



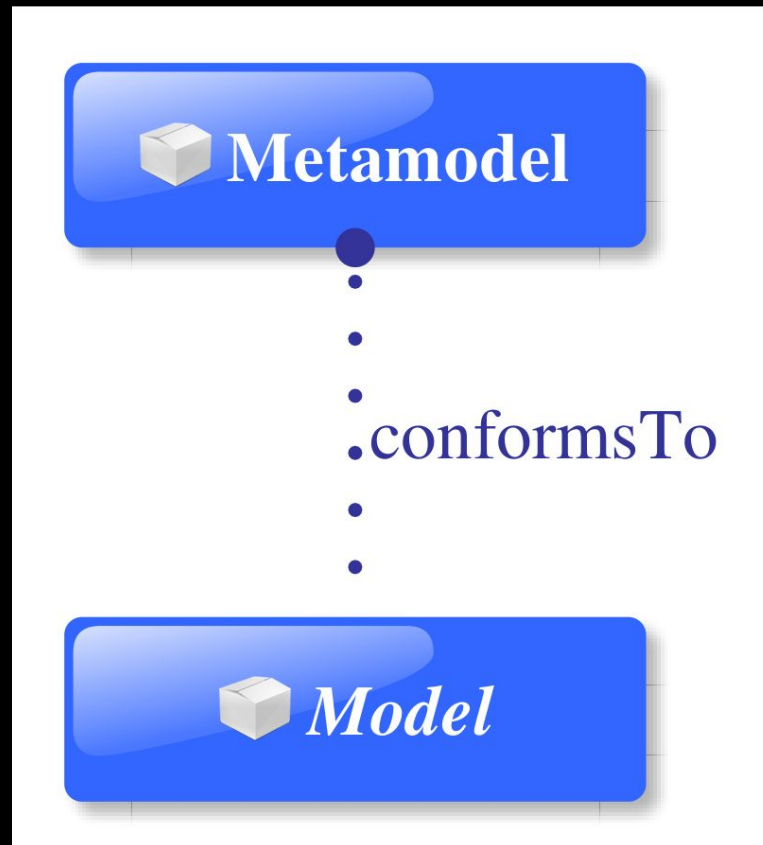
# Megamodeling with NGA Multimodels

V. Zaytsev @ CoCoS @ SPLASH 2017

# Outline for today

- Megamodelling and megamodels
  - quick intro and classification
- NGA: Node—Graph—Automaton
  - the main claimed contribution
- Case studies
  - application

