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IAWS Bulletin

Table of contents:

Please send correspondence by email to the editor,

Lloyd Donaldson

Message from the President

The entire world is still facing the wrath of the pandemic of COVID-19, though our Academy has been fortunate enough to carry out the scheduled tasks without hindrance. However, it saddens me deeply to report that fellows Prof. David A.I. Goring (McGill Univ., Canada), Prof. Dieter Eckstein (Hamburg Univ., Germany), Dr. Chung-Yun Hse (Southern Forest Resources Research Unit, Pineville, USA), and Prof. Dietrich Fengel (Technical University of Munich, Germany) have passed away. The Academy owes much to these extraordinary fellows, who made huge contributions to its growth. May their souls rest in peace.

The election of new Academy fellows is underway and is expected to be finalized before Christmas. Dedicated attempts are being made in addressing gender and geographical inequalities in the nomination of potential fellows and in bringing about improvements. The Academy Board granted three IAWS Ph.D. awards for 2021. Dr. Jimena Castro Gutiérrez (Lorraine Univ., France) has the honor of receiving 1st place. The honor of 2nd and 3rd places has gone to Dr. Qijun Zhang (Univ. of Tennessee, USA), and Dr. Sara Florisson (Linnaeus Univ., Sweden) respectively.

Two new Affiliate Members have joined the Academy this year, reflecting the steady expansion of the horizon of the IAWS:

- BioProducts Institute of the University of British Columbia, Canada
- Zhejiang Agricultural and Forestry University, China.

The Academy cordially welcomes these Affiliate Members and looks forward to their support in the Academy's future activities.

Owing to Lloyd Donaldson's painstaking work, the Academy has greatly enhanced its website accessibility. Almost all the communication is being done through the website. I am very happy to report that the IAWS is in a very sound financial position due to the extraordinary management of our budget by Howard Rosen. I am very grateful to both Lloyd and Howard.

This year almost all meetings were unfortunately forced to be held virtually. I learned, however, that many fellows actively took part in the scientific activities. I am particularly grateful to fellows who shared their experiences with young scientists. I had the opportunity to attend two international forums for young wood scientists. Fellow Park, Byung-Dae organized the "International Forum in Wood Science for Young Scientist" on October 1 in South Korea, supported by the National Research Foundation of Korea. Fellows Alfred Pizzi (France) and Guanben Du (China) were also present. Fellow Yafang Yin also organized the "2021 International Youth Forum for Wood Anatomy" on November 13 in China. Fellows Pieter Baas (Netherlands), Lloyd Donaldson (New Zealand), and Gerald Koch (Germany) also took part in this forum. I expect such events to continue, which will motivate and inspire young scientists through the participation of Academy fellows.

Message from the President

Last but not least, I would like to request all fellows to pay close attention to climate change. The situation is still volatile, although COP 26 has made a significant positive move by deciding to start saving the all-important tropical forests. An engagement as being-in-the-world (Da-sein) is also asked of scientists. We would not be satisfied to remain just as a problem-finder at times of growing uncertainty. More creative and meaningful endeavors for Mother Nature are expected even in the field of wood science.

We are now about to turn a corner in the very troublesome current year. According to Chinese philosophy, winter is the apex of yin energy, marking the starting point of returning the generative and creative powers of our universe. The darker winter, the brighter spring. Being in the winter means we are alive. Please stay safe, healthy and save your hugs for the next spring. I am very grateful to all fellows, Academy Board, and Executive members who show their passion for the progress of the Academy.

I wish you all a Merry Christmas and a Happy New Year.

Yoon Soo KIM

FIRST PLACE

Dr Jimena Castro Gutiérrez

Nanostructured carbon materials derived from tannin as electrodes for supercapacitors

Université de Lorraine, France

Supervisors *Vanessa Fierro & Alain Celzard*

The depletion of fossil resources and global warming are forcing a shift to "greener" technologies. However, the intermittency of renewable energy sources requires energy storage devices, among which electrochemical supercapacitors (SCs), capable of delivering high power, are suitable for applications in electric vehicles, as backup devices, or in hybrid systems with batteries.[1]

The research objective of the thesis was to produce biosourced nanostructured carbons for SC electrodes while reducing the environmental impact associated with their synthesis, which normally requires the use of hazardous and non-renewable substances. The first strategy was therefore to use condensed tannins as biosourced carbon precursors, which are polyphenolic substances, extracted from mimosa, pine, or quebracho trees, see Figure 1. Condensed tannins, in particular mimosa tannin (from *Acacia mearnsii*) used throughout the thesis, are currently extracted at large scale and valorized, among others, by the leather, wine, and wood-adhesive industries.[1] It would thus be possible to add extra value to this wood by-product. The second strategy was aimed at developing a synthesis method avoiding the use of toxic or hazardous substances. A novel surfactant-water-assisted mechanochemical mesostructuration (SWAMM) and one-pot method was developed, which uses only tannin, water, and a non-hazardous surfactant (Pluronic® F127) to create the nanostructure of the materials.[2] After optimization it was possible to produce ordered and disordered mesoporous carbons (OMCs and DMCs, respectively), only by adjusting the surfactant to water weight ratio, as shown in Figure 2.

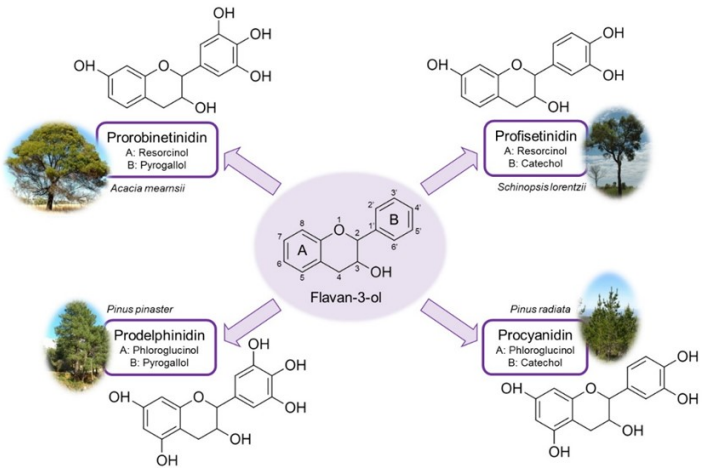

Figure 1. Main flavonoid units of condensed tannins, along with the plant commonly used for their extraction. [From Castro-Gutiérrez et al. Front. Mater. (2020) [1]]

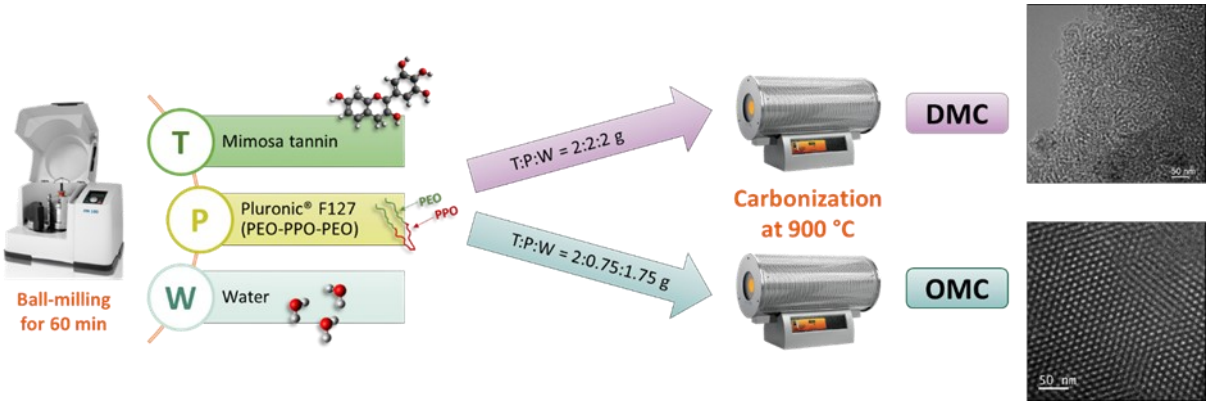

Figure 2. Schematic representation of the synthesis process of disordered and ordered mesoporous carbons (DMC and OMC, respectively) by the SWAMM method. [Adapted from Castro-Gutiérrez et al. Renew. Sust. Energ. Rev. (2021) and Castro-Gutiérrez et al. Green Chem. (2018) [2,3]].

For this study, material characterization is essential because the physicochemical properties of the nanostructured carbons directly affect their SC performance. After extensive characterization using different techniques such as nitrogen and argon adsorption, immersion calorimetry in n-hexane, 2-methylpentane, and 2,2-dimethylbutane in liquid phase, and adsorption of the same three alkanes in vapor phase, the mesoporous materials were found to exhibit characteristics to be used as model materials for the study of the connectivity of pores.[4] In particular, the results revealed that the DMC material has a network of well-interconnected pores, while the ordered pores in the OMC material are accessible only through narrow pores.

In order to test the tannin-derived carbon materials as electrodes for SCs, further physical and/or chemical activation was performed to increase their surface area and to improve their pore network. Physical activation by CO_2 of the OMC material allowed increasing its surface area from ~ 600 to 2000 $m^2 g^{-1}$ while maintaining the ordered structure almost unchanged.[5] The electrochemical performance of the SCs assembled with selected activated OMCs was tested using three electrolytes. The different capacitance retentions found depending on the electrolyte used were attributed to the ion size and its impact on their mobility through the pore network. The activated OMCs exhibited ideal supercapacitive behavior, high capacitance retention, and excellent long-term stability.

