Troodos painted churches and forests that integrates dendrochronological dating and dendroprovenancing with digital mapping and documentation of the structures and their surrounding landscapes. I provide key results from our work, which has created the first high-precision timeline for the building and object biographies of Byzantine to post-Byzantine art and architecture in Cyprus. I also discuss critical new environmental evidence for land use impacts of Byzantine-Medieval Troodos religious settlement, in which we find periods of local timber harvesting for church building and icon production coincident with heavy growth disturbance cycles in the tree-ring records of living (unharvested) trees in the Troodos forests.

Fuelling the mo(nu)ment: wood supply during the Renaissance reformation of the Convent of Christ (Portugal)

Gabriel Pereira
CEAACP, University of Coimbra

S9-004

Like any architectural reformation, the expansion of the Convent of Christ in Tomar required a substantial amount of wood. The construction works spanned over twenty years, commencing in 1530 and continuing until the 1550s. During this period, Portugal already faced challenges in woodland management and wood supply. The needs of the population for daily tasks like cooking or heating, coupled with the increasing naval construction and the demand of space for agriculture and farming, pushed Portuguese forests to their limits with almost no regenerative capacity. This strain led to a frequent need to import wood from the northern regions of Europe. As a consequence, it was a demanding task to provide enough wood for all the different uses applied in the construction of the Convent of Christ in Tomar.

This communication will delve into the working dynamics of the construction site. By analyzing archive documentation, it's possible to identify the specific wood species

used, the locations where trees were cut, transportation routes, required workers, and the monetary cost of the entire process.

Wood, being a versatile material suitable for various uses such as fuel for lime, brick, and tile kilns, as well as for construction and sculpture, will be the focus of the last part of this communication. It will explore the diverse ways in which wood materials were applied in the Convent of Tomar, including their role in surviving works of art and building techniques.

Wooden element in the Yoruba cultural heritage: a case study of Alaafin's Palace of Oyo Town

Sogbesan Oluwatoyin¹, Kenneth E. Aidelojie²

¹ Asa Heritage Africa, Lagos, Nigeria

² York University and Conestoga College, Canasa

S9-005

The Alaafin's palace, Oyo town is the home of culture and Yoruba heritage that is in its original state. Each architectural element exudes culture as it bears diverse interpretations and implications within the palace, representing the Yoruba community and culture. Many of such elements are produced using wood in varied forms. Wood is the most used material amongst the Yoruba people of Oyo and ranges from everyday utilitarian objects to sacred collections. Alaafin's palace is home to many wooden cultural heritages used within Yoruba architecture from the days of the Old Oyo Kingdom. Some wooden totems from the old Oyo empire are still evident in today's Oyo town within the palace of the Alaafin. Some of the wooden totems are made from hardwood species known as '*iroko*' and have continued to be used as part of the present structure to denote authority and substantiate history. Utilising a multimethod approach, the paper highlights the use of wood as an architectural and

spiritual element for the Yoruba people of Oyo. It seeks to highlight the indigenous knowledge associated with how the elements are preserved. Lastly, it emphasizes the need for proper inventory as they constitute part of Nigeria's valuable heritage.

From Panel Maker to Painter's Workshop: Signed and Dated Panels from the Same Tree in the Seventeenth-Century Low Countries

Kirsten Weterings¹, Sven Dupré¹,
Marta Domínguez Delmás²

¹ Utrecht University, ² Cultural Heritage Agency of the Netherlands,
Naturalis Biodiversity Center of the Netherlands

S9-006

Identifying paintings with boards from the same tree offers valuable insights for art historical research, particularly when panels are signed and dated by the artist. Historical sources suggest that seventeenth-century painters often purchased multiple panels simultaneously, which explains why boards from the same tree are commonly found among works attributed to the same workshop. Conversely, when boards from the same tree are identified in paintings attributed to different workshops, this suggests the painters obtained these panels from the same source. Previous research on paintings with boards from the same tree has been limited to smaller case studies due to constraints on the number of tree ring series that can be processed simultaneously in current analysis software. This research therefore explores patterns in the use of panels with boards from the same tree in the seventeenth-century Low Countries through a meta-analysis signed and dated paintings that

contain boards from the same tree. To identify these paintings, 4101 tree ring measurements corresponding to approximately 1991 panel paintings were compared using statistical analysis in R. The comparison of the date and attribution of signed panel paintings containing boards from the same tree reveals that many were completed within a one-to-two-year period. Variations in this pattern may be explained by workshop size, specialization, and productivity. In conjunction with archival evidence, these findings offer valuable insights into workshop productivity and the trade in panels for painting in the seventeenth-century Low Countries. Additionally, they provide a means for art historians to estimate approximate production dates for panels with boards from the same tree, especially when the date of only one panel is known.

Tree-ring based chronologies of brick architecture and historical building materials in Flanders, Belgium

Vincent Debonne, Kristof Haneca
Flanders Heritage Agency

S10-001

Building materials and construction techniques offer essential insights into the creation and evolution of historic buildings. Detailed surveys on historical building materials and construction methods are pivotal to the fields of construction history and architectural history. In regions marked by a profusion of brick architecture, a lot of attention is traditionally given to brick dimensions and masonry bonds as dating criteria for historic buildings, the so-called *mensiochronology*. In Flanders (northern Belgium), an area with an abundance of brick built heritage, the dimensions of bricks are commonly used as a dating criterion in both excavation archaeology and building archaeology when textual information is missing or when scientific dating is not possible.

However, the reliance on dimensions from imprecisely dated buildings has cast doubt on the reliability of these criteria, prompting a quest for a more dependable methodology. Enter tree-ring dated timbers, providing a solid foundation to compile the properties of brick built structures, such as brick dimensions and mason-

ry bonds, into coherent and reliable chronologies.

