



# XVII International Sauna Congress SUMMARY OF PAPERS (DAY 1)

June 8, 2018  
Park Hotel, Tornio

Summary prepared by Hanna Hägglund (Sweden)

*17<sup>th</sup> Congress of the International Sauna Association  
Hosted by the Svenska Bastuakademien  
June 7-10, 2018  
Haparanda & Tornio*

*Papers held at Park Hotel, Tornio (Finland)  
Papers listed in order of appearance*

*Sauna, accommodation, and Congress reception held at Kukkoloforsen (Sweden)  
(headquarters of the Swedish Sauna Academy)*



## Contents:

<b>Welcome from the Chairman.....</b>	<b>3</b>
<b>Session 1: Sauna &amp; Health .....</b>	<b>4</b>
Sauna and health – what have we learned the last 60 years? .....	4
Sauna bathing and cardiovascular health.....	5
Effects of sauna bath on heart failure: A systematic review and meta-analysis .....	7
The health effects of regular dry sauna bathing .....	8
The heat prescription: Sauna as a treatment modality .....	9
Short-term effect of sauna on gene expression.....	10
<b>Session 2: History &amp; Culture.....</b>	<b>11</b>
<i>Sweat</i> : 40 years later.....	11
Sauna and kallbadhus.....	11
Shinrin yoku (forest bathing) and sauna.....	12
Communicating with ancestors: a vanishing practice in the smoke sauna in Võrumaa Estonia.....	12
Roles of bath masters in modern time Lithuanian bath.....	12
<b>Session 3: Technology, Design &amp; Architecture .....</b>	<b>13</b>
Tylö-Helo 100 years .....	13
A novel concept to study sauna stoves .....	13
Second coming of steam: The new sauna movement in the UK .....	14
Inventory of old smoke saunas in the Torneo River Valley using laser scanning and photogrammetry .....	14
Landscapes of Ritual and Health.....	15
<b>Additional Workshops on Day 2 (Saturday, June 9).....</b>	<b>16</b>

## Welcome from the Chairman

Dear Ladies and Gentlemen, Congress participants.

It is a great honor for the Swedish Sauna Academy to arrange the XVII International Sauna Congress in Sweden. We will do our very best to spread a good sauna culture in the spirit of ISA, and to make sure that you enjoy the land of the midnight sun.

The Congress is being held at the Torne river, which also is the border between Sweden and Finland, a border originating from more than 200 years ago. Sauna culture in Swedish Tornedalen has a lot in common with the Finnish sauna culture, since both sides of the river earlier belonged to the same country, Sweden. Torne river was an important link between the villages on the east and west side of the river. People on both sides more or less speak the same language and our culture and history are to a large extent the same. This also makes it natural to designate Kukkolaforsen the Centre of Swedish sauna culture.

Kukkolaforsen, along with the two twin cities of Haparanda and Tornio, are places where you will spend time during the Congress. Lectures and workshops will be held in Park Hotel, Tornio. The Come together gathering will be held in Lappari, Tornio. The Sauna barbeque, Friday evening and the Farewell dinner, Saturday evening will take place in Kukkolaforsen. You will be able to try out some of Kukkolaforsen 20 saunas and take a swim under the midnight sun in the clean and beautiful Torneriver.

The Swedish Sauna Academy was founded in 1988 in a sauna in Jukkasjärvi, a village that is world famous for its Ice Hotel. Our mission is to spread a healthy sauna culture. We proudly note that our 30<sup>th</sup> anniversary coincides with ISA's 60<sup>th</sup> anniversary, as well as our arrangement of the XVII International Sauna Congress.

We are grateful for the large extent of abstracts we have received prior to the congress and that can be found in the program. We will focus on three areas during lectures and workshops:

- **Sauna and Health**
- **History and Culture**
- **Technology, Design and Architecture**

We hope that the congress will provide you with new knowledge around sauna culture, to be used and spread around the world.

Be warmly welcome and enjoy the Congress.

### ***IN SAUNA VERITAS***

A sauna a day keeps the doctor away.

