

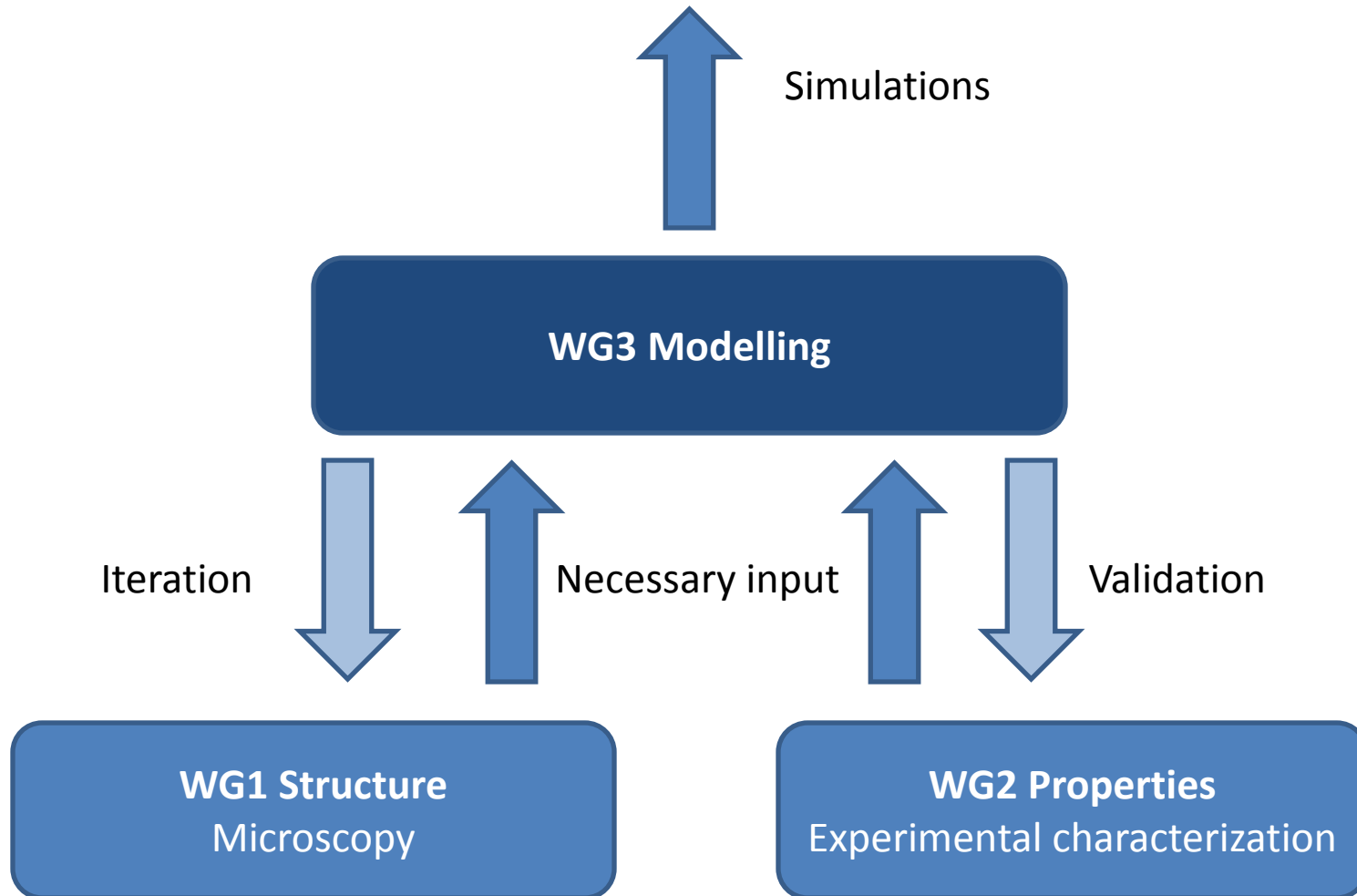


# Working Group 3

## Computational Modelling

August 25, 2011

# Purpose of WG3



# Form of working group activities

- Unresolved and relevant issues
- Discussions in smaller thematic groups
- Outcome relies on activity of participants, since no project (salary) funding available
- Thus, there are no stupid questions...

