



## **COST Action FP0802**

### **Workshop „Wood Structure/Function-Relationships“**

**5-8 October, 2010**

**Hamburg, Germany**

#### **Tuesday, October 5**

15.00-16.00h: **Registration**

16.00-18.00h: **Tutorial**  
**Markku Kataja:** MICRO X-RAY TOMOGRAPHY

18.00-19.30h: **Welcome Drink**

#### **Wednesday, October 6**

08.00-09.20h: **Registration / Coffee**

09.20-09.40h: **Opening** – Uwe Schmitt & Karin Hofstetter

09.40-10.20h: **Keynote 1**

**Martin Müller:** INVESTIGATING THE NANOSTRUCTURE OF THE WOOD CELL WALL USING SYNCHROTRON RADIATION: STATUS AND PERSPECTIVES

**Chair: Uwe Schmitt**

10.20-12.00h: **Session 1: Application of X-Ray Technology**

**Chair: Lennart Salmén**

10.20-10.40h: **Anwasha Fernandes, Lynne Thomas & Michael Jarvis:** HYDRATION OF THE NANOSCALE STRUCTURE OF SITKA SPRUCE: DIFFUSE X-RAY SCATTERING EXPERIMENTS

- 10.40-11.00h: **Kirsi Leppänen, Jessica Lucenius, Peter Immerzeel, Ewa Mellerowicz, Kurt Fagerstedt, Pekka Saranpää & Ritva Serimaa:** EFFECT OF MOISTURE ON CELLULOSE STRUCTURE IN JUVENILE HARD- AND SOFTWOOD AS REVEALED BY X-RAY DIFFRACTION
- 11.00-11.20h: **Kari Pirkkalainen, Jessica Lucenius, Marko Peura, Pekka Saranpää & Ritva Serimaa:** MULTISCALE INVESTIGATIONS ON TRACHEIDS AND RAY PARENCHYMA CELLS OF SPRUCE
- 11.20-11.40h: **Wiesław Olek & Jan T. Bonarski:** CHANGES OF THE CRYSTALLINE VOLUME FRACTION DURING THERMAL MODIFICATION OF WOOD
- 11.40-12.00h: **Tancrede Almeras, Arthur Gronvold, Delphine Jullien & Arie van der Lee:** X-RAY DIFFRACTION STUDY OF WOOD CELLULOSE BEHAVIOUR DURING HYGRO-THERMAL TREATMENT AND DRYING
- 12.00-13.00h: **Lunch**
- 13.00-14.00h: **Session 2: Structure/Function-Relationships**  
**Chair: Lisbeth Thygesen**
- 13.00-13.20h: **Christian Lanvermann, Uwe Schmitt & Peter Niemz:** MULTI-LEVEL ANALYSIS OF LIGNIN DISTRIBUTION AND CELL GEOMETRY IN *PICEA ABIES* (L. KARST.) AS A BASIS TO EXPLAIN ANISOTROPIC SWELLING
- 13.20-13.40h: **Stig L. Bardage:** BASIC MECHANISM OF SECONDARY CELL WALL FORMATION IN SOFTWOOD TRACHEIDS
- 13.40-14.00h: **Daniel Keunecke, Jozsef Garab, Stefan Hering, Jozsef Szalai & Peter Niemz:** INFLUENCE OF THE GROWTH RING ANGLE ON TRANSVERSE ELASTIC PROPERTIES OF SOFTWOODS
- 14.00-14.40h: **Poster Presentations**
- 14.00-14.05h: **Wolfgang Fischer, Lisbeth Kappel, Ulrich Hirn, Wolfgang Bauer & Robert Schennach:** POLARIZED LIGHT MICROSCOPY FOR FIBER-FIBER BOND AREA MEASUREMENT REVISITED
- 14.05-14.10h: **Jasna Simonović, Jasna Stevanic, Daniela Djikanović, Jelena Bogdanović Pristov, Lennart Salmén & Ksenija Radotić:** POLARIZED FT-IR STUDY OF CELL WALLS OF A HARDWOOD AND A SOFTWOOD
- 14.10-14.15h: **Nanna Bjerregaard Pedersen, Claus Felby, Poul Jensen & Charlotte Björdal:** MICROSCOPIC AND SPECTROSCOPIC CHARACTERIZATION OF WATERLOGGED ARCHAEOLOGICAL WOOD DEGRADED BY MICROORGANISMS IN ANOXIC ENVIRONMENTS
- 14.15-14.20h: **Joao Pereira, J. Xavier, P. Couto, J. Morais, J. Lousada & P. Melo-Pinto:** RADIAL VARIATION OF ELASTIC PROPERTIES OF P. PINASTER WOOD- CELLULAR STRUCTURE APPROACH
- 14.20-14.25h: **A. Zerizer, S. Kennouche, A. Daoui & A. Aknouche:** RESISTANCE TO CRACK PROPAGATION OF ALGERIAN WOOD
- 14.25-14.30h: **Jelena Bogdanović Pristov, Aleksandra Mitrović, Daniela Djikanović, Dragoslav Mutavdžić, Jasna Simonović, Ksenija Radotić & Ivan Spasojević:** HYDROXYL RADICAL-SCAVENGING CAPACITY OF CELL WALL FROM NEEDLES OF SERBIAN SPRUCE (*PICEA OMORIKA* (PANCIC) PURKYNE)