Göran Honkamaa  
President of Swedish Sauna Academy

**June 8, 2018**  
**09:30-09:45**

**Opening ceremony. Park Hotel, Tornio**

Welcome speeches by: Göran Honkamaa (President, Svenska Bastuakademien)  
Risto Elomaa (President, International Sauna Association)  
Ida Karkiainen (Member of Swedish Parliament)  
Sven-Erik Bucht (Swedish Minister for Rural Affairs)

## **SESSION 1: SAUNA & HEALTH**

### **Sauna and health – what have we learned the last 60 years?**

**Lasse Viinikka (Finland)**

In studies on sauna bathing there is strong consensus that sauna leads to an increased skin and core temperature as well as induces sweating. There is also strong evidence that sauna bathing results in increased pulse and decreased blood pressure. The most common topic studied in relation to sauna bathing is the effect on cardiovascular disease (CVD). Studies examine both sauna as treatment for CVD as well as potential risks in sauna bathing for people with CVD. Studies show that sauna seems to have beneficial effects on CVD.

In Finland there are ten deaths a year related to sauna bathing, which corresponds to one death per three million baths. Alcohol has been common in many of these accidents, and the association of alcohol with sauna deaths is sadly one of the most well-established scientific facts about sauna.

Viinikka also presented a study on the possible effect sauna bathing on fetus development, where 12,500 women were studied. Out of 49 newborns that had congenital central nervous system diseases (CCNSD), only two of the mothers had been in a sauna – meaning that no correlation was found between sauna bathing and CCNSD in the study.

Although multiple studies have been published on several topics related to sauna bathing, further research is needed to find evidence for a positive effect of sauna on health. In the literature there is limited evidence on saunas effect on both rheumatological and chronic obstructive diseases. There is no evidence on sauna curing cancer, and studies have showed conflicting results on the effect on spermatogenesis. No real evidence is published on saunas effect on common cold, though it is known to be dangerous for people with a fever to go in the sauna.

Viinikka finished his presentation by stressing the need for further scientific studies to be conducted in a robust, systematic manner in order to achieve stronger evidence for the health effects of sauna bathing.

## Sauna bathing and cardiovascular health

Jari Laukkanen (Finland)

Stress is commonly known to be related to the cardiovascular system. It can cause coagulation activation, hemodynamic changes such as increasing blood-pressure and heart rate, and also effect the immune system. Sauna is related to wellness and health, and has been used for the purpose of relaxation for centuries. Recent studies have indicated that sauna has beneficial effects beyond relieving stress.

Laukkanen presented five recent studies on sauna bathing published by his research team. Firstly he presented three studies based on the Kuopio Ischaemic Heart Disease (KIHD) Risk Factor Study, a cohort population study. These studies show positive effects on cardiovascular diseases, memory diseases as well as new-onset stroke risk as a response to heat stress in connection with sauna bathing. Secondly he presented a not-yet published prospective population study including 1688 men and women. This study shows a reduction of cardiovascular mortality. And thirdly he presented an experimental study, which shows positive effects on cardiovascular function.

The prospective KIHD population study had a follow up time on over 20 years with an annual outcome collection of various measurements such as biological, exercise, CVD risk factors. Questionnaires were also carried out on the participants' health habits, including sauna-bathing habits.

In the KIHD long-term population based study, the effects of sauna bathing on sudden cardiac death (SCD) risk, coronary heart disease (CHD) death risk, and all-cause mortality were investigated in 2315 middle-aged Finnish men. Mortality risk was examined based on comparison of the frequency of sauna per week. Once per week was used as a reference (n=601). Sauna bathing 2-3 times/week (n=1513) showed a decrease of 23% in CHD mortality risk, and a similar decrease in SCD risk, but not of statistical significance. Sauna bathing 4-7 times a week (n=201) resulted in a statistically significant decrease of 63% for SCD and 48% for CHD mortality risk.

