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IAWS Bulletin

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Please send correspondence to the Bulletin editor

Rupert Wimmer

Message from the President

Dear Fellows of the Academy,

I would like to express my honor of assuming the role of President of this distinguished institution. I am genuinely grateful for the trust and confidence you have placed in me to lead our community to new heights of excellence. Our Academy is a beacon of wood science learning and intellectual growth, and thus, I am committed to fostering an environment that encourages collaboration, exchanging ideas, mentoring young researchers, and pursuing knowledge. I look forward to working closely with you to uphold the values that define our Academy and to chart a course for a future filled with success and accomplishment. Many thanks to our past President, Fellow Yoon Soo Kim, for his leadership and to our new Executive Committee members, such as Vice-President, Fellow Ingo Burgert, Secretary, Fellow Rupert Wimmer, and Chair of the Academy Board, Fellow Katarina Čufar. We all, along with our Treasurer, Fellow Howard Rosen, have embarked on this journey with determination and a shared commitment to the pursuit of excellence.

Once again, we had many names of doctoral researchers submitted by Fellows for the prestigious IAWS PhD Award. The selection process was challenging, to say the least, because of the excellent research level, but finally, the Board picked three good ones, as you can read in this bulletin. Speaking of awards, I am also pleased to inform you that Fellow Voichita Bucur has been awarded the prestigious RWB STEPHENS medal by the Institute of Acoustics - UK.

From the knowledge dissemination front, long-time IAWS Fellow and BC Leadership Chair in the Department of Wood Science at UBC, Prof. Phil Evans, gave the IAWS Lecture at the IUFRO Division 5 Conference in Cairns, Australia (June 4th - 8th, 2023). A total of 140 scientists from 26 countries attended the conference. Phil's talk was on "Advances in the Biomimicry of Wood for the Development of Novel Additively Manufactured Materials."

This summer, the Academy plans to have a face-to-face research presentation session during the Society of Wood Science and Technology Annual Convention in July 2024 at Portoroz in Slovenia. We also hope to host a dinner of the Fellows in Slovenia, so everyone is invited. We hope to see and have the opportunity to socialize with as many as possible.

Regrettably, I am sad to announce the passing of Fellow Benhua Fei on July 10th, 2023, at 59, Director General of the International Centre for Bamboo and Rattan.

Lastly, I take this opportunity to wish everyone a healthy, happy, and prosperous 2024.

Stavros Avramidis

Message of the Retiring President

It is a pleasure for me to reflect on my tenure as the President of the International Academy of Wood Science (IAWS) amidst the challenges posed by the COVID-19 outbreak. The pandemic had an unprecedented impact on our operations, necessitating the shift from physical to virtual meetings and causing some delays in our other scheduled activities. Fortunately, we successfully executed essential tasks without major disruptions.

Over the past three years, IAWS has welcomed 32 new fellows from 18 countries, including Greece, Kenya, Malaysia, the Philippines, Slovenia, and Ukraine. It is a great pride and joy that the elected fellows represent a diverse group of individuals, representing various geographies, genders, and disciplines. Their outstanding academic achievements are valuable assets to the Academy, bringing great honor to our organization. We are committed to addressing gender and geographical imbalances in the nomination of fellows, and encourage fellows to make nominations also from under-represented regions, such as South America, Africa, and Southeast Asia, to achieve the Academy's goal.

I am pleased to announce the election of four new Academy Board Members: Dr. Voichita Bucur (Australia), Dr. Keiko Kuroda (Japan), Dr. Galina Gorbacheva (Russia), and Dr. Timothy Young (USA), with the new chairperson Prof. Katarina Čufar (Slovenia). In the last three years, we have also welcomed six new Affiliate Members, expanding the horizons of the IAWS.
These include the International Association of Wood Anatomists (IAWA), Korean Society of Wood Science & Technology (South Korea), National Institute of Forest Science, Korea (South Korea), BioProducts Institute of the University of British Columbia, (Canada), Zhejiang Agricultural and Forestry University (China), and South West Forestry University (China). We congratulate these organizations and eagerly anticipate their support in our future endeavors.

I am pleased to continue the IAWS PhD Program, providing opportunities for young wood scientists to engage with the international intellectual community and expand their horizons, even in a virtual setting. We are confident that these events will inspire and nurture the next generation of researchers through active participation by Academy fellows.

Thanks to the exceptional efforts of Lloyd Donaldson, the Academy's website has significantly improved its accessibility and visibility, becoming our primary communication platform. The Academy Bulletin also informs us of various news with a new, attractive format under his editorship. We are most grateful and highly appreciative for the outstanding service he has rendered as the Secretary, ensuring seamless operation of IAWS activities for the last six years. While we regret Dr. Donaldson's resignation as Secretary of IAWS, coinciding with his retirement from SCION, New Zealand, we remain indebted to him for his passion and enthusiasm in enhancing the Academy's exposure and image.

I am delighted to report that IAWS is in excellent financial health, thanks to the exceptional budget management by Howard Rosen. The total assets of the Academy now exceed $200,000 (exactly $215,772) for the first time since its foundation, partly due to the increased number of Affiliated Members, but also due to the reduced activities during COVID-19.

The passing of time is inevitable, though it saddens us deeply to learn that more than 10 fellows passed away in the past three years. Their passing has left an irreplaceable void in our hearts. We cherish their memory, and are highly appreciative of their significant scientific contributions, dedication, and leadership in advancing the Academy's mission.

Message of the Retiring President

Lastly, in an era where scientific knowledge is abundant and data inundates us like a tsunami, IAWS must remain attuned to rapidly changing dynamics. The 60th anniversary of IAWS in 2026 is approaching, symbolizing the full cycle of life and the beginning of a new life cycle. To ensure that IAWS remains an elite international organization, we must evolve beyond the confines of an honorary club of senior scientists to welcome a new life cycle for the IAWS. The horizon of the Academy must embrace active younger scientists with the potential to become future leaders, particularly from developing countries. The current budget would not be sufficient to cover extension of the current programs to incorporate new beneficial programs, prompting fundraising efforts for encouraging young wood scientists from underdeveloped countries. Candid critiques, suggestions, and initiatives from our fellows to meet the challenges that we face are highly encouraged. Particularly active participation of the Academy fellows is much needed, but I must say that the voting rate in some fellow elections has been disappointingly low.

Looking back, the COVID-19 pandemic has been a stress test of our solidarity and resilience, though remnants of pandemic culture still remain. My service with the Academy for nine years, including roles as Secretary, Vice President, and President, has ended this year. It was a true blessing, affording me the privilege of working with extraordinary Fellows from around the world. I have carried a profound sense of responsibility for upholding the expectations and trust of the IAWS community. I extend my sincere thanks to all the Fellows, Academy Board members, and Executive Council members for their support, enthusiastic participation, and immense contributions. I also pay tribute to my predecessors for their dedication in establishing our Academy as a highly prestigious international organization. Our new President, Prof. Stavros Avramidis (Canada), has already started his job since last June, with the newly elected Vice President Prof. Ingo Burgert (Switzerland) and Secretary Prof. Rupert Wimmer (Austria).

I have no doubt that President Avramidis will show the clear leadership we need for future growth of the Academy.

Now, I stand on the threshold of a new chapter in my life. Wherever and whenever that may be, even if it means returning to the ways of the past, I am happy to meet you all again. Please save your hugs and the wine for our next encounter. Until then, stay safe and healthy! Once again, a hundred thanks for all your support and help.

I wish you all a bright and healthy 2024 !

Yoon Soo KIM, President
(June 2020 - June 2023)

PhD Award 2023

The IAWS provides recognition to outstanding thesis/dissertation research at the PhD level by students throughout the world. The PhD Award was again opened to receive nominations and/or applications between August 16, 2022 and August 15, 2023.

The award is open to anyone (not limited to IAWS Fellows).

