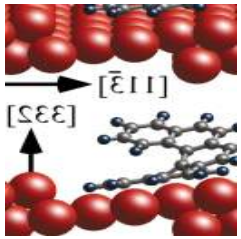
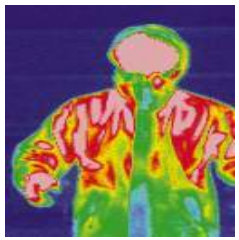
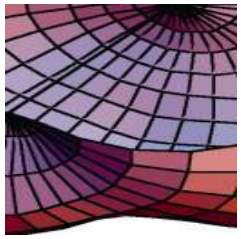


Technology & Society Lab
Lab day 29th August 2013

Introduction:

The Role of computational models in MFA

Lorenz Hilty

Head, Informatics and Sustainability Research Group

EMPA
Materials Science & Technology

EMPA
Materials Science & Technology

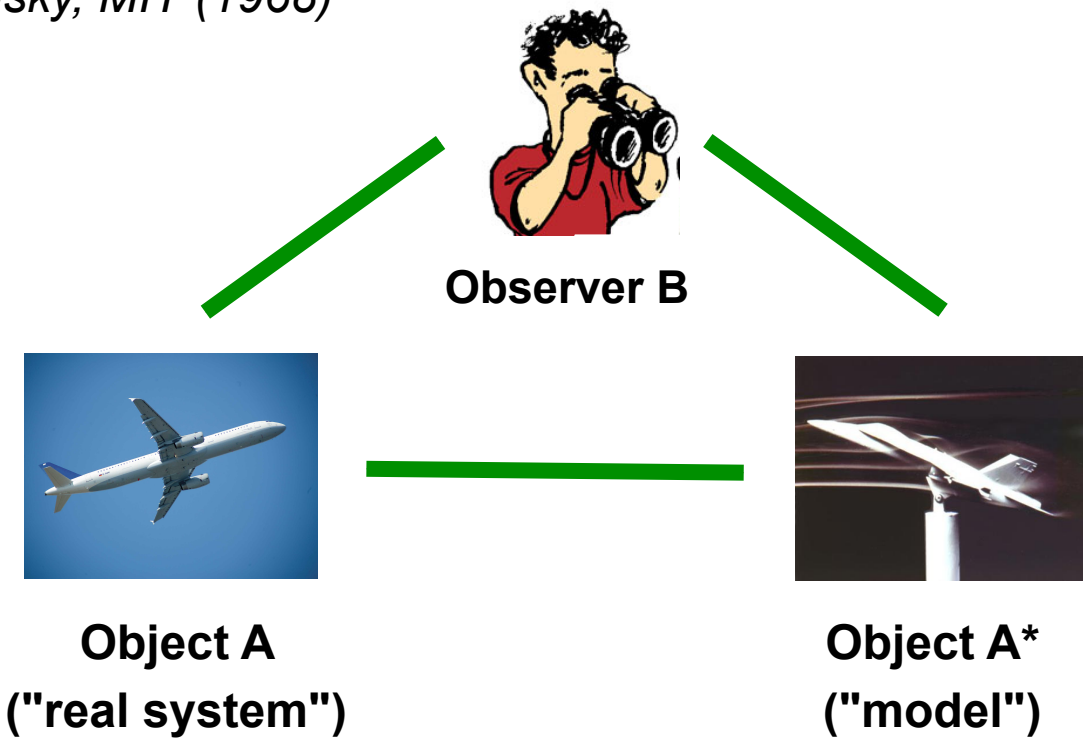
Status and innovative developments in Material Flow Assessment (MFA) methodologies

- Esther Müller
  Modeling metal stocks and flows - a review of dynamic material flow analysis methods
- Klaus Bornhöft
  Material flow modeling for environmental exposure assessment – a critical review of four approaches
- Fabiano Piccinno
  A decision support method to find sustainable applications of new materials – the case of cellulose nanofibre reinforced composites
- Sun Tianyin
  Comprehensive modeling of environmental emissions of engineered nanomaterial

What is a model?

"To an observer B, an object A* is a model of an object A to the extent that B can use A* to answer questions that interest him about A."