The duration of sauna bathing per session was also shown to have an effect on mortality risk. A duration of less than 11 minutes was used as a reference. A duration of 11-19 minutes showed a decreased risk of approximately 10% for both SCD and CHD, but none of statistical significance. The third group tested underwent a duration of over 19 minutes, which resulted in a statistically significant decrease of 52% for SCD risk, and 36% for CHD mortality risk.

The statistical method used in these studies adjusted for age, BMI, systolic blood pressure, serum low-density lipoprotein cholesterol, smoking, alcohol consumption, previous myocardial infarction, type 2 diabetes, cardiorespiratory fitness, resting heart rate, physical activity and socio-economic status.

The second study based on the KIHD-study included 1628 subjects, men and women. This study showed a reduced risk of new-onset stroke related to the frequency of sauna use. The study examines three different models in the correlation between

sauna use frequency and stroke risk. Model 1 is adjusted for age and sex and shows a 61% decreased risk of a new-onset stroke if sauna bathing 4-7 times a week compared to once a week. Model 2 is model 1 plus body mass index, smoking, systolic blood pressure, serum low-density lipoprotein, cholesterol, alcohol consumption, type 2 diabetes, use of hypertension medication, use of aspirin and use of lipid-lowering therapy. This multivariable adjusted model shows as well as model 1 a decreased risk of 61%. Model 3 is model 2 plus physical activity (duration per week) and socioeconomic status, and shows a decrease in risk of 62%.

The third study based on the KIHDS-study included 2315 middle-aged Finnish men. This study examines the correlation between frequency of sauna bathing and dementia and Alzheimer's disease. It shows that sauna bathing is inversely associated with the two memory diseases in middle-aged Finnish men. In the model adjusted for age, a decreased risk of both dementia and Alzheimer's diseases is shown for the groups bathing 2-3 times/week and 4-7 times/week, although statistically significant only for the group of a frequency of 4-7 times/week. In the multivariable adjusted model, a statistically significant decreased risk of 66% and 65% respectively is shown for both dementia and Alzheimer's disease in the 4-7 times/week-group.

The prospective population study (n=1688) examines the effect on cardiovascular mortality in relation to frequency and weekly sauna duration. Sauna bathing 2-3 times a week slightly reduced the cardiovascular mortality and a frequency of more than 3 times a week showed a significant reduction of mortality. The duration of sauna bathing follows the same pattern where less than or equal to 15 min/ week is used as a reference. A duration of 16-45 min gave a slight reduction, and more than 45 min/ week resulted in a significant reduction of mortality.

The experimental study included 102 subjects. It was made to investigate the changes in the human body during sauna bathing and to explore the mechanisms linking sauna bathing and cardiovascular health. The study was a health study on men and women of 32-75 years of age. It was carried out through questionnaires, health examinations and an exercise test beforehand. Participants were subsequently exposed to a sauna under a unique test-sauna environment, given a controlled fluid consumption of 500 ml. Collection of blood samples, measured arterial stiffness, body temperature, blood pressure and body weight was done before a 30-minute sauna-session, immediately after and after 30 minutes of recovery. Heart rate data (including heart rate variability) was collected during the study.

The main findings of this study were positive effects on multiple cardiovascular values. The study showed a decrease of blood pressure response during and after sauna. The systolic blood pressure (SBP) was decreased from a mean value pre bathing of  $136.5 \pm 16.2$  mmHg, a mean post SBP of  $130.3 \pm 14.4$  mmHg and a post 30 min value of  $129.8 \pm 13.8$  mmHg. The diastolic blood pressure (DBP) was decreased as well from  $82.1 \pm 9.6$  pre sauna, to  $75.1 \pm 9.3$  post sauna and  $80.6 \pm 9.2$  post 30 min. The study also shows positive changes in arterial stiffness related outcomes with decreased pulse wave velocity, augmentation index, left ventricle ejection time and diastolic time. All variables mentioned showed a decrease immediately, followed by a slight increase 30 mins post sauna bathing, but still at significantly lower levels than the pre-sauna values.