This paper showcases the application of this methodology to establish a chronology for brickwork through our research in Bruges (Belgium), where numerous roof constructions and floor joists of brick buildings have been tree-ring dated. The multitude of precisely dated timber structures enables the creation of comprehensive chronologies of brick sizes and masonry bonds for the city of Bruges and its surroundings, covering the 13th, 14th and 15th centuries. The insights gained from this study not only affirm the chronological value of brick sizes but also spark inspiration for future investigations, encouraging similar explorations into different materials, such as various types of stone.

Vincent Debonne is a researcher of built heritage at Flanders Heritage Agency (Belgium)

Kristof Haneca is a heritage researcher specialized in dendrochronology at Flanders Heritage Agency (Belgium)

Form Follows Material? Identification of Wood Species and Art Historical Research of Medieval Polychrome Sculpture in Finland

Katri Vuola
University of Åbo Akademi

S10-002

Around eight hundred polychrome wooden sculptures and altarpieces have survived from the Finnish Middle Ages (c. 1150/1200–1520). This material belongs to the oldest material cultural heritage we have, along with archaeological finds. In Finland, it is not possible to study the medieval artworks' production, acquisition or use from historical sources, so the objects themselves are the main source for their study.

Since the 19th century the identification of wood species has had a key role for determining the area of origin of medieval art. As a part of my PhD thesis, *Fragmented objects from a devotional past: Wooden polychrome sculptures in the diocese of Turku in the long fourteenth century* (2023), I explored the wood use in the 14th century. A new visual inspection of the sculptures and a microscopic examination of the wood material showed the unreliability of the earlier identifications. Sculptures previously identified as carved of birch are predominantly alder, but lime, pine and aspen also occur. The new findings

revolutionize the research paradigm, especially as the use of birch has traditionally been considered to indicate the local, 'Finnish' origin of the sculptures. Moreover, the analysis of 15th century sculptures has previously shown that many of the 'birch' sculptures are instead made of lime.

When looking at wood species from the point of view of their workability and availability, as well as how the chosen materials affect the form and durability of the sculptures, new research perspectives open for art historical research. In my paper, I will focus on the questions related to the use of alder and oak in a group of 14th century sculptures of the Virgin Mary and Child and the Resurrected Christ. I will discuss both the challenges of studying this fragile and unique material, but also how the research of the wooden artworks contribute to the understanding of the cultural, economic and environmental contexts of the time of their production.

The Economics of Tradition: Valuing Traditional Woodworking Skills in the Modern Market

Rafał Boguszewski, Małgorzata Herudzińska
Warsaw University of Life Sciences

S10-003

In an age where mass production and industrial manufacturing methods dominate the consumer market, traditional woodworking skills not only emerge as a bastion of cultural heritage but also as a unique consumer proposition. The quantitative study, whose results will be presented at the conference*, undertakes, among other things, the assessment and valuation of traditional skills associated with woodworking on the contemporary Polish market, by examining how consumers perceive artisanal activity and whether they are willing to pay more for traditionally manufactured products.

Our research illustrates the social and economic viability of traditional woodworking in modern times, revealing the potential scale of the market where consumers are in search of authenticity, quality, and sustainability — values deeply rooted in the age-old practice of woodworking.

This presentation will not only shed light on the social and economic aspects of traditional woodworking skills but will also discuss possible strategies for their maintenance and revitalization in the face of globalization. By doing so, it ensures that these valuable skills are not relegated to the annals of history but continue to thrive in the modern market.

*The quantitative (CAPI) study was conducted on a representative sample of Polish adults (N=1000) in August 2023.

Human impact on forests of early twentieth century Finland

Tuomas Aakala¹, Niko Kulha², Timo Kuuluvainen³

¹ University of Eastern Finland

² Natural Resources Institute Finland

³ University of Helsinki

S10-004

Traditional use of the forests and trees and the early industrial utilization shaped Finnish forest landscapes over long time periods prior to the onset of modern forestry, based on clearcutting and successive rotations of even-aged stands. These earlier forest uses led to landscapes that greatly differed from the forests we observe today. In this study, we analyzed the state of the forests in Finland in the early 20th century, relying on a re-analysis of the data from the first National Forest Inventory conducted in 1921–24, which was the first completed systematic survey of forest resources at a national scale in the world. We mapped the ca. 3000 sample plots in upland forests measured in the program and produced a series of maps of large-scale variation in forest characteristics. We analyzed forest age and size structures, and species compositions relative to human population and land-use data. Forest landscapes in the southern parts of the country showed strong human impact, visible as the

near-complete absence of large and old trees in populated areas. In contrast, in remote areas many of the forest characteristics that are typical of natural forests still prevailed. These gradients in human impact a century ago reflect regional differences in how the availability of wood developed, and these structures are still reflected as legacies in the current forest landscapes.

Forest meaning-making through geocache creation

Philip Chambers

University of Eastern Finland

S10-005

Technology has had a significant impact on our relationship with forests, yet our connection with nature has remained strong through various forms of playful interactions. Forests have always been a place of recreation for humanity, and the advent of digital technology has not hindered this. Instead, it has provided us with new tools for playful experiences, creative endeavours, and meaning-making. In urban and peri-urban areas where forests may be perceived as non-spaces, value and meaning are created through the process of interaction, play, and creativity.

Geocaching, a location-based game resembling a treasure hunt, has been played globally by millions for over two decades since the opening up of the Global Positioning System. Geocaches are camouflaged boxes or other types of containers hidden at specific coordinates by geocache makers. More than 3 million geocaches have been hidden worldwide, with around 80,000 currently in Finland. Over time, the hiding of these

geocaches has become elaborate, often placed in areas of interest or importance to the cache owner. Cache owners frequently exhibit creativity in their choice of location and materials when building their caches, aiming to evoke specific experiences for players, adding layers of hidden meaning to the chosen place.

In this work, we examine the role of playful technologies in modern meaning-making in Finnish forests by documenting and evaluating hand-made geocaches in Finnish forests. Traditionally, nature and forests have layered meanings deeply rooted in Finnish folklore and history, and we suspect these new tools could have enabled new interpretations and significance.

