INTERNATIONAL ACADEMY OF WOOD SCIENCE

BULLETIN 2016-I

www.iaws-web.org/

July 2016

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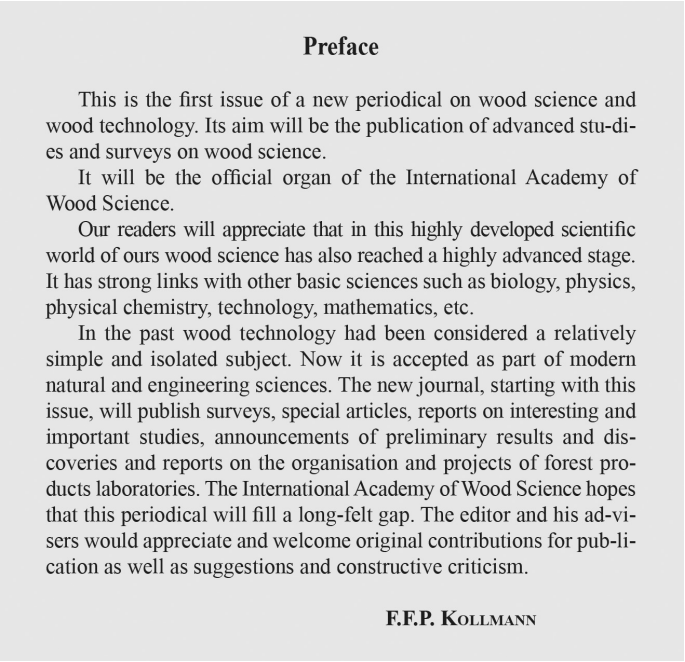
MESSAGE FROM THE EXECUTIVE COMMITTEE

The year 2016 is the 50th anniversary of the International Academy of Wood Science, and provides a good opportunity to look back at what the role was for the Academy at the time of its formation and to discuss the role which IAWS could play in the future to support wood science with its various disciplines.

According to the objectives laid down in the Constitution from 1966, IAWS shall

- *promote wood research and wood science on a highly scientific and technical level,*
- *on request, represent wood research and wood science at international or national meetings of other organizations dealing with the production and/or consumption of wood,*
- *focus the attention of governments, parliaments, industries, the press, associations, etc., on the importance of wood research and wood science.*



Preface

This is the first issue of a new periodical on wood science and wood technology. Its aim will be the publication of advanced studies and surveys on wood science.

It will be the official organ of the International Academy of Wood Science.

Our readers will appreciate that in this highly developed scientific world of ours wood science has also reached a highly advanced stage. It has strong links with other basic sciences such as biology, physics, physical chemistry, technology, mathematics, etc.

In the past wood technology had been considered a relatively simple and isolated subject. Now it is accepted as part of modern natural and engineering sciences. The new journal, starting with this issue, will publish surveys, special articles, reports on interesting and important studies, announcements of preliminary results and discoveries and reports on the organisation and projects of forest products laboratories. The International Academy of Wood Science hopes that this periodical will fill a long-felt gap. The editor and his advisers would appreciate and welcome original contributions for publication as well as suggestions and constructive criticism.

F.F.P. KOLLMANN

Fig. 1: Preface in the first issue of Wood Science and Technology journal from 1967

As a newly established Academy, IAWS started with a small number of Fellows (25) and increased to 49 in 1968. The First President Kollmann (Fig. 1) stated that the number of Fellows had to be limited to a maximum of 100 to secure high scientific quality.

IAWS activities during the early years were mainly focused on the creation of an action program, on the stabilization of its financial situation, and on the organization of the first meetings. The first scientific meeting was held in Salzburg/ Austria in 1967.

What is the difference between an Academy and other organizations? An Academy is defined as an organization or institution supporting or advancing something in a broader sense. Institutions such as the 'International Association of Wood Anatomists' or the 'Forest Products Society' are strongly focused on only a specific discipline. When looking closer at the third point of the IAWS objectives from 1966, it becomes clear that our Academy incorporated what we now call "umbrella" organizations. Did we achieve this ambitious goal over the past years? A critical review of our activities shows that we only partially did.

One prominent activity is our responsibility for the journal *Wood Science and Technology* (WST), founded in 1967 as the official organ of the Academy (Fig. 1). IAWS Fellows Franz Kollmann was first editor-in-chief from 1967 to 1976, Horst Schulz from 1977 to 1995 (co-editors: Tore E. Timell, Walter Liese), Gerd Wegener from 1996 to 2013 (co-editors: David J. Barrett, Robert W. Kennedy, John R. Barnett), and since 2014, Klaus Richter (co-editor: Robert Evans); these editors and co-editors continuously further developed the journal and improved its quality. WST is today well recognized as one of the leading internationally wood science journals and its impact factor presently is close to 2.0, which is a very good value as compared to other wood science journals. On behalf of the Academy, we are very grateful to these Fellows for their enormous work for WST and especially to the publisher Springer Science for this long-term fruitful cooperation.

Holding annual meetings is another important activity. We have had either our own meetings or were co-organizers of meetings with other complimentary scientific organizations. Many of these meetings were highly successful, and some suffered from low attendance, but all were worthwhile because of their high scientific standard. Let us highlight two recent meetings, which are representative of some of the others: In 2011, we had our annual meeting in Stockholm, Sweden under the title "Novel Materials from Wood or Cellulose," which was well attended and gave attendees an excellent overview on what a large variety of products can be made from wood. The annual meeting of 2013 was held in in Nanjing, China as a joint meeting together with the International Association

of Wood Anatomists (IAWA). Although wood anatomy was the main focus of this meeting, IAWS presentations covered a broad field of wood science, from wood identification over structure/function relationships to wood composites and nanocellulose. These two examples demonstrate that annual meetings are important in bringing together wood scientists from all over the world and an important activity to continue. Also, our meetings have always been open to non-Fellows.