In conclusion, Laukkanen's long-term population based studies show that sauna bathing

of higher frequency is related to a lowered risk of stroke, dementia and Alzheimer's, and also hypertension (not mentioned in this presentation but recently published elsewhere). The studies also suggest a lowered risk of SCD, CHD death, CVD, and all-cause mortality. Laukkanen's experimental study shows that sauna exposure for 30 minutes reduces blood pressure, and improves cardiovascular function (arterial stiffness). However, further studies are needed in different study-settings to understand more about the health benefits of sauna bathing.

## **Effects of sauna bath on heart failure: A systematic review and meta-analysis**

**Miika Källström (Sweden)**

This study conducted a meta-analysis of infrared sauna bathing studies from Japan.

Heart failure is a chronic disease where the heart does not supply sufficient amounts of blood and oxygen to the body, and is often the end-point after other heart diseases. The prevalence of heart failure is increasing as a result of people getting older and because the survival of heart diseases is increasing.

Källström presented a systematic review of literature examining the effect of sauna bathing on heart failure, suggesting a link to the findings of Laukkanen et al. (2015) that higher frequency of sauna bathing is related to lower cardiovascular and all-cause mortality.

The physiological effects of sauna bathing are similar to those of exercise. Heart rate increases, peripheral blood vessels dilate, body temperature rises and sweating occurs, leading to loss of fluid and heat. Earlier literature has often recommended that heart failure patients should not use sauna. Conversely, recent studies present conflicting results, and according to the study by Radtke et al. (2015) sauna bath is safe for heart failure patients.

This systematic review included men and women over 16 years of age. The review examines the effect on blood pressure, cardiac size and function, biomarkers, endothelial function, tolerance/safety and mortality of sauna bathing.

In this study, 3 databases were searched: PubMed, Cochrane library and CINAHL. A total of 1444 studies were identified; 9 studies met the inclusion criteria and 7 studies were used in the meta-analysis. The meta-analysis included 491 Japanese patients with heart failure. The studies included 15 minutes of infrared sauna bath of 60 degrees Celsius, with a rest of 30 minutes in a warm room at least 5 times a week for 2-4 weeks.

The meta-analysis gave 3 outcomes of statistically significant results. Firstly, it showed an increase of left ventricle ejection fraction from 0.55 to 2.35, which is a measure of the pump function of the heart and is related to decreased mortality in heart failure patients. Secondly the B-type natriuretic peptide decreased which is a marker of

cardiac muscle cell stretch, and could be a marker of the heart being in better shape than it was before the sauna. And thirdly the cardiothoracic ratio (CTR), a measure of heart enlargement, showed a decrease. Heart failure patients often get an enlarged heart leading to an increased CTR. As such, a decreased CTR together with an increased ejection fraction (which was seen in relation to sauna bathing) can potentially lead to better quality of life for heart failure patients.

Källström acknowledged that these promising results were achieved during only a short period of time, and that the mechanisms have not been fully established yet. No adverse effects were reported, but more research is needed for further evidence. Infrared sauna penetrates deeper and has a more even temperature and heat distribution than a Finnish sauna, but the physiological effects of this difference are not known. Therefore similar studies should be conducted to better understand the effects of Finnish sauna compared with infrared sauna.

## **The health effects of regular dry sauna bathing**

### **Joy Hussain (Australia)**

Sauna bathing has a long tradition in many cultures. Health benefits are claimed by individuals and facilities promoting sauna bathing, however the medical evidence to support these claims is not always well established. This presentation summarized Hussain's recently published (2018) systematic review of clinical research on the effects of repeated dry sauna interventions on human health. This review will be correlated with preliminary findings of a recent web-based global sauna survey (the findings of this survey are yet to be published).

Hussain presented a systematic review of 40 recent clinical studies involving a total of 3855 participants. Excluded from the systematic review were studies in wet/steam sauna, single session sauna and case reports/case studies. Of the 40 studies included, 13 were randomized control studies (RCT) and two were large prospective cohort studies. Hussain pointed out that more work needs to be done on the quality of sauna research.

