



# COST Conference | COST - FTP Young Researchers' Forum 2013

Young Researchers Direct the Way to  
Innovation in the Forest-Based Sector



Monday 11 - Tuesday 12 March 2013

Barceló Sants Hotel, Barcelona, Spain

Conference room MR.10 (Level E)

Event websites

<http://www.cost.eu/events/ftp8>

<http://www.ftp-c8.eu/>

# Introduction

'Young Researchers direct the way to Innovation in the Forest-based sector' is a Domain specific Science and Technology Strategic Event run by the Domain Committee for Forests, their Products and Services (DC FPS) in conjunction with the Forest-Based Sector Technology Platform.

The joint COST-FTP Forum will give Young Researchers the opportunity to present results of their research work and to discuss these with colleagues and industry representatives from all across Europe. Bringing together on the one hand young researchers and experienced researchers and on the other hand researchers and industry representatives, the Forum is an ideal opportunity to encourage networking of young researchers within the entire forest-based sector in Europe and additionally promote networking towards relevant industry and European and national bodies

The response to the call for applications was overwhelming. A total of 180 proposals were received by the Organising Committee and evaluated by a panel of experts, who selected 20 proposals to be presented orally and 56 proposals to be presented as posters within the programme of the Young Researchers' Forum.

The two best speakers will be invited to present their research during the FTP conference itself and the best poster will be displayed at the COST stand during the conference.

We are very happy with the high response to this initiative and would like to thank all those involved in its promotion. We would also like to thank all proposers for their interest and for submitting many innovative proposals. Finally, we are grateful to the panel for their comprehensive and high-quality assessments.

In this booklet we highlight the abstracts of the ideas selected to be presented at the Young Researchers Forum. We hope it will be useful not only to those participating in the event, but also to those with an interest in the future of the forest-based sector.

## **Martin Greimel**

Chair of the Young Researchers' Forum Organising Committee  
Vice-Chair of the COST Domain Committee Forests, their Products and Services

## **Johan Elvnert**

Manager of the Forest-Based Sector Technology Platform

## **Sjur Baardsen**

Chair of the COST Domain Committee Forests, their Products and Services

# COST Domain FPS



## Forests, their Products and Services

The following examples illustrate aspects of research in this Domain.  
The scope of the Domain is not, however, restricted only to these activities.

**Forestry** research supports activities aiming at meeting the economic, environmental and social needs of present and future generations in a sustainable way. In the light of the current international forest dialogue the DC FPS offers a forum for encouraging a scientific debate on ensuring a sustainable provision of forest products and services, such as wood and wood products, water and soil protection, climate regulation, bioenergy, rural development, recreation and public health, habitats for wildlife, landscape diversity, carbon sinks and reservoirs.

**Forests and Environment** research activities focus on the protection of forests from pollution, abiotic and biotic hazards (fires, storms, pests and diseases...) in order to maintain their full multiple values and the important roles of forests in climate change mitigation and adaptation. In this context adequate importance is attached to the provision of timely, reliable and accurate information on forests and forest ecosystems as they are essential for public understanding and knowledge-based decision-making.

**Wood Technology** research aims at an increase of knowledge necessary for an enhanced and broader use of wood as a sustainable, energy efficient and renewable resource in existing (buildings, constructions etc) and new applications. With the objective to enhance the competitiveness of wood and wood composites, DC FPS supports research activities focusing on the improvement of wood properties, the performance of timber and its indoor and outdoor usability.

**Pulp and Paper** research contributes to increased knowledge of the physical, chemical and biological characteristics of the pulps and the resulting products. High priority is placed on optimising the level of utilisation of the resources and to improve both the sustainability of pulp and paper making and the competitiveness of paper products in particular in new applications. The research also enables the development of intelligent and efficient manufacturing processes, including reduced energy consumption.

**Bioenergy from Forests** research enhances our knowledge about how to use biomass from forests to meet the energy needs of present and future generations sustainably and without damaging the forest's ability to meet other needs. Biorefinery research develops the potential for the forest-based sector to extract higher value innovative products for changing markets and customer needs.

At a cross-sector level the DC FPS addresses issues such as sustainability assessment, life-cycle analysis, tourism, public health, energy production and recycling. Therefore, new ideas and interdisciplinary initiatives are welcome.

Further information can be found at [http://www.cost.eu/domains\\_actions/fps](http://www.cost.eu/domains_actions/fps)

# Programme

## Monday 11 March 2013

12:00 Registration and welcome coffee

### 12:30 Opening of the Conference

**Angeles Rodríguez Peña** - President of the COST Committee of Senior Officials

**Johan Elvnert** - FTP Managing Director

### 12:50 Session I

Chair: **Anna Brown** - Chair of COST FPS Action FP1102

Introduction: **Robert Mavsar** - EFIMED Deputy Head of Office

**Pauline Rivière** - Carbon Nanotube- reinforced Wood Plastic Composites (WPC)

**Milena Lakicevic** - Application of Analytic Hierarchy Process and Borda count in management of protected areas

**Federica Melone** - LbL-tannase-mediated tannin activation in flow chemical processing

Coffee break

### 14:25 Session II

Chair: **Antje Potthast** - Vice-Chair of COST FPS Action FP0901

Introduction: **Harald Grossmann** - EFPRO Board of Directors' President

**Tsvetelina Simeonova** - Improving the environmental performance of Bulgarian furniture industry

**Michael Schneeberger** - Simulation of heat and mass transfer in paper drying to generate energy optimisations

**Agnieszka Jedraszak** - Influence of drying history on mechanical properties of Pinus Radiata wood

**Patrick Huber** - Smart use of small-diameter hardwood – A forestry-wood chain sustainability impact assessment in Austria

**Ali Akrami** - Developing of oriented strand boards from European beech and poplar

Coffee break

### 16:35 Session III

Chair: **Stefanie Wieland** - Chair of COST FPS Action FP1006

Introduction: **Joris Van Acker** - InnovaWood Vice-President

**Honorata Gruszka** - New technology of packaging papermaking with fines transfer

**Michael Drass** - Innovative design of bio-hybrid timber truss structures

**Marion Noël** - Thermal and thermomechanical analysis of bio-oligomeric treatments for wood stabilisation

**Urška Kavčič** - 2D codes and RFID antennas printed on smart packaging

**20:00 COST YRF Networking Dinner (upon invitation only)**

## Tuesday 12 March 2013

### 9:00 Session IV

Chair: **Anu Seisto** - Chair of COST FPS Action FP1104

Introduction: **Sjur Baardsen** - Chair of COST FPS Domain

**Emina Karišik** - Technologies of wood waste energy recovery

**Jenni Rahikainen** - Negative effect of lignin on cellulose bioconversion - lignin model surfaces for the study of cellulase-lignin interactions

**João Custódio** - Rehabilitation of timber structures – Evaluating the durability of bonded-in rod joints

**Gianluca Tondi** - Formaldehyde-free tannin foams

Coffee break

### 10:50 Session V

Chair: **Robert Prinz** - Chair of COST FPS Action FP0902

**Mislav Stepinac** - Innovative timber – structural glass shear wall panels in earthquake environment

**Anda Fridrihsone** - Tall oil, by product of pulp mills as a raw material for production of rigid PU foams filled with natural fibres

**Charalampos Lykidis** - Recycling of wood based composites using mild hydrothermal treatments

**Anna Dupleix** - Feasibility of green wood cutting by peeling method using infrared heating

### 12:10 Closing of the Conference

**Göran Persson** - Former Prime Minister of Sweden

Collection of votes for the best presentations (2) and poster (1)

(Award Ceremony will be within the FTP-c8 Conference)

**The FTP-c8 Conference will open at 12:30.**

**Lunch will be provided during registration time until 14:00.**

## Speakers



## Ángeles Rodríguez-Peña

Organisation	<b>COST - European Cooperation in Science and Technology</b>
Position	<b>President of the COST Committee of Senior Officials</b>
Organisation	<b>Spanish Ministry for Science and Innovation</b>
Position	<b>Special Advisor to the Technical Cabinet of the Secretary General of Innovation</b>
E-mail	president@cost.eu

About COST COST is an intergovernmental framework for European Cooperation in Science and Technology, allowing the coordination of nationally-funded research on a European level.