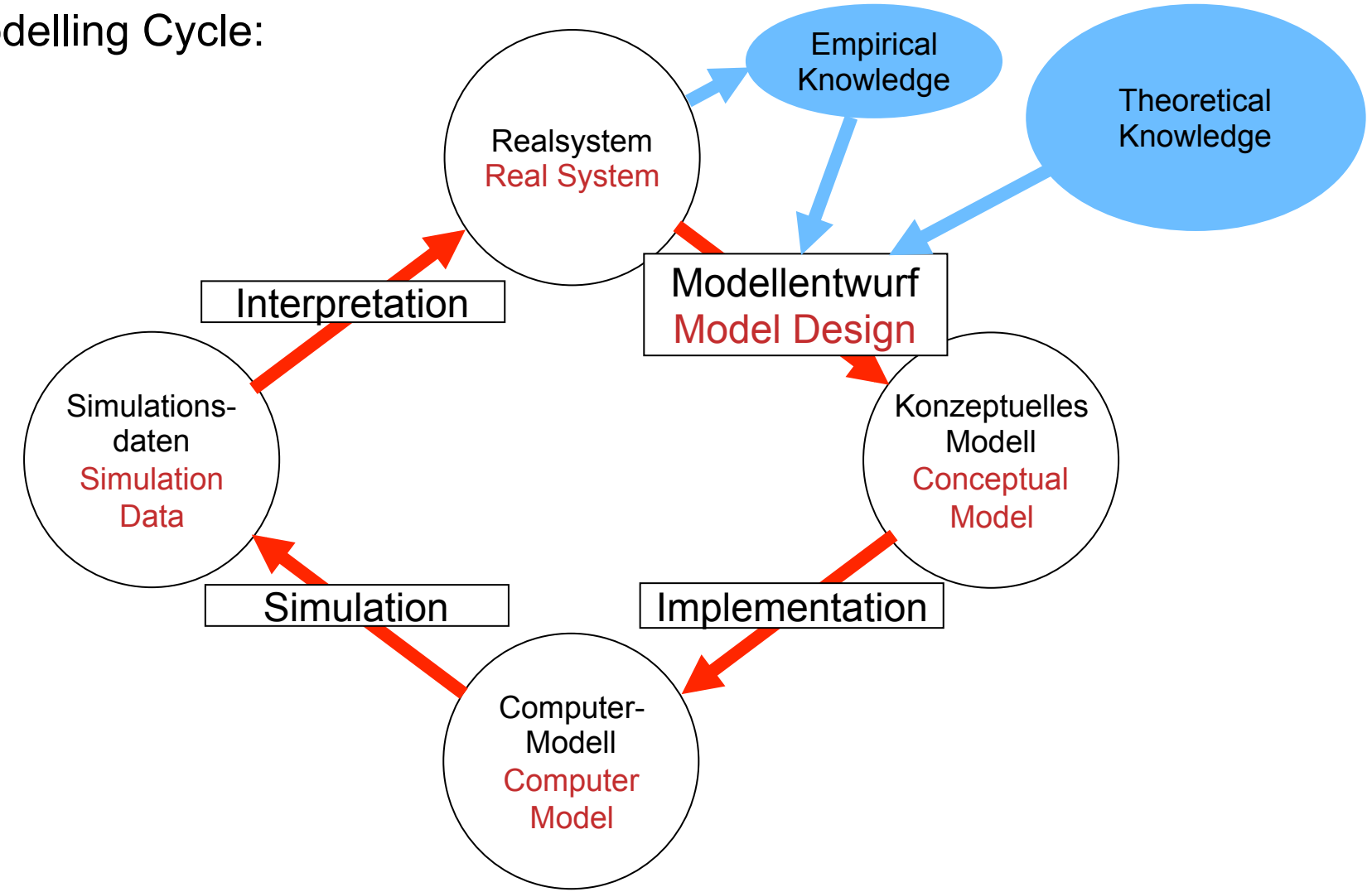
Marvin Minsky, MIT (1968)



How are computational models built?