Was fir wood favoured as construction timber?

Elisabeth Wächter^{1,2},
Sebastian Nemestothy¹,
Michael Grabner²

¹ BOKU University

² dendro.at OG,

S10-006

71 objects in the region „Waldviertel“ – north-west from Vienna, Austria were analysed. The region is characterised by low temperatures and dense forests. These forests are dominated by Norway spruce (*Picea abies*; 82%), followed by Scotts pine (*Pinus sylvestris*; 12%), Silver fir (*Abies alba*; 3%) and others (3%). The wood supply was local – no import, but partially export (especially fire wood) occurred. Furthermore, the “Waldviertel” shows a high probability of successful dendrochronological dating because of the consistent climate.

During dating, it became obvious, that there are several building phases which do exist of 100% fir wood. Therefore, the wood species distribution within the buildings phases were analysed. The time span reaches from 1284 to 1886 CE. We differentiated between churches and other buildings (e.g. farm houses).

The churches showed high numbers of building phases set up of fir wood only in the early period as well as in the late period. In between, pha-

ses with spruce wood only and mixed phases can be found. For the other buildings, the situation is different – having some building phases in the middle of the time span with fir wood only, and several building phases with spruce wood only.

As there were much more spruce than fir trees available, we can hypothesise, that fir wood was especially selected for building timber. But this preference was not visible during the whole period and is stronger in church constructions, which are usually bigger.

From the forest's cover: Ancientness and otherness in forests from archaeological and folkloristic viewpoints

Liisa Kunnas, Heidi Henriikka Mäkelä
University of Helsinki

S11-001

The relationship between Finnish culture and the forest has often been mythologized and the concept of Finns as self-proclaimed “forest people” seems to be embedded in the Finnish identity and the image of Finnishness. Forests and trees are also important in many spiritual practices that claim a connection to “ancient wisdom” or Finnish folk religions.

The forest is also home to many archaeological sites and remains, for example prehistoric cairns and other structures. In the pre-modern Finnish rural culture, these monuments were left outside the cultural heritage of the community, and were instead associated with the realm of semi-mythical, vaguely ancient beings and the non-human, possibly dangerous and even scary atmosphere of the forest. Instead of a place of spirituality and calmness, the forest was seen as an opposite to the agriculture-based village life.

In this presentation, we explore the heritagization processes of archaeological sites connected to the forest, and the changes in the notion of forest as part of Finnish identity.

From forests to buildings to heritage – The standardized houses of Puutalo

Laura Berger¹, Kristo Vesikansa¹, Philip Tidwell²

¹ Aalto University

² University of California - Berkeley

S11-002

This paper considers the largely forgotten history of the Finnish company Puutalo Oy (Timber Houses Ltd.), which became one of the world's largest manufacturers of prefabricated timber houses in the 1940s and 1950s. With more than 30 factories situated across Finland and an annual production of more than 10,000 buildings a year, the company was initially meant to address the domestic housing crises brought on by the Second World War. However, Finland's complicated geopolitical position meant that only a small percentage of the buildings were used domestically, with the larger part of them delivered to over 30 countries on every continent.

This paper explores two different processes. First, how the means by which Finnish forests were transformed into buildings and exported across the globe, and second, the ways in which these relatively modest structures have been included and excluded from notions of heritage in Finland and abroad. Our hypothesis is that the success of Puutalo was based on the company's use of existing resources, knowledge, and networks, with attention to new technology and design innovations. The design of buildings following 'kit-of-parts' and flat-pack systems significantly reduced transportation costs and opened new opportunities for export. At the same time, it also allowed for a decentralized system of production that

enabled individual factories to produce different building components, such as wall panels, roof trusses or windows, and that could be interchanged and produced as needed. Finally, the simplification of construction systems and development of carefully illustrated instructions allowed workers to erect buildings simply with relatively little skill or supervision from the designer and producer.

Furthermore, we suggest that it may be fruitful to analyze the Puutalo buildings from the point of view of heritagization. These structures are not only what one might call 'everyday heritage', but also industrially manufactured export products, often built as temporary solutions. As such, they would seem to easily evade any heritage status, but in practice, their reception has been surprisingly mixed. In some locations they remain highly valued and appreciated by their inhabitants, while in others they have been nearly erased or altered to such an extent that they are hardly recognizable. Many have been demolished, while others of similar design have been listed as heritage. In sum, we suggest that the Puutalo houses tell multiple stories of how Finnish forestry products have been marketed, exported and received internationally, and why they have achieved different statuses as heritage buildings in a variety of locations across the globe.

Traditional Carpentry: Craft or Art?

Rasa Bertašiūtė

Open Air Museum of Lithuania

S11-003

In the works of good craftsmen, function and aesthetics, rationality and beauty are merged into an indivisible unit. Craftsmanship connects all the components of authenticity (material, technologies, constructions and function) into the final form of expression. For a long time, the craft has been identified as an art since craftsmen created beauty, not only utilitarian things. Until Second World War, most wooden buildings were built without architects under the guidance of carpenters. The role of carpentry in the creation of wooden architecture and its beauty was essential. Beauty was understood as an overall criterion of quality. A craftsman, like an artist, who works with raw materials, has the best feeling for the material and its quality. Attention to details and surfaces, shows not only the aesthetic, but also the moral approach of the creator. Details, decoration and ornament give the building individuality and uniqueness. If we examine the details more closely, we will see how carefully they have

been done. Observing beautiful details of a wooden building, one can wonder - is it art or craft?

Carpentry is an important part of cultural and national heritage as well as the field of self-expression, creativity and economic activity necessary for preserving the local peculiarities. Old technologies that were once part of the traditional way of life are now becoming objects of intangible cultural heritage. Carpentry tradition is both an example of sustainability and an inexhaustible source for future, time-tested, unique and unrepeatable for every place in the World.