COST has a very specific mission and goal. It contributes to reducing the fragmentation in European research investments and opening the European Research Area to cooperation worldwide.

As a precursor of advanced multidisciplinary research, COST plays a very important role in building a European Research Area (ERA). It anticipates and complements the activities of the EU Framework Programmes, constituting a “bridge” towards the scientific communities of emerging countries. It also increases the mobility of researchers across Europe and fosters the establishment of scientific excellence in the nine key domains:

- Biomedicine and Molecular Biosciences
- Food and Agriculture
- Forests, their Products and Services
- Materials, Physics and Nanosciences
- Chemistry and Molecular Sciences and Technologies
- Earth System Science and Environmental Management
- Information and Communication Technologies
- Transport and Urban Development
- Individuals, Societies, Cultures and Health

In addition, Trans-Domain Proposals allow for broad, multidisciplinary proposals to strike across the nine scientific domains.

Further information can be found at <http://www.cost.eu/>





## Johan Elvnert

Organisation **Forest-based Sector Technology Platform (FTP)**

Position **Managing Director**

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About FTP The Forest-based Sector Technology Platform (FTP) - a European partnership for research and development

The forest-based sector includes all stakeholders with a major interest in forestry, forest-based materials and products. It also provides essential products and services for a more sustainable society. It accounts for 8% of manufacturing added value in the EU, using a renewable and continuously growing forest resource, counting 16 million private forest owners and providing nearly four million jobs.

FTP provides a forum for European forest owners, companies, researchers, regulators and financial institutions to work together in support of the development of new forest management schemes, products, services and business models.

To achieve significant breakthroughs through innovation, the sector needs access to financial capacity and basic scientific knowledge that is rarely available within one organisation or company. A critical mass of skills and resources is needed to break down barriers to innovation. Creating this critical mass is one of the prime purposes of the FTP.

In common with the Technology Platforms for other sectors, FTP is charged with defining a strategic Vision Document on behalf of the sector and agreeing on research priorities, set out in a Strategic Research and Innovation Agenda (SRA). These priorities help to inform EU research funding programmes, which in turn will support the implementation of the SRA, along with other sources of public and private funding.

FTP is owned by the following European confederations: CEI-Bois (European Confederation of Woodworking Industries), CEPF (Confederation of European Forest Owners), CEPI (Confederation of European Paper Industries) and EUSTAFOR (European State Forest Association).

Further information can be found at <http://www.forestplatform.org/en/>



## **Anna Brown**

- Organisation **Forest Research, Centre for Forestry and Climate Change**
- Position **Senior Scientist, Head Of Programme**
- COST involvement **Chair of COST FPS Action FP1102 'Determining invasiveness and risk of dothistroma (DIAROD)'**
- E-mail [anna.brown@forestry.gsi.gov.uk](mailto:anna.brown@forestry.gsi.gov.uk)
- About FP1102 Dothistroma needle blight is an economically important tree disease caused by two fungal pathogens, *Dothistroma septosporum* and *Dothistroma pini*. Although the disease has been a problem in the southern hemisphere for many years, only recently has it caused significant damage to plantations and natural forest ecosystems in Europe. The biosecurity implications relating to this recent upsurge are unclear, and this has raised a number of important questions: Are these fungi recently introduced, or is it that they are changing in behaviour, possibly due to changing climatic conditions? Alternatively, is the dramatic increase in disease intensity and geographical and host range due to the introduction of more aggressive strains? Is this situation likely to worsen, or maybe improve under future management and climate change scenarios? What are the most suitable management strategies? This Action, DIAROD, plans to build on the foundations of the International Dothistroma Alliance (IDA), established in 2006 to help combat the new problems faced due to this disease. The aim of the DIAROD cost Action is to synthesize knowledge, encourage collaborative research to address the key questions, determine future research priorities, and use the resulting information to develop management strategies applicable to this evolving disease and other future disease threats.
- Further information can be found at [http://www.cost.eu/domains\\_actions/fps/Actions/FP1102](http://www.cost.eu/domains_actions/fps/Actions/FP1102)



## **Robert Mavsar**

Organisation	<b>European Forest Institute Mediterranean Regional Office (EFIMED)</b>
Position	<b>Deputy Head of Office</b>
COST involvement	<b>COST FPS Actions E45 and FP1203</b>
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**About EFIMED** The European Forest Institute is the leading forest research network in Europe. It is an international organisation established by European States to conduct and advocate for forest research, and advance forest research networking across the whole of Europe. It is an acknowledged contact point for unbiased, policy-relevant information on forests and forestry.

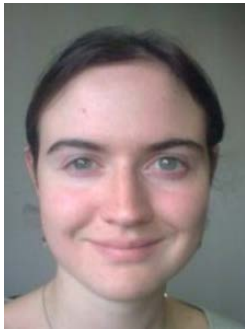
EFIMED is the Mediterranean Regional Office of the European Forest Institute. Based in Barcelona, Spain, it was the first EFI Regional Office, launched in 2007.

EFIMED:

- Coordinates a network of more than 60 forest research institutions from 17 Mediterranean countries.
- Promotes research and networking on Mediterranean forests, forestry and forest products.
- Responds to policy needs by providing science-based information on forests and forestry at the Mediterranean level.
- Supports scientific capacity-building, especially in Southern and Eastern Mediterranean countries.
- Consolidates an international forest research network, aiming to overcome the fragmentation of the Mediterranean forest rese

EFIMED receives funding from the Ministry of Science and Innovation of Spain and the Department of Innovation, Universities and Enterprises of Catalonia and from the CTFC, Forest Technology Centre of Catalonia.

Further information can be found at <http://www.efimed.efi.int/portal/>



## Pauline Rivière

Organisation **Universität Für Bodenkultur, Institut für Naturstofftechnik**

Position **Scientific project staff**

Country **Austria**

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Biography During her education at ENSTIB (School of Wood Science and Timber Engineering in Epinal, France), Pauline has worked for two months on the assessment of the durability of different species of untreated and treated wood at SP Technical and Research Institute of Sweden in Borås. This work was part of the national Ecobuild project. She has then worked, during 4 months in collaboration with the company Buffet-Crampon on the Characterization of Mozambique Ebony Tree regarding the manufacture of Clarinet. At the end of her studies at ENSTIB, she has worked for 5 months for the R&D department of Sonae Indústria. The subject of her internship was to technically develop a new product called Woodforce. This product is designed to offer a higher homogeneity and an easier dosage of the wood fibers in the production of Wood Plastic Composites (WPC). Instead of producing pellet for wood fibers, panel boards produced by the MDF process are cut in small dices.

Abstract **Carbon Nanotube- reinforced Wood Plastic Composites (WPC)**

The Institute for Natural Materials Technology (Boku University of Vienna) together with the carbon nanotubes manufacturer C-Polymers are co-operating to develop an electrically and thermally conductive Wood Plastic Composite (WPC). This project is incorporated in the program EFRE. First, different biopolymers are blended with Multi Walled Carbon Nanotubes (MWCNT). The aggregation phenomenon of the Carbon Nanotubes during their process is analysed by Atomic Force Microscopy (AFM). Second, to increase dispersion and adhesion between the components the biopolymers and CNT will be chemically modified. The optimal loading and treatments is then selected, according to the obtained mechanical and electrical properties profiles. Further, effects of natural elements on the optimized recipes are assessed as well. Currently, a first reference sample set of untreated CNT reinforced biopolymers was processed and mechanically characterized. Current results will be presented and discussed.