EMPA
Materials Science & Technology

The Modelling Cycle:

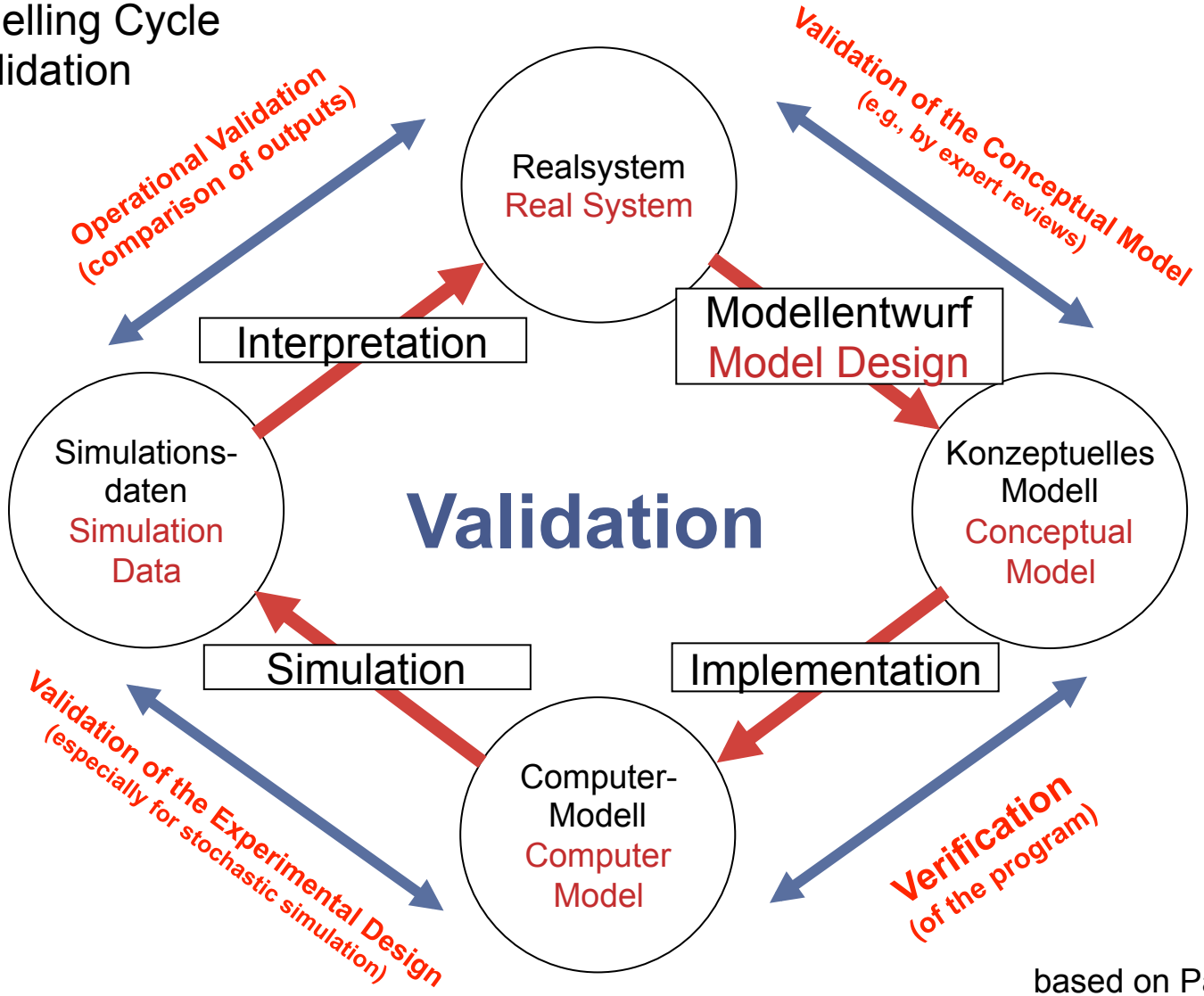


based on Page (1991)

How are computational models validated?

EMPA
Materials Science & Technology

The Modelling Cycle is the Validation Cycle!



based on Page (1991)

Current modelling projects *not* presented today

EMPA
Materials Science & Technology

- Comparison of the "System Dynamics" and "Agent-Based Modelling" paradigms for modelling socio-economic transitions
  (PhD project Mohammad Ahmadi Achachlouei, KTH/Empa)

- An agent-based model of the Swiss wood market
  NFP 66 "Resource Wood"
  (PhD project Stefan Holm, UZH/WSL/Empa)

- Submitted SNF project:
  Material transition networks: A conceptual framework for the assessment of the accessibility of material resources
  (Patrick Wäger, Xiaoyue Du, Rolf Widmer, Lorenz Hilty, Empa/UZH)