- 14.30-14.35h: **Jean Eudes Maigret & Bernard Kurek:** ANALYSIS OF SURFACE PROPERTIES OF BOTH HEMP FIBERS AND WOOD LIKE FIBERS
- 14.35-14.40h: **Marcus Müller, Timo Grüneberg, Holger Militz & Andreas Krause:** INFLUENCE OF PARTICLE GEOMETRY AND ORIENTATION ON SELECTED PROPERTIES OF WOOD POLYMER COMPOSITES
- 14.40-15.20h: **Coffee Break**
- 15.20-17.00h: **Session 3: Moisture Transport and Sorption Behaviour**  
**Chair: Kristofer Gamstedt**
- 15.20-15.40h **Ksenija Radotić, Charles Roduit, Sandor Kasas, Jasna Simonović, Jelena Bogdanović, Daniela Djikanović & Giovanni Dietler:** STIFFNESS OF THE ISOLATED ARABIDOPSIS CELL WALL DURING SOAKING
- 15.40-16.00h **Johannes Eitelberger & Karin Hofstetter:** THE PHYSICAL BACKGROUND OF MOISTURE TRANSPORT IN WOOD BELOW THE FIBER SATURATION POINT AND ITS MACROSCOPIC DESCRIPTION
- 16.00-16.20h **David Mannes, Walter Sonderegger, Stefan Hering, Eberhard Lehmann & Peter Niemz:** DETERMINATION OF MOISTURE TRANSPORT PROCESSES BY MEANS OF NEUTRON IMAGING
- 16.20-16.40h **Staffan Svensson:** MOISTURE TRANSPORT IN SEASONED WOOD; COUPLED DIFFUSION MODEL AND MODEL SENSITIVITY
- 16.40-17.00h **Wenwang Wu, Michele Griffa, Jan Carmeliet & Dominique Derome:** 3D SWELLING/SHRINKAGE OF SPRUCE WOOD AT THE CELLULAR SCALE
- 17.30-17.45h: **Bus Transfer to Boat**
- 18.00-21.00h: **Boat Trip with Dinner**

## **Thursday, October 7**

- 08.30-09.10h: **Keynote 2**  
**Stephen Eichhorn:** DEFORMATION MICROMECHANICS OF CELLULOSE FIBRES AND COMPOSITE INTERFACES USING RAMAN SPECTROSCOPY  
**Chair: Karin Hofstetter**
- 09.10-10.30h: **Session 4: Microstructure and Topochemistry of Cell Walls**  
**Chair: Uwe Schmitt**
- 09.10-09.30h: **Lennart Salmén & Anne-Mari Olsson:** STRUCTURAL ORGANISATION OF THE WOOD POLYMERS IN HARDWOOD - NORMAL AND TENSION WOOD
- 09.30-09.50h: **Karin Fackler, J. S. Stevanic, M. Schwanninger & Lennart Salmén:** LOCALISATION AND CHARACTERISATION OF INCIPIENT AND EARLY WOOD DEGRADATION PROCESSES WITH FT-IR IMAGING MICROSCOPY IN COMBINATION WITH MULTIVARIATE IMAGE ANALYSIS
- 09.50-10.10h: **Mathias Rehbein & Gerald Koch:** TOPOCHEMICAL INVESTIGATION WITHIN INDIVIDUAL CELL WALL LAYERS OF SCOTS PINE (*PINUS SYLVESTRIS* L.) SAPWOOD DEGRADED BY THE BROWN-ROT FUNGUS *ANTRODIA VAILLANTII*