## Milena Lakicevic

Organisation **University of Novi Sad, Faculty of Agriculture**

Position **Research Associate**

Country **Serbia**

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Biography Milena Lakicevic is a Research Associate at the Faculty of Agriculture, University of Novi Sad, Serbia and a PhD student at the Faculty of Forestry, University of Belgrade, Serbia. Her research is based on decision-making in forestry and management of protected areas. She published 20 papers in peer reviewed journals and international conference proceedings. In 2011, she took a part in two COST Training Schools: Vienna, Austria, 12-16 September 2011: Summer School – Adaptation to Climate Change in Forest Management, BOKU University, COST Action FP0703; and Kaprun, Austria, 8-13 May 2011: Spring School – Modeling Forest Ecosystems (Concepts, Data and Application), COST Action FP0603.

Abstract **Application of Analytic Hierarchy Process and Borda count in management of protected areas**

This paper offers a new decision-making framework in management of protected areas. Proposed framework combines application of multi-criteria analysis and social choice theory, by linking Analytic Hierarchy Process (AHP) and Borda count. Linking AHP and Borda count allows participation of different stakeholders' groups in decision-making and management of protected areas. The main goal of this research is to define a new methodology, which will provide the involvement of different stakeholders, according to the level of their competences. The application of proposed approach is shown on a case example of the National Park 'Fruska gora', Serbia.



## Federica Melone

Organisation **Università Della Tuscia, Ecologia e Scienze Biologiche**

Position **PhD Student**

Country **Italy**

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Biography Federica Melone received her master's degree in chemical science in 2008 from "Sapienza" University of Rome with a thesis on "Syntheses of novel HIV- Protease potential inhibitors, analogous of U-75875". She got a scholarship from Department of Agriculture, Forests, Nature and Energy (DAFNE) of Università degli Studi della Tuscia in Viterbo dealing with the "Development of novel 'eco-friendly' catalyst and biocatalyst". She is now finishing her PhD in Plant Biotechnology in DAFNE of Tuscia University. Her research interests focus on lignins and tannins; she developed a new quantitative <sup>31</sup>P NMR-based method for the elucidation of tannins structure and a new <sup>31</sup>P NMR/HSQC method for clarifying the polymeric/oligomeric lignin nature. She developed new immobilized biocatalysts for upgrading lignins and tannins.

Abstract **LbL-tannase-mediated tannin activation in flow chemical processing**

Hydrolysable tannins represent a precious raw material for pharmaceutical industries since natural source of gallic acid. Gallic acid, whose chemical synthesis is known to be expensive, possesses a wide range of biological activities, from the antibacterial and antiviral to the analgesic and anti-apoptotic ones. It is the substrate for propyl-gallate, a potent antioxidant used in food and beverage industry, and it is an important building block in the synthesis of active small molecules. The high sensitivity of enzymes towards the industrial environmental conditions limits the industrial applications. Immobilization techniques proven to be the unique approach to overcome these constraints. We have directed our efforts in the incorporation of an immobilized tannase into a continuous and segmented flow-chemistry set-up suitable for the production of gallic acid and gallic acid-based active small molecules exploiting tannins isolated from other biomass-transforming processes.



## Antje Potthast

- Organisation **BOKU Wien, University of Natural Resources and Life Sciences, Chemistry**
- Position **Group Leader**
- COST involvement **Vice-Chair of COST FPS Action FP0901 'Analytical techniques for biorefineries'**
- E-mail [antje.potthast@boku.ac.at](mailto:antje.potthast@boku.ac.at)
- About FP0901 

Trees, annual and perennial plants, recycled fibres, and lignocellulosic side streams from forest and agroindustry are renewable resources for the development of natural materials, biochemicals, and bioenergy. The chemical complexity of plant materials, the feed material of Biorefineries, renders the analyses of the feed constituents, processes, and valorised products challenging. The main objective of the Action is to develop new and evaluate existing analytical methods related to forest-based and agroindustrial Biorefineries. Thus, the Action covers the analytical methods for the Biorefinery feed material and for processed biochemicals, biomaterials, and process residues. Especially analytical pretreatments will be evaluated. Critical steps are the representativeness of the sampling and samples, the extraction, fractionation, and sample storage methods applied. New methods will be applied and evaluated for their relevance. Other emphasised areas will be development of analytical on-line applications, hyphenated techniques, and applying statistical multicomponent analyses to sort out the relevant data from the main data stream. The European forest-based, bioenergy-based and agroindustrial industries will benefit from the Action in receiving relevant information on their developments of sustainable and environmentally benign solutions for novel utilisation of renewable resources. The development of analytical tools will lead to cost effective and sustainable processes and products.

Further information can be found at [http://www.cost.eu/domains\\_actions/fps/Actions/FP0901](http://www.cost.eu/domains_actions/fps/Actions/FP0901)





## Harald Grossmann

- Organisation **EFPRO - European Fibre and Paper Research Organisations**
- Position **President of the EFPRO Board of Directors**
- Organisation **Dresden University of Technology**
- Position **Professorship for Paper Technology**
- COST involvement **COST FPS Actions E26, E32, E48, E54, FP1005 and FP1105**
- E-mail [harald.grossmann@tu-dresden.de](mailto:harald.grossmann@tu-dresden.de)
- About EFPRO The Association of European Fibre and Paper Research Organisations is an initiative in the pulp and paper research field. EFPRO is an independent non-profit organisation founded 2006 and it is aiming at:
- Promoting and represent the interest of organisations in Europe active in research in the area of wood fibre processing.
  - Providing a forum for its members.
  - Establishing a close network between its members to increase the efficiency of European fibre and paper related research.
- And by this contributing to:
- The development of the knowledge-based society.
  - Maintaining and extending Europe`s technological leadership.
  - The competitiveness and the sustainability of the European natural fibre based sector.
  - Meeting society´s needs for social cohesion and environmental compatibility.
- Further information can be found at <http://www.efpro.eu>





## Tsvetelina Simeonova

Organisation **Ecotechproduct Ltd**  
Position **Environmental & Marketing Manager**  
Country **Bulgaria**  
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Biography Tsvetelina has a bachelor degree in Business Management and a Master in Strategic Planning. In February 2012 she defended her PhD thesis “Environmental Management in the Furniture Industry” at the University of Forestry, Sofia. She has a Scientific Research Practice at Research and Transfer Centre “Applications of Life Sciences”, Hamburg University of Applied Sciences, funded by International Scholarship Program of German Environmental Foundation (DBU). She has taught exercises in Ecomanagement, Forest Policy and Management of Ecotourism at the University of Forestry, Sofia. She participated as a lecturer in the Erasmus Intensive Program INNO-NATOUR in 2010 at Suceava, Romania. Since 2002 she has worked for family-run company Ecotechproduct Ltd as an Environmental and Marketing Manager.

Abstract **Improving the environmental performance of Bulgarian furniture industry**

Bulgarian furniture manufacturers have significant environmental impacts. An important step towards better environmental performance in the sector is to raise awareness about the environmental impacts and provide easy-to-apply environmental management tools for companies. The methodology of Ecomapping is modified to reflect the specific situation in the furniture industry and experimentally applied in selected Bulgarian furniture producers. The results show that it is easy-to-apply, allows defining and prioritizing environmental problems and issues to act upon and raise awareness of environmental problems among workers and the management. This methodology is further developed into a consecutive model of Eco-steps. The model is easy-to-follow and completing its steps ensures the implementation of an environmental management system which corresponds to the needs of furniture producers. This model is complemented with Eco-tips which consist of principles and concrete actions.