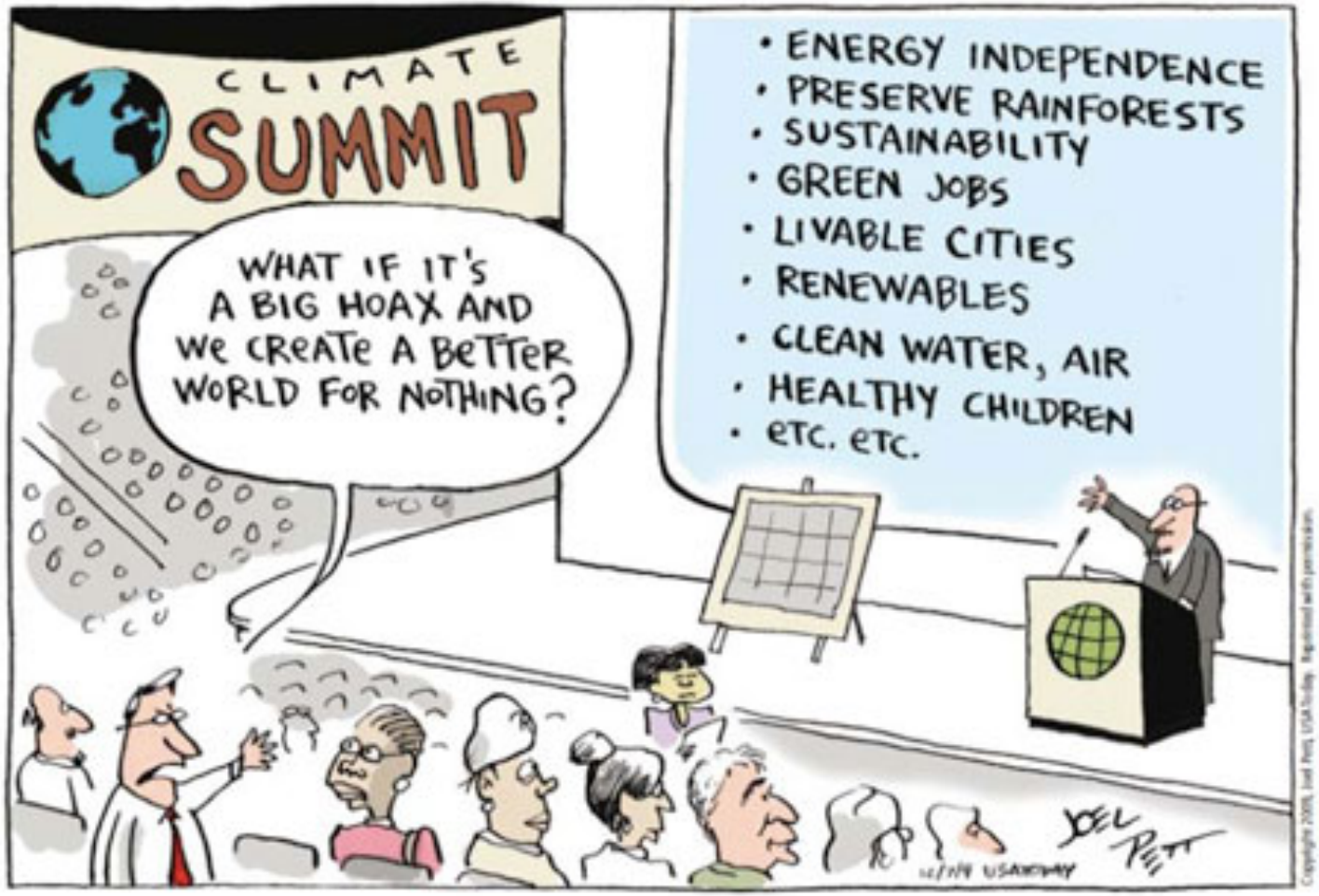
EMPA
Materials Science & Technology

Status and innovative developments in Material Flow Assessment (MFA) methodologies

- Esther Müller
  Modeling metal stocks and flows - a review of dynamic material flow analysis methods
- Klaus Bornhöft
  Material flow modeling for environmental exposure assessment – a critical review of four approaches
- Fabiano Piccinno
  A decision support method to find sustainable applications of new materials – the case of cellulose nanofibre reinforced composites
- Sun Tianyin
  Comprehensive modeling of environmental emissions of engineered nanomaterial

Thank you for your attention

EMPA
Materials Science & Technology



Prof. Dr. Lorenz Hilty

Head of Group, Informatics and Sustainability