The majority of studies on the SC performance of materials focus on the analysis of materials with different surface areas, porous textures, and having either an ordered or a disordered structure. Yet, the effect of the order is generally overlooked. Moreover, a direct comparison between published studies to obtain more insight on the effect of the order remains challenging because it is not easily isolated from other factors that also influence the SC performance, such as surface area, pore volume and size, surface chemistry, or even testing conditions. In this context, the tannin-derived carbon materials developed during this thesis served as models to better understand the effect of order and connectivity of the micro-mesoporous structure on the electrochemical performance of assembled SCs.[3] The in-depth characterization performed by scanning the hysteresis loops of the nitrogen adsorption-desorption isotherms allowed the pore connectivity, improved thanks to the activation process, to be assessed and correlated with the performance of the SCs assembled from these model materials, differing only in their mesopore ordering. It was found that the order of the mesopores slightly improves ion diffusion when using an aqueous electrolyte, but for larger size ions, such as those found in organic electrolytes, the well-connected pore network of the disordered materials facilitates ion mobility, explaining the differences in SC performance, see Figure 3. This methodology had never been used so far to correlate the textural properties to the electrochemical performance of porous carbons.

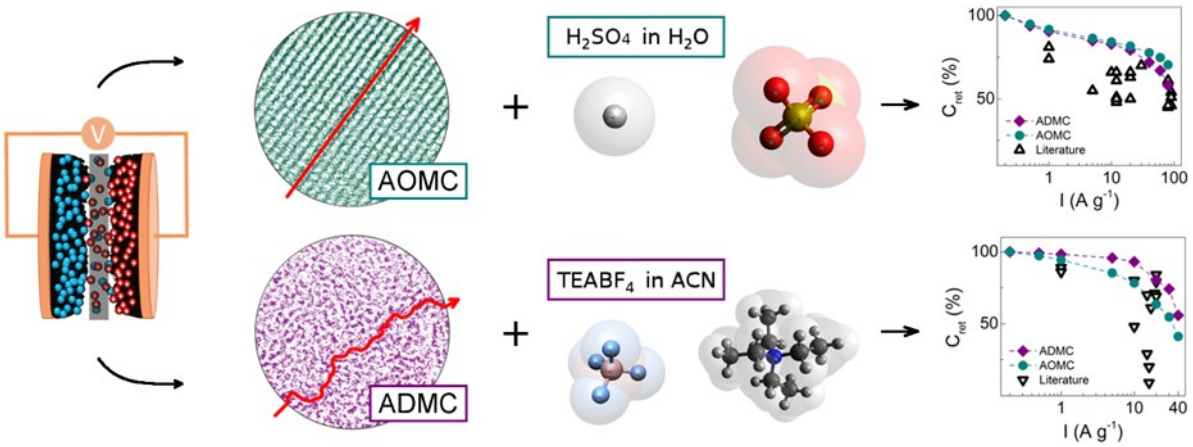

Figure 3. After activation, ordered and disordered mesoporous carbons of high surface area were produced (AOMC and ADMC, respectively), and high-rate capability supercapacitors were obtained from them. It was shown that ion size and mesopore connectivity strongly affect electrochemical performances.[3]

The next step was to study the effect of pore connectivity on the efficiency of chemical activation by KOH. KOH activation is known to produce materials with higher surfaces areas than those obtained by physical activation. The results showed that the ordered structure is better preserved through KOH activation than through CO2 activation, but this also entails a lack of improvement in pore connectivity. The high surface area of the KOH-activated materials lead to high capacitance values at low charging rates of the assembled SCs, but the low pore connectivity resulted in hindered ion diffusion and low capacitance retention as the charging rate increased, compared to the better results obtained using CO2-activated materials as electrodes.[5]

Finally, these studies also revealed that the tannin-derived nanostructured carbon materials exhibit properties that make them appropriate for applications beyond those of energy storage, see Figure 4. In collaboration with other research groups, it was indeed demonstrated that the well-defined ordered structure of the OMC material facilitates the separation of linear and ramified hydrocarbons necessary for the production of high-octane gasoline.[4] After activation, the ordered carbons were also used as model materials to validate a new method to determine the pore size distribution from gas adsorption data.[6] In addition, Cu and Fe functionalization of the DMC and OMC materials were tested as catalysts for the conversion of trans-ferulic acid into vanillin, with good selectivity and reusability.[7] The DMC material was successfully used as a pre-concentrator in a real-time detector of traces of volatile organic compounds in indoor air at 60% relative humidity.8 Even more, due to the hydrophobic nature of these mesoporous carbons, they could also be used to separate hydrocarbons from water or CO_2 from humid gas mixtures.[2]

The results of this thesis prove that a wood by-product such as tannin is an excellent precursor for the production of high-value porous carbon model materials, useful for fundamental and applied studies in the fields of energy and environment.

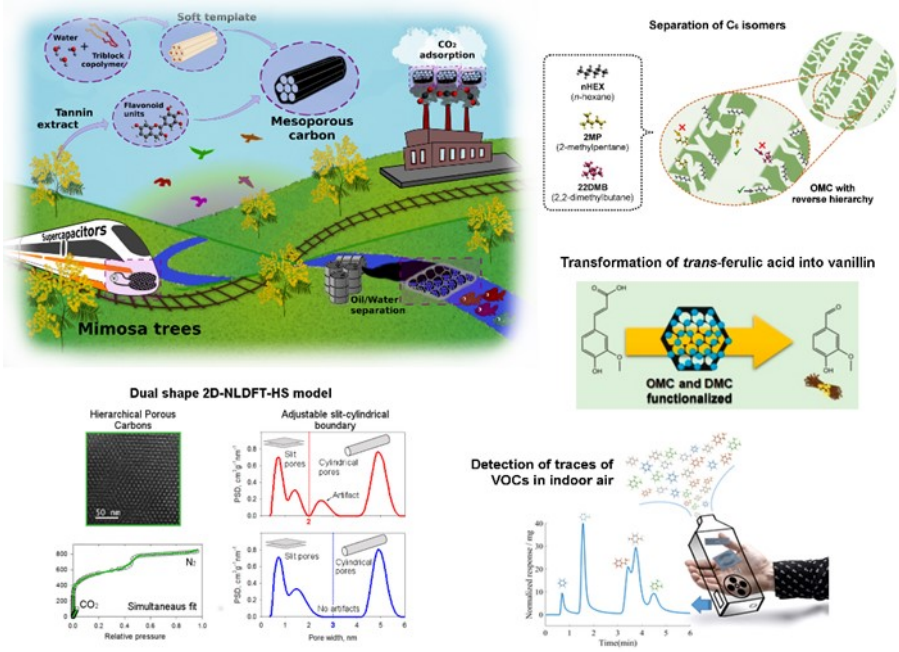

Figure 4. Different applications of tannin-derived mesoporous carbons. [Adapted from Castro-Gutiérrez et al. Green Chem. (2018), Castro-Gutiérrez et al. Carbon (2021), Lázaro et al. ACS Sustainable Chem. Eng. (2021), Jagiello et al. ACS Appl. Mater. Interfaces (2021), and El Mohajir et al. ACS Appl. Mater. Interfaces (2021) [2,4,6–8]].

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Acknowledgments

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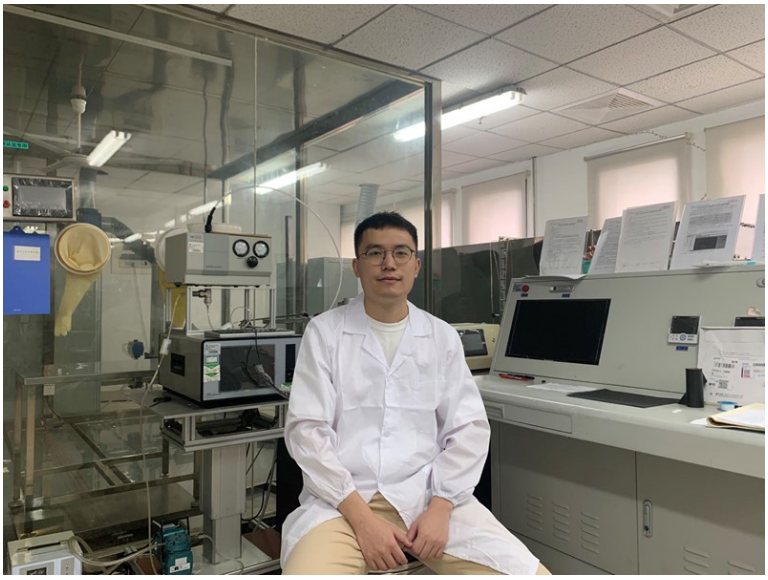
SECOND PLACE

Dr Qijun Zhang

Electrospun poly(vinyl alcohol)/cellulose nanocrystals composite nanofibrous filter: investigation of fabrication and application

Center for Renewable Carbon, Department of Forestry, Wildlife and Fisheries, University of Tennessee, Knoxville, United States

Supervisors *Prof. Siqun Wang & Tim Young*



Particulate matter (PM) pollution has become a global environmental issue because it poses a threat to public health. To protect individuals from PM exposure, one common method is using air filters for indoor air purification. Conventional air filters have various drawbacks, such as a large pressure drop across the filter, manufacturing process and raw materials are not environmentally friendly, filters are not fabricated cost-effectively, and they cannot be easily regenerated. To address these issues, one feasible strategy is to utilize electrospinning to fabricate nanofibrous air filters from environmentally friendly raw materials. Electrospinning is a technique that can reduce the fiber diameter of fibrous air filters to nanoscale. Therefore, the decreased fiber diameter could provide a large surface area to capture PM and allows air molecules to pass through effectively. However, many of the polymers used for fabricating nanofibers are not environmentally friendly, and a large amount of organic solvents may be used during the manufacturing process. The toxic materials and solvents may cause new environmental concerns, thereby lowering the significance of air filters for the protection of individuals and the improvement of environment. In addition, most air filters on the market at this time are not reusable, which will inevitably lead to higher energy consumption for production, increased demand for raw materials, and increased working load to treat and recycle the waste after use. All these drawbacks force the existing air filter fabrication technology to be improved, and it is urgent to develop a green and environmentally friendly filter preparation method.