The rules for PhD award competition are:

- The competition is limited to students receiving their degrees in other than their native country.
- The purpose is to foster and recognize cross-national interaction.
- The submission shall be no more than 2 pages of an extended abstract (in English) of the dissertation, a one-page CV of the student, and a recommendation letter from the student's advisor
- The submission can be by the student and/or the student's advisor.
- The thesis/dissertation must have been completed within one year prior to the yearly announcement.
- The documentation shall be sent by email to the president and secretary

As soon the nomination period was closed the IAWS board members (https://www.iaws-web.org/organisation/academy-board/) started with the process of evaluation to select the this years awardees. In 2023 call has received nine applications. The President with the IAWS board members agreed that all nine dissertations were eligible and at high standard. The final ranking was as followed:

Name	Evaluation
Dr. Yuhang Ye	1st place
Dr. Katarzyna Kurkowiak	2nd place
Dr. Juan Li	3rd place

Letters with the news have been sent to the candidates and their nominators, and the President of IAWS awarded the first, second and third place winners.

Afterwards, the IAWS invited the 1st, 2nd and 3rd place winners to attend the 2024 International Convention of the Society of Wood Science and Technology (SWST) conference which will take place from 30 June to 5 July 2024 in Portoroz, Slovenia where the IAWS will organise a special session entitled "The significance of basic wood science in a sustainable world". The Academy will cover part of the costs for attending the conference. Two awardees accepted the invitation.

One awardee cannot join us in Slovenia, therefore we invited her to present her work at the virtual World Wood Symposium (WWS) 2024 during the IAWS special session on Wood Products and Wood Biotechnology that will take place on 21-22 March 2024.

We cordially congratulate the awardees!

Katarina Cufar, Chair of the IAWS Board

PhD Award 2023—First place

Dr. Yuhang Ye

Nanocellulose-based gel ionic conductors: design, manufacturing, and applications

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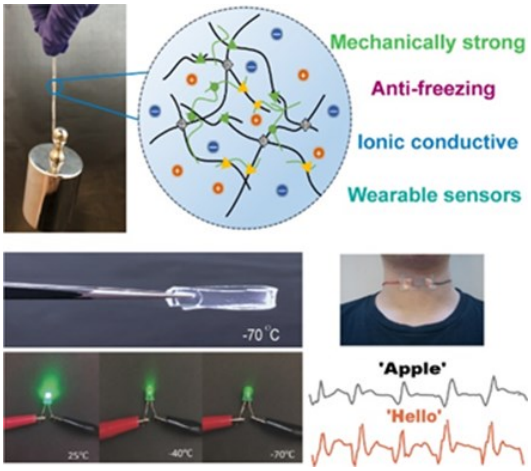
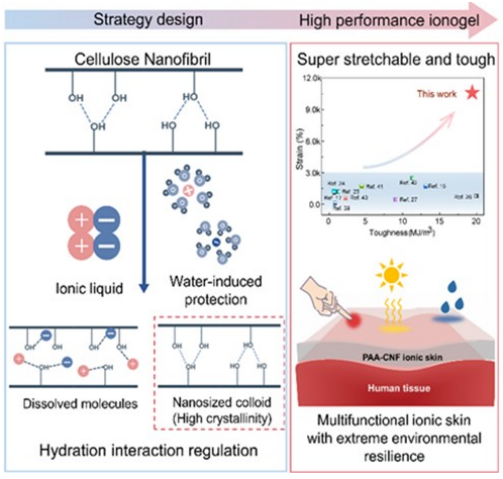
Supervisor: Prof. Feng Jiang

As the most promising candidate for replacing conventional rigid and brittle inorganic conductive materials, gel ionic conductors (GICs) have piqued enormous interest in a wide range of fields, including soft electronics, biomedicine, and energy storage and conversion. However, several limitations, including weak mechanical performance, low conductivity, narrow working temperature range, and proneness to dehydration, severely hinder their practical applications. In my PhD dissertation, I centered on leveraging cellulose nanofibrils (CNFs) extracted from wood to address these issues in combination with dedicated material design, innovative technology, and validation of theoretical mechanisms. These nanocellulose-based gel materials were further assembled into diverse functional devices for the proof-of-concept application.

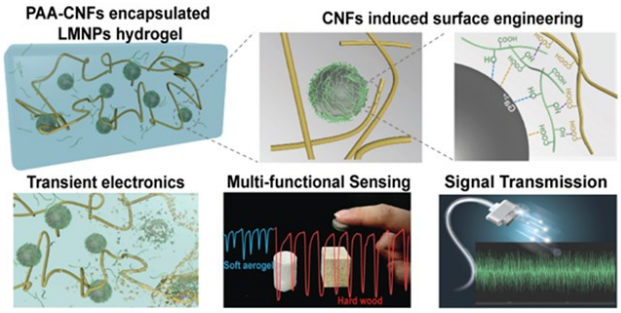
I first verified the addition of CNFs to GICs to improve both their mechanical properties and their ionic conductivity via benefiting from the intrinsic characteristics of CNFs. The new poly vinyl alcohol (PVA)-CNF ionic conductive organohydrogel was achieved through a simple sol-gel transition method using a DMSO/H_2O binary solvent system, which exhibits excellent mechanical performance, high conductivity at room temperature, transparency, freezing tolerance, and long-term solvent retention. The addition of CNF was proved to enhance both mechanical properties and ionic conductivity, providing a solution to the long-standing dilemma among strength, toughness, and ionic conductivity for ionic conductive hydrogels. Meanwhile, the ionic conductive organohydrogel also exhibited excel sensing performance and can be assembled into multi-functional sensors to detect full-range human body movement with high sensitivity, stability, and durability.



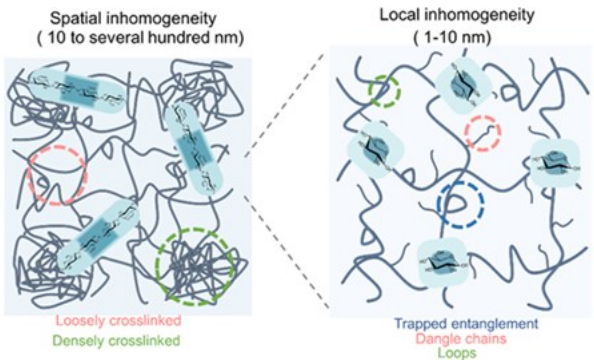
Although the environmental stability of gel materials has been improved to some extent due to the incorporation of water/DMSO binary organic solvent, it would still lose a significant amount of solvent and lead to reduced performance. I further extended this enhancement effect to ionogel system which presents higher environmental resilience. By controlling the intermolecular interactions among CNFs, water, and ionic liquid (IL), CNF was maintained in its colloidal state in a mixed IL/water solvent, resulting in remarkable



With the aid of IL's low volatility and its strong affinity for water, the ionogels exhibited excellent environmental stability and a wider range of working temperatures. Furthermore, we demonstrate the potential of ionogels as multifunctional ionic skins that exhibit high sensitivity to various stimuli, such as strain, compression, temperature, and humidity.



However, the sensitivity as strain sensors of previous two GICs were not satisfactory. With the aim of improving the sensitivity, we developed a conductive hydrogel through in-situ polymerization of acrylic acid (AA) within a CNFs-encapsulated liquid metal nanoparticles (LMNPs) colloidal dispersion without the addition of initiator and crosslinker. The resulting PAA-CNF-LMNPs hydrogel exhibited excellent stretchability, solvent-independent conductivity, and high strain sensing sensitivity. These properties surpass most previously reported conductive hydrogels. The hydrogel also exhibited self-healing, anti-fatigue, crack-insensitive, and transient properties owing to its physically crosslinked structure, providing a potential solution for electronic waste accumulation. This hydrogel was further demonstrated to be a promising platform for tactile sensing and audio signal transmission.



