
Bertrand MARCON, PhD

Age: 33. French, born in Le Puy en Velay (FR)

Spelling: French (mother tongue),

English, Italian, conversational Spanish and notion of Japanese

**Research Associate (2013-now)**

Department of Management of the Agrarian Systems,
Food and Forest (GESAAF), University of Florence - IT

- Panel paintings conservation and restoration -

- Wood heat treatment and natural/accelerated aging -

Keywords: finite elements modelisation, solid mechanic, wood ageing,
heat treatment (final product quality and kinetic analysis), material behaviour,
rheology, time-temperature equivalency, *in-situ* instrumentation

PREVIOUS POSITIONS

2013-now: Research Associate (*refer to upper box*)

Monitoring, modelisation and simulation of cultural heritage panel paintings for museums and replicas in laboratory. Mechanical performance evaluation of restoration procedures and advices for the dimensioning of framing technics.

+ 3 months as independent researcher for the GESAAF (January-March 2013)

2011-2012: 12 months as Research Associate (*PostDoctorat*) at the Research Institute of Sustainable Humanosphere, University of Kyoto – JP at the Department of Sustainable Material Department.

Research project: ***Properties of artificially and naturally aged poplar wood. Application to cultural objects.***

Keywords: wood, physical aging, cultural heritage, heat treatment, material behavior, swelling-shrinkage, time-temperature equivalency, chemical analysis (lignin, cellulose)

2010-2011: Lecturer and Research Engineer at Ecole Centrale of Lyon (FR)

Materials Department, research and teaching (about 100h: L3 to M2)

Research activities: ***Study of cracking initiation, fatigue of laminated glass and laws of friction between steel and polymer***

Keywords: fretting-fatigue, finite elements modelisation, law of wear and Friction between polymer/metal contact and crack propagation in laminated glass

2009-2010: Lecturer at National Institute of Applied Science of Lyon (FR)

Civil Engineering Department, research and teaching (about 100h: L3 to M2)

Research activities: ***Study of the transverse elastic behavior of coniferous LVL timber***

Keywords: multiscale approach, finite elements method, LVL softwood beams and digital image correlation

2006-2009: PhD position, located both in Montpellier (FR) and Florence (IT)

Mechanics and Wood Sciences, research and teaching (about 110h in 3 years: L1 to M2)

EDUCATION

2006-2009: **PhD**, LMGC, Montpellier, FR – DISTAF, Florence, IT

Major: Structural and Solid Mechanics, Wood Science

Advisors: FR: Professor D. Dureisseix, MDC D. Jullien, DR. J. Gril – IT: Professor L. Uzielli
- Mechanical Department, Research at LMGC (Mechanics & Civil Engng. Lab. - CNRS),
CC048, Place Eugène Bataillon, F-34095 MONTPELLIER CEDEX 5, FRANCE

- Wood Science, research at DEISTAF (Dept. of Forest Environmental Sciences – CNR),
13 via San Bonaventura IT-50145 FIRENZE, ITALY

Topic: **Hygromechanical study of wooden panels, supports of historical paintings,
in view of their conservation.**

Skills and keywords: rheology, finite elements, code coupling, wood science

2006: **Research Master Degree**, University Blaise Pascal, Clermont-Ferrand

Major: Solid Mechanics

Advisors: Professor J.F. Destrebecq

Topic: **Characterization of the mechanical behavior of bone using a three-
dimension scanner technique.**

Skills and keywords: medical imaging, finite elements, bone behavior

2005: **Engineering Master**, INSA Lyon (top school of engineering)

Major: Mechanical Engineering and Solid Mechanics

Advisors: Professor G. Jacquet

Topic: **Modeling of bearings life duration under polluted environment**

Skills and keywords: Hertz theory, mutli-grid method, tribology

2002-2003: **Maîtrise(*)** and **Licence** (bachelor's degree), University Blaise Pascal

Major: Mechanical Engineering and Solid Mechanics

Advisors: Professor M. Grediac, E. Toussaint

Topic: **Residual strain measurement of poplar wood maturation by image correlation**

Skills and key words: image correlation, maturation stress, tension wood, poplar

(*) *Equivalent to a B.S., includes some graduate level courses in mathematics, technology
and mechanics*

SKILLS

Material characterization tests; Modeling and mechanical interpretations; Mutli-physical couplings; finite element methods; rheological model; Management of tests campaign, test instrumentation; Data treatment and analysis; scientific valorization: scientific papers and conferences; Working in a multi-national and multi-cultural environment.

TECHNICAL AND COMPUTER SKILLS

Finite elements modelisation; physical aging of natural polymers; Mechanical tests (tensile, bending, fatigue, fretting); Experimentation *in-vivo* on human (EMG, motion capture) and on trees (dried or green state wood); Humidity and temperature regulation; Images correlation (2D-3D), medical scanner imaging; Strain gages; Surface tribology; Chemical analysis (GC, NIR, FTIR) for sugar content analysis and lignin content in wood.