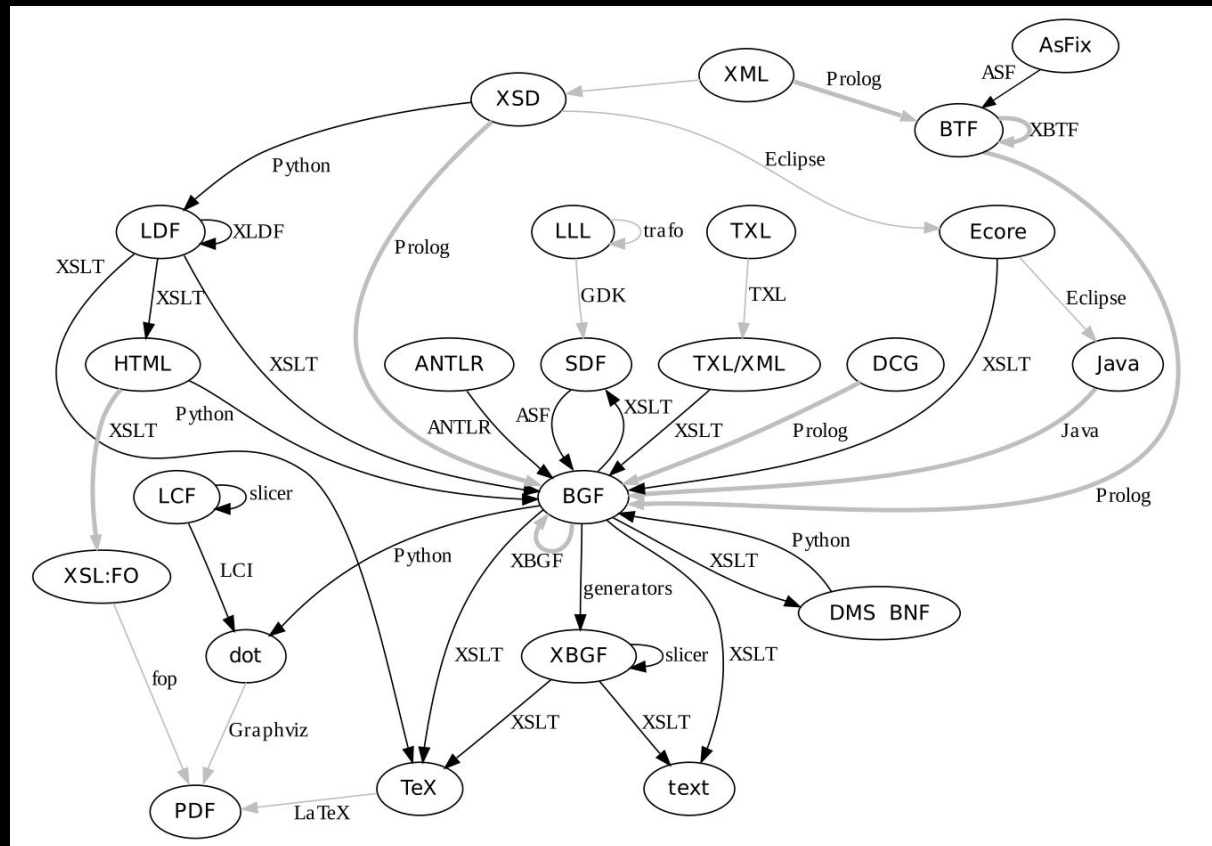
# The simplest megamodel



# Mega-I: modelling model systems

- focus on the abstract aspect
- megamodels are models which elements represent other models

# Mega-I: modelling model systems

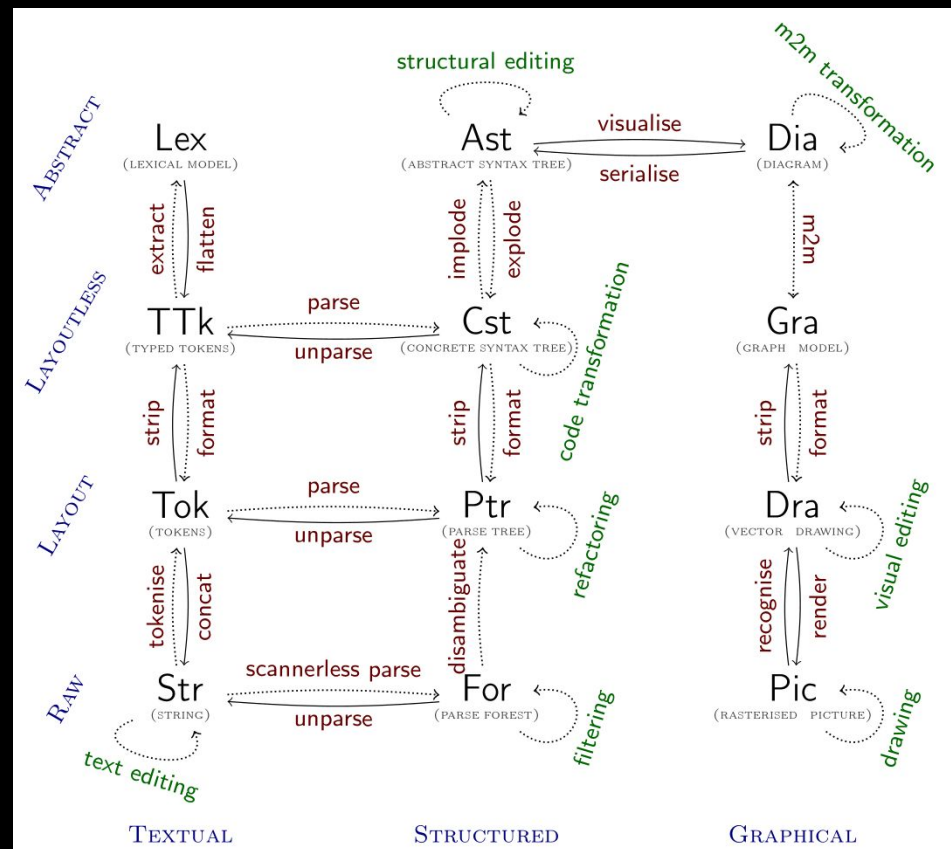


# Mega-II: modelling MDE

- model of main model-driven concepts
- a domain model for the domain of modelling
- megamodel elements are concepts, not artefacts