While previous strategies improved performance, there was a lack of robustness due to overlooking the fundamentals at the molecular level. We demonstrated a novel approach for improving the mechanical properties and environmental resilience of hydrogels through a multiscale saccharides-based patching strategy. By employing both nanoscale polysaccharides, specifically CNFs, and molecular-scale glucose to repair network imperfections at different dimensional levels, the mechanical performance of hydrogels is substantially enhanced. The repaired hydrogels exhibit remarkable environmental resilience, maintaining their properties even after exposure to ambient drying, freeze drying, and poor solvent treatment, owing to their high fraction of bound water. Importantly, this repairing strategy is demonstrated to be universally applicable across a range of hydrogel systems and manufacturing techniques. Our results suggest that this network-repairing approach, enabled by multiscale saccharides-based materials, could provide a new paradigm for optimizing the topological network of hydrogels for potential application scenarios.

Strategies proposed in the first four chapters have addressed a series of issues faced by gel conductors, while controllability and programmability remain elusive. To better control the performance of GICs at macroscale, we presented a simple and versatile approach to fabricate 3D patterned hydrogels using all-cellulosic materials (HPC/CNF) as ink, inspired by the heterogeneous structure observed in nature. By programming the mechanical properties through defining the pattern geometry, the resulting hydrogels possess great structural stability. This 3D patterning method using all-cellulose ink within hydrogels offers a promising strategy to create hydrogels with similar mechanical properties and functionalities as biological materials.

This research not only demonstrates the potential of CNFs by providing effective solutions to the problems encountered with current ionic gel conductors, but also deliver robust material platforms. This will make contributions to the pursuit of sustainable solutions with respect to emerging wood-based materials.

PhD Award 2023— Second place

Dr. Katarzyna Kurkowiak

Wood modification based on in-situ esterification of *Pinus sylvestris* with citric acid and sorbitol

Wood Biology and Wood Products, Georg-August-University Göttingen, Göttingen, Germany

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Supervisors: Prof. Holger Militz, Prof. Philippe Gérardin

Wood intended for outdoor application has to be resistant to biological degradation. Traditionally, tropical wood species having high durability or preservative-treated wood have been used for that purpose. However, the last years brought various restrictions regarding the import of tropical timber and the use of biocide-containing preservatives. Therefore, it became inevitable to find a biocide-free way of protecting native wood material against decay, for instance via wood modification. Within the last years, the most groundbreaking invention in that field has been wood modification with bio-delivered polycarboxylic acids (PCA) and polyols. In particular, wood treatment with sorbitol and citric acid (SorCA) has been promising. The first research on that topic was published in 2018 [1], whereas this work has resumed in late 2019.

The overall objective was to understand to which extent the SorCA treatment influences wood characteristics. More specifically, how polyesterification changes the properties relevant to outdoor , such as dimensional stability, moisture performance, and biological durability. Moreover, the way of improving the fire resistance of SorCA-treated wood and the stability of such treatment against leaching was examined. As it is essential for industrialization, the possible methods of quality control were explored and their capability to assess the distribution of impregnation chemicals was evaluated. To get a more in-depth understanding of how the polyesterification in wood proceeds, and therefore, be able to control all properties mentioned above, the interaction of sorbitol, citric acid (CA) and wood polymers has been investigated.

In the experimental part, solid wood was impregnated with aqueous solutions of sorbitol and citric acid at various molar ratios and concentrations. Subsequently, wood was dry-cured at elevated temperatures and its biological, chemical, mechanical, physical and thermal properties were characterized. The deposition of modification chemicals in wood and their penetration into the cell wall matrix were confirmed by the increase in oven-dry weight and oven-dry dimensions, respectively. Successful esterification was proved by several analytical techniques, such as liquid chromatography–mass spectrometry (LC-MS). Moreover, investigation of sorption behaviour revealed that the SorCA (poly) ester structure differed when performed in- and ex -situ, suggesting a reaction between SorCA and wood polymers. The moisture behaviour of treated wood gave some indications of cross-linking between cellulose microfibrils and SorCA (poly) esters. It was also established that both the molar ratio and concentration of sorbitol and citric acid influence the swelling and sorption behaviour of wood. Overall, the equilibrium moisture content (EMC) decreased after treatment, as did the liquid and water vapour uptake. Due to the deposition of impregnation chemicals in the wood cell wall, the spatial availability for water was reduced which, indirectly, provided high decay resistance against basidiomycetes, but also other wood-destroying macro- and microorganisms. One of the studies aimed to specifically investigate the mode of protective action of SorCA-modified wood, based on the changes in moisture dynamics.

In the course of this thesis, it was repeatedly confirmed that a temperature of 140 °C is required to achieve acceptable fixation of chemicals in the wood. The compatibility of the SorCA modification system with commercially used phosphorous-based flame retardant was also examined.

To control the property changes it is necessary to first understand the mechanism behind a particular wood treatment. Therefore, it was attempted to elucidate the mode of action of sorbitol and citric acid esterification in wood. Based on a theoretical study, an experimental investigation was conducted. It was revealed that it is not only sorbitol and citric acid which take part in the (poly) ester formation, but also their degradation products and derivatives (Fig. 1). Presumably, the products of hemicellulose hydrolysis are involved in these reactions as well. Overall, covalent bonding and cross-linking might take place upon SorCA modification between wood polymers and impregnation chemicals or their derivatives. In addition, (poly)esters might form in the wood lumen, which may cause extensive leaching if the formed compounds are not big enough.

It is also possible that some degradation products are formed from wood polysaccharides as they hydrolyse due to the acidic treatment at moist conditions and elevated temperatures.

My thesis also aimed to transfer the SorCA modification process from the laboratory to pilot scale with the overarching goal of industrialization. Therefore, it was important to find a quality control method, which would rapidly and accurately determine the treatment level at the cross-section of treated boards. Electromagnetic radiation-based methods were tested (X-ray density profiling, mid- and near-infrared spectroscopy) and their predictive power to assess the treatment level (weight-percent-gain, WPG) was determined (Fig. 2). The ultimate goal was a homogeneous impregnation and treatment of wood with SorCA modification system, which is a major challenge for any type of impregnation modification. Some approaches to mitigate this issue were attempted and presented in this thesis.

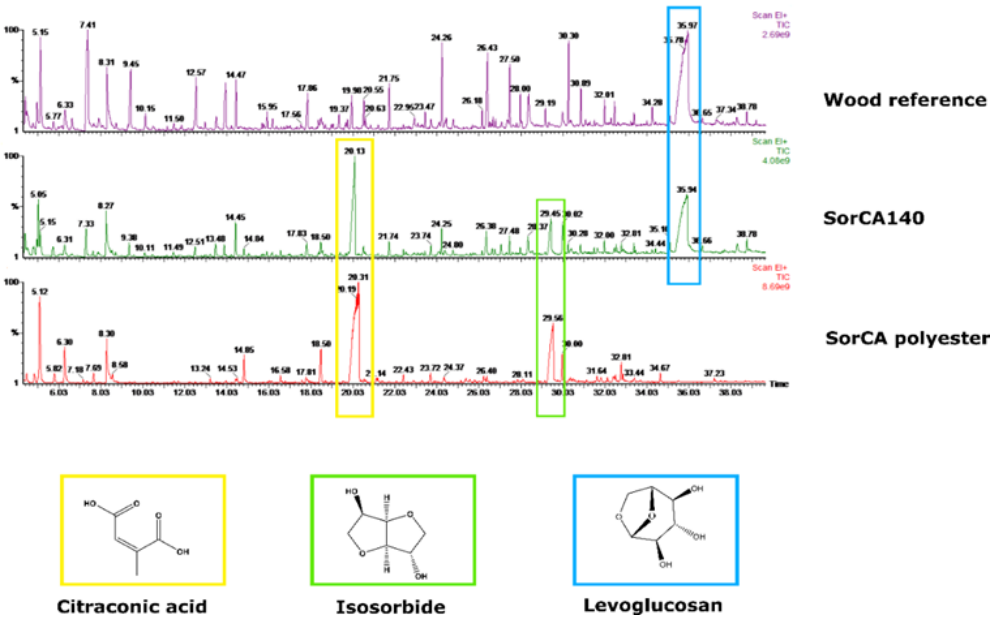

Figure 1: Py-GC/MS chromatograms of (from bottom): SorCA polyester (molar ratio 1:3, cured at 140°C for 24 h), Scots pine sapwood cured at 140°C for 24 h (leached) and untreated Scots pine sapwood reference.