38 out of the 40 studies reported beneficial health effects. The other two reported negligible health effects (Pach et al. 2010) and adverse health effects of impaired male spermatogenesis (Garolla et al. 2013) respectively. Eight out of the 40 studies reported on adverse side effects, all mild to moderate in level, such as light-headedness, transient leg pain, airway irritation and claustrophobia. Heat discomfort and intolerance, especially in cases of chronic pain, rheumatoid arthritis was also reported. No reports of severe adverse events were made.

The main research highlights of the systematic review were firstly Laukkanen et al. 2015-2016 cohort studies which showed a 40% reduced risk of all-cause mortality as well as a reduced risk of SCD and dementia, for men sauna bathing 4-7 times/week. Secondly, Tei et al. (2016), a multi-centre RCT, showed significant improvements in 6-minute walking distance, reduced CTR and improved New York Heart Association



(NYHA) classification after 2 weeks of infrared sauna protocol compared to control group.

Other “remarkable” results, according to Hussain, found in the review were: (i) a 44% reduction in headache intensity within 6 weeks of an 8-week sauna intervention group (2015 Kanji et al.); (ii) an improvement of 43 L/sec peak nasal inspiratory flow rate (a measurement used to help diagnosis of nasal obstruction and response to nasal provocation) and an 18.1% improvement in forced expiratory volume (a measurement of how much air a person can exhale during a forced breath) after 6 weeks in sauna group (2013 Kunbootsri et al.); and (iii) improvements in somatic well-being scores in sauna groups compared to control group (Hüppe et al. 2009).

## **The heat prescription: Sauna as a treatment modality**

**Mark Timmerman (USA)**

Today exercise can be prescribed instead of, or combined with, medicine for several diseases. Timmerman highlighted how he could use sauna bathing not as a researcher, but as a physician. If it is possible to prescribe lifestyle interventions such as diet and exercise – could sauna be prescribed this way in the future? Timmerman wants this to be a legitimate medical option. But to be able to prescribe sauna in the same way as exercise, more evidence is needed.

Research is needed to strengthen evidential claims about sauna, and to avoid unsubstantiated ‘alternative medicine’ claims (which are common on the internet). Funding of sauna research is a major challenge since drug companies would not profit from the results. Nevertheless, large-scale population studies and clinical trials are needed.

Important diseases to study further are hypertension, type 2 diabetes, depression and anxiety, hyperlipidemia and arthritis among others. There are benefits of sauna suggested for these diseases in limited prior studies.

Population studies can lead to an understanding of large groups, and groups of shared common diseases or behaviors. Clinical trials on the other hand can assign subjects randomly with different intervention arms. In clinical trials there are possibilities to manipulate environment to modify processes or outcome. A clinical sauna study of a factorial design allows for smaller sample sizes and can test two conditions vs. no treatment on a decided topic, such as depression, hypertension, blood sugar etc. In such a study four groups can be compared, one group of sauna bathing, one of exercise, one of both and one of neither.

In conclusion, more sauna research is needed to enable health care providers to prescribe heat therapy based on evidence from robust scientific research.

## Short-term effect of sauna on gene expression

**Frederik Otzen Bagger (Denmark)**

A study aiming to find the harmful effects of heat was conducted in Saudi Arabia and analysed saunas effect on gene-expression. The gene expression was measured before (T0), immediately after (T1) and an hour after (T2) a 15 minute sauna session through a blood sample. 15 subjects, men and female, were in a sauna at 75 degrees Celsius (some of the women had to leave before 15 minutes).

Bagger has re-analysed the results of the Saudi Arabian study.

Gene expression was looked at through quantification with a Affymetrix Chip and the data was plotted on a diagram through computer programming to analyze the biological data. The genes were compared between the T0, T1 and T2-groups. At the first point (T1) no genes of significance were changed whereas at the second point (T2) 650 genes were different. Concluded from this can be that the effect of sauna on gene expression might be delayed.

The changes seen in the single genes after 60 min were changes in many regulatory proteins, an increase of blood formation, increase of the innate immunity and a decrease of the adaptive immunity.