According to our constitution, last amended in 2015, IAWS should take the responsibility to act as a leading international organization covering wood science in its broadest sense. The constitution clearly expresses this, as follows:

Article 2/Section1: The Academy has the objective of promoting on the international level the concerted development of wood science and it's standing by:

- *Recognizing meritorious wood scientists by their election as Fellows,*
- *Honoring distinguished achievements in the science of wood,*
- *Promoting a high standard of research and publication, and*
- *Any other appropriate activity that contributes to the fulfillment of the above objectives.*

Today, wood utilization is receiving increased attention from a society strongly depending on fossil raw materials that might change to a more bio-based economy, obviously, the utilization of wood has a lot of advantages. Storage capacity for CO_2, bio-economy, and sustainability are only a few key attributes underlining wood's importance.

Regarding the involvement of IAWS in process design and guiding research activities on an international level, and its role in defining future-oriented wood research together with decision makers in politics and funding organizations, the Academy has played a less significant role.

Therefore the question has to be raised "How should we continue in the future?" In the same way as before by continuing our journal WST, electing new Fellows, and holding annual meetings? Could we extend our activities to deal with the big questions or problems associated with the utilization of wood? We have the expertise and numerous Fellows in leading positions. Shouldn't we be more involved in finding solutions for those important questions? Couldn't we be more active in stimulating those discussions and publishing e.g. IAWS position papers on specific topics? In that way our Academy would obtain much higher acknowledgement in our wood science community and we might have the chance to more effectively act as a bridge between the various disciplines as well as between science, industry and politics. We remember a very fruitful discussion with some Fellows during the conference dinner of our annual meeting

in Sopron/Hungary in 2013 clearly stating that it should be our duty to distinctly increase our activities in this matter.

Most importantly, now we are celebrating 50 years of our Academy. We congratulate the newly elected Fellows, and with camaraderie to the entire Fellowship, whether you are attending or not, we are wishing for an informative conference and fruitful discussions at the Anniversary 2016 Plenary Conference.

Uwe Schmitt/Hamburg
Robert Evans/Melbourne
Lennart Salmén/Stockholm
Yoon Soo Kim/Gwangju
Howard Rosen/Silver Spring
Roberta Farrell/Hamilton
Holger Militz/Göttingen

TREASURER'S REPORT 2016

Below is the audited Treasurer's Report for the calendar year 2015. The dues have been broken down into categories and the E is for "extra" year's payment. The net change for 2015 was $5,546. At the end of 2015, 115 of the 130 (88%) Active and Retired fellows and all of the Affiliate Members were current in their dues. Our CD's and mutual fund totals $81,259 and we have invested in less secure and longer term investments to obtain higher rates of return. The strength of the US dollar over many other currencies, especially the euro, means our funds have increased in buying power in those countries. We continue to purse creative avenues to continue the support from fellows and organizations. With expansion of the IAWS Website, regular technical meetings, the PhD Thesis/ Dissertation Award, the Distinguished Service Award, and inflation; continued revenue is essential to preserve our quality programs. Last year we started paying and receiving funds for our 50th Anniversary Meeting in Paris, France. We have made some preliminary payments of $5598 in preparation for the event, but have only taken in $2630 in registration so far; thus our net change would have $2698 higher without this special event.

So far in 2015, we have approximately $25,000 in Capital One Bank and $26,000 in our PayPal account. Added to our $84,000 in savings, we have a total of approximately $135,000 in assets. We need to contact delinquent members and actively encourage perspective Affiliate Members. All but 6 of our 21 Affiliate Members have paid 2016 dues and 59% of our Active and Retired members have paid this year. Our finances remain very sound.

Howard Rosen, IAWS Treasurer April 25, 2016

IAWS Expenses and Revenues--Calendar Year 2015

Revenues (E – extra years paid by a member)	
Retired dues (34 + 12E)	920.00
Active dues (67 + 5E)	3,600.00
Lifetime dues (9)	5,370.44
Affiliate member dues (19)	3,723.00
50th Anniversary Meeting	2,630.00
Donations (3)	1,150.00
Total	***$17,393.44***
Expenses	
Printing/mailing/webpage	183.00
Web Site Revision/Managing	680.33
Meetings	4,350.00
50th Anniversary Meeting	5,597.64
Foreign bank/wire fees Capital One	255.00
PayPal Fees	423.36
Total	***$11,489.33***

Income = $**17,393.44** - $**11,489.33** = ***$5,904.11***

Capital One Account	
Beginning balance January 1, 2015	18,364.45
Deposits by H. Rosen	1,662.00
Incoming bank wires	5,043.44
Transfers from PayPal	14,512.28
Interest	38.03
Withdrawal – Fees	-255.00
– Wires	-7,697.64
– Checks	-1,250.00
– Cash	-1,400.00
End Balance December 31, 2015	***$29,017.56***

PayPal Account	
Beginning balance January 1, 2015	7,535.84
Deposits (59 active, 26 retired, 5 life, 9 Support)	8,270.00
50th Anniversary registration	2,630.00
Donations	50.00
Transfers	-14,512.28
Payments	-680.33
Fees	-423.36
End Balance December31, 2015	***$2,869.87***

Total Assets

- CD Intervest National Bank **$33,148.57**
  - -renewed 10/16/13 at 1.55% for 3 years
  - -interest is accumulated
- Vanguard Dividend Appreciations Index Fund **$48,110.83**
  - -opened 5/23/13
  - -dividends are reinvested

Checking + PayPal Accounts = **$31,887**Total Assets = **$113,147 (2015)**
- $107,601 (2014)
Net change **2015 – 2014** **$ 5,546**

I have examined the books of the IAWS Treasury Account for 2015 and have found all the details in satisfactory order.

Frank C. Beall

Frank C. Beall, Fellow, IAWS
Professor Emeritus, UC Berkeley
Date 2/3/2016

REPORT: INTERNATIONAL CONFERENCE AND 2016 ANNUAL IAWS MEETING IN PARIS

From 1st to 3rd June 2016, the Academy celebrated its 50th anniversary with an international conference held in Paris, the city where the Academy was founded in 1966. Under the motto 'Wood Science for the Future', the conference theme underlined that wood and wood products nowadays achieve more and more attention as fossil raw materials are increasingly to be replaced by renewable raw materials.