## Michael Schneeberger

- Organisation **Graz University Of Technology, Institute for Pulp, Paper and Fibre Technology**
- Position **University Assistant**
- Country **Austria**
- E-mail [michael.schneeberger@tugraz.at](mailto:michael.schneeberger@tugraz.at)
- Biography Michael graduated as MSc in Process Engineering, branch of study Pulp and Paper Technology at Graz University of Technology in 2002. He started his career at Sappi in Gratkorn, a mill producing wood free coated paper, as a Project Engineer in the local Technology & Engineering Department. Initially he was supporting projects in the paper and finishing department in Gratkorn. In 2005 he moved within the T&E department to lead projects as a Senior Project Manager in the local Pulp Mill and Utilities Departments. End of 2010 he left Sappi company and started his new employment at the Institute for Pulp, Paper and Fibre Technology, Graz University of Technology Graz. He has changed his field of work from project management to research. His research and PhD studies are focused on energy optimisation in the drying group of paper machines.
- Abstract **Simulation of heat and mass transfer in paper drying to generate energy optimisations**
- In February 2011 an energy optimisation project was started by the Institute of Pulp, Paper and Fibre Technology, University of Technology Graz together with an external consultant, 4 industry partners and the support of the Özepa. Target of the project is to reduce the energy costs for four paper machines at least 2% per year. To decrease energy demand in the drying group the exact knowledge of the used fibre mix and the drying mechanism in paper drying are necessary. The presentation will start with an overview of the results of the study from the heat transfer mechanism of conductivity, convection and radiation energy to the paper web. Exact physical simulation models of the equipment used in the drying groups and heat recovery system have been developed and optimised. Some principle pictures of the simulation models will be shown and discussed in the presentation. In this presentation three case studies and the possible savings will be presented.



## Agnieszka Jedraszak

Organisation **Poznan University of Life Sciences, Department of Forest Utilisation**

Position **PhD Student**

Country **Poland**

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Biography Mrs Agnieszka Jędraszak is a PhD Student at the Faculty of Forestry, University of Life Sciences in Poznan, Poland. She has MSc degree in Forestry and in Chemical Wood Technology. Last year she did an internship at School of Forestry, University of Canterbury, New Zealand (she was granted STSM by COST Action FP0802) and at Faculty of Forestry, University of Zagreb, Croatia. She also took part in COST Workshop 'Green Engineering Camp' (GEC) in Croatia. She has just completed participation in the EU project 'Wielkopolski Engineer in the European Research Area'.

Abstract **Influence of drying history on mechanical properties of *Pinus radiata* wood**

The effect of the drying history on mechanical wood properties has gained increased interest in recent years. Lowering the moisture content below fibre saturation point increases the strength of wood. We have investigated the effect of drying history on the strength and stiffness of *Pinus radiata* wood. Basic wood density, ultimate compressive strength along the fibres, MOR, MOE in static bending and acoustic velocity were measured on core- and outerwood for 3 different drying histories. Physical properties of outerwood were significantly higher in outerwood than in corewood. Stiffness also increased upon drying. Complete drying induces drying damage to the molecular structure of wood reducing its mechanical performance. When wood in service dries to very low moisture contents it will be less strong and stiff than the original assessment in timber grading. That project could be realized thanks to financial support from COST Office in a form of RSTSM granted to Agnieszka Jedraszak.



## Patrick Huber

- Organisation **European Forest Institute Central-East European Regional Office (EFICEEC)**
- Position **Junior Researcher**
- Country **Austria**
- E-mail **patrick.huber@efi.int**
- Biography Patrick Huber holds a bachelor degree in Environmental and Bio-Resources Management of the University of Natural Resources and Life Sciences Vienna (BOKU). He completed the Double-Degree Programme Material and Energetic Utilization of Renewable Resources coordinated by BOKU in cooperation with the Technical University Munich at the end of 2011. His master thesis dealt with alternative use of kraft lignin. Since February 2012 he is employed at the Institute of Silviculture (BOKU) where he has been involved as a freelancer in various projects since 2008. Henceforward he is working as a staff member for the European Forest Institute Central-East European Regional Office (EFICEEC) under the guidance of Dr. Bernhard Wolfslehner. His research activities focus on sustainability dimensions of forestry-wood chains and forest ecosystem services.
- Abstract **Smart use of small-diameter hardwood – A forestry-wood chain sustainability impact assessment in Austria**
- Small-diameter hardwood (SDH) in Austria is currently a mass input for energetic use and pulp production. Its use is non-selective and non-distinctive with regard to wood quality and potential for value generation. Sustainability impact assessment methodology is applied for the stages of forest management & harvest, transport and wood processing & industries to test alternative ways of SDH. A higher amount of material use of SDH due to improved forest management, sorting, logistics and sawing techniques may lead to overall more sustainable wood-based value chains, including a more balanced benefit sharing and value creation within regions, and to higher efficiency of wood consumption in terms of cascade use and carbon storage. Enhanced cooperatives in the forest-based sector and active support by coherent regional policies are needed to overcome obstacles such as insufficient wood mobilization and supply chains that are non-integrated within and between forest-based sub-sectors.



## Ali Akrami

Organisation **University of Hamburg, Wood Physics and Mechanics**

Position **PhD Student**

Country **Germany**

E-mail [ali.akrami@uni-hamburg.de](mailto:ali.akrami@uni-hamburg.de)

Biography Ali Akrami got his M.Sc. Degree in Wood Engineering at Tehran University, the leading university in this field in Iran. He has two papers published in Iranian journals of his research works in his M.Sc. program. He started his PhD in August 2010 under the supervision of Prof. Dr. Fruehwald and Prof. Dr. Barbu at University of Hamburg. The topic of his PhD Thesis is 'Development and Characterization of European Beech and Poplar Oriented Strand Boards'.

Abstract **Developing of oriented strand boards from European beech and poplar**

Oriented strand boards (OSB) are one of the important engineered wood based panels for various applications such as wall and roof sheathing, flooring, packaging, and other structural applications. USA and Canada produces 83.5% of OSB in the worldwide. With 5.0 m<sup>3</sup>/year OSB holds 7% among the wood composites in Europe. An increasing demand for housing and other construction material will lead to higher volumes. In order to meet the challenges related to volume specific properties and production costs, scientists and manufacturers are trying to develop new technologies and look for alternative raw materials for this huge market in the future.



## **Stefanie Wieland**

Organisation **Salzburg University of Applied Sciences, Forest Products Technology & Construction**

Position **Head of R&D Department**

COST involvement **Chair of COST FPS Action FP1006 'Bringing new functions to wood through surface modification'**

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About FP1006 Many applications of products are determined by their special surface properties, and based on the physical, chemical and biological interchange of various molecules with the materials surface. This is especially true for the use of wood and wood based products due to the special wood characteristics like anisotropy, UV-degradation. Thus, bringing new functions to wood through surface modification is needed in order to enhance the quality of the existing wood products and to open the way to new applications, products or markets.

This COST Action aims to provide the scientific-based framework and knowledge required for enhanced surface modification of wood and wood based products towards higher functionalization and towards fulfillment of higher technical, economic and environmental standards. This will be achieved by working within three main areas: Wood surface modification and functionalization, Wood interface modification and interface interaction and Process and Service life modelling.

Further information can be found at  
[http://www.cost.eu/domains\\_actions/fps/Actions/FP1006](http://www.cost.eu/domains_actions/fps/Actions/FP1006)



## Joris Van Acker

Organisation **InnovaWood**

Position **Vice-President**

COST involvement **COST FPS Actions E18, E37, E44, IE0601 and FP0802**

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About InnovaWood InnovaWood is an umbrella organisation that integrates four European networks in the Forest, Wood-based and Furniture industries into a more effective mechanism to support innovation in these sectors.

With more than 70 members from 24 countries it is one of the leading networks of excellence in Forest-Wood-based sector. Members are active in the areas of Research, Education & Training and Technology Transfer.

The overall aim of InnovaWood is to bring business benefit to the forestry, wood and furniture chain by providing a forum for member organisations to contribute more effectively to the development of the FWC. In particular they seek to support the use of innovation, research, training and education as tools for increasing the competitiveness of European industries in line with the general policies of the European Union.