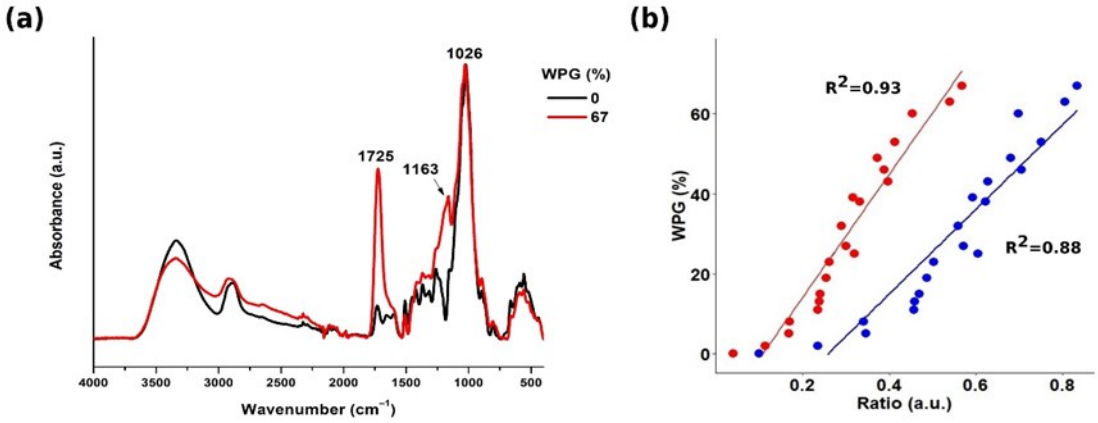

Figure 2: ATR-FTIR spectra of (a) untreated (black curve) and SorCA-treated (red curve) wood; (b) correlation between the WPG and the band area ratio (BAR, red line) and band height ratio (BHR, blue line) in the wavenumber range 1774–1689 cm^{-1}/1139–914 cm^{-1}, calculated from ATR-FTIR spectra of SorCA-treated wood

References

[1] E. Larnøy, A. Karaca, L. R. Gobakken & C. A. S. Hill (2018) *Polyesterification of wood using sorbitol and citric acid under aqueous conditions*, International Wood Products Journal, 9:2, 66-73, DOI: 10.1080/20426445.2018.1475918

To access the publications written within the scope of this thesis, check my ResearchGate profile: https://www.researchgate.net/profile/Katarzyna-Kurkowiak

Acknowledgements

I extend my heartfelt gratitude to the Procope-Mobilität 2021 mobility fellowship, the Northern European Network of Wood Science and Engineering (WSE), and the International Research Group on Wood Protection (IRG-WP) for their generous support, which played a pivotal role in facilitating invaluable research exchange throughout my PhD journey.

PhD Award 2023— Third place

Dr.-Ing. Juan Li

Aging of wood as a construction material measured by atomic force microscopy

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Supervisor: Prof. Bohumil Kasal

Wood has been used as a construction material by human beings since ancient times. Under dry conditions, wood structures can sustain hundreds or even thousands of years. The combination of lignocellulosic materials with concrete reduces the mass of structures, reuses the waste material, increases the structure ductility, and reduces the construction cost. Natural fibers or wood particles are used as the reinforcements in concrete; timber beams in tension are combined with concrete beams in compression. The combination of different materials raises the issues of compatibility and aging due to various technological (such as cement hydrations) and environmental factors. The aging of wood has attracted a lot of research interest in both natural aging and accelerated aging studies. However, the fundamental understanding aging mechanisms is still lacking.

My Ph.D. research focused on the aging mechanism of wood surfaces in thermal and cement alkaline conditions in the nanoscale using atomic force microscopy (AFM) and other analytical techniques. The detailed objectives included two interrelating parts: (1) to develop and establish the AFM measurement method on wood surfaces; (2) to use the established AFM method to measure the aging of wood surfaces in the cell wall level. To measure the changes on the wood surface due to the aging process, an identical tip was used to measure the identical area (cell wall or pit) on the wood surface before and after each treatment. I believe the methods developed in this work and the findings resulting from these methods are of a general applicability to all lignocellulosic materials.

The contributions of this study are:

1. Developing a reliable and simple relocating method to reposition the identical part on the wood surface before and after each treatment (Fig. 1): The bordered pit of the wood radial surface was used as a natural marker for the precise positioning of the AFM tip; A systematic AFM measurement procedure on the cell wall was introduced [1].

2. Defining the jump-off force ratio in the retract force-displacement curve to study the adhesion force phenomena (Fig. 2 (c)). This allows considering the regular changes in the shape of the adhesion curves during the cell wall aging process, expanding the adhesion information from 1-D (dimension) to 2-D, and separating the changes resulting from the aging of different wood polymers (Fig. 2(a)(b)) [2].

3. Proposing two sigmoidal curves to describe the change of adhesion forces and jump-off force ratios during the aging of wood cell walls. During thermal aging (Fig. 2 (a) and (b)), the 1st sigmoidal curve of the adhesion force – jump-off force ratio relationship described the transportation of extractives and their oxidation on the surface. The 2nd sigmoidal curve suggested the degradation of the hemicellulose-lignin matrix and the exposure of the cellulose aggregates.

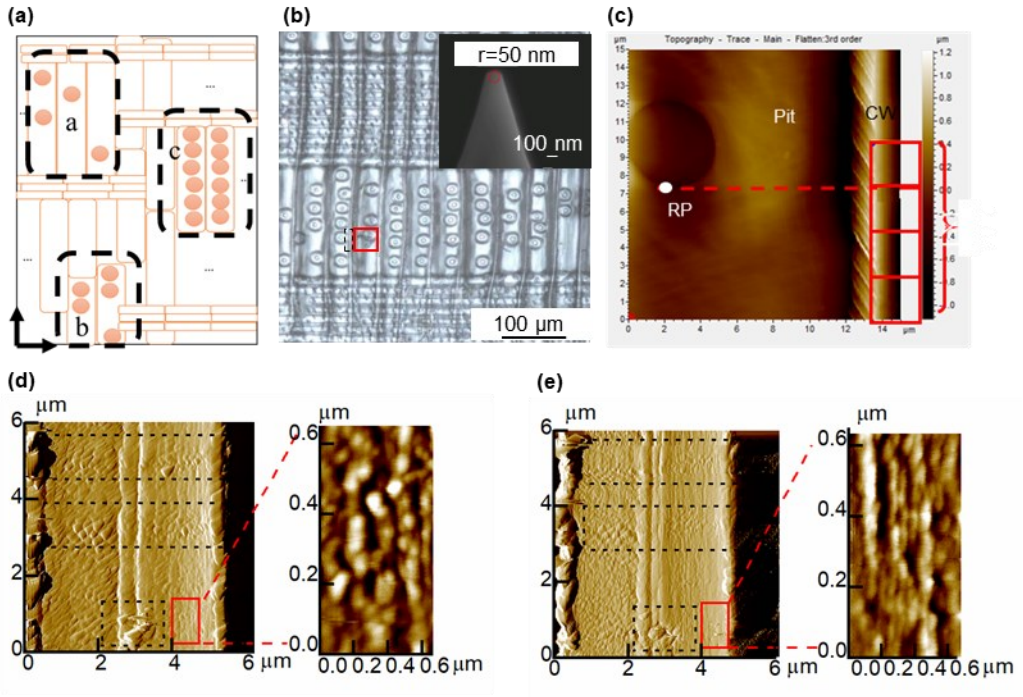


Figure 1: The relocating method using pit patterns. (a) The pit patterns on a wood surface; (b) Choosing a pit for locating the cell wall and using the tip with a radius of 50 nm to measure the cell wall; (c) Using the chosen pit to locate the cell wall section; (d) The measured cell wall.