The conference was held in the historic rooms of the French Academy of Agriculture (FAA) in the very heart of Paris. On behalf of the Academy, it is gratefully acknowledged that FAA hosted our meeting in their building. On Wednesday evening, 1st June, participants and their accompanying persons enjoyed a welcome reception in the FAA library. The conference started on 2nd June with an opening speech by President Uwe Schmitt and welcome addresses by Patrick Ollivier, permanent treasurer of FAA, and Fellow Xavier Deglise who did an extraordinarily good job as head of the organizing committee. Fellow Gerd Wegener from the Technical University of München was honoured with the Acade-

my Lecture for his outstanding achievements in wood science and his long-year support of the Academy, e.g. as editor-in-chief of our journal *'Wood Science and Technology' from 1996-2013*'. His lecture was entitled '1966-2016: Science and Use of Wood in a Changing World' and focused mainly on the increasing global role of forests and wood utilization for a future post-fossil society. The situation and developmental aspects of forest resources worldwide as well as wood and wood products was highlighted. Also, the need of continuing innovation was identified as a must for wood science and wood industry. Fellow Wegener finally also pointed out that wood science is increasingly becoming a broader material science requiring a certain balance between traditional wood science and enhancing its standing within the scientific community.

Group photo of conference participants in the lecture hall of the building of the French Academy of Agriculture

Another highlight of the conference was the presentation of the 2015 gold medal IAWS PhD prize winner Michaela Zauner who made her dissertation at ETH in Zürich under the supervision of Fellow Peter Niemz. The title of her presentation was *'In-situ Synchrotron-Based Tomographic Microscopy of Uniaxially Loaded Wood: In-situ Testing Device, Procedures and Experimental Investigations'*. An abstract of Michaela Zauner's dissertation has been published in our 2015/1 Bulletin. Altogether, 34 very interesting and informative presentations were given subdivided into the sessions 'Chemical Biology', 'Wood Technology', 'Pulp and Paper', 'New Products', 'Wood Biology and Wood Protection', and 'Future Aspects'. The final presentation by Fellow Yoon Soo Kim covered the decline of wood science and technology education programs in several northern hemisphere countries, particularly in English speaking countries, a severe problem which was lively discussed. Overall, the conference excellently demonstrated the wide span of fields in wood science and also the challenge for wood science to fit the future needs in a more and more bio-based society.

During a very interesting post-conference tour from 4-6 June, under the guidance of Fellow Xavier Deglise, a smaller group visited Reims and Epernay in the Champagne region as well as Èpinal and Nancy in the Lorraine region for the presentation of the wood engineer's school and two research units. A detailed

Group photo of post-conference-tour participants in the lecture hall “Philippe SEGUIN” of ENSTIB in Èpinal

insight in the teaching and research activities in ENSTIB (Ecole nationale Supérieure des Technologies et Industries du Bois) with the multidisciplinary research laboratory LERMAB (Laboratoire d’études et de recherche sur le matériau bois) of Lorraine University in Épinal was provided by its director and newly elected IAWS Fellow Philippe Gérardin. On the final day INRA (French National Institute for Agricultural Research) in Nancy-Champenoux presented to the group its various research activities in the field of forestry and wood; many thanks to its director Erwin Dreyer for his informative introduction of the centre and for several presentations of his researchers. The post conference tour ended in the late afternoon of 6 June in Paris.

Uwe Schmitt/Hamburg
Howard Rosen/Silver Spring
Xavier Deglise/Nancy

OBITUARIES

ROLF BIRKELAND (1938-2015)

Rolf Birkeland, one of chieftains of the wood industry, passed away on March 12th 2015, 77 years old.
His entire professional life was devoted to wood. He grew up in Grünerløkka in Oslo, Norway, and completed his civil engineering degree at the Department of Mechanical Engineering at Norwegian Institute of Technology (NTH; – now the Norwegian University of Science and Technology, NTNU) in 1961. He then became a researcher at the Norwegian Institute of Wood Technology. From 1966 to 1978 he was Development Manager and head of the Department of Timber Industry at the National Institute of Technology (Norway). He then became head of institute at the Norwegian Institute of Wood Technology until 1993.In 1982 he was appointed adjunct professor in Timber Processing at NTH, and from 1993 he was also appointed adjunct professor in Timber Processing at Norwegian Agricultural University (NLH; – now the Norwegian University of Life Sciences). In 1995 he was appointed full time professor in Wood Technology at NLH, a position he held until he retired in 2002.

There was hardly anyone who has had so extensive contact network in the wood industry as Rolf Birkeland. He had also important positions in various national and international scientific organizations. He was a prolific writer with numerous articles in national and international journals.
It was as a lecturer Rolf was in his real element. With excellent illustrations, rich experience, elegant language and a good temperament, he could catch the attention of any audience.

Rolf had an eye for wood, but also for other materials. He constructed, built and repaired, and in the carpenter's workshop he enjoyed himself. He was very active in his spare time. But when he calmed down, he was into reading, drawing and writing.

The wood industry has lost a solid scholar.

His wife Elisabeth and his children Ellen and Harald have lost an enthusiast, and his grandchildren have lost a grandfather who was the epitome of learning.

Submitted by Birger Eikenes and Per Skogstad

SHIGEO ISHIDA (1920-2013)

We have been informed that Fellow Shigeo ISHIDA in Japan passed away in 2013 at the age of 93. He was born in 1920 and graduated from Hokkaido University. He has worked as Professor at Hokkaido University since 1947 until he retired in 1984. He was appointed as full professor in 1965 and accomplished pioneer works on frost cracks of trees growing in the cold region. His advanced studies on wood micromorphology using scanning electron microscopy with the late Prof. Jun Ohtani were highly appreciated in Japan. Due to his academic achievements, he was honored as Emeritus Professor from Hokkaido University in May 1984.

Submitted by Prof. Yuzou Sano at Hokkaido University

ANTS TEDER (1936-2016)

Ants Teder, Professor Emeritus at KTH, Stockholm Sweden passed away on January 31, 2016. He is survived by his children Marita and Paul and their families. Ants Teder came as a child with his family from Estonia to Sweden after World War II. The family quickly established themselves in Sweden. Ants graduated with honours from the Royal Institute of Technology, KTH, in Stockholm with his doctorate in the subject of cellulose in 1969 with the thesis “Some aspects of the chemistry of polysulfide pulping”. Ants joined the Cellulose Industrial Central Laboratory in 1960 and took over as head of the Department of Pulping Technology in 1975 for the Swedish Wood, Pulp and Paper Research Institute (STFI), today Innventia AB. Ants held the post of Research Director in 13 years to become Senior scientist and Scientific advisor.