# Mega-II: modelling MDE



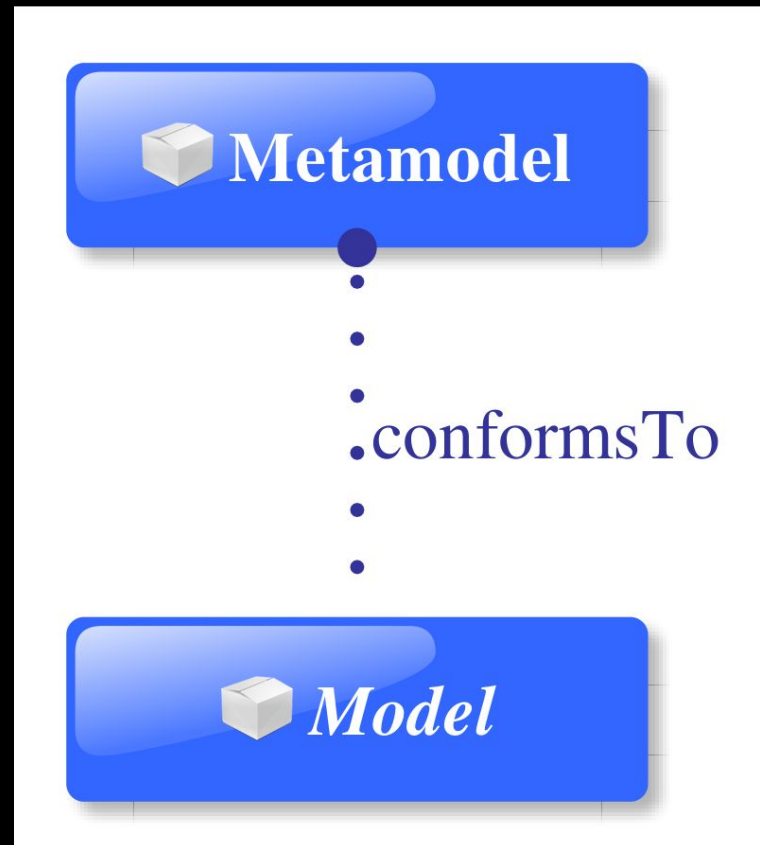
# Mega-III: resolvable megamodels

- statements are made about concrete entities
- entities are linked to artefacts





# Back to the simplest megamodel



# NGA

- **Node**
  - a named dot
  - pluggable into bigger megamodels
- **Graph**
  - its internal structure
  - a megamodel with nodes-models
  - syntax
- **Automaton**
  - what happens with execution
  - semantics
  - behaviour

N

$$L \rightleftharpoons S$$

# E1: Data Synchronisation

G

*L*

*S*

$[(1924, \text{Büchi}), (1925, \text{Moore}), (1927, \text{Mealy})] \rightleftharpoons \{(1925, \text{Moore, Madison}), (1927, \text{Mealy, Harvard}), (1924, \text{Büchi, ETH})\}$