The research objective of this dissertation was to develop a novel method, which utilized cellulose-based materials, to fabricate environmentally friendly reusable air filters with high PM removal efficiency and low pressure drop. The problem of the compromise between the removal efficiency and the air resistance of air filter was solved with this new air filter fabrication technique. The use of harmful materials during the manufacturing process was avoided. Therefore, neither the preparation procedure nor the final product would generate pollutants to the environment. The reusability of the filter also reduced the cost for cumulative use of raw materials. Additionally, the use of renewable materials demonstrated in this dissertation may promote the production and use of green air filters. This would not only reduce energy consumption, but also decrease potential carbon and microplastic emissions.

Since cellulose is the most abundant natural polymer on the earth, the efficient utilization of it may expand the application prospect and market of renewable resources, thus further increasing the economic value of agricultural and forestry products.

In this dissertation, a new electrospun poly(vinyl alcohol) (PVA)/cellulose nanocrystals (CNCs) composite nanofibrous filter was successfully developed. This PVA/CNCs composite material was demonstrated as an air filter for the first time. The CNCs improved the filtration performance by increasing the surface charge density of the electrospinning suspension thereby reducing the diameter of fibers (Figure 1a). High PM2.5 removal efficiency was achieved (99.1%) with low pressure drop (91 Pa) at a relatively high airflow velocity (0.2 m s^{-1}), under extremely polluted conditions (PM2.5 mass concentration >500 µg m^{-3}) (Figure 1b and 1c).

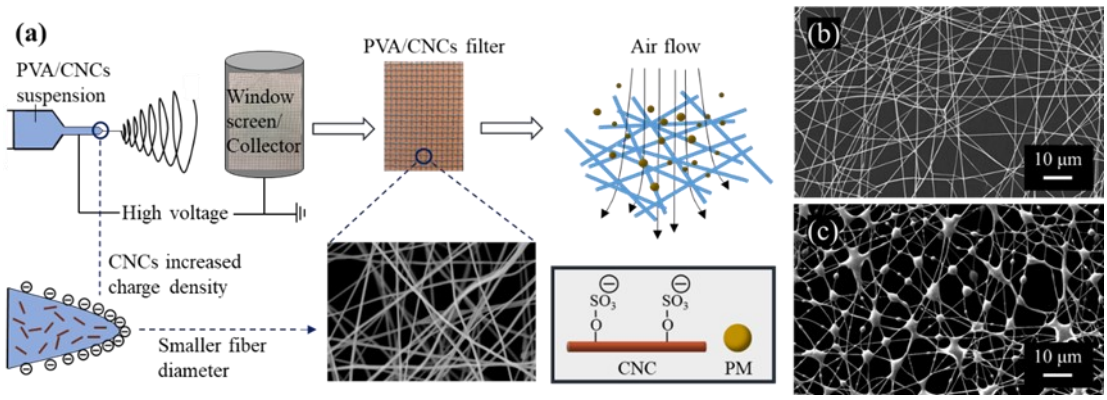


Figure 1. (a) Fabrication process of electrospun PVA/CNCs filters. SEM images of electrospun PVA/CNCs filter (b) before and (c) after particle capturing.

The integral effect of various electrospinning suspension properties on filtration performance was also investigated using response surface methodology. 'Suspension concentration' and 'CNCs percentage' were selected as independent variables, and 'removal efficiency' and 'pressure drop' were the responses (Figure 2). With a three-level-two factor face -centered central composite design, two prediction quadratic models were constructed and validated. The operating parameters for fabricating PVA/CNCs air filters were then optimized with reduced experimental runs, and the optimum filtration performance was achieved as removal efficiency was 94% and pressure drop was 34.9 Pa, with the suspension concentration of 7.34% and CNCs percentage of 20%.

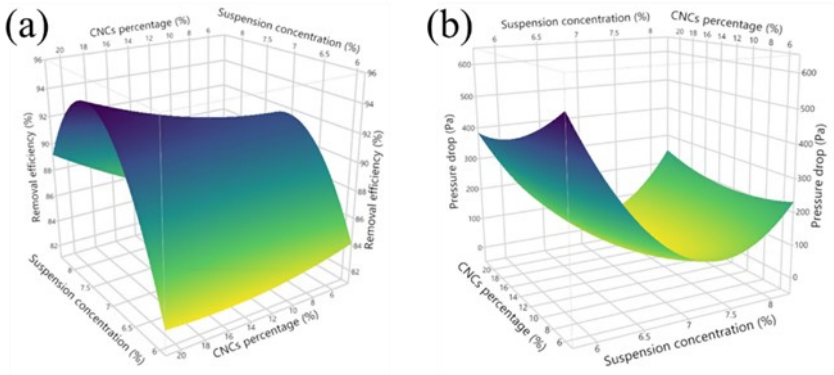


Figure 2. Response surface plot of (a) removal efficiency and (b) pressure drop.

To make the electrospun PVA/CNCs filter reusable, a facile heat treatment was applied. The water-soluble PVA/CNCs composite was converted to be completely water-resistant when the electrospun material was heated at 140 ^{o}C for only 5 min. The mechanism of the change of water solubility of the fibers was investigated systematically. Our results revealed that increased crystallinity is the key factor for improving the aqueous stability, and CNCs provided additional nucleation sites for PVA crystallization during both electrospinning and heating process. The heated filters were effectively regenerated by water washing and the filtration performance was satisfactorily maintained (Figure 3).

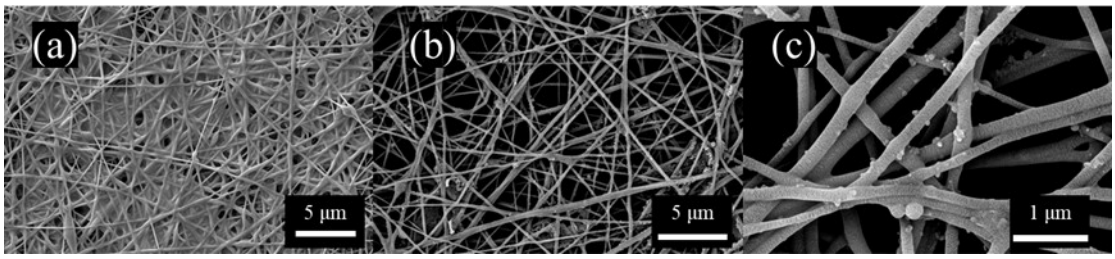


Figure 3. SEM images of fouled PVA/CNCs filters (a) before and (b, c) after water washing.

Because both PVA and CNCs are nontoxic and biodegradable, no organic solvents or crosslinking agents were used in the whole fabrication process, and the heating process is facile, the method proposed in this dissertation for fabricating electrospun PVA/CNCs nanofibrous filters is environmentally friendly and cost-effectively. This new cellulose-based air filter, which possesses high removal efficiency for PM, low pressure drop, and long lifetime, is very promising for practical air purification.

THIRD PLACE

Dr Sara Florisson

Moisture-Induced stress and distortion in wood: A numerical and experimental study of wood's drying and long-term behavior.

Linnaeus University, Sweden

Supervisors *Prof. Sigurdur Ormarsson & Dr. Johan Vessby*

In contrast to other building materials, wood actively interacts with its surrounding climate, continuously trying to establish a moisture content in equilibrium. The changing moisture content of wood affects the mechanical behavior of the material, but also the quality (shape stability, cracking). This phenomenon creates challenges through the entire life cycle of the material, including the drying stage performed in drying kilns and the long-term performance in timber structures. With Europe's ambition to create a carbon-neutral building industry, wood is an excellent construction material due to its low carbon footprint, its renewable character, and high strength-to-weight ratio. Since the nineties, with the introduction of cross-laminated timber, the use of wood as a building material has excelled, now finding not only purpose in residential buildings and halls, but also in multi-storey housing. Parallel to these developments, also the computational power of desktops – now similar to the supercomputers of the late two-thousands – and the possibilities of commercially available finite element software has increased, creating a renewed research interest for the mathematical modelling of the moisture-induced mechanical behavior of wood. Mathematical models play an important role in understanding the phenomena associated with the wood's interaction with climate and load. However, to commercially implement such a model, an experimental calibration and validation is essential.