Ants became Professor in cellulose technology at KTH in 1992, but had already in in 1983 been assigned with the Professor’s name. In 1988, Ants was elected TAPPI Fellow and in 1992 elected as Fellow of the International Academy of Wood Science. Together with Professor Nils Hartler, Ants was awarded the 1993 Marcus Wallenberg Prize for research on modified sulphate cooking which began at STFI in the early 1970s. Ants was a dedicated researcher and his efforts were internationally recognised. His main research efforts was I the area of (sulphate) kraft pulping, the chemistry around the recovery boiler and on the

various stages of chemical bleaching chemistry. His research resulted in that Swedish kraft pulp mills were the first in the world to be eco-friendly adapted by introducing modified sulphate cooking, oxygen bleaching and elimination of chlorine gas.

Ants was also a very modern Director according to the concept of "management by walking around". He always worked in teams of scientists and engineers whom he educated and developed. Many of his co-workers got leading positions in the industry while others became recognised scientists. Those of us who had the privilege to have Ants as head remembers his razor-sharp intellect and analytical ability as both encouraged and challenged. Ants was also extremely loyal to his employees. 2001 a big party for Employees was held when he retired from STFI. Anyone who worked at STFI during his years as Research Director (1975-1988) was invited, from near and far; a surprise party where Ants got a wide recognition as the Director and leader he was. Ants was a model for many and his achievements will long be remembered. We are many who miss Ants, but his spirit and glow lives on through all the people he has influenced. This is how one can characterise an important and unique fellow being.

Submitted by Colleagues of (STFI) Innventia

HONOURS AWARDED TO FELLOWS

Prof. Holger Militz receives Carl-Olof Ternryd Research Prize

Prof. Holger Militz, department head in Wood Science at Georg-August-University Göttingen, has received an important research prize at Linné-University Växjö, Sweden in April 2016. The prize (300.000 SEK) was donated by Ternryd Foundation for strengthening research cooperation between Växjö and Göttingen. Militz was honoured for his internationally renewed research in wood preservation and wood modification technology. He and his research group developed several innovative technologies to protect wood against weathering and biological degradation. Some of the processes are industrialized in Europe and in New Zealand.

FIFTY-YEAR ANNIVERSARIES

Congratulations to the journal *Cellulose Chemistry and Technology,* founded by Cristofor Simionescu who was a member of IAWS, which is celebrating 50 years from its foundation. Submitted by Valentin I. Popa

The International Academy of Wood Science was established on 2nd June, 1966, as remarked several times in this Bulletin, and celebrated with the *50 Years of IAWS Wood Science for the Future* conference in Paris, 1-3 June 2016.

NEWLY ELECTED FELLOWS 2016

KATARINA ČUFAR
Department of Wood Science and Technology, Biotechnical Faculty, University of Ljubljana, Slovenia

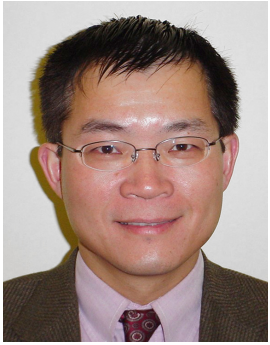
Professor Čufar has 34 years R&D and teaching experience in wood science andtechnology. She has published more than 65 referred papers in journals on ISIlist and over 50 mainly per reviewed articles in other journals as well as ca.20 book chapters, all related to wood, less known tropical wood species, tree growth, dendrochronology, wood and phloem formation, wood quality and wood in cultural heritage. She led several projects, introduced dendrochronologyin her home country and developed broad interdisciplinary and internationalcollaboration. Besides dendrochronology and wood anatomy she and her teamhave reputation in investigating wood formation and response of trees to climate. Currently she is leading the applied project Rational use of beech-wood. Her team is the only one in the country dedicated to wood anatomy and wood identification, and leading in the field of wood science and dendrochronology in Slovenia. They cooperate and support all kind of applied research and consultancy related to wood structure and quality by great variety of users.

PHILIPPE GERARDIN
Laboratoire d'Etudes et de Recherche sur le Matériau Bois (LERMAB), University of Lorraine, Nancy, France

Prof. Philippe Gerardin research activities consist of 3 main fields of investigations, all related to Wood Chemistry and Wood Sciences, as follows:

- research and development of new wood protecting antifungal agents andformulations. This topics is aimed to the development of new wood protecting treatments involving synthesis of new biocides as well as new formulations, but also to all the aspects concerning evaluation of fungicidal activities of these new products or treatments and their effect on fungal metabolism.
- thermal and chemical modification of wood for development on "non biocide" treatments and wood based materials in order to improve their properties (resistance to biodegradation, dimensional stabilization, compatibilization with polymer matrix) and to find new application for wood based products.
- natural durability in relation with extractives content of naturally durable wood species and interactions of extractives with wood degrading fungi, as well as valorization of extractives for potential applications for food, nutraceutic, cosmetic or pharmaceutical applications.

Prof. Philippe Gérardin has led or contributed to different national and international research projects, he is active in some domestic and international associations. He is member of the International Research Group on Wood Protection and participate as vice-Chairman of the Section concerning "Thermal Wood Modification". He has supervised numerous PhD students from all over the world and especially from African countries, with which he develop several collaborations. He is author or co-author of numerous articles in international journals and has supervised several PhD students.