InnovaWood offers a range of different products and services related to education, research and innovation projects of members and contributors: from development of new partnerships and collaborations, consultancy and technical support services, seminars, conferences and workshops to the promotion of members capabilities, facilities, products and services and a co-coordinated, representative voice on behalf of members to key decision makers in the EU and forest-based industries.

Further information can be found at <http://www.innovawood.com/>





## Honorata Gruszka

Organisation **Lodz University of Technology, Institute of Papermaking and Printing, Faculty of Pulp Technology**

Position **Technologist**

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Biography Honorata Gruszka finished her studies at the Lodz University of Technology, department of Papermaking and Printing, at the faculty of Mechanical Engineering in 2006. After graduating she worked for two years as the Quality Engineer and by the assembly of light pipes in a Corning Cable Systems. In 2009 she started doctoral studies in Institute of Papermaking and Printing. She opened procedure PhD in June 2012 under the title 'Analysis of returning of fines fraction on the quality of paper and pulp paper drainage mechanism on paper machine'. Her promoter is PhD DSc Pawel Wandelt (professor). She analyzes the concept of management of separated fines in a main product neither as a by-product nor undesirable waste. She had a training period during her study in the paper factory Arctic Paper in Kostrzyn.

Abstract **New technology of packaging papermaking with fines transfer**

M. Sc. Eng. Honorata Gruszka, PhD DSc Pawel Wandelt, Institute of Papermaking and Printing, Lodz University of Technology, Wolczanska 223, 90-924 Lodz, Poland, <http://www.pulppaper.eu> The Faculty of Pulp Technology of the Institute of Papermaking and Printing at the Lodz University of Technology developed and then verified the concept of management of separated fines in a main product neither as a by-product nor undesirable waste. The modification in the paper production process involves separation of a given amount of the fines from the pulp after beating the entire pulp as they always deteriorate pulp drainability losing the effect of fractionation and moving the fines to the short fibres. According to this method the separated part of the fines is added to paper in the dry end of the paper machine at surface sizing stage, passing by the wet end. This operation improves drainability and it may also enhance some paper quality parameters. Keywords:Fines management,Packaging paper





## Michael Drass

Organisation **Mainz University of Applied Sciences, Timber Structures and Structural Design**

Position **PhD Student**

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Biography His studies of civil engineering started 2008 in Mainz, Germany, and ended in 2012 with a Master's Degree from the University of Applied Sciences in Mainz. After an employment as tutor in the field of Mechanic Systems II and Constructional Steelwork I (2010), he started a student employment in the engineering office Grebner Ingenieure GmbH in Mainz. Here, he worked for nearly for 2 years as a structural engineer (2010-2012). After an internship in the engineering office König und Heunisch Frankfurt, Germany, in the field of superstructures and bridge engineering, he's now working as a research assistant and PhD Student at the Mainz University of Applied Sciences (2013). His research topic is the construction and mechanical behaviour of timber-concrete-composite constructions.

Abstract **Innovative design of bio-hybrid timber truss structures**

It is commonly known that timber trusses are a constructed assembly of girders, diagonal braces and joints. The design and construction of such timber trusses are not very common in structural timber engineering. However, there are following advantages of trusses in comparison to solid web girders: 1. Aesthetics of transparency girders by use of eco-efficient round timber 2. Light-weight construction for large spans 3. Minor material consumption To benefit from these advantages and to design large-span trusses in timber engineering the structural system, contribution of forces within the assembling points and the most restrictive parameters in design codes have to be considered. Furthermore, there have to be innovative designs of the assemblage points, which are in unison with the contribution of forces and design parameters. To achieve these objectives it is essential to utilize multi-material solutions and composite constructions.



## Marion Noël

Organisation **Bern University of Applied Sciences, Architecture, Wood and Civil Engineering**

Position **Scientific Collaborator**

Country **Switzerland**

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Biography Born in the South of France, Marion moved to Epinal (North East) to study wood science and wood technology. She got her Master of Engineering and Master of Sciences at the National Engineering School of Wood Technologies and Industries (ENSTIB). She graduated from the University of Nancy in 2007. Her PhD thesis dealt with the elaboration of a new innovative composite material based on solid wood and lactic acid oligomers. She spent then two years as an assistant lecturer in the ENSTIB, and moved to Switzerland 3.5 years ago, to the Bern University of Applied Sciences (Architecture, wood and civil engineering) in Biel, where she is a scientific collaborator in charge of research projects, expertises, accredited tests and industrial contracts related to surfaces, wood coating, wood protection and wood modification.

Abstract **Thermal and thermomechanical analysis of bio-oligomeric treatments for wood stabilisation**

The potential of biopolymers as wood stabilisation treatments is evaluated. Polylactic and polyglycolic acids, polybutylene succinate and adipate are assessed as wood treatment in their oligomeric form. As polar polyesters, they are expected to show a good affinity to wood. Their monomers and oligomers are carboxylic acids, able to be grafted on hydroxyl groups of wood and to polymerise in cell walls and lumens. Treatments have been impregnated and reacted into solid wood. Chemical, thermal and thermomechanical analyses of treatments and composites obtained were conducted. FTIR-ATR and GPC analyses are used as polymerisation assessment. To understand the influence of impregnation on wood thermomechanical properties, DMTA and TGA analyses are performed. A strong influence of the treatment has been noticed on wood thermomechanical behaviour, explained by penetration of treatment in the cell wall at a certain temperature, and polymerization carried out into the lignocellulosic structure.



## Urška Kavčič

Organisation **Valkarton Rakek d.o.o. and University of Ljubljana, Faculty of Natural Sciences and Engineering**

Position **Young Researcher**

Country **Slovenia**

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Biography Urška Kavčič studied Graphic Technology at the Faculty of Natural Sciences and Engineering in Ljubljana. She graduated in 2008 with the thesis "The influence of surface finishing on packaging gradation". After graduation she enrolled to postgraduate study of Textile, Graphics and Textile Design at the same Faculty and applied for a position as a young researcher from the economy. Now she partially works for graphic company Valkarton Rakek d.o.o. and partly at Faculty of Natural Sciences and Engineering in Ljubljana. Her PhD thesis will include experimental work on smart packaging, especially on integration of 2D codes and printed RFID tags onto the packaging.

Abstract **2D codes and RFID antennas printed on smart packaging**

The development of information and communication technology affects also the area of packaging. Different multifunctional elements applied directly to the packaging were developed and more and more packaging include intelligent or active and interactive components that make packaging smart. Two of those elements are also 2D codes and RFID tags, which can be applied (also printed), to the packaging for automatic identification, authentication or protection. The decision for the application of mentioned technologies to the packaging opens lots of questions on the field of graphic technology. In the case of 2D code incorporation different colour codes with different size and visibility where the code is still readable were investigated. When using RFID tags, besides graphic (printing) technology limitations we have to be familiar also with properties and principle operation of radio waves. In the research both technologies were investigated to be as close as possible for mass production.



## Anu Seisto

Organisation **VTT Technical Research Centre of Finland, Smart Interaction Solutions**

Position **Team Manager**

COST involvement **Chair of COST FPS Action FP1104 'New possibilities for print media and packaging - combining print with digital'**

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About FP1104 The goal of this Action is to promote discussion on the benefits that may be achieved from novel combinations of print and digital. It will also be used to enhance innovations that will make use of the benefits of both print and electronic media as well as innovations where print and electronic media are combined. Several examples exist where successful combinations have been achieved e.g. through the use of image recognition, augmented reality or printed electronics to bring interactivity into fiber based products. To give the forest industry a competitive edge this Action will focus on new innovations by combining knowledge of the end users with most recent technological achievements. New models of ongoing change in social interaction and in the cultural products of paper and electronic media will be elaborated and proposed. The results will promote critical and theoretical discussion on the changing meanings of contemporary media culture. The Action will explore new business opportunities for the fiber based products and the value chains of print media and packaging through novel, innovative uses. It will also serve as a channel for communication between industry and academia, thus contributing to the development of new commercial applications.