As part of the doctoral thesis, a three-dimensional numerical model was developed in finite element software Abaqus FAE®, which can model the transient nonlinear moisture flow and the moisture-induced stress and strain behaviour in wood. The model includes several so-called user-subroutines that cover the selected constitutive behavior (UMAT, UMATHT), the required boundary conditions (FILM), and the material orientation of wood, such as annual ring curvature, conical shape, and spiral grain (ORIENT). The moisture flow was described by means of a nonlinear single-Fickian approach, combined with a nonlinear Neumann boundary condition, which describes the flux normal to the exchange surface based on a moisture and temperature dependent surface emission coefficient. Where, the mechanical behavior assumes a strain relationship that can describe both the hygro-mechanical and visco-elastic behavior of wood and comprised of an elastic, hygro-expansion, creep and mechano-sorptive component.

The main aim of the doctoral thesis was to investigate whether the numerical model can predict the behavior of wood when simultaneously exposed to mechanical load and a particular climate. Therefore, the numerical model was used in three different applications: 1) to study the effect of green-state moisture content on the tangential stress development in different configurations of sawn timber experienced during drying, 2) to calibrate the numerical model using self-performed four-point bending tests on clear-wood specimens subjected to low-level bending (stress level ultimate bending strength < 34%) and systematic changes in relative humidity, and 3) to validate the numerical model using self-performed four-point bending tests on sawn timber exposed to northern European climate.

In the first application, the numerical model was calibrated using moisture content profiles obtained with computed tomography taken from literature. As part of the second application, an experimental methodology and an analytical method were developed, which contributed to the isolation and assessment of the mechano-sorptive deflection occurring in the constant moment area of the four-point bending test.

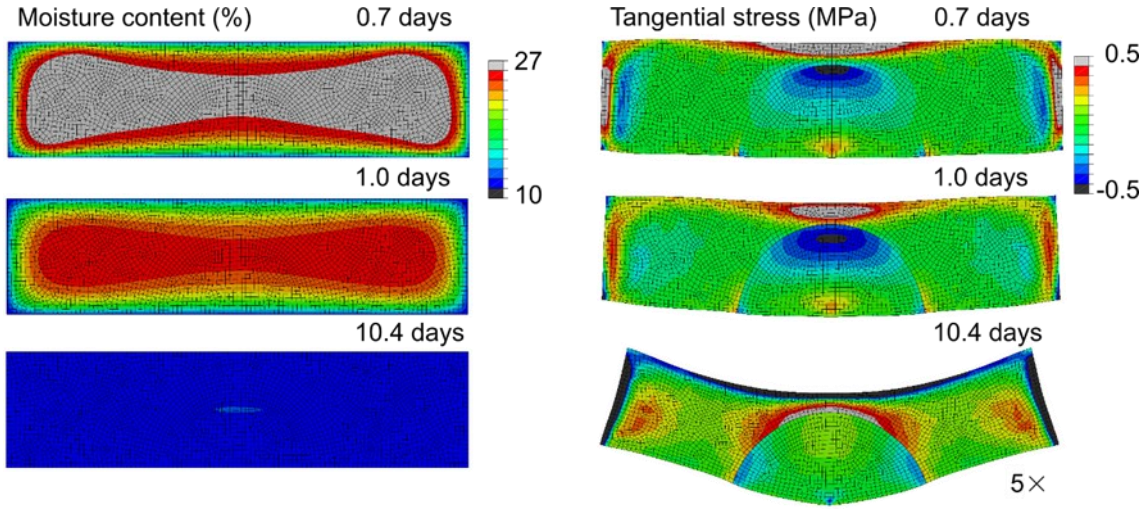


Figure 1. Moisture content change and tangential stress development in a piece of sawn timber during drying from green state to equilibrium moisture content .

The three-dimensional character of the numerical model contributed to the analysis and visualisation of moisture change, stress, and deformation in/of wood, each affected by varying material properties (i.e., from pith to bark, between heartwood and sapwood, and due to temperature and moisture content, material orientation and climate). The study on the drying behavior of sawn timber, which was part of the first application and visualised in Figure 1, clarified phenomena, such as stress reversal and casehardening, and showed that the green-state moisture content influenced the time, size, and frequency with which tension peaks in tangential stress developed. Due to the variation in moisture content associated with the green state of sawn timber, the tension peaks occurred later in time, were slightly smaller in size, and occurred at different moments in time in various locations in the cross-section of the timber, when compared with an initial constant moisture content state at fibre saturation point. The calibration and validation, performed as part of the second and third application, indicated good agreement between experimental results (moisture gradient, moisture speed and deflection) and simulation results obtained in the considered temperature and relative humidity ranges (between -2°C and 60°C and 40% and 80% relative humidity). The clear-wood beams studied in the second application showed the strong effect that spiral grain and climate have on deflection, calibrated material properties and the normative stress states. In addition, it was seen that the experimental methodology and analytical method developed as part of the same application led to a successful identification of each deflection component (elastic and creep) in the constant moment area of the four-point bending test setup and isolation of the mechano-sorptive deflection. Further, the experimental methodology benefitted the experimental calibration of the numerical model, and a mentionable fit was found between experiment and simulation. The beams tested as part of the third application (see Figure 2) showed that the sawn timber, when exposed to a combination of mechanical load and natural climate, experienced a slower change in moisture, smaller moisture gradients, higher tension peaks due to drying, and more seasonal fluctuation in longitudinal, tangential, and longitudinal-tangential shear stress then the clear -wood beam.

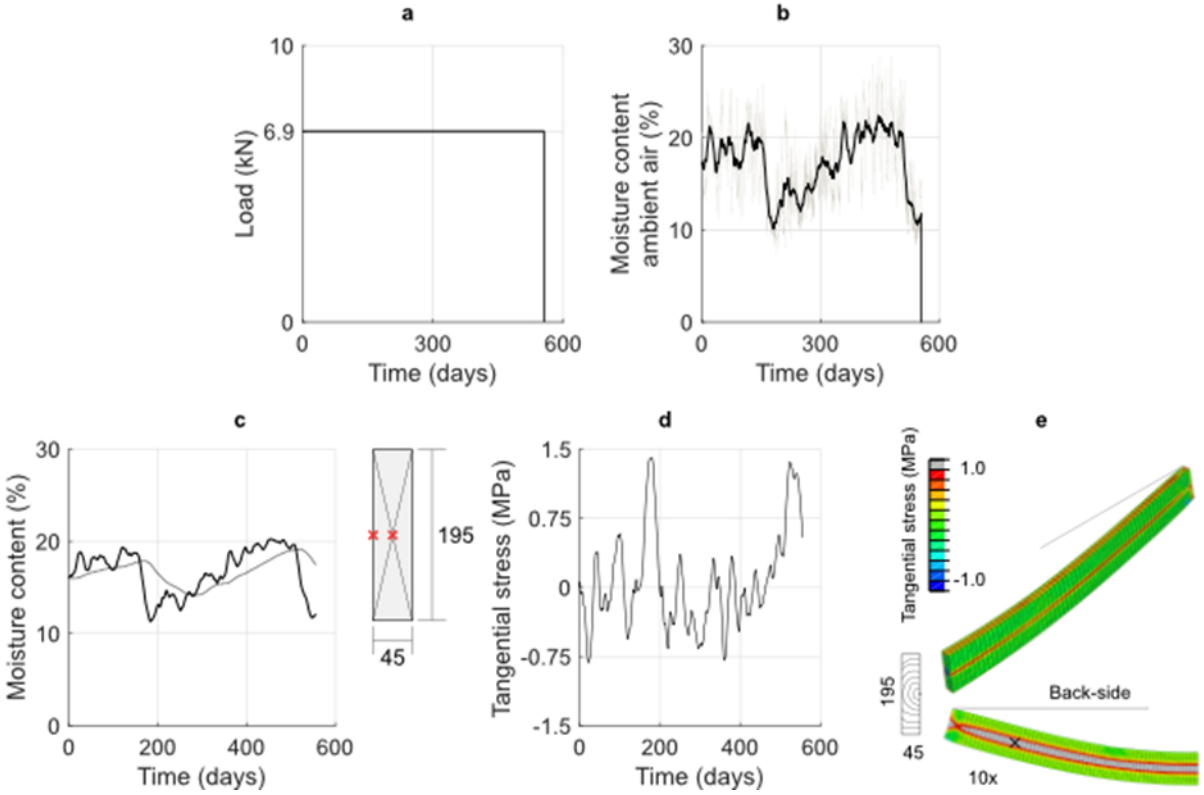


Figure 2. Moisture and tangential stress development in outdoor climate: a) mechanical load, b) moisture content of the outside environment, c) moisture content change for two selected locations in the cross-section of the beam, d) tangential stress development at the left surface (mid height) of the cross-section, and e) colour plot of the tangential stress state after 180 days of testing.

An interesting observation that could be made for all three applications was that in areas where the tangential material direction aligned with the exchange surface of the sawn timber or the clear-wood beams, the wood was prone to a development of high tensile tangential stress. Adjacent to the tension area, slightly more inwards, this stress field was compensated by a compression field. The tangential tension areas seen in the first application showed prone to stress reversal and casehardening, which caused the stress field to change from tension to compression in the course of the drying time. The beams tested as part of the second and third application experienced a tangential tension field located directly below the exchange surface, which continuously changed between tension and compression due to desorption and adsorption of moisture, respectively. Based on the observations made in all three applications it can be stated that the size and location of these tangential stress fields were strongly affected by change in climate and material orientation and resulted in situations where the wood became prone to cracking. However, the beams that were exposed to both bending and fluctuating climate experienced showed additional complex stress states that were also influenced by both material orientation and climate, where the latter led to a mentionable increase in tension in the longitudinal direction (max. 33.4%) and longitudinal-tangential shear stress (max. 14.7%).