Swedish hollow post windmills, an endangered type of windmill

Mattias Hallgren
Traditionsbärarna

S11-004

The biologist Carl von Linné wrote in 1746, on his journey through the province of Västergötland: *"Ah, they still have these old hollow post mills here! I hope some of them will be preserved for the future."*

Out of thousand of hollow post mills only 17 in Sweden and 12 in Finland have survived. None of the Swedish mills have an heritage protection and most of them are in need of restoration.

A scientific project started with the restoration of an 18th century hollow post windmill from the village of Söne relocated to the open air museum in Skara. The windmill needed a total dismantling which gave us a unique opportunity to regain lost knowledge about the woodwork and building process of a mill of this kind. We formed a group of specialists and started an inventory, surveying technical details of the other 17 hollow post mills in Sweden, all located in coastal or lakeside areas with windswept forests. Only Finland and Sweden have these type of windmills. The survey showed that 50% of the

original buildings and equipment have been lost during restoration work and many technical details have not been documented.

For the Söne mill restoration, local timber from the coastal areas was chosen, low quality seen to the restoration norm but "right" for this building. The woodwork restoration and erection of the mill was done using tools, techniques and rigging methods from the 18/17th century. The aim was to understand constructional details and the evolution of hollow post mills.

Dendrochronological dating of the mill from Söne got us to look closer at the local forests. We took samples from old living trees in the same area and compared with the timber in the windmill to try to find overlapping year-rings. Also to see if the wind-swept trees at the lakeside had other characters than trees in the countryside. We also took dendro samples from the hollow post windmill in the neighboring village of Rackeby, dated 1785 by an inscription.

POSTERS

Poster code	Poster authors and affiliations	Poster title
P-001	Tuomas Aakala University of Eastern Finland	Zetterberg tree ring data collection
P-002	Mats Almlöf The Woodbank Icomos International Wood Committée, Sweden	Right wood for the right piece tomorrow. But how?
P-003	Angela Balzano¹, Maks Merela¹, Alessia D'auria³, Valeria Amoretti², Antonino Russo², Paola Sabbatucci², Stefano Mazzoleni^{3,4} 1 = Department of Wood Science and Technology, Biotechnical Faculty, University of Ljubljana, Slovenia; 2 = Parco Archeologico di Pompei, Via Plinio, 26 – Pompei (NA) 3 = Department of Agricultural Sciences, University of Naples II, Portici, Italy 4 = Centro Museale – Musei delle Scienze AgrarieMUSA, Portici, Italy	Bronze Age Waterlogged Wooden Canoe from Sarno Plain (Longola – Poggiomarino, Southern Italy): Insights from Anatomical Characterization
P-004	Iris Brémaud Wood Team, LMGC, Univ. Montpellier, CNRS, France	Guitar-makers' woods – at the crossroads of artisanal values and natural heritage
P-005	Gao Chen¹, Zhang Qiunan¹, Chen Jiangang¹, Mu Baogang², Lu Fei³ 1 = Architects & Engineers Co. Ltd. of Southeast University, China Architectural Heritage Conservation Department 2 = School of Civil Engineering of Southeast University 3 = Jiangsu Southeast University Testing and Inspection Technology Co., Ltd	The Significance of Restoration Research on the Display and Utilization of World Heritage

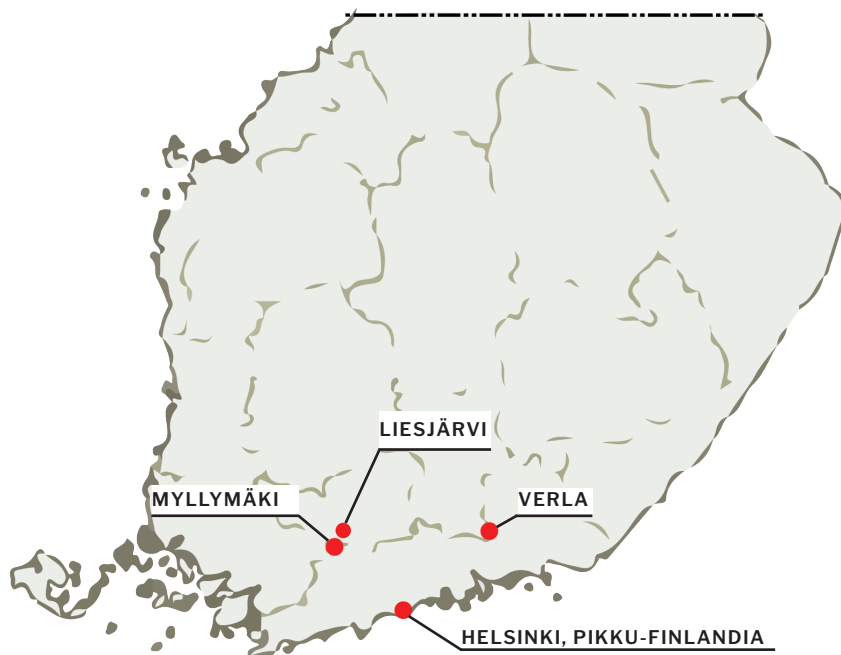
Poster code	Poster authors and affiliations	Poster title
P-006	Franziska Dalheimer¹, Tuomas Aakala² 1=Aalto University, 2=University of Eastern Finland	Availability and Consumption of Wooden Resource for the Construction of Late Medieval Roof Structures in Finland
P-007	Bettina Ebert Museum of Archaeology, University of Stavanger	Wood tar in cathedral construction: novel medieval usage of a common forest by-product
P-008	Laura-India Garinois Massachusetts Institute of Technology	Designing (with) Trees: Active Agents in Architectural Production
P-009	Kristof Haneca Flanders Heritage Agency	<i>fellingdater</i> —Estimate, report and combine felling dates of historical tree-ring series
P-010	Toms Kokins Umeå School of Architecture	Sweden's Timber Empire
P-011	Vincent Labbas^{1,2}, Justine Daltin², Nils Milis², Emmanuel Delye², Pascale Fraiture¹, Patrick Hoffsummer² 1 = Royal Institute for Cultural Heritage (KIK-IRPA), 2 = University of Liège	Two churches, one forest? Timber supply for the Holy Cross church's and St. Paul Cathedral's roof frames (1251–1332 CE)