This interpretation was independently proven by the cell wall topography before and after treatments, and chemical analysis with Fourier-transform infrared spectroscopy (FTIR), and Headspace GS-MS. During alkaline aging (Figure 2 (d)), the gradual shift of data points could also be described by the two sigmoidal curves [2–4].

4. Measuring the immediate and short-term degradation process of the wood cell wall surfaces from 0.5 h to several days quantitatively in thermal aging and cement alkaline aging. Presenting the progressive degradation from the dissolution of extractives, through the degradation of the hemicelluloses-lignin matrix, to the exposure of cellulose aggregates using the two sigmoidal curves in terms of jump-off force ratio and adhesion force. Measuring the changes in surface deformation and modulus of wood in cement alkaline aging and revealing that the cement hydration heat significantly accelerated the aging process: The 1-h treatment at 50°C (cement hydration temperature) caused a 20% decrease in the surface moduli similar to 144-624 h at 20°C; a 50% decrease of the surface modulus occurred after 264 h at 50°C similar to after 1104 h at 20°C [3,4].

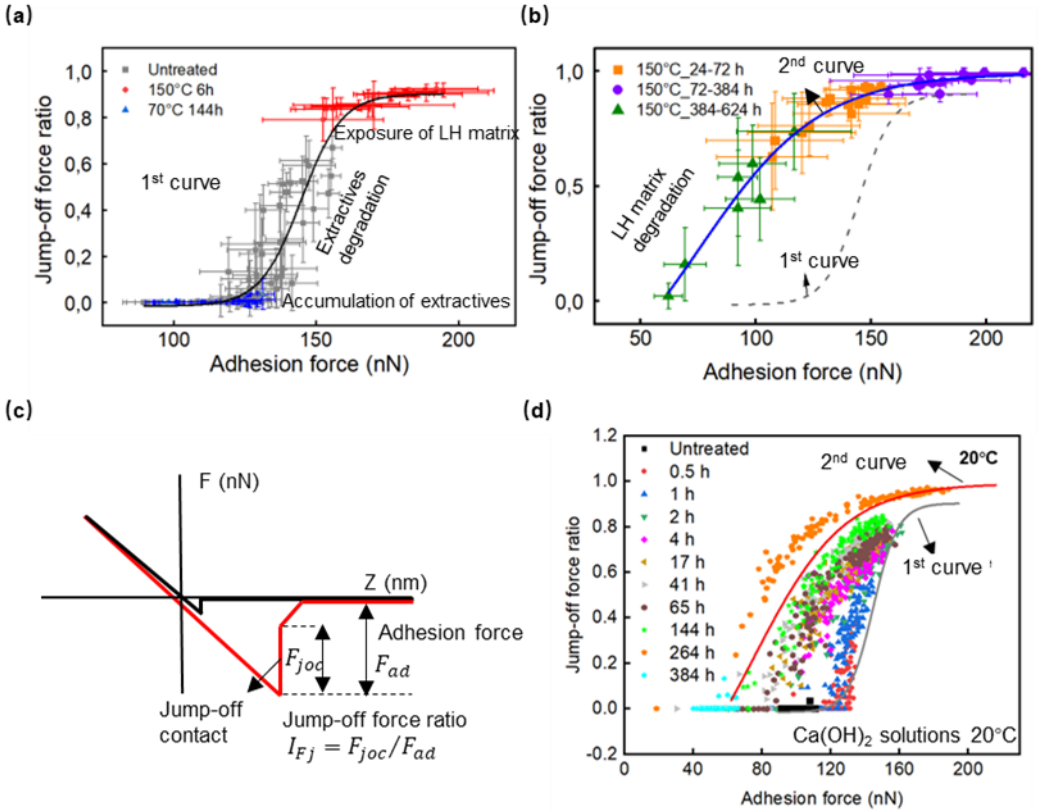


Figure 2: Two sigmoidal curves in thermal and alkaline aging of wood cell walls. (a) The 1st curve in thermal aging; (b) The 2nd curve in alkaline aging; (c) The new parameter jump-off force ratio; (d) The two sigmoidal curves in alkaline aging.

References

(1) Li, J.; Kasal, B. Repeatability of Adhesion Force Measurement on Wood Longitudinal Cut Cell Wall Using Atomic Force Microscopy. WFS 2021, 53 (1), 3–16.

(2) Li, J.; Kasal, B. Effects of Thermal Aging on the Adhesion Forces of Biopolymers of Wood Cell Walls. Biomacromolecules 2022, 23 (4), 1601–1609.

(3) Li, J.; Kasal, B. The immediate and short-term degradation of the wood surface in a cement environment measured by AFM. Mater Struct 2022, 55 (7).

(4) Li, J.; Kasal, B. Degradation Mechanism of the Wood-Cell Wall Surface in a Cement Environment Measured by Atomic Force Microscopy. J. Mater. Civ. Eng. 2023, 35 (7).

Wood Science and Technology
Journal of the International Academy of Wood Science

Springer

Bibliometric impact scores update

We are pleased to inform you that our journal is continuously improving its bibliographic impact. In the recently updated Journal Science Citation report by Clarivate® for the year 2022, WST is still ranked as the second best journal in the category *Materials Science, Paper & Wood* (Q1; 2/21).

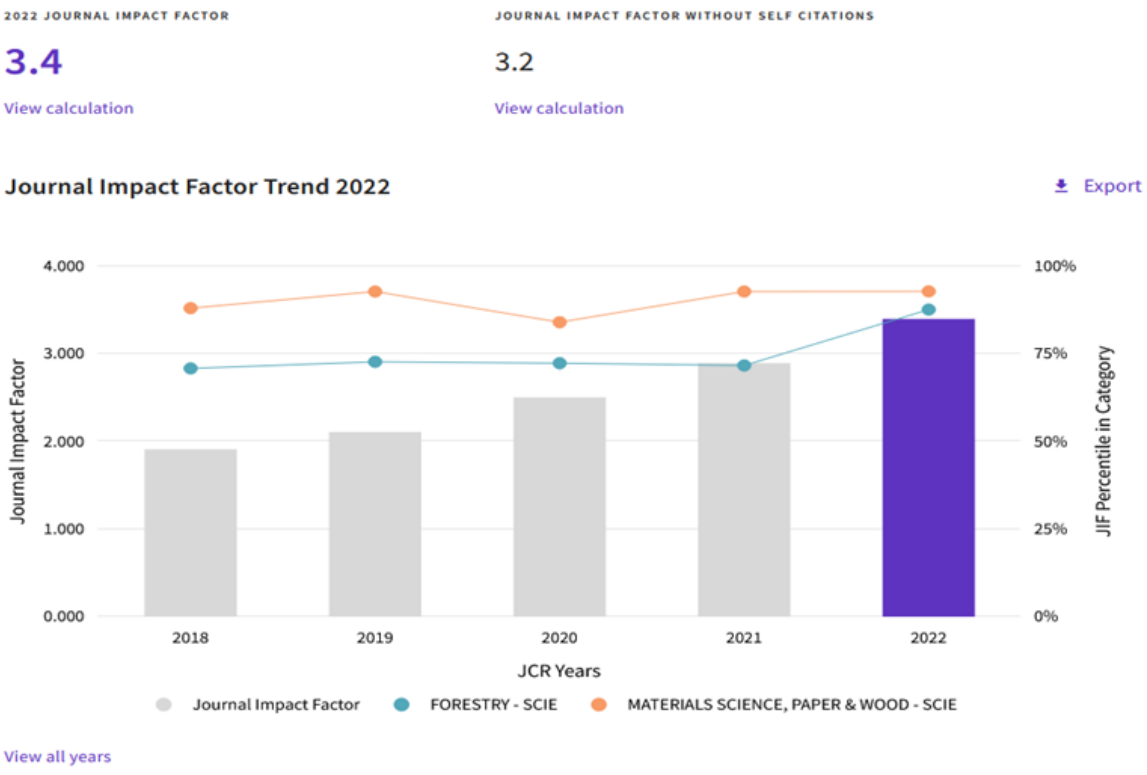
The impact factor has passed the 3.0 score, and is now 3.4.