Short-term effect of sauna on the global gene expression were large changes in regulatory proteins, brief activation of pro-inflammatory programs, brief constriction of blood vessels, increased metabolism – later also catabolism, and cells being prepared to divide – but are stopped at anaphase check-point.

Further studies of this nature are needed.

## SESSION 2: HISTORY & CULTURE

### **Sweat: 40 years later**

**Mikkel Aaland (USA/Norway)**

Aaland is an award winning photographer, a popular workshop leader and the author of ten books. He is the author of the book *Sweat* from 1978.

The sweat bath is known as “sauna” in the modern world. In the Middle East it is the “hammam”, for the Native Americans it is the “sweat lodge”, and in Russia it is the “banya”. There are also other versions.

Our ability to sweat and its regulation of temperature, from an evolutionary perspective, makes humans able to survive all around the globe, and it helps us against diseases.

Aaland stressed that sweat bathing belongs in the 21<sup>st</sup> century, and that sweat bathing is having an explosive rebirth. The Islamic bath hammam is spreading all over the world. Russian banyas are spreading, for old and young. Sauna Aufguss, which started mostly in Germany, is spreading all over Europe and is a ritual that brings more youth in to the sauna.

Aaland showed video clips of his current project *In Search of the Perfect Sweat*, which a TV-series following up the original locations visited in *Sweat* forty years ago. In *Perfect Sweat* Aaland travels the world trying saunas of different cultures and meeting youth to explore their relation to sauna bathing today.

### **Sauna and kallbadhus**

**Jesce Walz (USA)**

Jesce Walz is a graduate student of Architecture and Landscape Architecture at the University of Washington, Seattle. In 2017 Walz researched sauna and kallbadhus in Finland and Sweden as part of a research fellowship. Over three months she visited 55 saunas and kallbadhus. In her presentation, she showed photos and told stories about her experiences during her research travel. Walz recounts her perception of the sauna community being very welcoming, and sauna not as just an instrument for physical health but also social health.

Walz discussed sauna as an instrument for systematic health. She stressed how kallbadhus, which are open for the public, could be of importance with the increase of people living in homelessness and other types of social disadvantage. Walz argues that sauna is seeing a renaissance and could be a place of sanctuary and sweat in new locations.

## **Shinrin yoku (forest bathing) and sauna**

### **Miki Tokairin (Japan)**

Shinrin-yoku (forest bathing) was developed in Japan during the 1980s, and is spreading worldwide for the positive effects it has on health. Sauna bathing and its benefits is in many ways similar to those of shinrin-yoku.

'Forest bathing' is a concept like 'sun bathing' – the activity does not necessarily mean bathing in water, but instead visiting the forest to immerse oneself in the healthy, wholesome feeling of nature. In some places, water bathing or sauna bathing are also available.

Shinrin-yoku has beneficial effects on health such as lowering the stress hormones cortisol and adrenalin. It suppresses the sympathetic nervous system and enhances the parasympathetic system. Forest bathing also lowers blood pressure and increases heart rate variability (HRV).

## **Communicating with ancestors: a vanishing practice in the smoke sauna in Võrumaa Estonia**

### **Eda Veeroja (Estonia)**

Smoke sauna is an older type of sauna and is the place where the Võro people practice their tradition of speaking with ancestors. Communication with ancestors has always been an important practice among the Võro people, but today the practice is fast vanishing. Veeroja talked about these traditions, and presented a detailed explanation of various aspects of traditional Estonia sauna folklore.

The smoke sauna tradition in Võrumaa has been recognised by UNESCO in 2014 on the *Representative List of the Intangible Cultural Heritage of Humanity*. (See <https://ich.unesco.org/en/RL/smoke-sauna-tradition-in-voromaa-00951>)

## **Roles of bath masters in modern time Lithuanian bath**

### **Birutė Masiliauskienė (Lithuania)**

The bath master was described as “the one who heats the sauna” in the traditional Lithuanian bath (pirtis). Today in modern Lithuania, bath masters combine traditional practices with different procedures in the bath. There are different roles of a bath master, such as “the entertainer”, “the healer” or “the teacher” etc. Masiliauskienė explains that consciously or not every bath master performs one of the typical roles, or combines several roles. The performance always depends on interaction and community with guests. These traditions are well developed in Lithuania, which has a Bath (Pirtis) Academy.