Programming: Matlab, C and C++, Castem (FEM), Ansys, CATIA, Gnuplot.

Basics in Fortran, Python and LabVIEW.

Report and Communication software: M-Office, LaTeX and OpenOffice.

References manager: Mendeley, JabRef and Endnote.

Operating systems: MacOSX, Windows and Linux.

REVIEWING ACTIVITIES FOR SCIENTIFIC JOURNALS

Since 2014:

Reviewer for iForest *Biogeosciences and Forestry*

Open Access, peer-reviewed, published by the Italian Society of Silviculture and Forest Ecology.

Journal website: <http://www.sisef.it/iforest/>

Impact factor (2013/2014): 1.150

Reviewer for BioResources

Open access, peer-reviewed online journal devoted to the science and engineering of lignocellulosic materials, chemicals, and their applications for new uses and new capabilities.

Journal website: <http://www.ncsu.edu/bioresources/>

Impact factor (2013/2014): 1.549

PUBLICATIONS AND CONFERENCES

International peer-reviewed journals (*corresponding author)

Goli G., Marcon B.*, Fioraventi M. *Poplar wood heat treatment: Effect of air ventilation rate and initial moisture content on reaction kinetics, physical and mechanical properties*. Submitted in March 2014 in Wood Science and Technology, 2014. (DOI : [10.1007/s00226-014-0677-5](https://doi.org/10.1007/s00226-014-0677-5)) IF:1.873

Marcon B.*, Fouvry S., Guegan J. and Daniel G., *Fracture mechanics of impacted laminated glass subjected to various fatigue stressing conditions*. Engineering Fracture Mechanics, 2014. (DOI: [10.1016/j.engfracmech.2014.05.013](https://doi.org/10.1016/j.engfracmech.2014.05.013)) IF:1.662

Marcon B.*, Mazzanti P., Uielli L., Dureisseix D. and Gril J., *Mechanical study of a framing technic for cupping control of cultural painted panels combining crossbars and springs*. Journal of Cultural Heritage, vol. 13(3): S109-S117, 2012 (DOI: [10.1016/j.culher.2012.04.003](https://doi.org/10.1016/j.culher.2012.04.003)) IF:1.111

Dureisseix D.* and Marcon B., *A partitioning strategy for the coupled numerical simulation of hygro-mechanical wood structures of Cultural Heritage*. International Journal for Numerical Methods in Engineering, vol. 88(3): 228-256, 2011 (DOI: [10.1002/nme.3173](https://doi.org/10.1002/nme.3173)) IF:1.961

PhD thesis: Montpellier 2 University (FR) and Università degli Studi di Firenze (IT)

Hygromécanique des panneaux en bois et conservation du patrimoine culturel - Igro-meccanica dei dipinti su tavola e conservazione dei beni culturali.

Jury: Pr Ario Ceccotti (Reviewer), Pr Frédéric Dubois (Reviewer), Pr David Dureisseix (Advisor), Pr Luca Uzielli (Advisor), MdC Delphine Jullien (co-advisor), Pr Alberto Corigliano (Reviewer and President), DR CNRS Joseph Gril (Scientific director and invited), Dr Emmanuel Maurin (invited)

Download: http://tel.archives-ouvertes.fr/docs/00/70/43/01/PDF/2009_TheseMarcon.pdf

International conferences with proceedings

Gril J., Marcon B., Bremand F., Cocchi L., Dionisi Vici P., Dupré J.C., Gauvin C., Goli G., Hesser F., Jullien D., Mazzanti P., Ravaud E., Togni M., Valle V., Uzielli L. *The Mona Lisa Project: an update on the progress of measurement and monitoring activities*. EuroMech Colloquim 556 « Theoretical, Numerical, and Experimental Analyses in Wood Mechanics », mai 2015, Dresde, Allemagne.

Marcon B., Cocchi L., Mazzanti P., Uzielli L. *Methodology for the design of crossbeams and springs system for cupping control of wooden panel paintings*. EuroMech Colloquim 556 « Theoretical, Numerical, and Experimental Analyses in Wood Mechanics », mai 2015, Dresde, Allemagne.

Goli G., Marcon B. et Fioravento M. *Wood heat treatment modifications: effects of initial moisture and air exchange rate on kinetic and final product characteristics*. COST FP0904 Final Meeting « Recent Advances in the Field of TH and THM Wood Treatment », May 2014, Skellefteå, Sweden.

Marcon B., Kawai S., Matsuo M., Gril J. et Uzielli L. *Artificial aging versus natural aging of poplar wood*. COST FP0904 Meeting «Modelling the isolated and combined effects of chemical modification and hygro-thermo-mechanical loading of wood», December 2012, Paris, France

Marcon B., Kawai S., Uzielli L. and Gril J., *Physical properties of artificially aged poplar wood in view of application to cultural objects*. Workshop Action FP0802, Experimental and Computational Micro-Characterization Techniques in Wood Mechanics, October 2012, Edimburgh, Scotland.