As indicated by the green/turquoise line in the figure below, this has also improved the journals status in the subject category *Forestry*, where WST is now equally listed as Q1-Journal (grouped in the highest percentile, #9 out of 69 journals in this subject category).

We would like to thank you cordially for your service as member of the editorial board of WST.

The Editors:

Prof. Klaus Richter & Prof. Jan Willem van de Kuilen



IAWS in Wikipedia

As most of us know, Wikipedia is a free Internet-based encyclopaedia (since 2001), which and operates under an open-source management style. Wikipedia uses a collaborative software known as *wiki* that facilitates the creation and development of articles.

Since August 2023, a Wikipedia article is now featuring the IAWS can be accessed in Wikipedia, thanks to our Fellow George Mantanis and other contributors. Since its first appearance on August 15, 2023, the article has undergone so far 23 revisions, the last one from December 25, 2023. The IAWS article is currently available in nine languages, including English, Chinese, Korean, Russian, Greek, German, Spanish, French and Italian.

Access:

https://en.wikipedia.org/wiki/The_International_Academy_of_Wood_Science

Further, Wikipedia also has now an article on "*wood science*", also initiated by George Mantanis, available in four languages.

https://en.wikipedia.org/wiki/Wood_science

This greatly helps to make our Academy, and wood science in general, better known and visible !

The International Academy of Wood Science

9 languages

Article Talk Read Edit View history Tools

From Wikipedia, the free encyclopedia

The International Academy of Wood Science (IAWS)[1] is an international academy and a non-profit assembly of wood scientists, recognizing all fields of wood science with their associated technological domains and securing a worldwide representation.[2]

Since June 2023, the academy is represented by Dr. Stavros Avramidis, a Greek-Canadian professor and wood scientist who serves as the 19th President of the IAWS,[3] and, also by Dr. Ingo Burgert, a Swiss wood engineer who is presently the elected vice-president for the period 2023–2026.[4]

History [edit]

The academy was first established on June 2, 1966, at Centre Technique du Bois, Paris.

The development and establishment of the International Academy of Wood Science involved many people, but the key-person who had the idea of creating a wood academy was Professor Franz Gustav Kollmann, of the Wood Research and Technology at the University of Munich, Germany.[5] In fact, he was also the first elected President of the academy in the years 1966–1972.

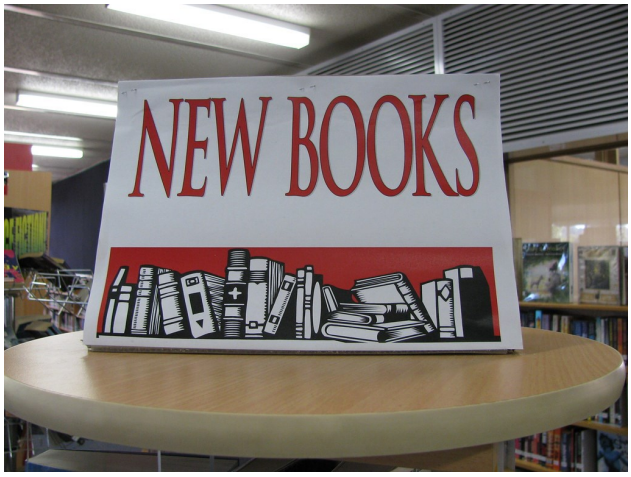
Objectives [edit]

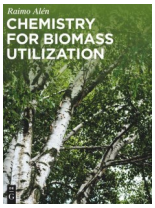
The academy has the objective of promoting at the international level the concerted development of wood science and its standing by recognizing meritorious wood scientists by their election as Fellows thereby honouring distinguished achievements in the science of wood, and by promoting a high standard of research and publication. In addition, the academy holds annual plenary meetings, including business meetings and technical sessions, in the form of international scientific conferences.[6]

AcadeMY NEWS

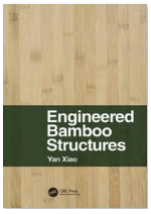
News from Fellows

Congratulations to Fellow Prof. **Kelin YE**, who has recently retired from the Research Institute of Wood Industry, Chinese Academy of Forestry, Beijing, P.R.China. Your continued active role in the Academy is highly appreciated !

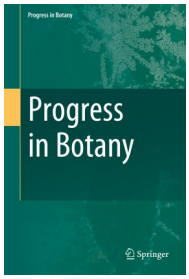




Fellow Prof. **Raimo Alén**, University of Juväskylä, Finland, has published a new book, entitled "Chemistry for Biomass Utilization" released December 4, 2023. This book follows his earlier book (2018) as a kind of "sequel", entitled "Carbohydrate Chemistry – Fundamentals and Applications". To all Fellows working in the biorefining area, this is a great new publication of interest ! Details can be found under this LINK.



Fellow **Yan Xiao**, University of Illinois at Urbana-Champaign, has published new book, entitled "Engineered Bamboo Structures". This book is about Bamboo as a bio-based green material used in modern construction. In particular, the relationships between modern timber structures and bamboo structures are discussed. Based on the discussion, the framework is set for this book on developing engineered bamboo structures with close reference to modern timber engineering.



In a recent, extensive review Fellow Prof. **Roni Aloni** is presenting hypotheses and evidences on mechanisms that regulate wood formation, adaptation and evolution. The review clarifies major controlling mechanisms that regulate vascular differentiation, regeneration, adaptation, and evolution of plants, which were discovered during the past 50 years. Hormonal mechanisms that regulate vascular differentiation are discussed, focusing on phloem and xylem relationships, control of vessel width, fiber differentiation, leaf and flower development, root initiation, evolution of ring-porous wood, parasitism, gall formation, cancer development and prevention.

If you have any NEWS, please share!

AcadeMY NEWS

News from Fellows

Fellow Prof. **Nami Kartal** has adopted a new position at the University of the Sunshine Coast, Ecosciences Precinct, Brisbane, Queensland, Australia, as a Senior Research Fellow of the National Centre for Timber Durability and Design Life. Between 2012-2023, he headed the Department of Forest Biology & Wood Protection Technology, Forestry Faculty, Istanbul University-Cerrahpaşa. **Congratulations !**

Fellow Dr. **Nicolas Brosse** from the University of Lorraine, France, has launched in September 2023, a pilot-scale steam explosion prototype, located at the Campus Bois in Epinal (France). Steam explosion is a pre-treatment process currently used in the energy sector (biothanol, black pellets). Research carried out at the Université de Lorraine includes new wood applications, such as extraction and the development of innovative materials.

Fellow Prof. **Rubén A. Ananías**, University of the Bío-Bío, Concepción, Chile, was recognized with the Municipal Award in Applied Research 2023, awarded by the Municipality of Concepción, Chile. **Congratulations !**

Fellow, highly-cited, Prof. **Art Ragauskas**, University of Tennessee, USA, with his team, has made news by demonstrating that high-quality polyurethane (PU) foams are readily prepared from lignin extracted from biomass. This advancement strengthens overall operations of cellulosic biorefineries and provides PU foams with improved economic feasibility and environmental performance. **Congratulations!**

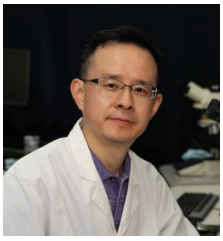
At the 2023 meeting of the International Research Group on Wood Protection (IRG-WP), which took place in Cairns/ Australia, Fellow Prof. **Holger Militz** was awarded with the Honorary Life-Long Membership. Honorary Life-Long Members are scientists who have made outstanding contributions to the aims, functions, organisation or standing of the IRG-WP. In the last decade, only eight researchers did receive this award. **Congratulations !**

If you have any NEWS, please share!