YONGHAO NI
Limerick Pulp and Paper Centre, Department of Chemical Engineering/Department of Chemistry University of New Brunswick, Canada

Dr. Ni has about 25 years R&D and teaching experience in wood chemistry, pulp and paper manufacturing processes, cellulosic material and integrated forest biorefinery. He has supervised 61 graduate students (37 Master's students, 24 Ph.D. students), numerous undergraduate students, and post-doctoral fellows/ visiting scholars. His research can be characterized as interdisciplinary, combining both the fundamental chemistry/ chemical characterizations with engineering principles. The research outcome of Dr. Ni and his team has had a significant impact on the commercial practices. For example, in the area of high-yield pulp (HYP), Dr. Ni and his team have developed new HYP products and novel applications. The use of HYP to produce high-quality uncoated and coated papers has now been widely accepted in the paper industry, particularly in China, creating new markets for the Canadian HYP producers. Significant economic impact has been demonstrated via the increased sales of HYP for the Canadian HYP sector. Dr. Ni and his colleagues have been recognized in a number of awards for the achievements. Another example is the Conductive Paper Technology (CPT) developed and patented by Dr. Ni and his colleagues, which was licensed to KnowCharge Inc. The company is in partnership with a number of international companies, including Celestica, on the commercialization of the first generation of CPT commercial product: cellulose paper based recyclable Electrostatic Discharge (ESD) packaging products (replacing plastic based existing products). Other CPT products that are under development include paper based antennas, and energy storage devices. Dr. Ni and his team have played a critical role in developing and commercializing the magnesium hydroxide-based peroxide bleaching of mechanical pulps. By determining the process chemistry on anionic trash, and the effect of using magnesium hydroxide on the pulp quality and on the effluent characteristics, the team has overcome the process limitation, therefore
making the technology's entrance to the marketplace possible. The team has been recognized by a number of awards. There are numerous mills in North America, Europe, and China that use the technology.

BYUNG-DAE PARK
Department of Wood and Paper Sciences
Kyungpook National University, Daegu, Republic of Korea

Professor Park has more than 20 years R&D and 10 years teaching experience in wood science and technology. He has published more than 85 refereed papers, over 10 technical reports, 1 patent, and co-authored the book "Thermoset Nanocomposites" (Wiley-VCH, Germany). Professor Park has made major contributions to characterizing wood adhesives aimed at developing advanced environmentally friendly and cost effective polymer adhesive systems in relation to development and utilization of high value wood-based products. In particular, his research on the development and characterization of low formaldehyde-based urea formaldehyde adhesives and in understanding wood-adhesiveinteraction has combined traditional approaches with modern sophisticatedchemical and microscopic tools and techniques, including Confocal Laser Scanning Microscope, TEM-EDX and nano-indentation in combination with AFM.
Professor Park's current research interests are wood adhesives and compositematerials, and nanocellulose-based materials. He teaches Polymeric Materials Science and Wood-Based Composite Materials for undergraduates and Advanced Study in Wood Science for graduates. He also gave many invited presentations at international conferences and hosted leading wood and polymer scientists from Canada, USA, Italy, New Zealand and Indonesia.

XIPING WANG
Research Forest Products Technologist, USDA Forest Service, Forest Products Laboratory, Madison/WI, USA

Dr. Wang has 20 years of research experience in the areas of nondestructive evaluation of wood, wood quality assessment, condition assessment of wood structures, and heat sterilization of wood. He has published 75 refereed papers and 50 technical reports, and has been awarded 8 patents in the U.S. and abroad. He received the Markwardt Award (FPS 2014) for distinguished contribution to knowledge of wood as an engineering material, and the George G. Marra Award (SWST 2014) for excellence in research and writing exhibited in Wood and Fiber Science. Throughout his career, Dr. Wang has demonstrated

great originality in developing innovative nondestructive evaluation methods that are used in laboratory, field, and industrial environments worldwide. He has contributed significantly to understanding fundamental wave propagation mechanisms in wood materials, which is critical to predicting intrinsic wood and fiber properties. His research on standing timber quality assessment has been recognized by his peers as pioneering work and has resulted in the development of technology that has been commercialized and is now in use worldwide. Dr. Wang has been a scientific lead in developing new methodologies and procedures for assessing structure integrity of various wood structures. His work on evaluating wood in historic structures has received considerable recognition from the U.S. Department of Interior (National Park Service) and preservation groups in several countries. Dr. Wang has led a research program that collectively addresses a host of technical issues regarding heat sterilization of wood for invasive species mitigation.

JORIS VAN ACKER
Laboratory of Wood Technology (Woodlab), Ghent University, Belgium

Prof. Joris Van Acker has more than 20 years R&D and teaching experience in wood science, technology and engineering. He has published 79 referred papers and over 20 technical reports regarding wood technology and engineering. He is the leader of the Laboratory of Wood Technology (Woodlab – UGent) where he both coordinates and participates in several international (European) and national projects. His research team is active in several domains e.g. wood protection and modification, dendrochronology and wood anatomy (using 3D micro/nano CT scanning) with focus on the tropics, wood moisture interactions, exterior wood coatings, interaction with tree breeding and wood durability in relation to service life. He is responsible for lecturing forest exploitation, wood anatomy and wood technology courses at Master level at Ghent University.

CORDT ZOLLFRANK
Technichal University Munich, Germany

Professor Zollfrank has almost years in fundamental research and teaching experience in wood science especially related to chemical wood modification on all length scales, the use of wood and lignocellulosic materials in materials science and engineering and in the pyrolysis of wood. He has published more than 76 referred papers and numerous technical reports related to the field of "Bioinspired Materials Engineering", where wood plays an important role as so-called hierarchical biotemplate. The research work of Professor Dr. Cordt Zollfrank is focused on applying bioinspired synthetic methods to the development of innovative structural and functional materials. A key area of his work is the formation of biogenic polymer esp. lignocellulosic structures and their conversion to composite materials for engineering and biomedical applications. The fundamental chemical and physical transformation processes involved in these conversions are investigated at each level of the structural hierarchy. Early worked was devoted to the chemical functionalisation of the wood cell wall with silicon-organic compounds (12). After that he focused on the conversion of wood in silicon carbide ceramic materials retaining the original wood structure (11). During this period he elucidated the structural changes of the wood cell wall during pyrolysis by small angle X-ray scattering (10) and transmission electron microscopy (9). He developed a new method for the determining the microfibril angle in the wood cell wall using a transmission electron microscope (7,9). His further research was then focused on the hierarchical conversion of wood an all length scale (2-6,8). He succeeded in the full hierarchical transfer of the nanostructure of the wood cell wall into inorganic silicon dioxide (silica). In particular, the nanostructure of the cellulose elementary fibril orientation was retained in the silica, giving rise to the very first anisotropically and hierarchically structured inorganic material from a biotemplating approach. He teaches basics wood and forest as well as biopolymer sciences for undergraduates and for graduates at TUM.

