

A probabilistic approach to moisture risk assessment for internally insulated solid walls



UCL
Engineering
Doctorate

Visual Environments
Imaging and Visualisation



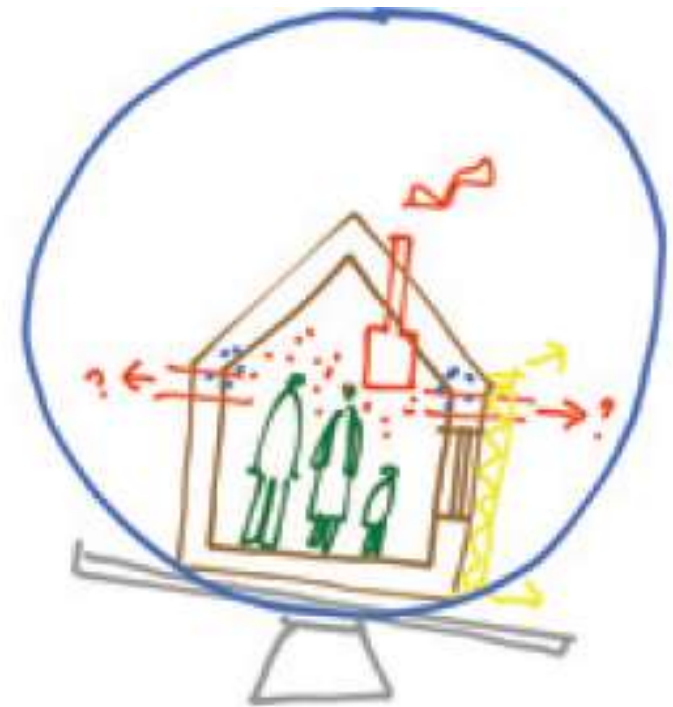
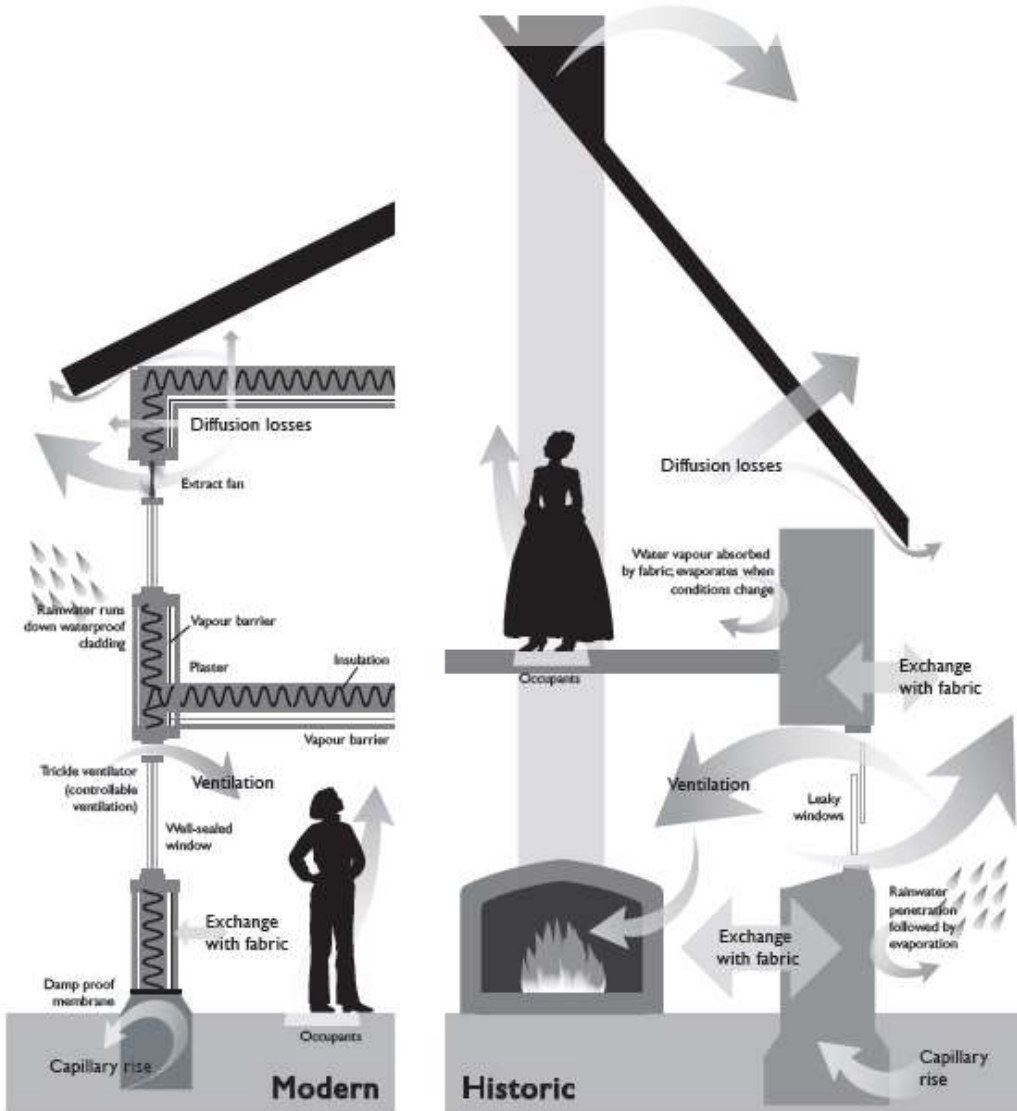
Why do we insulate?