AcadeMY NEWS

News from Fellows

In July 20023, Fellow Prof. **John Ralph**, Great Lakes Bioenergy Research Center, University of Wisconsin–Madison, was honored with Lifetime Achievement Award at the International Symposium on Wood, Fiber and Pulping Chemistry, Venice.



Fellow, Prof. **Yafang Yin**, Wood Anatomy and Utilization Department, Chinese Research Institute of Wood Industry, Chinese Academy of Forestry, Beijing, China, was eElected as Executive Committee Member of the International Union of Biological Sciences (IUBS). In the 34th General Assembly (GA) of the International Union of Biological Sciences (IUBS) March 2023, Professor Yafang Yin was elected as Executive Committee Member (2023-2026) of IUBS. IUBS, established in 1919, is a non-governmental and non-profit organization comprising of national academies and international scientific associations and societies. Professor Yin's new position in IUBS will contribute to promoting collaboration between IAWS and IUBS, thus, strengthen important role of IAWS in the wood science development and technology innovation of global biological research. **Congratulations !**

If you have any NEWS, please share!

Upcoming Conferences

11th European Conference on Wood Modification, 15-16 April 2024, Florence, Italy

11th Hardwood Conference, 30-31 May 2024, Sopron, Hungary

25th IUFRO World Congress, 23-29 June 2024, Stockholm, Sweden

Society of Wood Science and Technology Annual Convention, 30 June – 5 July 2024, Portoroz, Slovenia

Important: This conference **includes a IAWS session**, with presentations by 2023 PhD awardees, and more. Further, IAWS will hold an **Academy Lecture**, the highest honor the Academy is giving.

Forest Products Society Annual International Conference, 4-6 June 2024, Knoxville, TN, USA

The 10th Pacific Regional Wood Anatomy Conference, September 2024, Hokkaido, Japan

Obituary Prof. Dr. Benhua Fei
1964– 2023

We regret to inform our Fellows that Prof. Dr. **Benhua Fei**, Director of International Center for Bamboo and Rattan (ICBR), has passed away on July 10th, 2023.

Prof. **Benhua Fei** was an engaged doctoral supervisor and Executive Deputy Director General at the International Centre for Bamboo and Rattan (ICBR), China. He was an influential scholar in the field of wood and bamboo materials science and technology. He has received his doctoral degree in wood science and technology from the Chinese Academy of Forestry in 1999 and joined its faculty afterwards. In 2001, he worked at the Forestry and Forest Products Research Institute, Japan as a visiting scholar. He served as Director General of Beijing Forestry Machinery Research Institute, State Forestry Administration, China, from 2005-2009, then as Deputy Director General of ICBR from 2009-2013. Since February 2013, he has served as Professor, Doctoral Supervisor and Executive Deputy Director General at ICBR. He also was Vice President of Chinese Society of Forestry, Member of the Specialists Panel for "Construction Technology of Chinese Modern Wood Frame" under Ministry of Housing and Urban-Rural Development of China (MOHURD), Chairperson of ISO Technical Committee on Bamboo and Rattan (ISO/TC 296). Dr. Fei was long engaged in the education and research of wood and bamboo science and technology, with a focus on the structure of bamboo cell wall and bamboo and wood-based structural materials. He did lead more than 10 national research projects, including projects of the National Science and Technology Support Program, National High-Tech Research & Development Program and National Natural Science Fund, and won one first prize and three second prizes of the National Science and Technology Progress Award, and three first prizes of Liang Xi Forestry Science and Technology Award. Over the years, Dr. Fei has obtained 20 national invention patents. He has published over 300 academic papers, including 110 SCI papers, authored over 10 monographs, including „Characterization and Application of Mechanical Properties of Wood Cell Walls", „Materials Sciences in Timber Architecture", „Wood Properties of the Global Important Tree Species", and „Secondary Xylem Biology: Origins, Functions, and Applications". Prof. Fei has supervised over 43 postgraduate students.

Rupert Wimmer

Journal Ranking—Wood Science & Technology (Google Scholar)

		h5-index	h5-median
1.	Cellulose	65	80
2.	BioResources	39	54
3.	Journal of Bioresources and Bioproducts	30	69
4.	Wood Science and Technology	28	35
5.	European Journal of Wood and Wood Products	27	32
6.	Holzforschung	26	31
7.	Journal of Wood Science	23	41
8.	Journal of Renewable Materials	23	30
9.	Wood Material Science & Engineering	21	25
10.	Maderas. Ciencia y Tecnología	19	28
11.	Journal of Wood Chemistry and Technology	19	27
12.	International Association of Wood Anatomists Journal	17	22
13.	Wood and Fiber Science	16	23
14.	Cellulose Chemistry and Technology	16	20
15.	Floresta e Ambiente	16	18
16.	Nordic Pulp & Paper Research Journal	14	20
17.	Wood Research (Bratislava)	14	19
18.	Forest Products Journal	14	18
19.	Journal of Forestry Engineering	14	18
20.	International Wood Products Journal	11	17