Poster code	Poster authors and affiliations	Poster title
P-012	Vincent Labbas¹, Mélanie Saulnier², Sylvain Burri³, Laurent Larrieu⁴, Vanessa Py-Saragaglia² 1 = KIK-IRPA, Royal Institute of Art Heritage / University of Liege (Belgium), 2 = CNRS UMR GEODE 5602, University of Toulouse-Jean Jaurès (France), 3 = CNRS UMR TRACES 5608, University of Toulouse-Jean Jaurès (France), 4 = INRAE UMR DYNAFOR 1201 (France) / CNPF-CRPF Occitanie (France)	Reconstructing ancient timber supply practices of an ancient and mature forest (Gavarnie-Gèdre, Pyrénées, France)
P-013	Laura Laine Department of Architecture, School of Arts, Design and Architecture, Aalto University	Tracing the assemblage of Karjaa church roof trusses from 1470
P-014	Oskari Lumikari Aalto University	Forest, Body and Space – Architectural Approach to the Spatial Experience in Forests
P-015	Oliver Nelle¹, Koen Deforce², Zoë Hazell³, Valentina Pescini⁴, Jeannette Lucejko⁵, Magdalena Zborowska⁶ 1 = Landesamt für Denkmalpflege Baden-Württemberg, Germany, 2 = Ghent University, Belgium, 3 = Historic England, UK, 4 = Catalan Institute of Classical Archaeology, Spain, 5 = University of Pisa, Italy, 6 = Poznan University, Poland	PoTaRCh: A network for forest by-products charcoal, resin, tar, potash

Poster code	Poster authors	Poster title
P-016	Stephan Nicolaij, Koen Deforce, Silke Lange, Kristof Haneca, Jelte van der Laan WOODAN Foundation	WOODAN: an online database of archaeological wooden artefacts. A situation report and future prospects
P-017	Goodluck Edobor Omoregie Blessing Agbonlaho International Council of Museums	A Discourse Analysis of The Importance Of The African Ebony Wood To Benin Art Works
P-018	R. Pukienė¹, R. Bieliauskaitė Mikolaitienė², L. O. Adomaitytė² 1= National Museum – Palace of the Grand Dukes of Lithuania, 2 = Pranas Gudynas Conservation Centre at the Lithuanian National Museum of Art	The use of Pinus cembra and other wood species for the 16–19th c. Italian mirror supports
P-019	Flavio Ruffinatto¹, Massimo Mannucci², Alan Crivellaro¹ 1= University of Turin, Department of Agricultural, Forest and Food Sciences (DISAFA), Italy, 2= LegnoDOC srl Prato (PO), Italy	Fast, non-destructive on-site identification of wood species used in timber structures

Poster code	Poster authors	Poster title
P-020	Oula Seitsonen¹, Ari Björn^{1,2,3}, Marika Hyttinen¹, Aleksi Kelloniemi¹, Tuuli Matila¹, Annemari Tranberg^{1,4}, Mathilde van den Berg¹	Oulu Vaakunakylä: From forest to Nazi barracks and working-class housing
	1 = University of Oulu, 2 = Aalto University, 3 = Art & Process Oy, 4 = Museum of Torne Valley	
P-021	Lisa Shindo^{1,2}, Sanrine Borel-Dubourg³, Carine Cenon-Salvayre⁴, Alain Badie³	The woods of Orange's ancient theater
	1 = Service d'archéologie de Nice Côte d'Azur, France, 2 = Aix Marseille University, CNRS, CCJ, Aix-en-Provence, France, 3 = CNRS, Aix Marseille University, Institut de Recherche sur l'Archi- tecture Antique, Aix-en-Provence, France, 4 = Aix Marseille University, CNRS, LA3M, Aix-en-Provence, France.	
P-022	Armelle Weitz¹, Patrick Hoffsummer², Kristof Haneca³	Estimating sapwood counts for historical oak timbers from Brussels (13th–18th C)
	1 = Royal Institute for Cultural Heritage, Brussels, BE, 2 = University of Liège, BE, 3 = Flanders Heritage Agency, BE	
P-023	Pan Yue	Rebuilding in Wood Method for Vernacular Heritage
	Tongji University, College of Architecture and Urban Planning, Shanghai, China	

MAPS



PRE- AND POST-CONFERENCE EXCURSIONS

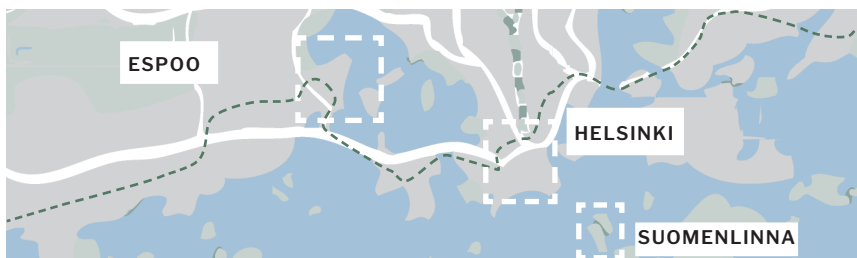
Monday, 27 May 2024

9–ca 18.30 Pre-conference excursion to Myllymäki farmstead and Liesjärvi National Park (preregistration required)