Further information can be found at  
[http://www.cost.eu/domains\\_actions/fps/Actions/FP1104](http://www.cost.eu/domains_actions/fps/Actions/FP1104)



## **Sjur Baardsen**

Organisation **Norwegian University of Life Sciences, Department of Ecology and Natural Resource Management**

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COST involvement **Chair of COST FPS Domain**

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About FPS The Forests, their Products and Services COST Domain has the mission to promote research along the whole forest-wood-chain by providing a platform for effectively coordinating nationally-funded research activities in the areas of forestry, wood technology, and pulp and paper.

The Forests, their Products and Services Domain Committee is responsible for the general oversight of the COST activities within the Forests, their Products and Services domain, in particular, for the quality assurance of new Action proposals, for monitoring progress of ongoing Actions, for evaluating completed Actions, as well as the development of strategic initiatives (such as this Young Researchers' Forum).

The members of the Forests, their Products and Services Domain Committee (including your country's representative) are found at [http://www.cost.eu/domains\\_actions/fps?dc\\_members](http://www.cost.eu/domains_actions/fps?dc_members)

Information about running (and past) Actions in the Forests, their Products and Services Domain is found at [http://www.cost.eu/domains\\_actions/fps/Actions/%28all%29](http://www.cost.eu/domains_actions/fps/Actions/%28all%29)

Further information can be found at [http://www.cost.eu/domains\\_actions/fps](http://www.cost.eu/domains_actions/fps)



## **Emina Karišik**

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Biography Development of technologies for wood waste energy recovery. Energy efficiency in school buildings and measures for improvement. Research and planning of fire and explosion protection. Designing in thermal engineering - energy efficient systems. Heating, Ventilation and Air conditioning.

Abstract **Technologies of wood waste energy recovery**

As the last stage in the chain, energy recovery from contaminated wood waste is faced with strict legislative and environmental aspects as it has unpredictable and various chemical content. On the other hand, conversion technologies depend on fuel properties including contamination, and the overall energy potential is affected as a result. Environmental compliancy and energy efficacy are final goal that should be reached by the optimization of the process. The outcome is controlled contaminants flow throughout the process including their influence in addition to conversion process optimisation. Comparison between conversion technologies for both, contaminated and fuel with controlled chemical content will be performed as the assessment of effects achieved by designed decontamination. The final goal of our research project is illumination of points which can ensure compliance with legislative, sustainability and economic benefits in real applications.



## Jenni Rahikainen

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Position **Research Scientist / PhD Student**

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Biography Jenni accomplished her MSc degree in Biotechnology in 2009 from the University of Helsinki, Finland. Since then she has been working as a Research Scientist at VTT Technical Research Center of Finland. The main focus of her work has been on studying enzymatic hydrolysis of lignocellulose for fuel and chemical production and the inhibitory role of lignin in the degradation process. The work will be documented in a Doctoral thesis which will be defended in 2013.

Abstract **Negative effect of lignin on cellulose bioconversion - lignin model surfaces for the study of cellulase-lignin interactions**

Biochemical processing of lignocellulose aims at enzymatic degradation of cellulose and hemicellulose down to simple sugars that are precursors for fuel and chemical production. Pretreatment is required for enzymatic digestibility of lignocellulosic biomass. In steam pretreatments, lignin is preserved insoluble with the cellulosic fraction which presents a challenge for enzymatic hydrolysis of cellulose. Lignin adsorbs enzymes, leading to increased need for enzyme and difficulties in enzyme recycling. Better control of the binding requires detailed understanding of the enzyme-lignin interactions involved. Lignin was isolated and characterised from steam pretreated and non-treated spruce and wheat straw. The isolated lignins were used to prepare ultrathin lignin films for quartz crystal microbalance (QCM) studies that enable on-line measurement of enzyme adsorption on the different types of lignin surfaces. The effect of lignin structure on enzyme adsorption will be discussed.





## João Custódio

Organisation **Portuguese National Laboratory for Civil Engineering (LNEC),  
Materials**

Position **Post Doctoral Research Fellow**

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Biography João Custódio graduated in Technological Chemistry by the Faculty of Sciences of Lisbon University in December 2002 and completed a PhD degree with a programme of work entitled 'Performance and Durability of Composite Repair and Reinforcement Systems for Timber Structures' at Oxford Brookes University (UK) in December 2009. Custódio is currently a Post-Doctoral Research Fellow at the Materials Department of LNEC – Laboratório Nacional de Engenharia Civil, I.P. (National Laboratory for Civil Engineering – a Portuguese government research and development institute).

Abstract **Rehabilitation of timber structures – Evaluating the durability of bonded-in rod joints**

Rehabilitation systems involving bonded-in rods represent an efficient alternative method for the repair and/or reinforcement of structural timber members. However, in spite of their advantages, their use is still restrained by the lack of knowledge about their long-term performance. Also, reliable and realistic accelerated ageing tests do not yet exist, and the application of the existing standards to epoxy bonded products are much too penalising, since they merely impose severe conditions that are not verified in service although these are suitable for other adhesives. To address these concerns a test procedure to assess long-term behaviour of bonded-in rod connections was developed with the aim of providing a simple method for the selection of candidate repair system materials for specific applications. From the results obtained so far using the method developed, it seems that it can predict correctly the end-use performance for different adhesives as well as for different timbers.





## Gianluca Tondi

- Organisation **Salzburg University of Applied Sciences, Forest Product Technology & Timber Construction**
- Position **Key Researcher**
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- Biography Master in Chemistry at the University of Florence with specialization in modified polyvinylacetates. PhD in Wood science at the University of Nancy on a project based on the valorization of industrial tannin extracts. PostDoc at the Salzburg University of Applied Sciences in the frame of natural wood preservatives. Actually Key-researcher in the same institute.
- Abstract **Formaldehyde-free tannin foams**  
Tannin foams are one of the most important discovers in wood technology of the last years. Recently important improvements have been done in the formulation and in the technology. Many perspectives are now opened and industrial interest is strongly rising.



## Robert Prinz

Organisation	<b>Finnish Forest Research Institute (Metla)</b>
Position	<b>Researcher</b>
COST involvement	<b>Chair of COST FPS Action FP0902 'Development and harmonisation of new operational research and assessment procedures for sustainable forest biomass supply'</b>
E-mail	robert.prinz@metla.fi
About FP0902	<p>The main objective is to harmonise forest energy terminology and methodologies of forest operations research and biomass availability calculations thereby building the scientific capacity within forest energy research and supporting the technology transfer of the forest biomass procurement chain and sustainable forest management. At present the use of forest biomass for energy is an increasingly important topic particularly in light of the debate on climate change. Forest biomass offers the largest potential as a renewable fuel. In order to ensure the reliable and sustainable supply of forest fuel new technological solutions to procure forest biomass are needed. By harmonising research methodologies in forest biomass operations research it is anticipated that more solid conclusions can be drawn from research results since the Action enables more comparable repetitions of the same studies across Europe. Furthermore, research results will be more comparable and the generalisation of research results will be improved. The Action will provide an original synthesis of multidisciplinary research efforts and an innovative European wide reference for forest biomass for energy terminology, sampling methods, standard measurements, and research methodologies. This synthesis will promote the increase in the use of forest biomass for energy as laid out in the EU strategies. Through the possibilities of the networking concept, the most suitable research methods can be identified, harmonised and standardised throughout the EU. The Action contributes to provide a more solid basis for the decision making on national and EU levels on biomass supply.</p> <p>Further information can be found at <a href="http://www.cost.eu/domains_actions/fps/Actions/FP0902">http://www.cost.eu/domains_actions/fps/Actions/FP0902</a></p>



## Mislav Stepinac

Organisation **University of Zagreb, Faculty of Civil Engineering, Department for Structures**

Position **PhD Student**

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Biography In 2008 Mislav finished Faculty of Civil Engineering in Zagreb, Croatia. From that time he has worked at the Department for Structures, Faculty of Civil Engineering, University of Zagreb. His main activities and responsibilities are to work with students and do scientific researches. He lectures on Timber and Lightweight Structures. He has participated in a few European projects (SMooHS, Climate for Culture) and still participates in two COST Actions (FP1101 and FP1004). Through the years he attended three COST Training Schools. His main field of research is timber structures (details in timber structures - glued in rods or similar) and he has published a few articles about the use of glass in structures. This year he was on Short-Term Scientific Mission for seven weeks at Technical University of Munich. He has published fifteen scientific and non-scientific papers.