- 10.10-10.30h: **Igor Dobovšek:** EXPLORING PIEZOELECTRIC PROPERTIES OF WOOD AND RELATED ISSUES IN MATHEMATICAL DESCRIPTION
- 10.30-10.45h: **Poster Presentations**
- 10.30-10.35h: **Thomas K. Bader, C. Wikete, A. Jäger, Karin Hofstetter & J. Eberhardsteiner:** MECHANICAL PROPERTIES AND MICROSTRUCTURAL CHARACTERISTICS OF HARDWOOD
- 10.35-10.40h: **Patrice Dole, Johnny Beaugrand, Gérard Mougín & Bernard Kurek:** MECHANICAL PROPERTIES OF CELLULOSIC FIBRE COMPOSITES AS A FUNCTION OF FIBRE CHEMICAL QUALITY, PLASTIC TYPOLOGY AND PROCESSING WAY
- 10.40-10.45h: **Thomas Joffre & Kristofer Gamstedt:** MOISTURE INDUCED SWELLING OF WOOD FIBRES IN THE CONSTRAINED CASE OF A COMPOSITE MATERIAL
- 10.45-11.15h: **Coffee Break**
- 11.15-12.35h: **Session 5: Modelling and Wall Modification**  
**Chair: Michaela Eder**
- 11.15-11.35h: **Landry Charlier & Karim Mazeau:** ATOMISTIC MODELLING OF LIGNOCELLULOSIC COMPLEXES
- 11.35-11.55h: **Ingo Mayer, Christelle Ganne-Chédeville, Katja Hunger, Gerald Koch, Eberhard Lehmann, Urs von Arx & Frédéric Pichelin:** THERMAL TREATMENT OF BEECHWOOD RAILWAY SLEEPERS FOR RECYCLING. CHANGES IN WOOD MICROSTRUCTURE AND MECHANICAL PROPERTIES
- 11.55-12.15h: **Cedric Montero, Bruno Clair, Tancrede Almeras & Arie van der Lee:** X-RAY DIFFRACTION USE FOR NANOSTRUCTURAL INVESTIGATIONS OF WOOD CELLULOSE DEFORMATION
- 12.15-12.35h: **Rahime Bag, Johnny Beaugrand, Patrice Dole & Bernard Kurek:** STUDY OF THE ACID IMPREGNATION OF WOODY HEMP CORE IN AMBIENT CONDITION
- 12.35-13.45h: **Lunch**
- 13.45-15.15h: **Working Group Meetings**  
**WG Oral Presentations:**  
**Marco Fioravanti, Luigi Rigon, Nicola Sodini & Franco Zanini:** X-RAY MICROTOMOGRAPHY WITH LARGE DETECTORS  
**Martin Dressler, Christian Lanvermann, Daniele Derome, R. Guyer & J. Carmeliet:** POROELASTIC MODELLING OF THE COUPLED MECHANICAL MOISTURE BEHAVIOUR OF WOOD  
**Alexander Pfriem & Mario Zauer:** INVESTIGATIONS TO THE UNSTEADY SORPTION BEHAVIOUR OF THERMALLY MODIFIED WOOD AND ITS CONNECTION TO THE ALTERATION OF PORE STRUCTURE DUE TO THERMAL TREATMENT  
**Vladimirs Biziks, Lubova Belkova, Elina Kapaca & Bruno Andersons:** EFFECT OF THE HYDROTHERMAL MODIFICATION ON THE ANATOMICAL STRUCTURE OF BIRCH WOOD  
**Ingela Bjurhager, Anne-Mari Olsson, Bo Zhang, L. Gerber, M. Kumar, L.A. Berglund, Ingo Burgert, Björn Sundberg &**

**Lennart Salmén**: ULTRA-STRUCTURE AND MECHANICAL PROPERTIES OF WOOD FROM TRANSGENIC *POPULUS* WITH REDUCED LIGNIN CONTENT

15.15-15.45h: **Coffee Break**

15.45-17.30h: **Management Committee Meeting**

19.00-22.00h: **Conference Dinner at "Hotel Alt-Lohbrügger Hof"**

## **Friday, October 8**

09.20-10.00h: **Keynote 3**

**Daniel Wagner**: THE MECHANICS OF SMALL OBJECTS: SELECTED EXPERIMENTS FROM VARIOUS LANDSCAPES

**Chair: Michaela Eder**

10.00-11.40h: **Session 6: Micromechanics of Wood**

**Chair: Karin Hofstetter**

10.00-10.20h: **Pierre Cabroler, Françoise Huber, Xavier Frank, Giana Almeida & Patrick Perré**: EXPLORATION OF WOOD SUB-CELL WALL ORGANIZATION IN THE TRANSVERSAL PLANE BY CONFOCAL RAMAN MICRO-SPECTROMETER, WITH MICROMECHANICAL PERSPECTIVES

10.20-10.40h: **Kristofer Gamstedt**: MICROMECHANICS OF MOISTURE-INDUCED DIMENSIONAL INSTABILITY OF WOOD-BASED COMPOSITES

10.40-11.00h: **Ahmad Rafsanjani, Dominique Derome & Jan Carmeliet**: A MICROMECHANICAL APPROACH TO THE NONLINEAR POROELASTIC BEHAVIOR OF WOOD

11.00-11.20h: **Michaela Zauner, Daniel Keunecke, Federica Marone, Marco Stampanoni & Peter Niemz**: SYNCHROTRON BASED TOMOGRAPHIC *IN-SITU* MICROSCOPY OF WOOD UNDER UNIAXIAL LOAD

11.20-11.40h: **Emil Tang Englund**: NUMERICAL MODELLING OF SOFTWOOD TIME-DEPENDENT BEHAVIOUR BASED ON MICROSTRUCTURE

11.40-12.00h: **Poster Prize and Closing**

12.00-13.00h: **Coffee and Cake**

13.00-14.30h: **Optional Tour through the Institute**