REPORT OF MEETING

World Wood Day 2016 Celebration in Kathmandu, Nepal, March 19-26, 2016

Nature and Culture was the theme of the 2016 World Wood Day (WWD) held March 21, 2016 in Katmandu, Nepal. That concept increased awareness of wood as an eco-friendly renewable biomaterial and demonstrated the key role of wood in a sustainable future. The theme explored the interrelationship between nature and culture that influences the way we use wood in our daily lives. Although WWD is celebrated on March 21st each year, three pre-events projects began as early as February 27th and other events continued until March 26th. About 500 people from 100 countries attended this event and over 40,000 local people participated. IAWS was represented by myself, shown in the opening ceremony with the President of Nepal, Bidhya Devi Bhandari, in the center.

The main event was held at the Nepal Academy in the center of Kathmandu, that consisted of the Hall; which enclosed displays, concerts, symposium presentations, exhibitions, and ceremonies; and the large Outdoor Squares; where wood carving, wood turning, furniture making, folk art, a children's event, special projects, and individual musical performances were held. A technical symposium with 61 speakers ran over

three days under the heading of *Nature and Culture: Interdisciplinary Approaches to Peaceful Coexistence and Sustainable Development*. The topics focused on raising awareness of current issues and enhancing multidisciplinary discussions for the crucial role of wood in human civilization and the environment. A music concert with wooden instrument including 70 musicians (The Kazakhstan Folk Group is shown performing at the music concert.) The day after the WWD program, many of the attendees traveled to Godawari, Lalitpur near a botanical garden and planted saplings to emphasize the need for a sustainable source of trees to continue making wood products.

Nepal had a major earthquake on April 25, 2015 and is still recovering from its aftermath. In fact, the Kasthamandap Temple (early 1500's) that means "wood covered shelter" in Sanskrit collapsed during the earthquake. Several unique projects of the 2016 celebration from recycled Nepalese refuse reflected on this tragedy and hope for the future: an international, collaborative project with 19 artisans from 14 countries that designed and constructed a "Brick by Brick" wooden statue (Jacques Vesery-USA, the manager, is shown on the ladder during the construction), two architectural projects (the Nepal Two-Tiered Temple and the Memorial Temple (US), and the "Elephant in the Room," a US wood design project. As observed on tours to central Kathmandu and its environs, it was obvious that Nepal has suffered considerable damage from the 2015 earthquake and has a long recovery and restoration period ahead.

More details and pictures from these meetings and tours can be found at the World Wood Day 2016 websites http://www.worldwoodday.org/2016/ and https://www.facebook.com/worldwoodday.

Howard Rosen, IAWS Treasurer, WWD Foundation, Chair

FORTHCOMING MEETINGS OF INTEREST TO FELLOWS

First Announcement: In late-February 2017, a Cell Wall Symposium will be held in conjunction with IAWS Executive Committee meeting, at Scion, Rotorua, New Zealand. Dates and details, soon to follow.

Cell Wall Symposium 2017

Scion is hosting a 1-day symposium on plant cell walls next summer. This will be held at our Rotorua campus on Tuesday 21st February from 9am to 5pm. Registrations are now open. A registration fee of NZ$40 covers coffee, lunch and a printed programme. Depending on demand we may organise a dinner afterwards at own cost. We intend to produce an abstract document based on presentations at the meeting. This meeting is timed to coincide with a business meeting of the International Academy of Wood Science the preceding day so several international speakers will be able to attend. Presentations on any aspects of primary or secondary cell walls in plants, or products including food or materials made from cell walls, are welcome.

Registrations and abstracts are due by 1 January 2017. To register please send the attached form by email to Lloyd Donaldson (lloyd.donaldson@scionresearch.com) giving your details. Payment can be made by either credit card or direct transfer to Scions bank account (reference H32151), or you can pay in cash on the day. Receipts will be provided.

Air NZ fly's to Rotorua daily from Auckland (3 flights) and Wellington (3 flights). Rotorua is a 3h drive from Auckland and has a wide range of accommodation - Alpin motel is 5 minutes' walk from the Scion campus and rooms are about NZ$90. We recommend booking flights and accommodation early as demand will be high during summer and late bookings are usually much more expensive.

Please send an abstract of your talk as a Word document prior to the January 1 deadline. Please use minimal formatting. The abstract can be up to 2 A4 pages and may include 1 colour figure. If including a figure please attach as a high-quality jpg file < 10Mb in size. Sorry, we don't anticipate poster presentations.

Contact details:
Dr Lloyd Donaldson
Email: lloyd.donaldson@scionresearch.com
49 Sala Street, Rotorua 3010
Ph: 64 7 343 5581

July 20, 2016

Registration Cell Wall Symposium

Name :

Address:

Email:

☐ I would like to give a presentation

Amount to be tendered (GST inclusive): $40.00
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Email: lloyd.donaldson@scionresearch.com

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First Announcement: Joint IAWA/IAWS plenary meeting and 9th Pacific Regional Wood Anatomy Conference; 26-28 September 2017 (with an option to extend by one day may be depending on the amount of presentations). Venue is at Harris Hotel in Bali island, Indonesia

HIGHLIGHTS

Tracing native crystalline and amorphous cellulose *in situ* during fiber wall development.

Jean-Paul Joseleau Prof. Emeritus and Katia Ruel Dr. CNRS Honorary
E.I. LINK-Conseil, Grenoble, FRANCE

How crystalline and amorphous forms of cellulose coexist in walls of wood fiber
Wood fibers are surrounded by a cell wall made of polymer composite organized around cellulose microfibrils. Depending on the developmental stage, the tissue type and the cell wall layer, the cellulose microfibrils are differentially imbedded in pectic polysaccharides, hemicelluloses and lignin. The macromolecular organization of these structural polymers at the ultrastructural and nanoscale levels greatly defines the fundamental biological, physical, mechanical and chemical properties of wood and wood materials. In particular, the description of the physical forms, crystalline and amorphous, under which native cellulose is deposited during biosynthesis is essential for the understanding of plant, wood cell walls and complex cellulosic materials properties.

A difficulty in studying the native state of cellulose in cell walls is its hierarchical structure and inhomogeneity due to local variations (Saxena and Brown, 2007). In higher plant cell walls cellulose has been described as being in the crystalline state I, and consisting of a composite of two crystalline allomorphs, the triclinic Iα and the monoclinic Iβ, in variable proportions (Atalla and VanderHart 1984; Sugiyama et al. 1991; Jarvis 2003). The cellulose in secondary walls of wood was described as containing a much higher proportion of Iβ over Iα than primary walls (Wada et al. 2001).