Abstract **Innovative timber – structural glass shear wall panels in earthquake environment**

Last few years new generation of constructive glass with much better ductility and mechanical properties has been used in structures. This fact gives the opportunity to create new generation of structural composite systems of glass and wood with high aesthetic, economic and load-carrying value. Evaluation of load-carrying capacity of composite systems are the main goal of the research. Glass as material is non-ductile and behaves elastically until failure, and for these reasons we must be focused on the details and design of contacts between all the elements. This paper will focus on the seismic survey results obtained by testing of timber-glass composite system. The full dynamic testing of the model was conducted with the shaking table. Experimental results showed behaviour of the composite panels and the failure mechanism under strong earthquake load. Energy is dissipated through sliding of glass over timber frame and through activation of connectors in the corners of timber frame.



## **Anda Fridrihsone**

Organisation **Latvian State Institute of Wood Chemistry, Polymer Laboratory**

Position **Scientific Assistant**

Country **Latvia**

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Biography Anda Fridrihsone graduated from Riga Technical University in 2012 and gained a Master's Degree in Environmental Science. Before that she has earned a Bachelor's Degree In Chemical Engineering. Now she continues her PhD studies at Riga Technical University in field of bio-based polyurethanes PUR and life cycle assessment. She is a scientific assistant at the Polymer department of Latvian State Institute of Wood Chemistry (IWC). In the field of polyurethane IWC is the leading Institute in Baltics.

Abstract **Tall oil, by-product of pulp mills as a raw material for production of rigid PU foams filled with natural fibres**

In 21st century due to the decreasing petrochemical reserves and an increasing attention is paid to obtain polymer materials from renewable resources, recycled materials and by-products. Nowadays PU foams are one of the most important insulating materials used in the construction industry. It is the main insulation material used in the global appliances (refrigerators, freezers, etc.) industry. Renewable polyols were synthesized from by-product of pulp mills – tall oil (TO). TO is a viscous, dark yellow odorous substance derived from the chemical pulping of pine and other woods. TO polyols were synthesized using amidization with diethanolamine. Developed PU foams have a renewable material content up to 29 %, with addition of natural fibers renewables content could be increased to 35 %. Modulus of elasticity and compressive strength increased most at 2% natural fiber content. Water absorption is low and corresponds to technical requirements of construction and refrigeration industry.



## Charalampos Lykidis

Organisation **Hellenic Agricultural Organization 'Demeter', Institute of Mediterranean Forest Ecosystems and Forest Products Technology, Laboratory of Wood Anatomy and Technology**

Position **Researcher**

Country **Greece**

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Biography Charalampos Lykidis since 2011 is a researcher at the Laboratory of Wood Anatomy and Technology, Institute of Mediterranean Forest Ecosystems and Forest Products Technology in Athens (Greece). He has been working in the fields of: Recycling of wood based composites, Utilization of alternative raw materials for the production of wood based composites, Formaldehyde emissions from wood based products, Thermal and hydrothermal treatments of wood and wood based composites He is a member of various COST as well as other Greek and International scientific foundations Concerning his teaching experience, since 2002 he is a visiting lecturer at the Department of Design and Technology of Wood and Furniture, Technological Institution of Larissa, Greece. He was also visiting lecturer at Faculty of Department of Forestry and Natural Environment, Aristotle University of Thessaloniki, Greece.

Abstract **Recycling of wood based composites using mild hydrothermal treatments**

The aim of the project was to study the possibility of applying hydrothermal treatments for the recovery of raw materials used in the production of UF-bonded boards and their reuse in the production of recycled ones. The applied wood particle recovery caused a reduction of their acidity and formaldehyde emission, an increase of the total extract content, while it does not appear to considerably influence the ash content. Regarding the chemical structural components of wood, the hydrothermal treatments caused a reduction of holocellulose and minor alteration of lignin content. Concerning the board properties, the participation of recovered material (including the crushed recovered coverings in the core layer) up to 35% do not have substantial influence on the main properties of the recycled boards. Similarly, percentages of old particleboard recovered material (after removing of recovered coverings) up to 50% do not negatively influence the quality of the recycled particleboards.



## Anna Dupleix

Organisation **Arts et Metiers Paris Tech**

Position **PhD Student**

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**Biography** Anna Dupleix successfully graduated from the French “Ecole Centrale” Engineering School. She decided to pursue her cursus at current Aalto University, Finland towards the Master degree of “Forest Product Technology”. There, she could study the different properties of wood in relation to his physical, chemical, anatomical characteristics. Delighted by studying this material, she then started her Master thesis at the University of Auckland in timber design on the investigation of the modes of failure of multiple-nail steel-to-timber connections in case of New Zealand Radiata Pine solid timber. She is currently working on the feasibility of green wood cutting by peeling method using radiant energy. This PhD work is supported by Aalto University, Helsinki, Finland and Arts et Métiers ParisTech, France. Her research studies has been recently awarded by the French Academy Foundation, the Kaksin Scholarship, the Fortum Foundation, and the RYM-TO Doctoral Programme.

**Abstract** **Feasibility of green wood cutting by peeling method using infrared heating**

Peeling process requires the prior heating of round green-wood at temperatures ranging from 50 to 90 °C. This treatment is necessary to increase wood deformability, to lighten lathe checking into veneers and to reduce cutting forces. It is usually done by immersion into hot water. However it presents many disadvantages among which duration of treatment (12 to 72 hours), washing out of polyphenolic extractibles inducing water pollution and affecting wood natural durability, increasing bolt end splitting threatening bolt cohesion. The goal of this PhD thesis is to develop an infrared heating system embedded on the peeling lathe to circumvent many of these disadvantages. This PhD thesis is prepared in co-tutelle between Arts et Métiers, France and Aalto University, Finland within the COST Action FP0904 on Thermo-Hydro-Mechanical Wood Behaviour and Processing.



## Göran Persson

Organisation	<b>Swedish Government</b>
Position	<b>Former Prime Minister</b>
Organisation	<b>Sveaskog</b>
Position	<b>Chairman</b>
Organisation	<b>ThinkForest</b>
Position	<b>President</b>
Organisation	<b>World Resources Institute (WRI)</b>
Position	<b>Member of the Board of Directors</b>
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**Biography** Göran Persson served as Prime Minister of Sweden between 1996 and 2006. He led the reduction in Sweden's greenhouse gas emissions by 13.5 percent between 1996 and 2005, and set a national target to reduce emissions to 25 percent below 1990 levels by 2020. In 2007, he was awarded the Sophie Prize for his leadership on climate policy. During Sweden's EU Presidency in 2001, Mr Persson was President of the European Council. Prior to serving as Prime Minister, he served as Finance and Education Minister, as a Member of Parliament, and was a local politician.

Mr Persson currently holds the position of Chairman of Sveaskog, Sweden's largest forest owner and leading supplier of timber, pulpwood, and biofuel. The company is government-owned and uses sustainable management methods in which forest lands are grown faster than they are felled. It is also one of the largest forest owners in all of Europe.

Mr Persson is also the President of ThinkForest, a high-level discussion and information-sharing forum which aims to strengthen communication between the science community and key policy makers in the EU in view of the extremely diverse policy environment which affects forests and the increasing demands on forests from other sectors and from general society.