The doctoral thesis concluded with a powerful numerical tool created based on theory that is both accessible to scientists and engineers and can be applied on both solid wood and engineered wood products. The applications for which the tool was used contributed to the understanding of wood drying and long-term behavior of wood tested in bending, and the complex stress fields that were affected by fibre orientation, climate, and load.

The implementation of the theory into a commercially available finite element software created a flexibility to create detailed geometric models, initial states and boundary conditions, but also allows for an extension of theory in future research with for example a multi-Fickian and sorption hysteresis model for a more extensive description of moisture flow, a more complex fibre reconstruction model to include fibre deviation and knots, a plasticity model to better describe failure criteria or the extended finite element method to simulate moisture-induced fracture.

Publications associated with the doctoral thesis

Florisson S, Ormarsson S, Vessby J. (2019) A numerical study of the effect of green-state moisture content on stress development in timber boards during drying. Wood and Fiber Science 51(1) 41-57.

Florisson S, Vessby J, Mmari W, Ormarsson S. (2020) Three-dimensional orthotropic nonlinear transient moisture simulation of wood: analysis on the effect of scanning curves and nonlinearity. Wood Science and Technology 54 1197-1222.

Florisson S, Muszynski L, Vessby J. (2021) Analysis of hygro-mechanical behaviour of wood in bending. Wood and Fiber Science 53(1) 27-47.

Florisson S, Vessby J, Ormarsson S. (2021) A Three-dimensional Numerical Analysis of Moisture Flow in Wood and of the Wood's Hygro-mechanical and Visco-elastic Behaviour. Wood Science and Technology.

New Affiliate Members 2022

Bioproducts Institute

The University of British Columbia (UBC) on Canada's west coast is one of the world's leading academic centres for bioeconomy research. The UBC BioProducts Institute (BPI), recently recognized as UBC's Global Research Excellence Institute, represents more than 60 researchers creating fundamental knowledge and applications from seed genetics to cutting-edge bio-refining technologies, from thermochemical and bioconversion pathways to novel bio-based products. The BioProducts Institute is developing advanced materials using nanotechnologies, nanocelluloses and lignin-based particles and fibers, to mention a few. The key differentiating factors between Bioeconomy Research at UBC and other institutions are UBC's biobased pilot scale facilities and a high level of internal and external collaboration, with researchers and industrial practitioners combining knowledge throughout a fully integrated "seeds to solutions" operation.

Faculty of Applied Science | BioProducts Institute
The University of British Columbia | Vancouver Campus
2385 East Mall | Vancouver BC | V6T 1Z4 Canada
https://bpi.ubc.ca/

Zhejiang Agricultural and Forestry University , China

Established in 1958, Zhejiang A&F University (ZAFU) is a provincial-level key university jointly built by the provincial government and the National Forestry and Grassland Administration.

The College of Engineering of Zhejiang A&F University grew out of the Department of Forest Industry (established in 1958) and the Department of Forest Products Industry (established in September 1986). The department was canceled, and the college was established in January 2002.

There are 107 faculty members, including 72 full-time teachers, 19 professors, 23 associate professors, 6 doctoral supervisors and 28 master supervisors. There are two science and technology innovation teams from Zhejiang province, one academician of Chinese Academy of Engineering, one "National Thousand Talents Program" talent, one national "young and middle-aged" science and technology innovation talent, one provincial "young and middle-aged" expert with outstanding contributions, two "Thousand Talents Program" talents, seven provincial "151" talents, and three "young and middle-aged" academic leaders of universities in Zhejiang.

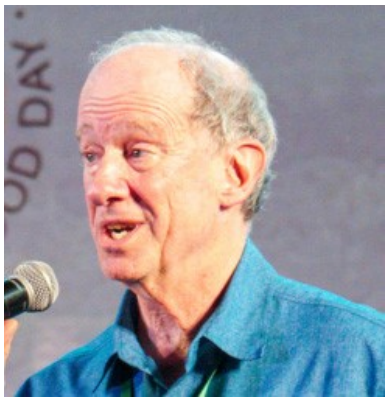
The college opened 4 undergraduate programs: Wood Science and Engineering, Industrial Design, Mechanical Design Manufacturing and Automation, High Polymer Material and Engineering and wood science and engineering (interior and furniture design), among other specialties. Wood Science and Engineering is a national characteristic specialty and dominant specialty of Zhejiang province, the country's first top-notch innovative "talent education and cultivation plan of outstanding agriculture and forestry talents" reform pilot specialty; Mechanical Design Manufacturing and Automation is the provincial key construction and a new characteristic specialty. It has one doctoral cultivation project of bamboo resources and efficient use, one first-level discipline master program of forestry engineering, and six second-level discipline master programs, including: wood science and technology, forest engineering, chemical processing engineering of forest products, biomass energy and materials, furniture design and engineering, and industrial design and theory. It has two professional master programs, mechanical engineering, and agricultural mechanization and agricultural extension. There are 1,944 students in the college, including 1,767 undergraduate students, 173 postgraduate students, and four doctoral students. https://en.zafu.edu.cn/

Financial Report

Following is the audited Treasurer's Report for the calendar year 2020, dated January 24, 2021. The dues have been broken down into several categories. The net change for 2020 was $17,890. At the end of 2020, 97 of the 117 (83%) Active and Retired fellows and 20 out of 25 of the Affiliate Members were current in their dues. Our CD and mutual fund totals $132,855 and have been invested in less secure and longer-term investments to obtain higher rates of return. Our difference between 2020 and 2019 of $17,890; mostly due to a significant increase in our indexed mutual fund and no meeting costs because of covid-19 restrictions on travel. Website costs have increased as we move our IAWS website from Germany to New Zealand.

So far as of May of 2021, we have approximately $55,000 in Capital One Bank and $3,500 in our PayPal account. Added to our $143,200 in investments, we have a total of approximately $201,700 in assets. So far, 12 of our 25 Affiliate Members have paid 2021 dues and 55% of our Active and Retired members have paid this year. As was true last year, I think dues payments are a little slower this year because of the coronavirus pandemic. We continually need funds to support our website, the PhD Thesis/Dissertation Award, the Distinguished Service Award, and technical conferences. Our finances continue to be very good.

Howard Rosen



Financial Report

IAWS Expenses and Revenues--Calendar Year 2020

Revenues (E – extra years paid by a member)

Retired dues (20)	400.00
Active dues (76)	3,800.00
Lifetime dues (0)	0.00
Affiliate member dues (22)	4,402.00
Donations (3)	180.00
Total	***$8,782.00***

Expenses

Supplies	10.00
Web Site Revision/Managing	3,574.66
Awards	1,000.00
Meetings	0.00
Wire fees Capital One	135.00
PayPal Fees	272.65
Total	***$4,992.31***

Income = $**8,782** - $**4,992** = ***$3,790***

Capital One Account

Beginning balance January 1, 2019	39,009.04
Deposits by H. Rosen	950.00
Incoming bank wires	1,652.00
Transfers from PayPal	0.00
Interest	19.85
Withdrawal – Fees	-135.00
– Wires	-1558 .74
– Checks	0.00
- PayPal	-1922.19
End Balance December 31, 2020	***$38,014.96***

Financial Report

PayPal Account

Beginning balance January 1, 2020	6,743.16
Deposits (65 active, 17 retired, 13 Affiliate)	6,190.00
Donation	80.00
Transfers	-0.00
Payments	-1,093.73
Fees	-273.83
End Balance December 31, 2019	***$11,645.60***

Total Assets

CD Bank Sandy Spring Bank **$36,422.23**

-renewed 10/12/18 at 2.75% for 35 months

-interest is accumulated

Vanguard Dividend Appreciations Index Fund **$96,432.61**

-opened 5/23/13

-dividends are reinvested

Checking + PayPal Accounts = **$49,660.56** Total Assets = **$182,515**

$164,625 (2019)

Net change **2020 – 2019** **$17,890**

I have examined the books of the IAWS Treasury Account for 2020 and have found all the details in satisfactory order.

Frank C. Beall

Frank C. Beall, Fellow, IAWS
Professor Emeritus, UC Berkeley
Date 2/24/2021

Obituary

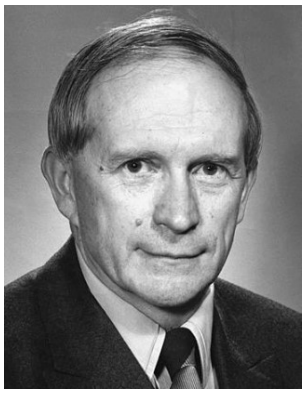
Edmone ROFFAEL

We are deeply saddened by the loss of Prof. Dr.-Ing. Edmone Roffael who passed away on 14th of January 2021 at the age of 81. A full obituary was published in European Journal of Wood & Wood Products.

Schneider, T., Behn, C. & Kües, U. Professor Dr.-Ing. Edmone Roffael. Eur. J. Wood Prod. 79, 509–510 (2021). https://doi.org/10.1007/s00107-021-01693-3 .