It has become apparent that the model of cellulose microfibrils made of regions of crystalline arrangement of the β-1,4- linked homoglucan chains, maintained by intra-and inter-hydrogen bonds, alternating with amorphous regions of non-organized (less ordered) chains does not reflect the reality of native cellulose. During the course of biosynthesis, defaults in the crystallization occur and create amorphous regions, mostly at the microfibril surface. The stresses and strains due to cell wall enlargement influence the mesomorphic state of cellulose (Kataoka and Kondo 1996).

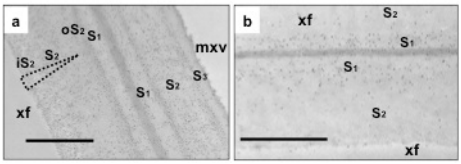
Carbohydrate Binding Modules (CBM) for probing amorphous and crystalline cellulose in planta Localization of native cellulose within primary and secondary cell walls with regard to crystalline and amorphous distribution is not well understood and has been compromised by the lack of specific tools to probe and discriminate *in situ* between the various cellulose states (Saxena and Brown 2007). Recently, the usefulness of cellulose-directed Carbohydrate-Binding Modules (CBMs) has been demonstrated to differentiate cellulose microstructures in fiber walls by laser confocal microscopy (Hildén et al. 2003; Blake et al. 2006).

In view of investigating the localization of crystalline and non-crystalline cellulose within the cell wall layers, we have used *CBM3a* from type A family of CBMs, targeting crystalline cellulose, and *CBM 28* from type B family, targeting amorphous cellulose. The respective specificity of these CBMs is explained by the topology of the adaptation of their binding sites to the macromolecular structure of the ligand (Lehtio et al. 2003). Our study involving CBM-immunolabeling in transmission electron microscopy (TEM) using *Arabidopsis thaliana* as a model plant, demonstrated that the deposition of crystalline and amorphous cellulose from primary to secondary wall undergoes variations at the supramolecular and ultrastructural levels within primary and secondary walls, and among the sublayers S1, S2, and S3 of secondary walls (Ruel et al. 2012).

CBM immuno-gold labeling reveals variations in the patterns of amorphous and crystalline celluloses across the walls Our study of the tissues of *A*. *thaliana* stem showed that the respective distribution of amorphous and crystalline cellulose differed according to the cell type and also between the sublayers of the secondary walls. This is the indication that the molecular organization of cellulose is cell-type specific, and varies during cell wall biogenesis.

Our results of labeling of fibers walls with CBM3a and the corresponding manual counting of gold particles per μm^2 in the different secondary wall layers and sublayers underscored the variation in the fixation of CBM3a in transverse *versus* longitudinal sections. It appears likely, due to the requirement of fixation of CBM3a on the flat surface of cellulose crystallites, that the progressive variation of microfibril angle across the secondary wall influences the accessibility of CBM3a to the crystalline cellulose surface. This kind of supramolecular design of crystalline cellulose arrangement suggested to be responsible for the modulus of elasticity of the tissue in adaptation to mechanical properties (Burgert et al. 2009) and that we observed in the fibers of *A. thaliana,* may be biophysically driven during cellulose deposition in adaptation to the mechanical properties of fibers in order to regulate growth stress or movements.

Modification of cellulose microstructures during cell wall development In the incipient fiber walls, labeling with CBM3a revealed the scattered occurrence of crystalline cellulose suggesting that cellulose was appearing locally and was readily assembled in an ordered structure. This confirms X-ray indication that the nascent primary wall harbored cellulose I of low crystallinity (Müller et al. 2002). As soon as secondary wall matures, both amorphous and crystalline cellulose appear in S1, although with weaker intensity for the amorphous form. At a more mature stage the labeling provided by both CBMs in S2 becomes more intense (see illustration below):



TEM-immunogold labeling of the distribution of crystalline and amorphous cellulose microstructures in xylem fiber from the inflorescence stem of A. thaliana: transverse sections. a, crystalline cellulose depicted by CBM3a shows a characteristic decreasing gradient pattern from inner to outer S2 in the thick-walled if and xf (dotted arrows). b, this pattern after CBM28 labeling, underscores the predominance of amorphous cellulose in S1 layer. Abbreviations if(s), interfascicular fiber(s); xf, xylem fiber. Bar = 1 µm (from Ruel et al. 2012)

possibly in relation with the activity of the distinct cellulose synthases specifically expressed during primary and secondary walls formation (Paredes et al 2008) thought to determine the crystallographic characteristics of the microfibrils. Internal defaults in the degree of organization of cellulose (Sugimoto et al, 2003) may also be influenced by stress and the deposition of the non-cellulosic polymers.

Conclusion

Our results may be regarded as a “finger print” of the occurrence of the two cellulose types across cell walls layers and sub-layers. The remodeling of the microstructural patterns of cellulose deposition during cell wall development, including periodic structural defaults, denotes a deterministic mechanism of cellulose biogenesis, as early inferred by Frey-Wyssling et al. in 1948, inducing a cellulose structure specific to a precise type of cell adapted to a precise function in the plant. Our recent results identifying the respective deposition of amorphous and crystalline celluloses in the intertidal red alga *Calliarthron* (Martone et al 2016) support this view. This brings additional evidence that the ontogeny of secondary cell walls exhibits similar characteristics in red algae and vascular terrestrial plants.

Deciphering the distribution *in situ* of cellulose structures at the nanoscale and how processes or environmental factors may influence crystallization could help explaining some of the mechanical properties of cellulosic fibers and woody materials.

