



**2022 World Wood Day Online Symposium & The 4th**

**IUFRO Forest Products Culture Colloquium**

# **ABSTRACT BOOKLET**

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# Wood Products and Wood Biotechnology (IAWS Special Session)

# Wood Anatomy - from Tradition into the Digital Future

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## **Abstract**

The knowledge about recognition and utilization of commercial timbers is of prime importance to forestry, timber trade and wood industry as well as private consumers for the assessment of wood quality and utilisation. Furthermore, wood identification is important in enforcing the control of illegal logging according to the requirements of international regulations, e.g. European Timber Regulation, USA Lacey Act, or Illegal Logging Prohibition Act in Australia and CITES policies.

A valuable support for computer-aided wood identification is introduced and provided by the new developed Apps *macroHOLZdata* and *CITESwoodID*. The Apps enable the user to identify trade timbers and CITES protected species by means of macroscopic wood structural features.

In addition, the App *macroHOLZdata* allows access to a data pool with timber specific information on properties, utilization, and other relevant characteristics of the timbers, i.e., data on biological, physical and mechanical properties, wood machining, wood processing, and appropriate end uses. Both Apps for smartphones and tablets are freely available in four language versions (App Store® and Google Play®) and serve as visual (illustrations) and textual (descriptions) identification aid to all institutions and persons involved in wood science. The modern digital systems may also constitute very useful applications for professionals in forestry, wood industry and the wood products market, architecture, engineering, etc., as well as wood enthusiasts. Fundamental developments in the scientific field of wood anatomy will also be forthcoming by the design of automated

identification systems (deep learning or machine learning). The first portable digital systems are currently available and several basic studies have been published in this rapidly moving field of computer-assisted wood identification using neural network methods. The very dynamic progress in the field of modern wood anatomy and digital wood identification will be presented.

**Notes:** The App *CITESwoodID* is already downloadable; the App *macro-HOLZdata* will be published in March

## **Investigating Interlocked and Spiral Grain with X-ray Microtomography**

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### **Abstract**

Interlocked and spiral grain are examples of wood grain that run in non-vertical orientations. The developmental mechanisms that generate these grain patterns likely involve the slow rotation of fusiform initials within the vascular cambium, but how these mechanisms function at a cellular level remains unclear. Clarification of these developmental pathways may come through assessing grain at the cellular level across large areas of wood, but such experiments are difficult using traditional serial sectioning. To overcome these limitations, wood samples were assessed by X-ray computed microtomography ( $\mu$ CT) with the Skyscan 1172 system.  $\mu$ CT generates large data sets at near cellular resolution that can be resliced and reoriented in ImageJ. Furthermore, reconstructed tangential longitudinal

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- Since 2004: Curator of the wood collection and the wood anatomical laboratory at the Thuenen Institute of Wood Research, Hamburg
- 2004: Habilitation at the University of Hamburg (Department of Biology) and appointment as Associate Professor (*Venia legendi*) for the profession “Wood Biology” at the University of Hamburg
- 1998: PhD in Wood Science and Wood Technology at the University of Hamburg, graduation: PhD / Dr. rer. nat.
- Diploma-Study (M.Sc.) of Wood Science and Wood Technology at the University of Hamburg, graduation: Diplom - Holzwirt (1995)