## **SESSION 3: TECHNOLOGY, DESIGN & ARCHITECTURE**

### **Tylö-Helo 100 years**

**Tomas Hjalmeby (Sweden)**

Tylö was created in 1949 by Sven-Olof Jansosn under the name “El-Spiraler” in Halmstad. In 1950 El-Spiraler’s new factory started to build which today is 20,000 square meters. In 1952 Tylö’s first heater was launched. Already in 1965 the export business started with Denmark as its first costumer. Since 1970, Tylö has had ready-made sauna rooms, and the first sauna with complete stove unit costing below 500 Euros.

Tylö-Helo has a world wide production and development with factories in the U.S, Sweden, Germany, Finland and China. Tylö-Helo are distributors of 89 countries with the U.S. as its largest market.

### **A novel concept to study sauna stoves**

**Valtteri Nieminen (Finland)**

Residential wood combustion causes a lot of emissions, mainly due to poor combustion conditions. Emissions lead to large amounts of carbon dioxide, fine particle matter and polycyclic aromatic hydrocarbons which is class 1 carcinogen.

Nieminen discussed the importance of, and how to, produce a simple, affordable and repeatable way to measure sauna stove emissions in real life conditions. The aim of the study is to produce comparable information between the different sauna stoves. This research is also directed towards addressing new EU regulations about wood-burning stoves, which have major implications for sauna, as many traditional stoves and traditional heating practices may no longer comply with EU regulations.

This study is part of work being conducted at the Fine Particle and Aerosol Technology Laboratory (FINE), Department of Environmental and Biological Sciences, University of Eastern Finland. Some images and experimental data were shown.

This research will hopefully lead to improvements in sauna stove efficiency and optimization of burning processes.

## **Second coming of steam: The new sauna movement in the UK**

**Mika Meskanen & Katie Bracher (UK)**

Meskanen and Bracher talked about their journey and work of spreading a sauna bathing in the UK. Meskanen discussed the founding of the British Sauna Society and how their member-driven organization is working to promote authentic sauna practices in the United Kingdom. The British Sauna Society works through an online community with meet-ups, field trips, and other events to promote awareness and recognition of sauna. The society encourages members to open up their saunas to help spread the sauna community in the UK. Bracher gave a short summary about the Finnish Rooftop Sauna in the Southbank center in 2017, and a case study done of sauna experiences there. Bracher also discussed her experience of recently founding a pop-up sauna in Brighton.

## **Inventory of old smoke saunas in the Torneo River Valley using laser scanning and photogrammetry**

**Sara Porzilli (Italy) & Markku Seppänen (Finland)**

The smoke saunas on the Swedish side of the Torneo river represents a historical type of Finnish sauna culture and sauna buildings. Every time a smoke sauna is heated there is a risk of fire, meaning there is a strong risk of cultural heritage vanishing in the Torneo river valley, especially because no inventory of these saunas has been done. Many smoke saunas on the Finnish side were also destroyed in the Lapland war.

Porzilli presented the Meän Sauna project, where smoke saunas in the Swedish Torneo river valley are being inventoried using laser-scanning and photogrammetry, as well as local historical records. 3D models of sauna buildings are being created, and saunas will be classified. Porzilli explained their methods of laser scanning and photogrammetry, showing examples of one particular sauna and the cumulative process of 3D modeling. This approach yields images with an extremely high level of detail, which will be useful for conservation efforts to preserve these important smoke saunas.

## Landscapes of Ritual and Health

Jesce Walz (USA)

Building on her earlier presentation, Walz discussed the effect of availability of saunas and kallbadhus, especially in urban environments. The needs for saunas are different from what they used to be. Saunas and kallbadhus today promote exchange between urban and ecological environments. The availability of these structures near cities allows people to pause for reflection and engage with the elements of nature. Eleven or more public waterfront saunas and baths have opened in Sweden and Finland in the past fifteen years, as local groups advocate for accessible bathing in their communities.