Obituary

David GORING



We are deeply saddened by the loss of Prof. David Goring who passed away on July 17 2021 aged 100 years. Obituaries can be found at the following links:

https://www.legacy.com/ca/obituaries/theglobeandmail/name/david-goring-obituary?pid=199776543

https://www.mcgill.ca/channels/channels/news/passing-dr-david-i-goring-1920-2021-332027.

Obituary

Dieter ECKSTEIN (15 March 1939 – 10 November 2021)

The wood science community lost an inspiring teacher and enthusiastic researcher with the passing of Dieter Eckstein. Dieter Eckstein was born on 15 March 1939 as the third child of a forester's family in the German state Hessen. Probably, his childhood very close to nature and especially the long walks with his father through the forests were the reason for him to study wood science at the University of Hamburg with the former campus in and around the castle of Reinbek close to Hamburg. In 1965 Dieter Eckstein received his diploma degree with a thesis about soft rot. His PhD thesis entitled "Development and application of dendrochronology for the dating of the historic settlement Haithabu" under supervision of Prof. Walter Liese and Prof. Kurt Schietzel (director of the Archeological State Museum in Gottorf/Schleswig Holstein) was completed in Hamburg in 1969 and much noticed by the wood science community, because it demonstrated that dendrochronology was applicable also for trees growing in a maritime climate in northern Germany. Dieter Eckstein was appointed professor in wood biology at the University of Hamburg in 1977. During the following decades, Dieter's working group in Hamburg was known worldwide as a center for dendrochronology. Many of his former students are still in leading positions in countries distributed all over the world. Throughout his scientific career, Dieter Eckstein covered all aspects of dendrochronology, including dendroclimatology and dendroecology. He was also a pioneer in applying computer-assisted data processing for the management of the flood of resulting data. During the time of the "iron curtain" in Europe, Dieter Eckstein initiated various joint projects with colleagues in Eastern Europe wherever it was possible. In the laudatio on the occasion of his 65th birthday, Dieter Eckstein was described by his colleagues in Hamburg in the following: *"Perhaps the most remarkable quality of Dieter Eckstein is his ability to identify research goals, present and future, to formulate relevant objectives, and the unrelenting persistence with which he strives to attain these goals. In persuing his goals he acted preferably in the concealment of the backstage. Effectiveness does not require many and loud words - few words and down to the point is more in line with his philosophy of life."*

He served as president of the International Tree-Ring Society for 20 years, was elected Fellow of the International Academy of Wood Science in 1987, covered the position of dean of the Department of Wood Biology of the University of Hamburg, and headed the Institute of Wood Biology and Wood Protection of the Federal Research Center for Forestry and Forest Products in Hamburg from 1995 until his retirement in 2004 (since 2008 part of the Thünen Institute/Federal Research Institute for Rural Areas, Forestry, and Fisheries). For a 4-year term he was also appointed director general of this Research Centre from 2000-2003. Even after his retirement in 2004 he was holding an office in the Hamburg institute for many more years. This office mostly had an open door which invited colleagues and students whenever they needed his advice. Many used this offer.

Dieter Eckstein passed away after a long illness on 10 November 2021. We keep him in memory as a brilliant teacher, an excellent researcher, an always helpful colleague, and a good friend.

Uwe Schmitt and Gerald Koch, Hamburg

Obituary

Dr. Chung-Yun HSE (Feb. 19, 1935-Nov. 12, 2021)

Dr. Chung-Yun Hse, a fellow of the International Academy of Wood Science, distinguished international wood scientist, and emeritus scientist in Southern Research Station of USDA passed away on Nov. 12, 2021, at the age of 87.

Dr. Hse was born in Taiwan, China on 19 February 1935. He graduated from Chung Hsing University in 1957 and obtained his master's degree in forest science at Louisiana State University in 1963. Then, he joined the University of Washington to pursue his Ph.D. in wood science and technology. He worked in the Southern Research Station of USDA for over 50 years (1967-2020) after graduating from UW in 1967. He became a consultant for the Food and Agriculture Organization of the United Nations (FAO) and United Nations Development Programme (UNDP) in 1977.

Dr. Hse's work focused on the efficient utilization of biomass including wood adhesives, wood liquefaction, and the development of evaluation methods of value-added biomass-based products. He received numerous honors and awards which included: the United States Department of Agriculture Honor Award for Superior Service (1998); the Forest Service Chief's Honor Award for Distinguished Science (2004); Fred W. Gottschalk Memorial Award for Outstanding Service to the Forest Products Society (2008); and Distinguished Service Award, Society of Wood Science and Technology (2012).

Dr. Hse was devoted to establishing the study and research platform for students and scholars all over the world. He hosted over 100 students and visited scientists from Europe, Asia, and America during his career. Meanwhile, Dr. Hse was the leading pioneer for the Sino-US cooperation in forestry science and technology, which promoted the development of forestry science and technology in China. In 1994, Dr. Hse donated to establish the Youth Science and Technology Award (Xu Zhongyun Award) in the Wood Industry Branch of the Chinese Forestry Society to encourage and recognize outstanding scholars in China. His generous and dedicated activities helped numerous international students and visiting scholars to realize their dreams. For those contributions, Dr. Hse received several recognitions from the Chinese government including: Chinese Ministry of Forestry Award for International Forestry Cooperation and Scientific Exchange (1994); Chinese Friendship Award (2001), and International Scientific and Technological Cooperation Award of the People's Republic of China (2013).

Dr. Hse was always full of passion for his life, family, and friends. He loved to travel, make food, and sing songs. During holidays, he held parties at home and invited his students to sing and cook together.

Dr. Hse always said: "I did what I had to do, and I did it my way." His life was full of meaning and giving. We are all saddened by the loss of a very good friend and colleague.

Obituary

Dietrich FENGEL (1931 – 14 November 2021)

On 14 November 2021, Prof. Dr. Dietrich Fengel passed away at the age of 90.

After his school education, Dietrich Fengel studied chemistry at the Technical University of Darmstadt from 1952 to 1959. In 1962, he received his doctorate at the "Institute for Cellulose Chemistry" under Prof. Georg Jayme, and became a leading member of the electron microscopy department. On 1 October 1963, he joined Prof. Kollmann at the "Institute for Wood Research and Wood Technology" at the Ludwig-Maximilian-University in Munich (now "Holzforschung München"). With great pioneering spirit and professional competence, he thoughtfully and steadily built up the working area "Chemistry and Ultrastructure of Wood" and gained high recognition worldwide through numerous pioneering publications of this group. A special feature of many of his works was the close linking of classical wood chemistry with the possibilities of high-resolution electron microscopy, which already proved to be a fortunate move in his habilitation thesis (1968) and led to a much-noted model of the structure of the lignified cell wall in 1970. In addition to diverse basic research on the cell wall components, the range of research topics extended from fossil woods and Egyptian tomb linen to practical issues in the pulp and paper industry. In 1974, he was appointed Professor.

A particular highlight was the publication of the comprehensive monograph "Wood - Chemistry, Ultrastructure, Reactions" (with co-author Gerd Wegener) in 1984. This textbook is still used today by students and scientists worldwide as a valued reference work.

Numerous trips abroad, lectures at international congresses and international reviewer activities, in addition to a publication list of about 200 titles and a large number of doctoral students, testify to Fengel's successful teaching and research activities in a highly specialized field within the former Faculty of Forest Sciences.

With his retirement in 1994, Dietrich Fengel ended his academic activities with his characteristic consistency. He moved back to his home region in southern Hesse and spent happy years with his wife and a large circle of friends with diverse activities and experiences in nature and in the world of theatre, music and art. Many small works of art made of wood in combination with other appreciated materials, in addition to his academic legacy, bear witness to the craftsmanship of a great scientist.

Gerd Wegener und Klaus Richter

Fellow Popa has recently edited a number of books of interest to fellows

Valentin I. Popa (editor) Pulp Production and Processing; high-tech applications, 2nd edition, De Gruyter, 2020, ISBN 978-3-11-06588305, 404 p.

I. Volf, I.Bejenari and V.I.Popa, Chapter 6- Valuable biobased products hrough hydrothermal decomposition, p. 141-161 in Valentin I. Popa (editor) Pulp Production and Processing; high-tech applications, 2nd edition, De Gruyter, 2020, ISBN 978-3-11-06588305.

D.Ciolacu and V.I.Popa, Chapter 11- Nanocelluloses: preparation, properties and application in medicine, p.317-339 in Valentin I. Popa (editor) Pulp Production and Processing; high-tech applications, 2nd edition, De Gruyter, 2020, ISBN 978-3-11-06588305.

Valentin I.Popa (editor) Sustainability of Biomass through Bio-based Chemistry, CRC Press, 2021, ISBN 978-0 -367-36595, 304 p. V.I.Popa, Chap.1 – Biomass and sustainability, p. 1-33 in Valentin I.Popa (editor) Sustainability of Biomass through Bio-based Chemistry, CRC Press, 2021, ISBN 978-0-367-36595.

IAWS Website

We frequently post news to the website so remember to check with the latest news from fellows. To post a news item to the web site send content to the Secretary. Please note that the new website does not require any login. We would like to use the email woodscience@iaws-web.org but unfortunately some fellows do not receive this email so please add it to your address book and maybe send a test email to train your computer.