Statistics

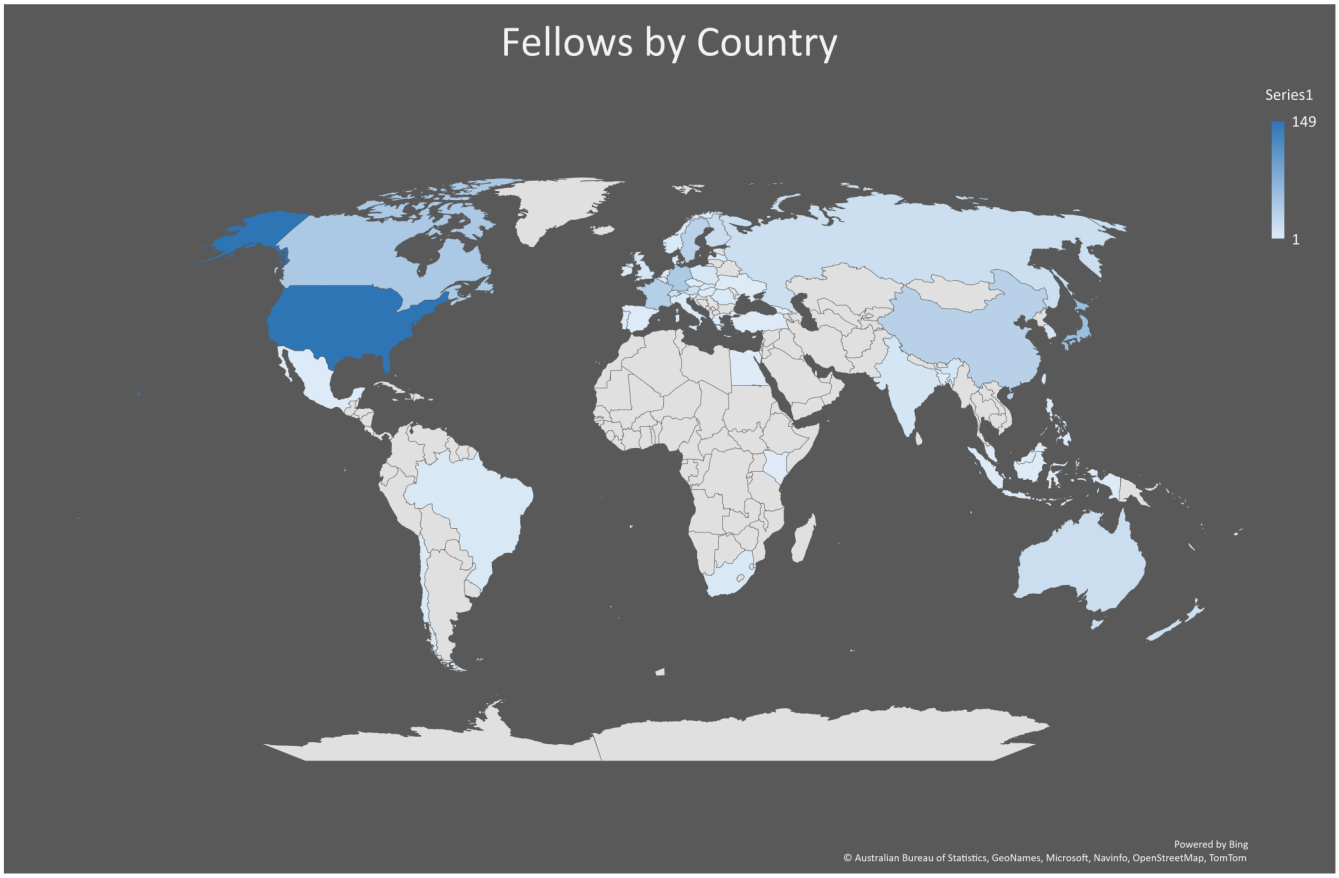
Distribution of Fellows by Country

Country	Fellows	Females
Australia	17	1
Austria	15	2
Bangladesh	1	0
Belgium	2	0
Brazil	5	1
Canada	44	4
Chile	4	0
China	33	5
Costa Rica	1	0
Czechia	2	0
Denmark	5	0
Egypt	1	0
Finland	18	3
France	36	7
Georgia	1	0
Germany	42	1
Greece	3	0
Hungary	1	0
India	9	0
Indonesia	1	0
Ireland	1	0
Israel	4	0
Italy	4	2
Japan	58	1
Kenya	1	1
Korea, South	8	0
Latvia	3	0
Malaysia	2	1
Mexico	2	1
Netherlands	2	1
New Zealand	15	1
Norway	4	0
Philippines	3	0
Poland	7	0
Portugal	1	0
Romania	4	0
Russia	16	2
Slovakia	3	0
Slovenia	3	3
South Africa	5	1
Spain	2	2
Sweden	32	2
Switzerland	13	2
Taiwan	5	1
Turkey	1	0
Ukraine	1	0
United Kingdom	9	0
USA	149	6
Total	599	51

Active fellows	132
Lifetime fellows	149
Retired fellows	279
Deceased fellows	176

Statistics

Distribution of Fellows by Country



Affiliated Members elected in 2021
BioProducts Institute, UBC
Zhejiang Agricultural & Forestry University

Affiliated Members elected in 2020
International Association of Wood Anatomists
Korean Society of Wood Science & Technology, Korea
South West Forestry University, China
National Institute of Forest Science, Korea

Affiliated Members elected in 2017
International Wood Culture Society, USA
Department of Wood Science – UBC, Canada

Fellows elected in 2022
Pavlo BEKHTA, Ukraine
Rowland BURDON, New Zealand
Laurent MATUANA, USA
Nicole STARK, USA
Yan XIAO, China

Fellows elected in 2021
Menandro ACDA Philippines
Henri BAILLERES, Australia
Mikhail BALAKSHIN, Finland
Warren GRIGSBY, New Zealand
Minjuan HE, China
George MANTANIS, Greece
Aji MATHEW, Sweden
Frédéric PICHELIN, Switzerland
Dick SANDBERG, Sweden
Rubin SHMULSKY, USA
Taraneh SOWLATI, Canada
Yuki TOBIMATSU, Japan
Aleksander VASILYEV, Russia
Ning YAN, Canada

Fellows elected in 2020
Benhua FEI, China
Aster GEBREKIRSTOS, Kenya
Mark IRLE, France
Andreja KUTNAR, Slovenia
Lu LIN, China
Chantong MEI, China
Veronica de MICCO, Italy
Rozi MOHAMED, Malaysia
Antje POTTHAST, Austria
Scott RENNECKAR, Canada
Jinquan WAN, China
Shuangfei WANG, China
Zhihui WU, China

Fellows deceased in 2023
Walter LIESE Germany
Benhua FEI, China

Fellows deceased in 2022
Frank BEALL, USA
Günter SCHULTZE-DEWITZ, Germany

Fellows deceased in 2021
Edmone ROFFAEL, Germany
David GORING, Canada
Dieter ECKSTEIN, Germany
Chung-Yun HSE, USA
Dietrich FENGEL, Germany

Fellows deceased in 2020
Fritz SCHWEINGRUBER, (Switzerland)
Robert YOUNGS, (USA)

Affiliate Members

Affiliate Members shall be educational, research, industrial, or governmental organizations and individuals, who are actively engaged in carrying out or promoting research in wood science or the enhanced utilization of wood on the basis of scientific or technological principles and practices. The importance of Affiliates to the Academy is two-fold:

• The Academy derives direct contact with organizations and individuals actively engaged in the utilization of wood and wood products.

• The Academy receives financial support for its activities from these members.

Contact details are available on the IAWS website.

AFFILIATE MEMBERS LIST

- BAUMAN MOSCOW STATE TECHNICAL UNIVERSITY/MYTISHCHI BRANCH , Russia, www.bmstu.ru/en
- BIOPRODUCTS INSTITUTE, UBC, Canada, https://bpi.ubc.ca/
- CHINESE ACADEMY of FORESTRY (CAF), China, www.caf.ac.cn
- CIRAD FORETS (French Agricultural Research Center for International Development), France, www.ur-bois-tropicaux.cirad.fr
- DEPARTMENT OF WOOD SCIENCE – UBC, Canada, www.wood.ubc.ca/
- ESB- ECOLE SUPÉRIEURE DU BOIS, France, www.ecoledubois.com
- FORESTRY & FOREST PRODUCTS RESEARCH INSTITUTE, Japan, www.ffpri.affrc.go.jp
- FRAUNHOFER-INSTITUTE OF WOOD RESEARCH, Germany, www.wki.fraunhofer.de
- HOLZFORSCHUNG MÜNCHEN, Germany, www.holz.wzw.tum.de
- INTERNATIONAL ASSOCIATION OF WOOD ANATOMISTS, www.iawa-website.org
- INTERNATIONAL CENTRE OF BAMBOO AND RATTAN, China, www.icbr.ac.cn/en
- INTERNATIONAL WOOD CULTURE SOCIETY, USA, www.iwcs.com
- KOREAN SOCIETY OF WOOD SCIENCE & TECHNOLOGY, Korea
- KYOTO UNIVERSITY, Japan, www.rish.kyoto-u.ac.jp
- MISSISSIPPI STATE UNIVERSITY, USA, www.cfr.msstate.edu/forestp
- NATIONAL INSTITUTE OF FOREST SCIENCE, Korea,
- OREGON STATE UNIVERSITY, USA, www.woodscience.oregonstate.edu
- RISE - RESEARCH INSTITUTES OF SWEDEN, Sweden, www.ri.se/en
- SCION, New Zealand, www.scionresearch.com
- SEOUL NATIONAL UNIVERSITY, Republic of Korea www.adhesion.org
- SOUTHWEST FORESTRY UNIVERSITY, China
- STATE UNIVERSITY OF NEW YORK, USA, www.fla.esf.edu
- TECHNICAL UNIVERSITY in ZVOLEN, Slovakia, www.tuzvo.sk/en
- THÜNEN INSTITUTE, Germany, https://www.thuenen.de/new/
- UNIVERSITE LAVAL, Canada, www.xylo.sbf.ulaval.ca
- UNIVERSITY OF GÖTTINGEN, Germany, www.holz.uni-goettingen.de
- UNIVERSITY OF MINNESOTA, USA, www.bbe.umn.edu
- US FOREST PRODUCTS LABORATORY, USA, www.fpl.fs.fed.us
- VIETNAM NATIONAL UNIVERSITY OF FORESTRY, HANOI, VIETNAM, Vietnam, www.vnuf.edu.vn
- WOOD TECHNOLOGY INSTITUTE, Poland, www.itd.poznan.pl
- ZHEJIANG AGRICULTURAL and FORESTRY UNIVERSITY , China, https://en.zafu.edu.cn/

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www.iaws-web.org

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