Saturday, 1 June 2024

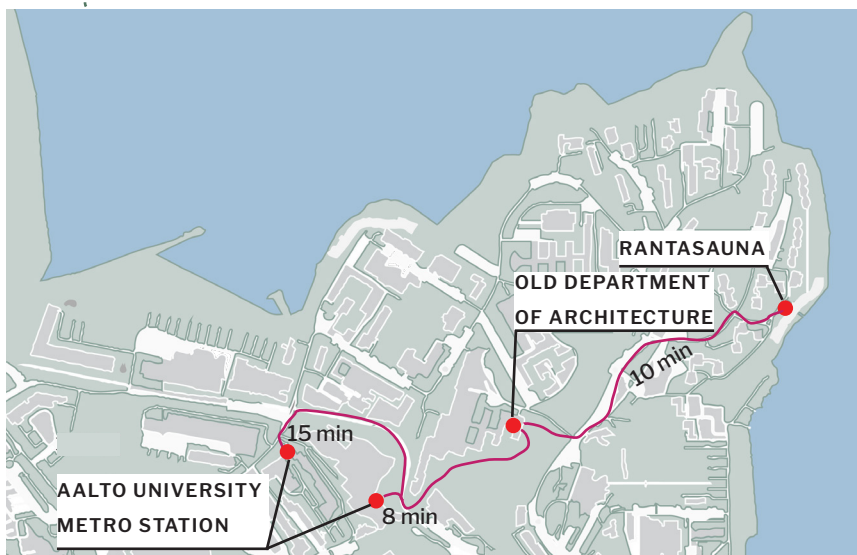
9–18 Post-conference excursion to Verla old paper mill (UNESCO World Heritage Site) (preregistration required)

11–12 Post-conference guided tour to Piikku-Finlandia in Helsinki



OTANIEMI–HELSINKI CENTRE METRO CONNECTION

 Metro route



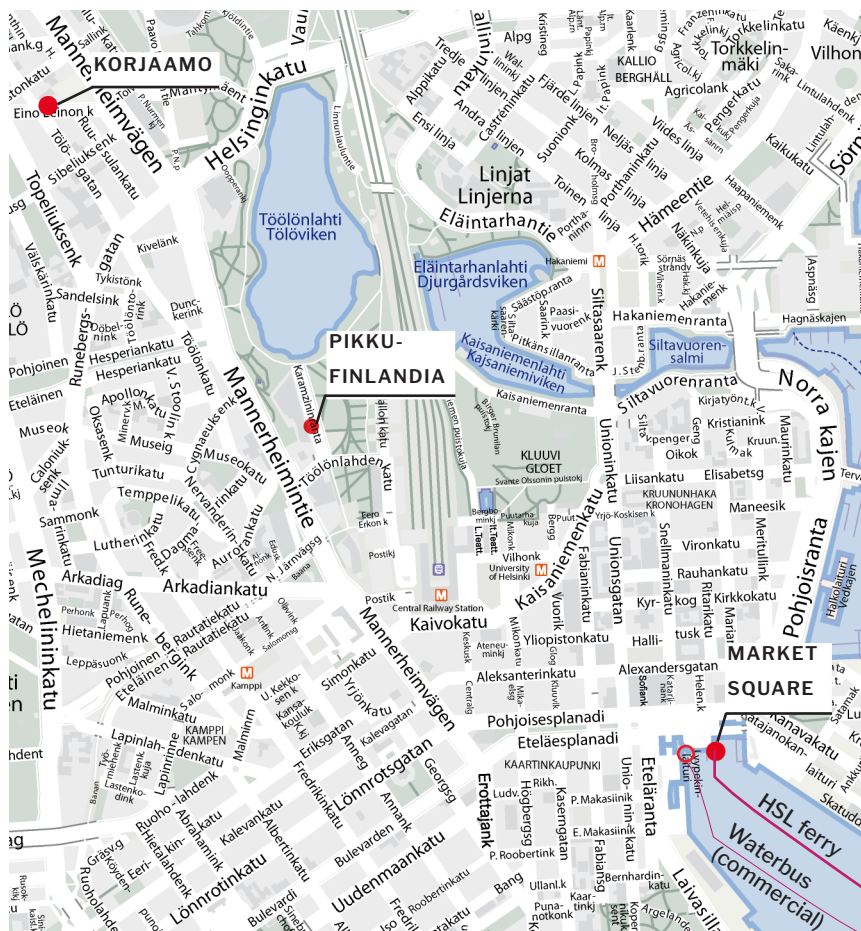
OTANIEMI, ESPOO

Tuesday, 28 May 2024

18:00–21:00

Registration and icebreaker at Otaniemi Aalto University campus, the lobby of the old Department of Architecture Aalto University Undergraduate Center, "Beta SPACE gallery", Otakaari 1 X, Espoo.

Afterwards an option for **seaside sauna** at student union sauna "**Rantasauna**", address: behind Jämeräntaival 5, Espoo. A 10-minute walk from the university.



HELSINKI

Market Square:

HSL ferry to Suomenlinna. Travel time 15–20 minutes, plus a 10–15-minute walk. Suomenlinna can also be accessed by a waterbus, please note that you need to buy a separate ticket for it and cannot use the HSL card.