In 2010 Mr Persson was elected to the Board of Directors of the World Resources Institute (WRI). The WRI's mission is to move human society to live in ways that protect Earth's environment and its capacity to provide for the needs and aspirations of current and future generations. WRI was launched June 3, 1982 as a center for policy research and analysis addressed to global resource and environmental issues.

Göran Persson is known for his broad personal knowledge of issues such as climate change, European relations with Russia, and challenges facing the Swedish welfare state.

## Posters





**Salvatore Martire** (Italy)

Sustainability Impact Assessment on a local forest-energy supply chain.  
The case of the Alpine area of Lake Como, Italy  
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1



**Miriam Muñoz Rojas** (Spain)

Climate change impacts on Mediterranean forest ecosystems:  
Application of Sierra and CarboSOIL models  
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**Pieter Vandezande** (Belgium)

Recovery of bio-chemicals from wood-derived biomass using advanced  
membrane processes  
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3



**Sandro Sacchelli** (Italy)

Sustainability, modelling and planning of forest sector: a GIS decision  
support system application for wood-energy chain  
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**Chiara Bedon** (Italy)

Prediction of the seismic response of “Blockhaus” shear walls under in-  
plane cyclic loads by means of experimental investigations and  
numerical simulations  
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5



**Zhouyan Xia** (Germany)

Numerical Analysis of Timber-Concrete Skyscrapers under Wind Loads  
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6



**Xavier Turon** (Spain)

Cellulases and other catalytic enzymes from marine microbial  
microorganisms  
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7



**Markus Lukacevic** (Austria)

A criterion for the effective strength of wooden boards with knots  
derived by a 3D Finite-Element tool  
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8



**Henri Kröling** (Germany)

Engineering and modelling of tensile strength of paper-epoxy composites

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9



**Diego Peñaloza Corredor** (Sweden)

The role of bio-based products in a carbon-efficient building environment - The Wälluden Case Study

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10



**Thomas Reynolds** (United Kingdom)

Dynamic stiffness of dowel type connections in service conditions

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11



**Heiko Lange** (Italy)

Exploring alternative strategies for lignin functionalisation and modification

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12



**Bishnu Chandra Poudel** (Sweden)

Forest biomass production potential and its implications for total carbon balance

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13



**Matija Mraovic** (Slovenia)

Printed electronics – screen printed capacitive humidity sensors on recycled paper and cardboard

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14



**Anamarija Zagar** (Slovenia)

the importance of forest clearings for reptiles in northern dinaric region: results and conservation management recommendations

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15



**Urša Vilhar** (Slovenia)

Core indicators for provisioning of fresh water, water purification and flood regulation services in urban forests

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16



**Boštjan Vimpolšek** (Slovenia)

Multi-attribute decision model to determine the best management option of non-hazardous waste wood  
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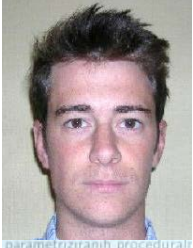
17



**Ali Shalbafan** (Germany)

Innovative lightweight foam core particleboards produced in an integrated process  
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18



**Sylvain Boulet** (France)

Impact of wood on hygrothermal comfort in buildings through objective and subjective analysis of in-situ measurements  
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19



**Aleš Zamuda** (Slovenia)

Environmental framework to visualize emergent artificial forest ecosystems and differential evolution for parameterized procedural woody plant models reconstruction  
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20



**Maria Riala** (Finland)

Wood in garden and outdoor construction: consumer preferences  
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21



**Eneja Osterman** (Slovenia)

Heat storage unit with PCM for more energy efficient wood biomass systems  
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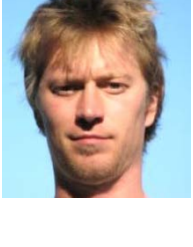
22



**Veronika Beil** (Germany)

An alchemist's dream come true: Converting paper into ceramics and metals  
veronika.beil@ptspaper.de

23



**Pavli Pori** (Slovenia)

Hydrothermal deposition of TiO<sub>2</sub> on spruce wood surfaces at different water contents in samples  
pavli.pori@gmail.com

24



**Johann Rathke** (Germany)

Transborder Forest Governance – an approach to investigate the transborder cooperation in the forest-related sector and its interdependences in the multi-level system  
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25



**Heike Ehrlich** (Germany)

Application of high-power ultrasound treatment to improve ink detachment and fragmentation of UV-offset prints: Effect of intensity  
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26



**Selma Franceschini** (Italy)

Discovery of four phenotypically and phylogenetically distinct lineages in the Chamaecypris pathogen *Phytophthora lateralis*  
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27



**Christian Ewald** (Germany)

Mineral oil removal from paper for recycling by high temperature treatment processes  
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28



**Francesco Negro** (Italy)

Optisoundwood Project – Plywood for acoustic improvement  
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29



**Robert Jockwer** (Switzerland)

Enhanced load-carrying capacity of timber beams with notches by means of optimised reinforcement  
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30



**Eero Kontturi** (Finland)

Cellulose structures in 2D  
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31



**Josefin Illergård** (Sweden)

Antibacterial fibres for a sustainable future  
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32





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Moisture and temperature influence on biocomposites-to-timber bonding

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33



**Valentina Castellani** (Italy)

Environmental sustainability assessment of wood-based products from a short supply chain in the Italian Alps

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34



**Ashraful Alam** (Finland)

Hot-spot of carbon emissions in forestry production system: life cycle perspective

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35



**Radim Matula** (Czech Republic)

The sprouting ability of the main tree species in Central Europe: implications for coppice restoration

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36

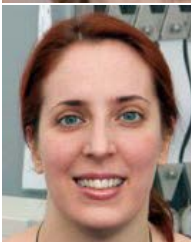


**Ingegerd Backlund** (Sweden)

Cost-effective cultivation of lodgepole pine (*Pinus contorta*) for use in biorefineries

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37



**Sonja Jamnicki** (Croatia)

Deinking possibilities in the reduction of mineral oil content from defined recovered paper grades

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38



**David Filipe Ramos Silva** (Portugal)

Biomass ashes recycling to the soil: treat to material valorisation for forest sustainability

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39



**José Xavier** (Portugal)

Assessing quality of wood and wood products by inverse identification methods based on full-field measurements

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40



**Vjekoslav Živković** (Croatia)

Significance of spectral sensitivity for service life of wood building products

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41



**Emilia-Adela Salca** (Romania)

An outline upon the potential of *Alnus glutinosa* wood in Romanian furniture industry

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42



**Grzegorz Kondora** (Poland)

Modelling the hydrodynamics of a low-consistency refiner

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43



**Jorge Manuel Branco** (Portugal)

Hybrid wood-based system to build tall

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44



**Waldemar Perdoch** (Poland)

New glyceride based biocide-free wood protection systems stabilised with organosilicone compounds

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45



**Marko Kebert** (Serbia)

Changes in levels of plant hormones (IAA and ABA) as the indicators of heavy metal pollution in poplar plant species (*Populus* spp.)

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46



**Nuno Alves da Costa** (Portugal)

VOC emission profile on particleboards made from softwoods

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47



**Ana Cristina Pinto Monteiro** (Portugal)

Economic and environmental evaluation of energetic conversion of forest biomass residues in Portugal

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48



**Csilla Maria Csiha** (Hungary)

Study of glaze adhesion as function of surface roughness and surface free energy

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49



**Marko Teder** (Estonia)

Condition Assessment of Glulam Arches with Non-destructive Methods (ongoing research)

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50



**Milica Marceta** (Serbia)

Commercialization and marketing of Non-Wood Forest Products in Vojvodina

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51



**Jorge A. Pinto Paiva** (Portugal)

Genomic studies on molecular regulation of wood formation in Eucalyptus

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52

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