Uzielli L., Gril J., Cocchi L., Colmars J., Dionisi Vici P., Dureisseix D., Goli G., Jullien D., Marcon B.

- and Mazzanti P., *Experimental studies on the wooden support of the « Mona Lisa »*. In Strategic Workshop for The Safeguard of Cultural Heritage : a Challenge from the Past for the Europe of Tomorrow. 2011, Florence, Italy
- Dubois F., Dureisseix D. and Marcon B., *Code coupling for thermo-hygro-mechanical problems with application to wooden structures and painting supports of cultural heritage*. European Conference on Computational Mechanics, May 2010, Paris, France
- Dubois F., Dureisseix D. and Marcon B., *Simulation of wooden structures and painting supports of cultural heritage with a code coupling for thermo-hygro-mechanical évolutions*. Meeting COST Action IE0601 Wood Science for Conservation of Cultural Heritage, April 2010, Cracow, Poland
- Dureisseix D. and Marcon B., *A partitioning algorithm to couple diffusion and elasticity for the simulation of hygromechanical wood structures of Cultural Heritage (Poster)*. US National Congress on Computational Mechanics, July 2009, Columbus Ohio, USA
- Colmars, J., Marcon B., Maurin E., Rémond R., Morestion F., Mazzanti P. and Gril J., *Hygromechanical response of a panel painting in a church: monitoring and computer modeling*. Meeting COST Action IE0601 Wood Science for Conservation of Cultural Heritage, October 2009, Hamburg, Germany
- Marcon B., Dureisseix D., Jullien D., Uzielli L. and Gril J., *Experimental and numerical mechanical study of a framing technique for cupping control of painted panels combining crossbars and springs*. Meeting COST Action IE0601 Wood Science for Conservation of Cultural Heritage, November 2008, Braga, Portugal

National conferences with proceedings

- Cocchi L., Goli G., Mazzanti P., Marcon B., Uzielli L. *The lapidazione di santo stefano by Giorgio Vasari: How monitoring and analyzing the wooden support's deformations contributed to the restoration decisions and to the successive surveillance*. ESRARC - 6th Symposium: "Religious Art – Restoration and Conservation", juin 2014, Florence, Italy
- Marcon B., Uzielli L., Santacesaria A., Castelli C., Piacenti D. *Evaluer l'interaction entre un châssis à ressorts et son support pour garantir son utilité*. 4ème journée d'étude « Lorsque nos certitudes sont mises à l'épreuve Ces objets qui nous surprennent ». Section française de l'institut international de conservation (groupe Bois), October 2013, Paris, France.
- Marcon B., Masuo M., Kawai S., Uzielli L. and Gril J., *Wood aging: Physical properties of heat-treated poplar wood in view of application to cultural objects*. 62nd Annual Meeting of Mokuzai Gakkai (the Japan Wood Research Society) (Poster), March 2012, Sapporo, Japan
- Marcon B., Dureisseix D., Dubois F. and Jullien D., *Couplage de codes en thermo-hygro-mécanique pour les panneaux peints en bois du patrimoine*. Congrès français de Mécanique 2009, Marseille, France
- Marcon B., Noirfalise C., Destrebecq J.F. and Poumarat G., *Analyse du comportement mécanique d'un os ostéoporotique à partir d'images scanner*. Congrès français de Mécanique 2007, Grenoble, France
- Noirfalise C., Marcon B., Destrebecq J.F. and Poumarat G., *Characterization of the mechanical behaviour of cancellous bone by means of the three dimension scanner technique (LaMI/Laboratory of Anatomy and Biomechanics)*. Photomécanique, 2006, Clermont-Ferrand, France
- Coutand C., Marcon B., Toussaint E. and Vacher P., *Mesures de déformations résiduelles longitudinales de maturation du bois de peuplier par corrélation d'images*. Photomécanique, mai 2004, Albi, France

International communications without proceedings

- Uzielli L., Gril J., Cocchi L., Colmars J., Dionisi Vici P., Dureisseix D., Goli G., Jullien D., Marcon B., Mazzanti P. and Rémond R., *Monitoring and modelling deformation of the « Monna Lisa »*. 5th International Congress « Science and technology for the safeguard of Cultural Heritage in the Mediterranean Basin », 2011
- Marcon B., *Hygro-mechanical study of panel paintings of cultural heritage*. International Workshop on biological characteristics of wood and its related properties, November 2008, Teheran, Iran Rep.
- Marcon B., Dureisseix D., Jullien D., Uzielli L. and Gril J., *Contribution de la mécanique à la conservation du patrimoine*. Communication de vulgarisation avec relecture, DOCTISS, April 2009, Montpellier, France

Marcon B., Dureisseix D., Jullien D., Uzielli L. and Gril J., *Hygromechanical study of painted panels*. Meeting COST Action IE0601 Wood Science for Conservation of Cultural Heritage (Poster), June 2007, Tervuren, Belgium