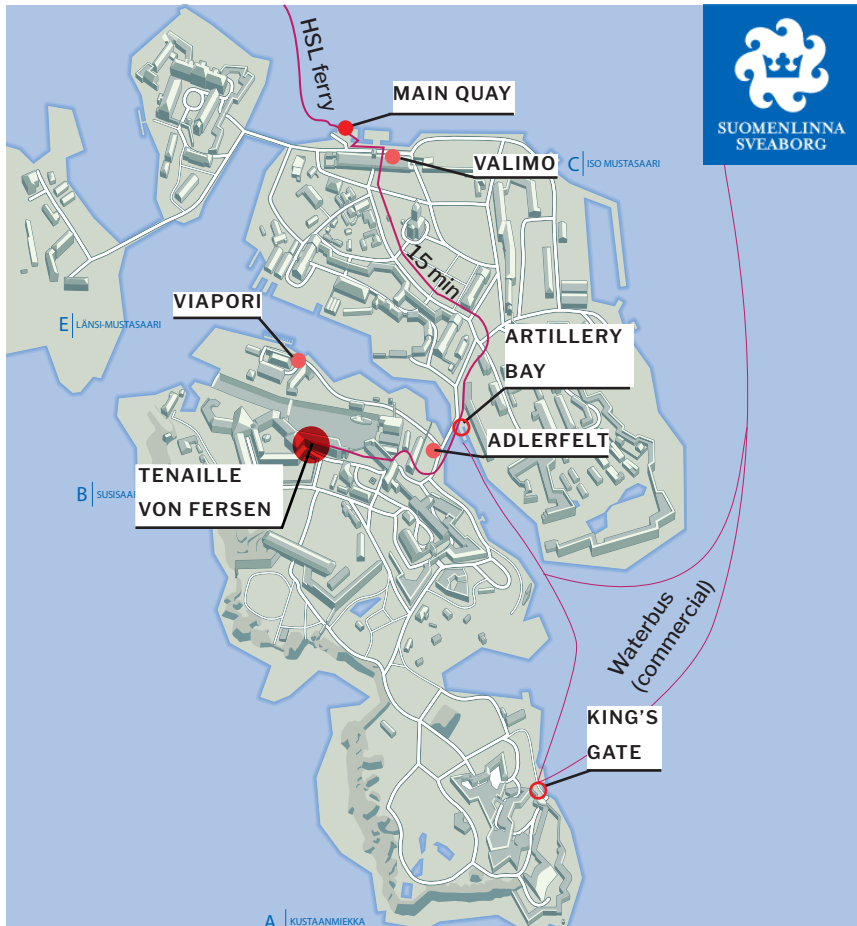
Korjaamo, Kulmasali:

Conference dinner (separate registration). Address: Töölönkatu 51 B, Helsinki. Korjaamo can be reached by HSL tram 4, closest stop: "Töölön halli".

Pikku-Finlandia:

Post-conference guided tour. No registration required. Address: Karamzininranta 4, Helsinki. Located on the eastern side of the Finlandia Hall.

SUOMENLINNA AND CONFERENCE VENUE



Main Quay:

HSL ferry to the Market Square. Travel time 15–20 minutes. Note that the ferry runs 1-4 times per hour and will not accept more customers when full. Suomenlinna can also be accessed by waterbus, please note that you need to buy a separate ticket for it and cannot use the HSL card.

Tenaille von Fersen (in Finnish Tenalji von Fersen):

Conference venue. Address: Suomenlinna B 17C, 00190 Helsinki

Alternative lunch spots (<15-minute walk):

Adlerfelt, Viaporin Deli & Cafe, Cafe Bar Valimo.
Note that the lunch breaks are one hour long.

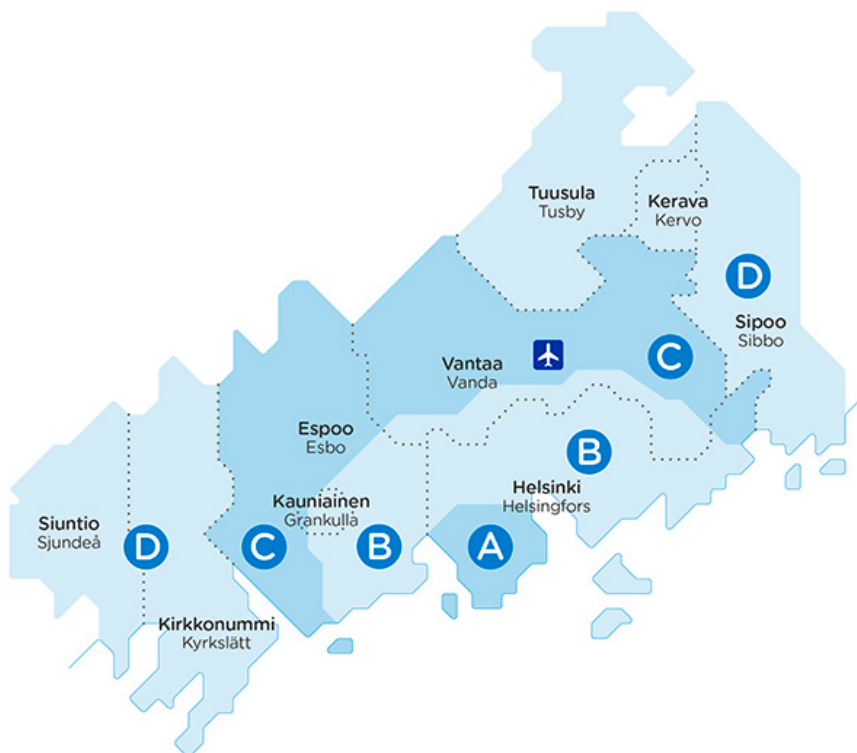
PUBLIC TRANSPORT AND FERRY TRAFFIC IN HELSINKI

HSL area and zones

The HSL area is divided into four zones, identified by letters A, B, C and D, spreading out from the center of Helsinki. You can use the same public transport ticket to travel by tram, bus, metro, commuter train, light rail and the Suomenlinna ferry.

To be able to access Suomenlinna you will need an AB-ticket.

For travel between the airport and Helsinki City Centre you need an ABC-ticket.



<https://selkokieli.hel.fi/liikenne/matkaliput-ja-vyohykkeet/>



HSL tickets

Bying tickets from ticket machines and sales points

You can buy single and day tickets from HSL tickets machines and various sales points such as R-kiosks and S Group outlets Please note that the sales points may charge a service fee.

Buying tickets via the HSL app

The HSL app is the easiest way to buy tickets. You can buy single, day or season tickets wherever and whenever you like. The app also includes our Journey Planner which helps you to choose the right ticket and plan your route. When using the app, you can select from a number of payment methods including a debit/credit card, MobilePay or a commuter benefit (HSL Commuter Benefit, Edenred, Epassi and Smartum).