Walz again reflected on the potential that such spaces have for empowering community health practices and local creative energies, meaning that they should be encouraged in other locations.

---

*Day 1 finished with Sauna Barbeque Evening back at Kukkolaforsen,  
including celebration of 30 year anniversary of Swedish Sauna Academy.  
Guests enjoyed 22 saunas and multiple hot tubs.*

*Kukkoloforsen sits on the banks of the Torne River.  
Many guests used the river for sauna cool down.*

## ADDITIONAL WORKSHOPS ON DAY 2 (SATURDAY, JUNE 9)

*Program for Saturday June 9 (Congress Day 2).  
Morning sessions were held concurrently, as listed below.*

Time	Room 1	Room 2	Room 3
09:00-09:25	WS 1	WS 2	WS 3
09:30-09:55	WS 4	WS 5	
10:00-10:25	Break for Coffee		
10:30-10:55	WS 6	WS 7	WS 8
11:00-11:25	WS 9	WS 10	WS 11

- WS 1**      **Design of the Finnish Sauna: Five mysteries for future research**  
Lassi Likkanen (Finland)
- WS 2**      **Building a mobile smoke sauna**  
Michael Besnier Jensen (Denmark)
- WS 3**      **Sauna as Subversion**  
Sofia Eriksson (Australia)
- WS 4**      **Discussion on standards for a sauna lab (health studies)**  
Hans Hägglund (Sweden) & Jarkko Tissari (Finland)
- WS 5**      **The truth behind the sauna mystique**  
Ulf Salomonsson (Sweden)
- WS 6**      **Russia banya in youth culture**  
Anna Artemieva (Russia)
- WS 7**      **Sauna bathing habits in Finland**  
Lassi Likkanen (Finland)
- WS 8**      **Whisking in SPA: to be or not to be?**  
**And whisks in Lithuanian bath: Plants, types, and conservation**  
Birutė Masiliauskienė (Lithuania)
- WS 9**      **Sauna culture in Japan**  
Katsuki Tanaka (Japan)
- WS 10**     **The smoke sauna RT-card, a guide for design and construction of  
traditional smoke saunas in accordance with Finnish tradition**  
Risto Elomaa (Finland) & Markku Sepänen (Finland)
- WS 11**     **Bodies of Water: Approaches to gender in sauna and bathing**  
Jesce Walz (USA)



### Additional plenary presentations on June 9:

- 12:30-12:45**     ***In Search of the Perfect Sweat: The Aaland project***  
Mikkel Aaland (USA)
- 12.45-13.00**     **Interbad (International trade fair, Stuttgart)**  
Kaja Hoppe (Germany)
- 13:00-13:15**     **Problems of Terminology in Sauna Research:  
Towards a Taxonomy of Thermic Bathing**  
Jack Tsonis (Australia)
- 13:15-13:45**     **Conclusion of the Congress**  
Göran Honkamaa & Hans Hägglund (Svenska Bastuakademien)  
Risto Elomaa (International Sauna Association)
- 13.45-15.30**     **Inaugural business meeting of the *International Journal of Sauna  
Studies (IJSS)***  
Chaired by Jack Tsonis (Australia)

---

*A whisking class was held back at Kukkolaforsen 14:00-17:00 by Rimas Kavaliauskas and members of the Lithuanian Bath Academy. Russian banya was also offered by Egor Andreev throughout the afternoon and evening.*

*Congress Closing Dinner held at Kukkolaforsen 19:00-21:00, hosted by Lena Callne (Svenska Bastuakademien).*

*Guests used the 22 saunas at Kukkolaforsen until 3am, under the midnight sun.*

# IN SAUNA VERTIAS

**Congress Organising Committee:**

*Göran Honkamaa (Chairman)  
Svante Spolander  
Hans Hägglund  
Roger Häggström  
Mats Winsa  
Risto Elomaa*