Awards

Fellow Prof. Jack Saddler is the recipient of the 2021 Researcher Award from the BC Bioenergy Network. The inaugural award ceremony was held on BC Bioenergy Day. Dr. Saddler, who served as the NSERC Industrial Senior Chair and Task Leader for the IEA Bioenergy Task 39, has been recognized by the Network for his many leadership contributions to advancing bioenergy research within the province of British Columbia.

“I very much consider this to be a team award,” Dr. Saddler said during his acceptance speech at which time, he named team members individually. “All of these people are making such an important impact both in BC and globally.”

Meetings

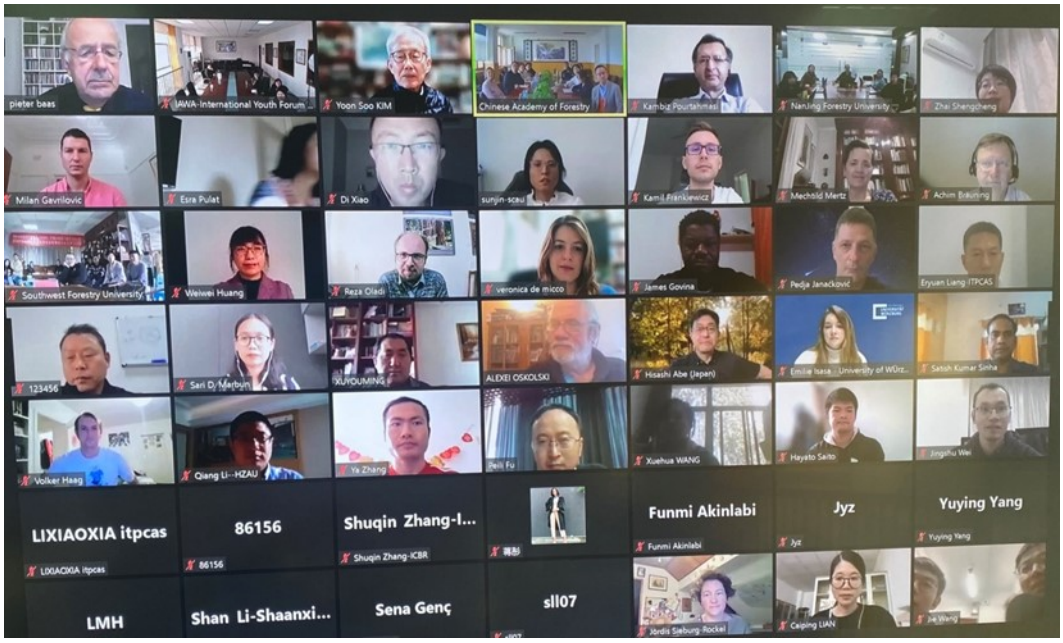
The 8th IAWA-China Group Annual Meeting and 2021 International Youth Forum for Wood Anatomy, Online, Chengdu, China, November 13-14, 2021

The 8th IAWA-China Group Annual Meeting and 2021 International Youth Forum for Wood Anatomy was held online on November 13-14, 2021, organized by Sichuan Agricultural University and Inspection and Test Center (Chengdu) of National Furniture Product Quality, co-sponsored by IAWA, IUFRO (5.16.00) and IAWS together. The theme of the conference is “Promote Ecological Wood Anatomy for Sustainable Wood Utilization”. The local organizers of China, the former Editor-in-Chief of IAWA Journal Pieter Baas and IAWA Secretary Yafang Yin gave opening remarks. The President of IAWS Yoon-Soo Kim, and the Coordinator of IUFRO Division 5 Pekka Saranpää were invited to participate the conference.

The China Group Annual Meeting was held in the morning on November 13th and 14th. More than 350 representatives from over 50 related universities, research institutes, forest products inspection centers and wood companies attended this IAWA-China Group Annual Meeting. There were two keynote lectures and 39 oral presentations presenting their research progress on xylem formation, dendrochronology, wood identification, wood properties, wood and bamboo utilization, and archaeological wood etc. After the voting of the local committee members, the Excellent Presentation Awards (EPA) of the IAWA-China Group were awarded to eight qualified graduate students. The first prize winners are Liu Jiabao from Anhui Normal University and Liu Xing from Nanjing Forestry University. The second prize winners are Yong Lu from Nanjing Forestry University and Xu Haocheng from International Center of Bamboo and Rattan. The third prize winners are Chen Yan from Sichuan Agricultural University, Li Wen from Fujian Agricultural and Forestry University, Huang Yaqian from Nanjing Forestry University and Jia Huiwen from Southwest Forestry University.

The Youth Forum was held in the afternoon on November 13th. This is the first time for IAWA to organize an international youth forum for wood anatomy. Over 160 representatives took part in this forum. There was one keynote lecture and 15 oral presentations, by speakers from 10 countries including Brazil, Canada, China, Germany, Hungary, Indonesia, Japan, Poland, Serbia, and South Africa, presenting the research referring to ecological wood anatomy, wood identification, and the relationship between wood anatomy and properties. Three best reports were selected by the International Scientific Committee of the forum. The first prize of the conference report was awarded to Yana Campos Rizzieri, Brazil (Ontogeny of divided vascular cylinders in Serjania: the rise of a novel vascular architecture in Sapindaceae), the second prize went to Qi Chen, China (Hygroscopic swelling of moso bamboo cells), and the third prize was won by Volker Haag, Germany (Anatomical identification of charcoal and briquettes - developments in the international charcoal trade and the increasing use of substitutes from ntfps).

The 8th IAWA-China Group Annual Meeting, Chengdu, China, 2021.



The 2021 International Youth Forum for Wood Anatomy, Chengdu, China, 2021

The abstracts (both in English and Chinese) of the 8th IAWA-China Group Annual Meeting and 2021 International Youth Forum are available online under the download menu of the IAWA website (http://www.iawa-website.org/en/Downloads/Publications/index.shtml).

The 9th IAWA-China Group annual meeting will be held in 2022, at South China Agricultural University, Guangzhou, China.

Qi Jingqiu, Liu Jie, Jiao Lichao, Shan Li, Zhai Shengcheng, China

[Contributed by Fellow Yafang Yin, Beijing]

263rd ACS Spring National Meeting in San Diego

Latest News Meetings

Probing Structure & Transforming Biomass for Value Added Opportunities:
A Symposium in Honor of the Lifetime Contributions of Prof. D. S. Argyropoulos

March 20-24, 2022
(Hybrid in person and online format)

It is our distinct pleasure to contact you in order to invite you to a celebration on the occasion of the phase retirement of our friend and colleague Professor Dimitris Argyropoulos of North Carolina State University.
Our symposium aims to honor his numerous contributions to our science. Professor Argyropoulos is best known to our community for the development of the invaluable pivotal analytical tool of 31P NMR with numerous applications by all of us. The work of his team over the years has allowed the biomass/biomaterials chemistry community to embark and address detailed investigations promoting biomass utilization on many fronts. These contributions further advance the vision of a forest based biorefinery. These efforts arrived at an opportune juncture since our community works so intensely these days at promoting the principles of Green Chemistry and a Sustainable Circular Economy. It is therefore a timely pleasure to invite you to gather in San Diego to celebrate and discuss our progress to date.
We thus welcome contributions on the wide range of topics the work of Professor Argyropoulos has covered such as: Development & application of new methods to Understand, Modulate, Catalyze & promote the transformation of wood biopolymers to New Materials, Chemicals & Energy.
While we are not able to offer any reimbursement for your participation, this is promised to be a truly unique scientific and social occasion. There is a link to the conference on the IAWS website.

Claudia Crestini, Department of Molecular Science and Nanosystems
Ca'Foscari University of Venice, Italy
Email: claudia.crestini@unive.it

Nathalie Lavoine, Department of Forest Biomaterials, North Carolina State University, USA
Email: nmlavoin@ncsu.edu

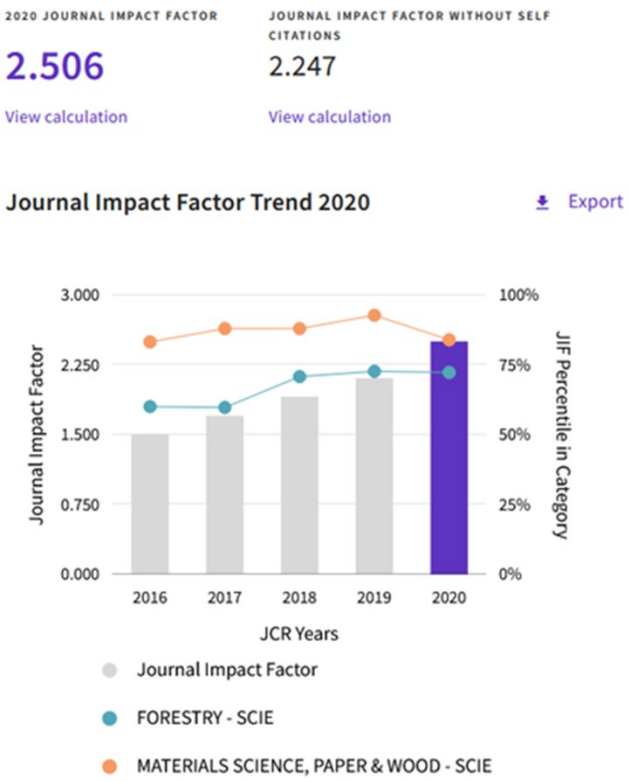
Lucian Lucia, Department of Forest Biomaterials, North Carolina State University, USA
Email: lalucia@ncsu.edu

Wood Science & Technology

All in all, the publisher (Springer) is continuously satisfied with the bibliographic and commercial status of the journal. The recent increase in impact factor is taken as positive sign that the scope of the journal, the discipline of wood material science, and the contributions of the wood science community are of continuing relevance within academia and industrial research. Our last year attempt to renew several members of the editorial board was well accepted.