Download the HSL app for free from AppStore, Google Play or App-Gallery. When you open the app for the first time, you need to answer a few questions about, for example, data protection and notifications.

Enter your contact details on the app at the latest when buying your first ticket. When buying single and day tickets, you only need to provide your name, phone number and e-mail address. To buy multi-journey and season tickets, you need to strongly authenticate and log in using your HSL account.

Note: some credit cards may not work with the HSL app. In these circumstances we recommend you buy tickets from machines and sales points.

<https://www.hsl.fi/en/>



Alternative: FRS Finland waterbus to Suomenlinna

The waterbus service (Vesibussi) to Suomenlinna and Lonna island is operated by FRS Finland Oy. The waterbus service to the fortress runs from May until the end of September. Trip to the fortress with a waterbus takes about 20 minutes. Please see FRS Finland website for detailed schedules. The waterbus departs from Keisariluodonlaituri pier at the Market Square. In Suomenlinna, the waterbus departs from the Artillery Bay pier and also stops at the King's Gate.

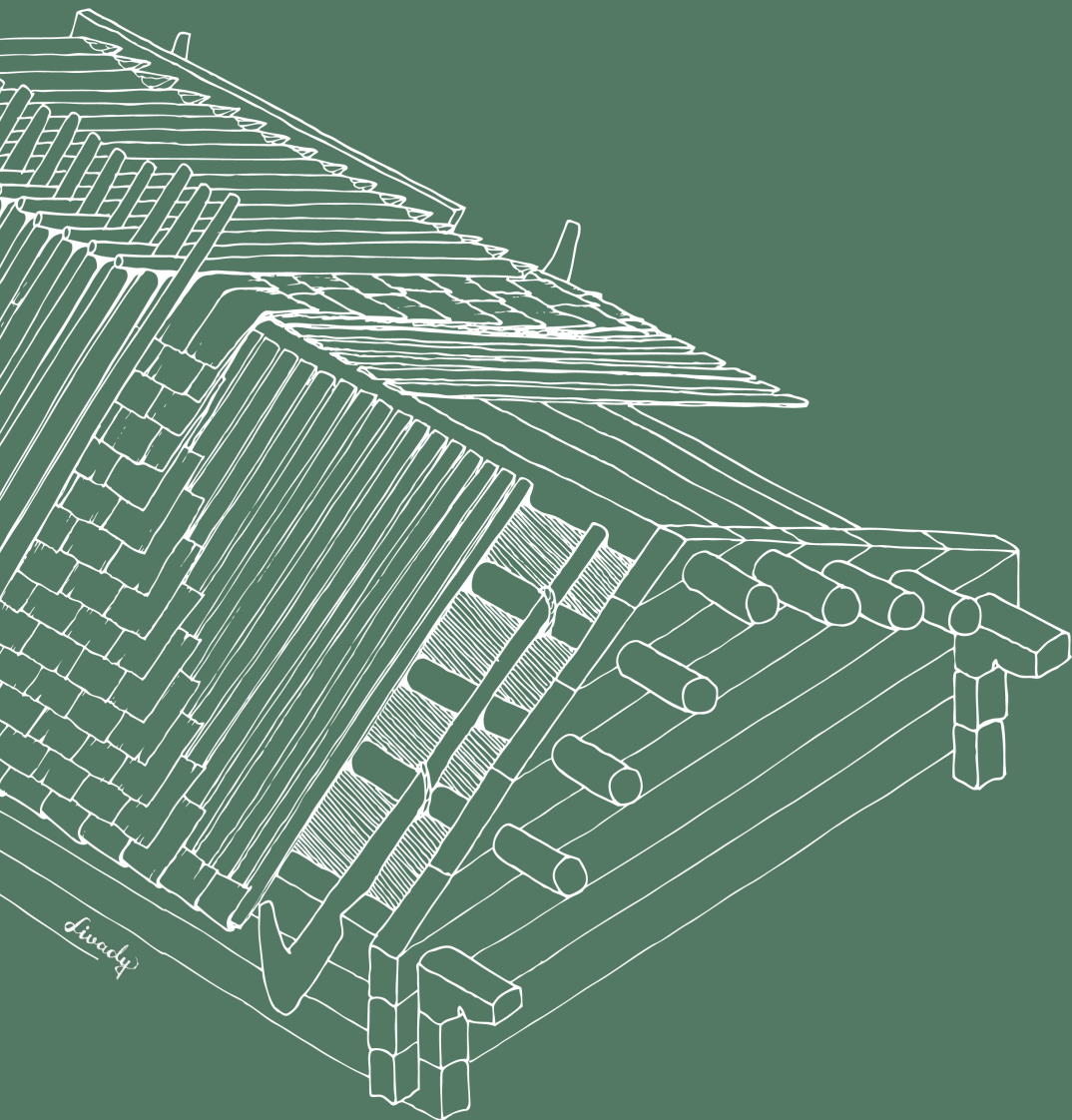
Buying tickets

Season tickets can be purchased directly from the vessel during the first trip. We recommend buy tickets in advance from the online store. You can also buy tickets from the vessel. Please, pay for the trips with a debit card, (preferably by local payment. Visa, MasterCard and Visa Electron are valid). Cash payment is possible in case of emergency, but please reserve a flat rate in this case.

Prices:

Adults return	8,50€
Adults one way	4,25€
Special groups return (children 7–17 years, students, pensioners)	4,25€
Special groups one way	2,15€

<https://www.frs-finland.fi/suomenlinna-lonna/>



Aalto University



UNIVERSITY OF
EASTERN FINLAND



THE GOVERNING
BODY OF
SUOMENLINNA



Museovirasto
Finnish Heritage Agency

LIVADY
OSAKEYHTIÖ