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Submitted by Fellow Jean-Paul Joseleau, Professor Emeritus University Grenoble, CNRS (Fr), 8th April 2016

Annual Report 2015 of Valentin I. Popa, Prof. emeritus, PhD, Chem. (Gheorghe Asachi Technical University Romania)

International Academy of Wood Science, International Lignin Institute, American Chemical Society, Corresponding member of Technical Sciences from Romania

- Fourteen Published Papers , which include the following:
  - Iulian Andrei Gilca, Valentin I. Popa and Claudia Crestini. Obtaining lignin nanoparticles by sonication. *Ultrasonics Sonochemistry* 23, 369–375(2015) IF 4.321 http://dx.doi.org/10.1016/j.ultsonch.2014.08.021/
  - O. C. Bujor, I. A. Talmaciu, I. Volf, and V. I. Popa. Biorefining to recover aromatic compounds with biological properties, *Tappi J*.,14 (*3*) 187-193 (2015) IF 0.732
- Seven major Communications, Lectures, including the following :
  - Adina Iulia Talmaciu, CorneliuTanase, Csilla Iuliana Bara, IrinaVolf and Valentin I. Popa . New Aspects in Biomass Wastes Valorization: Spruce Bark as Plants Growth Regulators. Paper presented at 8th International Conference on Environment Engineering and Management, September, 9-12, 2015, Iasi., Romania

- V.I.Popa. A model for valorization of biomass as a source of energy and chemical products, The Xth Edition of the Annual Confernce "The Academic Days of Romanian Academy of Technical Sciences",October, 8-10, 2015, Galati, Romania

- Corneliu Tanase, Valentin I. Popa. Wastes from forestry and energy industry as potential bioregulators in soybean (*Glycine max* L.) plants. The 14th International Symposium "Prospects for the 3rd Millennium Agriculture", September, 24-26, 2015, Cluj-Napoca, Romania, ISSN: 2392 6937.

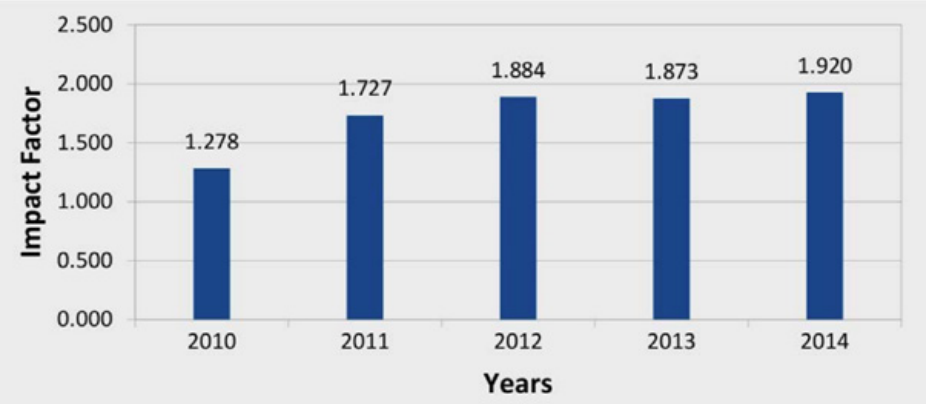
Other activities include Evaluation of international projects (Project leader: Ivana Radojčić Redovniković. Institution: University of Zagreb, Faculty of Food Technology and Biotechnology Project title: Green Solvents for Green Technology); Project leader: Francisco Javier Rodriguez Mercado. Fondecyt regular 2016, Conicyt-Chile, Proposal number: 1161278. Title: Cyclodextrin inclusion complex formation with essential oil derivatives and its application for active food packaging; Supervisor PhD Project, defended *Study of polyphenolic compounds from spruce wood bark and their possibilities to be immobilized*, thesis was carried out in the SCIEX-Immophenol cooperation program between Romania and Switzerland; Member of Scientific Committee The 8th International Symposium Advanced Technologies for the Pulp, Paper and Corrugated Board Industry, September, 15-18, 2015, Braila, Romania; and
Partner in Horizon 20 Project proposal: Ligno Topia 19.01. 2016.

WOOD SCIENCE AND TECHNOLOGY 2015

Impact Factor increased in 2014!
According to Thomson Reuters Journal Citation Reports® 2015 IAWS, Journal Wood Science and Technology has further improved the Impact Factor (IF) in the year 2014. WST now ranks #2 out of 21 journals in the category "Materials Science, Paper & Wood", and #13 out of 65 journals in the category "Forestry". This development underlines that the efforts of all colleagues serving the scientific publishing of wood science (editorial team, reviewers and authors) are acknowledged internationally. Some more facts and editorial statistics are compiled below.

Impact Factor Trend (2014: 1,920)
The graph below shows the development of the Impact Factor, still the most important bibliometric measure, over the last five years. In 2014 a total number

of 2671 citations were counted. The editorial office received 317 manuscripts (top submitting countries: China (52 manuscripts), India (21), Brazil (19) Iran (18), Turkey (18), Canada (16)). In the printed volume 48 (2014) 95 articles were published covering 1326 pages. The average acceptance rate ranges around 30%. Almost 97000 full text downloads were counted in 2014 by the publisher, -12% compared to the previous year. The average time from submission to first decision was 47 days, to final disposition 'accept' 181 days, to final disposition 'reject' 30 days. The average time from acceptance to online first was 11 days. The journal author satisfaction is high: 90 % of authors express the likelihood to publish in WST again. The active support of the journal and the editorial processes by IAWS fellows could be improved. In 2014 out of 488 requested reviews less than one fifth (16.8%) were provided by fellows.



Source: Wood Science and Technology – 2014 publishers report

Submitted by Klaus Richter, Editor

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. Such institutions may apply to join the Academy by submitting a statement to the Secretary that includes the mission and objectives. The Academy Board will vote on acceptance of the application and the President shall inform the applicant of the result. Affiliate Members have the privilege of designating a Representative (who may or may not be a Fellow), to represent the organization in the Academy.

Contact Details are available on the IAWS website.

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WOOD TECHNOLOGY INSTITUTE, Poland	www.itd.poznan.pl

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 scientist 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
- Give due credit to the work of others in the field, not just summarise the author's work
- Contain important references to the literature for further reading
- Finish with a statement of future direction in the area

NOMINATION PROCEDURE FOR ELECTION OF FELLOWS

he 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 **30 September**.

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 November, 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 two 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.

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.

Uwe Schmitt

NOMINATION FORM

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: Uwe Schmitt uwe.schmitt@thuenen.de

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Nomination for Fellowship of the International Academy of Wood Science

Name of Candidate:
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Telephone:

Please return to: Uwe Schmitt uwe.schmitt@thuenen.de

Imprint

Editorial
International Academy of Wood Science
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21031 Hamburg

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Layout: Christina Waitkus/Thünen Institute

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