
S E M I N A R
on
Semiconductor Physics and Nanotechnology

Mo, 19.01.2026, 11:15 Uhr,

**Seminar in
person in the Physics lecture hall or via Zoom**

**“Wood-Based Functional Materials for Mechanical Energy
Harvesting and Conductive Interfaces”**

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Wood is an abundant, renewable and CO₂-storing material with a highly hierarchical and anisotropic structure. Owing to its favourable environmental and mechanical properties, wood is a state-of-the-art building material. However, to further expand its use beyond structural applications, it is necessary to enable it with additional functions, such as the possibility to harvest mechanical energy and to transport electrical charge.

Native wood has been reported to exhibit energy-harvesting properties after conversion into a wood sponge via delignification, yet the electrical output remains too low for most practical applications. To enhance the electromechanical response, various piezo- or triboelectric materials can be introduced into the porous wood scaffold. A process facilitated by wood’s high porosity and the relative ease with which its structure and composition can be tailored.

For functional energy-harvesting devices, electrodes are required to collect and transport charge. Using a commercial CO₂ laser, treated wood can be converted into a conductive carbon network via laser-induced graphitisation. The high spatial resolution of the laser processing enables direct patterning of electrodes and the integration of sensing elements within the wood-based platform.

Combining these two technologies provides a route towards fully wood-based energy-harvesting devices and self-powered sensing elements for sustainable electronics.

Zoom – Link:

<https://zoom.us/j/96375934537?pwd=RTIKTWhSdzRHU211YTY1bGFxTUpZz09>
Meeting-ID: 963 7593 4537
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