The editiorial board is composed of the following colleagues most of whom are IAWS fellows:

G. Daniel, Uppsala, Sweden
P. Evans, Vancouver, Canada
P. Gerardin, Vandoevre-lès-Nancy, France
M. Hughes, Aalto, Finland
F. Kamke, Corvallis, OR, USA
S. Kelley, Raleigh, NC, USA
Y. Matsumoto, Tokyo, Japan
C. Mei, Nanjing, China
S. Nisgoski, Curitiba, Brazil
E. Obataya, Ibaraki, Japan
W. Olek, Poznan, Poland
B. Ozarska, Richmond, QLD, Australia
A. Potthast, Vienna, Austria
L. Salmén, Stockholm, Sweden
P. Saranpää, Helsinki, Finland
U. Schmitt, Hamburg, Germany
Y. Xie, Harbin, China
H. Yamamoto, Nagoya, Japan
Y. Yin, Beijing, China
S. Zelinka, Madison, WI, USA



Journal Impact Factor (JIF)

The JIF of WST nicely increased over the last years and especially in 2020 we improved considerably. However we have to accept that despite this improvement we lost two positions in the ranking in Category Materials Science, Paper and Wood. We are now # 4 of 22 journals, and still in Q1. This is because Journal of Wood Chemistry and Technology improved JIF to 2.63 and Wood Material Science & Engineering has a JIF of 2.55.

Klaus Richter 6/11/2021

IAWA Journal

The IAWA Journal is an international quarterly periodical publishing original papers and review articles on any subject related to the microscopic structure of wood and bark of stems and roots of woody plants (including palms and bamboo). Apart from anatomy per se, subjects at the interface of microstructure and developmental genetics, systematics, paleobotany, archaeology, tree biology, ecology, forestry, structure property relations of timber, biomechanics, wood identification, etc. are welcomed.

Journal Impact Factor

2020 Journal Impact Factor: 2,308
5-year Impact Factor: 3,013

Journal Ranking—Wood Science & Technology (Google Scholar)

	h-index
Cellulose	56
BioResources	40
European Journal of Wood & Wood Products	26
Holzforschung	26
Wood Science & Technology	24
Journal of Wood Science	23
Journal of Bioresources & Bioproducts	22
International Association of Wood Anatomists Journal	21
Journal of Renewable Materials	20
Maderas Ciencia y Tecnologia	20
Journal of Wood Chemistry & Technology	18
Wood Material Science & Engineering	18
Floresta e Ambiente	15
Nordic Pulp & Paper Research Journal	15
Wood & Fiber Science	15
Cellulose Chemistry & Technology	15
Forest Products Journal	14
Wood Research (Bratislava)	13
Acta Facultatis Xylologiae Zvolen res Publica Slovaca	12
Journal of Biobased Materials & Bioenergy	11

Nominations for IAWS PhD Award

The International Academy of Wood Science (IAWS) wishes to provide recognition to outstanding thesis/dissertation research at the PhD level by students throughout the world. I would like you know that the IAWS PhD Dissertation Award for 2022 is open to receive nominations and/or applications. The deadline is **June 15, 2022**. Please consider to nominate your students. Nomination can be made by anyone and is not limited to IAWS Fellows.

Here are the detailed rules:

- 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 thesis/dissertation and a one-page CV of the student.
- 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.

Fellows Report

Distribution of Fellows by Country

Country	Number of fellows	Females
Australia	16	1
Austria	15	2
Bangladesh	1	
Belgium	2	
Brazil	5	1
Canada	42	3
Chile	4	
China	31	4
Costa Rica	1	
Czechia	2	
Denmark	5	
Egypt	1	
Finland	17	3
France	36	7
Georgia	1	
Germany	42	1
Greece	2	
Hungary	1	
India	9	
Indonesia	1	
Ireland	1	
Israel	4	
Italy	4	2
Japan	57	1
Korea, South	8	

Fellows Report

Distribution of Fellows by Country

Country	Number of fellows	Females
Latvia	3	
Malaysia	2	1
Mexico	2	1
Netherlands	2	1
New Zealand	13	1
Norway	4	
Philippines	2	
Poland	7	
Portugal	1	
Romania	4	
Russia	15	2
Slovakia	3	
Slovenia	3	3
South Africa	5	1
Spain	2	2
Sweden	30	1
Switzerland	12	2
Taiwan	5	1
Turkey	1	
United Kingdom	9	
USA	146	6
Grand Total	**579**	**47**
Active Fellows	**210**	
Retired Fellows	**273**	
Deceased Fellows	**165**	

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 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 elected in 2019
Voichita Bucur (Australia)
Bertrand Charrier (France)
Jozica Gricar (Slovenia)
Keiko Kuroda (Japan)
Jean-Michel Leban (France)
Roger Moya-Roque (Costa Rica)
Shri Ramaswamy (USA)
Sabine Rosner (Austria)
Ute Sass-Klaassen (Netherlands)
Rita Scheel-Ybert (Brazil)
Tatjana Stevanovic Janezic (Canada)
Maija Tenkanen (Finland)
Teresa Terrazas (Mexico)
Brenda Wingfield (South Africa)
Tomoya Yokoyama (Japan)
Makoto Yoshida (Japan)
Timothy Young (USA)
Amy Zanne (USA)
Meiyun Zhang (China)
Xiaoyan Zhou (China)
Tanya Zimmerman (Switzerland)

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)

Fellows deceased in 2019
Marian BABIAK, Slovakia
Robert KENNEDY, Canada

Fellows deceased in 2018
Lothar GöTTSCHING, Germany
Hikaru SASAKI, Japan
Wayne WILCOX, USA
Mikhail ZARUBIN, Russian Federation

Fellows deceased in 2017
Peter ALBERSHEIM, USA
Kazumi FUKAZAWA, Japan
Takayoshi HIGUCHI, Japan
Peter F. NELSON, Australia
Derek H. PAGE, Canada.

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
SOUTHWEST FORESTRY UNIVERSITY, China
SCION, New Zealand, www.scionresearch.com
SEOUL NATIONAL UNIVERSITY, Republic of Korea www.adhesion.org
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/

Guidelines for Highlights

The purpose of the Highlights, published in the Bulletin, is to promote the integration of the fields of wood science. Fellows are encouraged to submit Highlights to any of the Officers.

Highlights should:

- Be free of jargon and highly technical language and (unexplained) acronyms, and be readily
- understood by wood scientists in other fields
- Be no more than 1000 words (roughly 4 pages in the Bulletin)
- Begin by providing a brief background or framework to put the report in perspective
- Contain important references to the literature for further reading
- Give due credit to the work of others in the field, not just summarize the author's work
- Finish with a statement of future direction in the area

Nomination for Election of Fellows

The nomination process is relatively simple; all you need to do is fill in the Nomination form and send it to me. For those to be considered in the next election, the deadline for receipt of nominations is **1 August 2022**.

I then contact the nominee, confirm their willingness to stand for election, and then have them complete the more detailed application form. The Executive Committee reviews the nominees to determine if their applications are complete, and then, in early September submits the completed applications to the membership for ballot.

Typically, scientists who are nominated are either mid-career, showing great promise and accomplishments, or near the end of their career, when their peers feel that they have made major continuing contributions over their professional life.

There are several areas of Fellowship that are under-represented in IAWS. One is Fellows from developing countries, where the number of refereed scientific contributions, as viewed by the developing world, may be somewhat lacking because of the past or current inability to publish in the leading journals, and/or difficulty with the English language. The other area relates to the few numbers in certain scientific disciplines; if you are in one of those, you are aware of that. The Executive Committee is also interested in election of wood science managers who have had a major impact through their oversight of research activities, without necessarily having the expected number of refereed publications. The academy is also under represented by female researchers so we encourage nomination of female colleagues.

Please spend some time thinking about potential nominees, perhaps looking through the Directory and the listing of Fellows by countries. Since we do not “promote” ourselves to gain members, it is up to the Fellows in the Academy to provide the basis for this recognition.

Yoon Soo Kim

NOMINATION FORM [You can download this form from the "New Fellows" page on the website]

Nomination for Fellowship of the International Academy of Wood Science

Name of Candidate: Position of Candidate: Candidate Mailing Address:

Candidate email address (required!):
Candidate's Background (maximum 100 words):

Reasons for the candidate's nomination (outstanding in his/her field; substantial contributions to wood science; major results in management of research; etc):

Date:
Nominator name:
Email address:
Telephone:

Please return to: Yoon Soo Kim and Lloyd Donaldson

IAWS

www.iaws-web.org

President: Prof. Yoon Soo Kim
Vice President: Prof. Stavros Avramidis
Past President: Dr Robert Evans
Treasurer: Dr Howard Rosen
Board Chair: Prof. Siqun Wang
Secretary: Dr Lloyd Donaldson