# What has happened so far...

- Vienna 2009: missing link in multi-scale modelling
- Stockholm 2009: how to use model to interpret mechanical fibre tests
- Krakow 2010: use models for wooden cultural objects (with IE0601)
- Hamburg 2011: Unresolved issues, moisture
- Vila Real 2011: Mixed methods
- STSMs

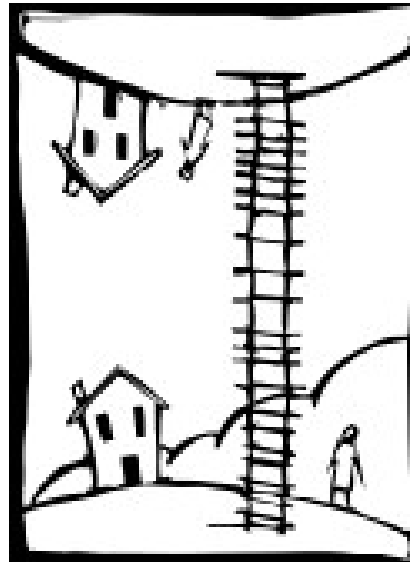
## 2 worlds

### Experiments:

Chemical analysis,  
microstructure,  
mechanical properties

### Modelling:

Numerical predictions,  
analytical models



## Classical approach...

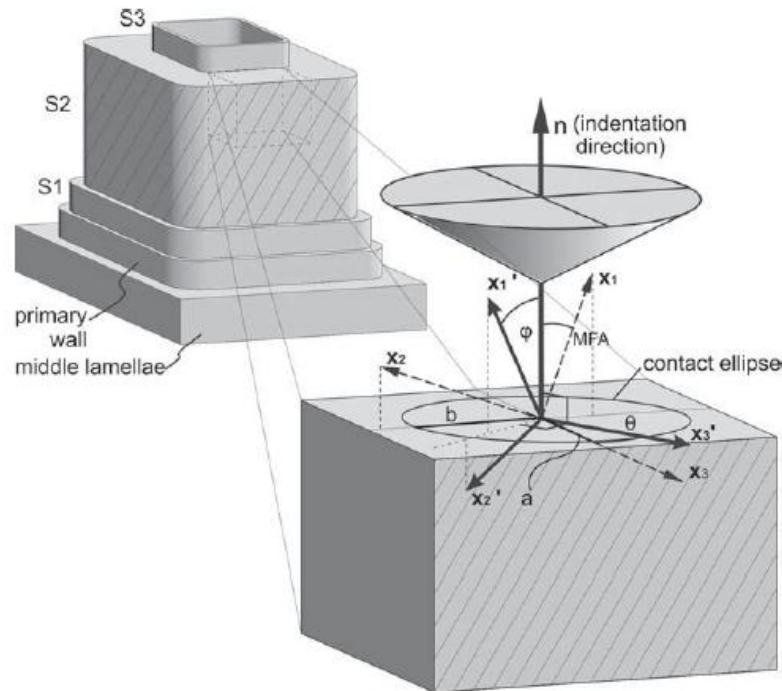
# How to integrate 2 worlds?



## Mixed numerical-experimental methods!

# Example 1: From measured indentation modulus to cell-wall stiffness

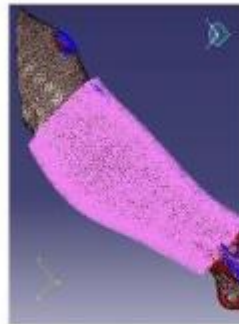
Jäger et al. Compos. Part A, 2011



# Example 2: Digital image correlation to indentify mechanical properties in loading of complex structures



In vitro deformation full-field measurements



Numerical modeling of the human leg under compression



Mechanical characterization of tissues



Fluid/structure interactions in the stenosed carotid

(from Stephane Avril's homepage)



Problems to be addressed with mixed numerical-experimental methods for wood materials?