Why moisture risk assessment?





Why moisture risk assessment?



Why moisture risk assessment?



Water exists...



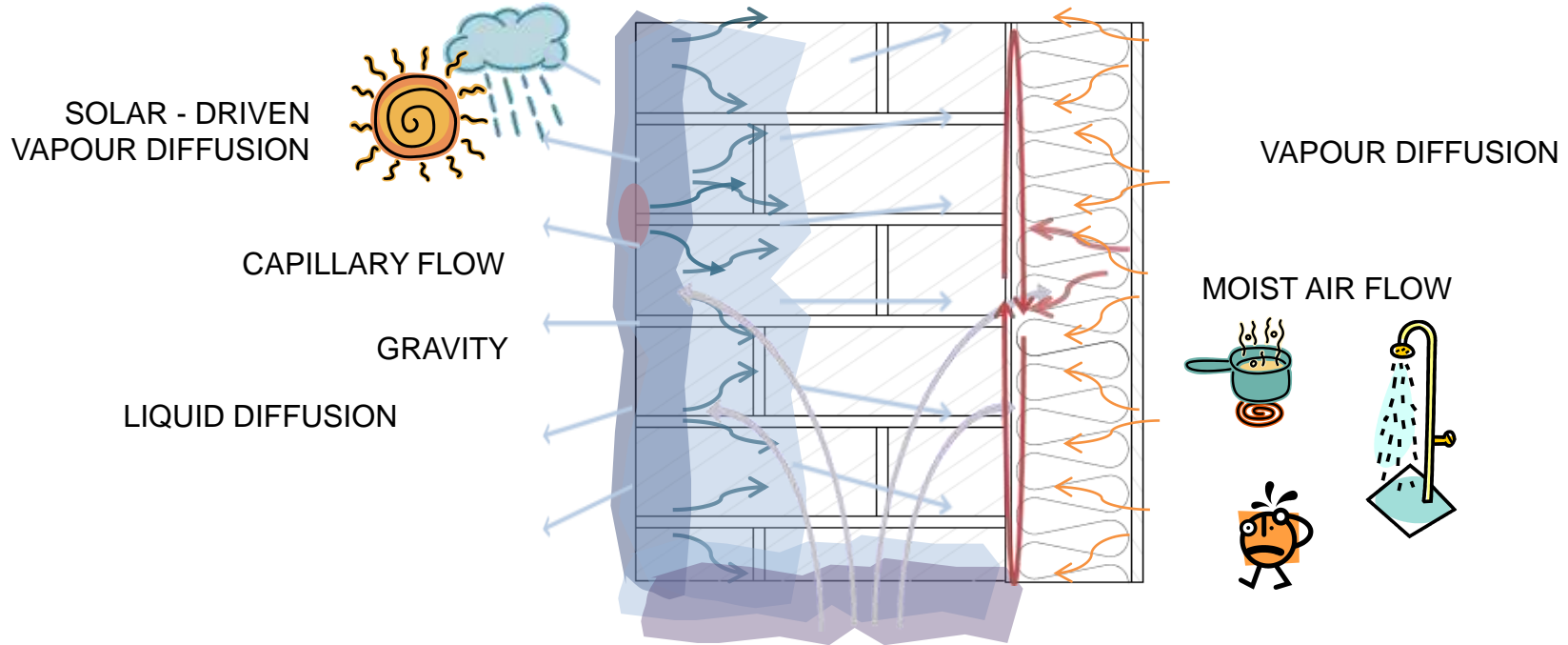
As a solid – ice



As a liquid – liquid water



As a gas – water vapour



What are the available tools?





What are the available tools?

- Glaser *BS EN ISO 13788*
- HAMT (WUFI ...) *BS EN 15026*

Limitations:

- 1D (no thermal bridges)
- do not include all moisture mechanisms
- **Deterministic**

Available software for deterministic HAMT:

WUFI® Pro

Fraunhofer Institute for Building Physics

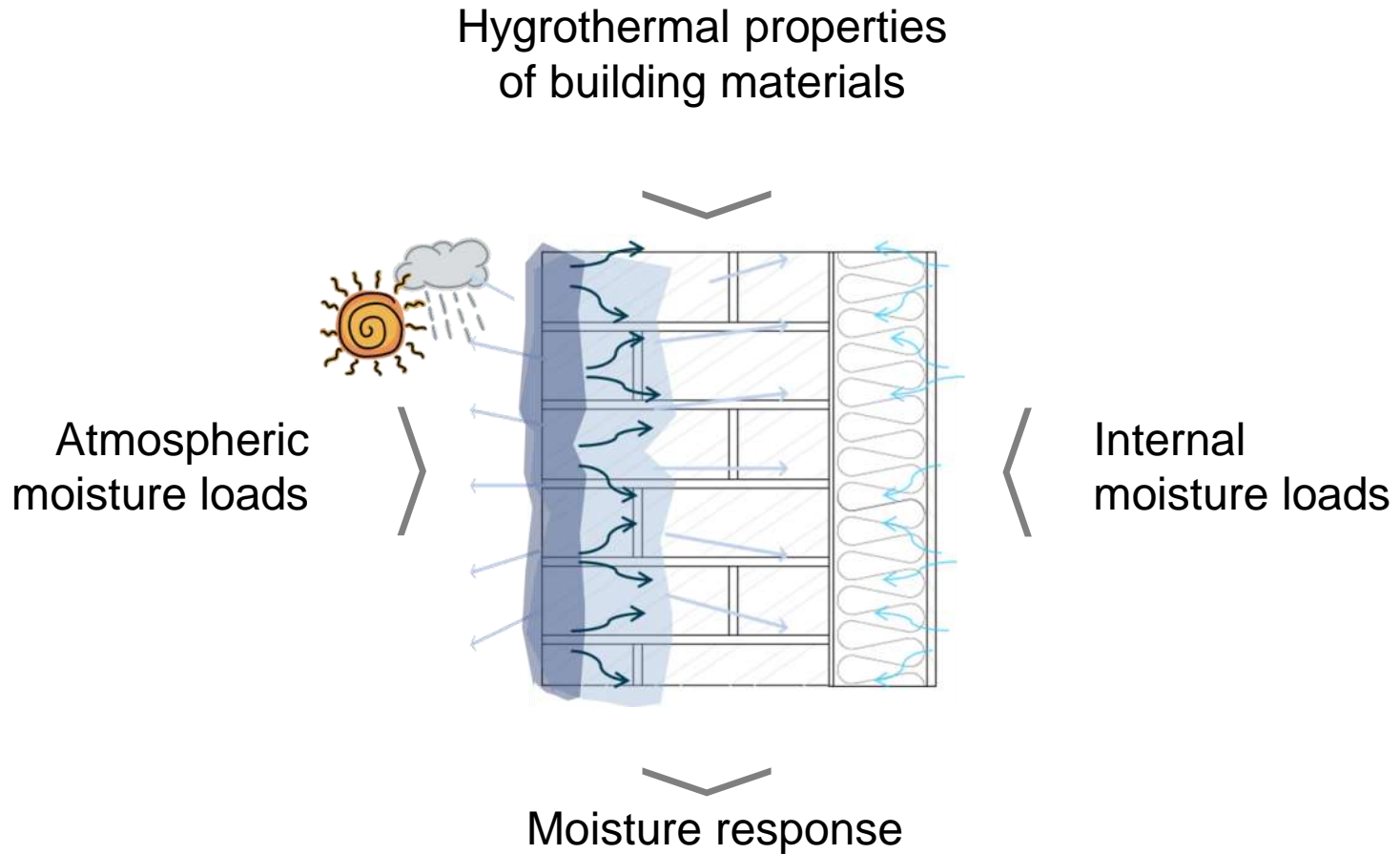
WUFI® 2D

Fraunhofer Institute for Building Physics

DELPHIN

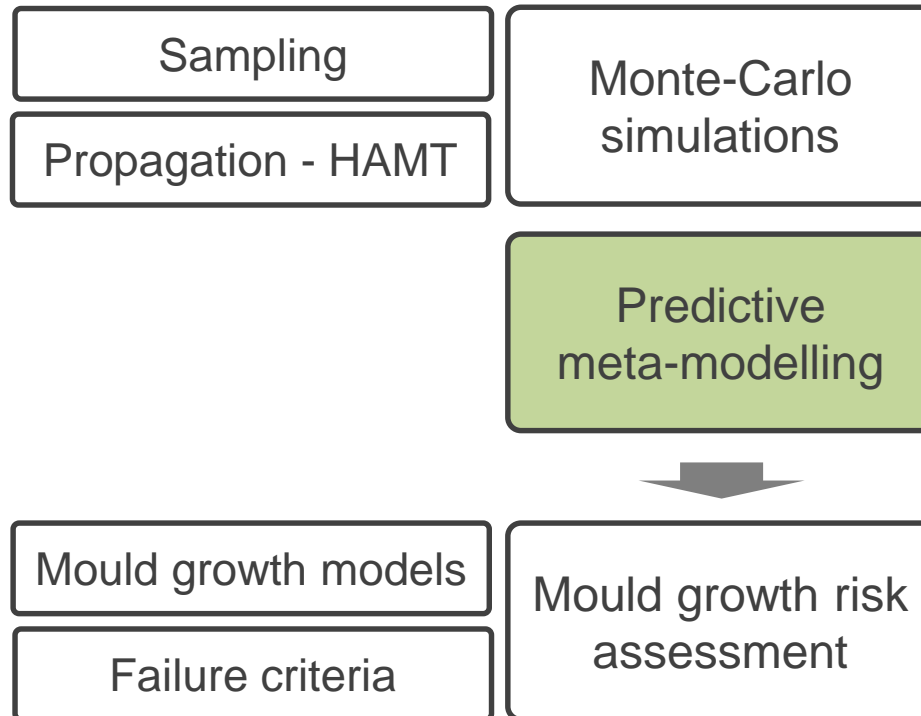
TU Dresden

Probabilistic risk assessment



Probabilistic risk assessment

Key challenges



- Space-filling techniques
- Functions parametrisation
- Semi-parametric vs non-parametric models
- Trade-off between prediction, interpretation and flexibility
- Building mycology



Future research

TOOLS FOR

- Risk assessment
- Design process
- Construction process

EVIDENCE

- Policy making
- Faulty practices