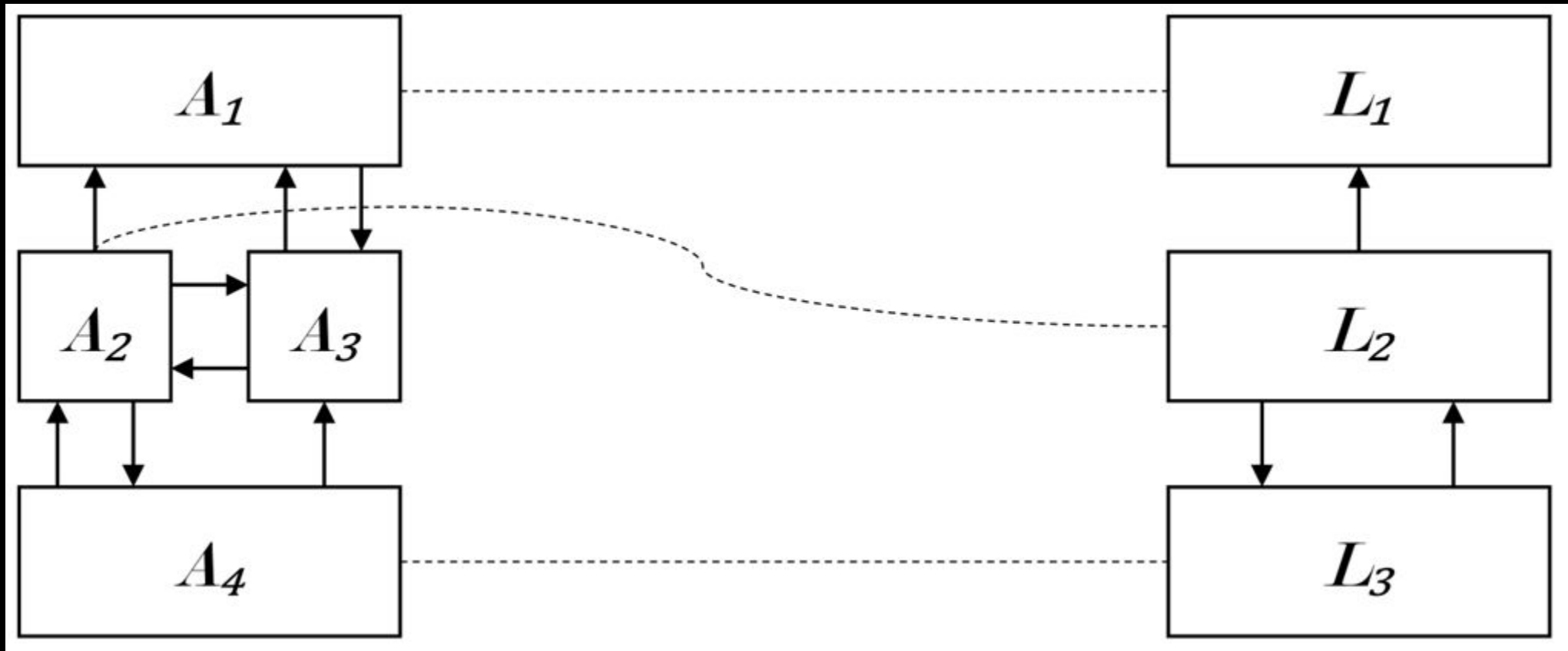
A

N

$$S_1 \xrightarrow{\tau} S_2$$

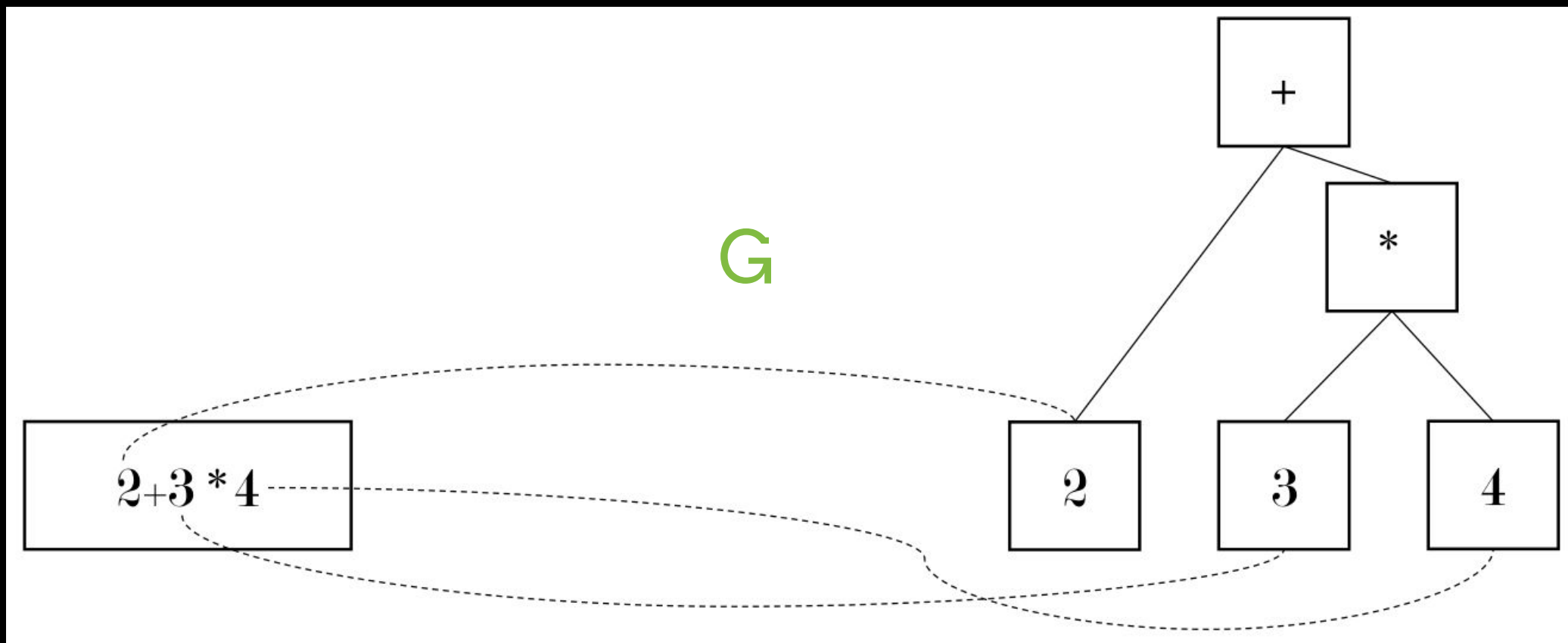
## E2: Software Migration

G



**N**  $S \xrightarrow{\text{parse}} T$

# E3: Parsing

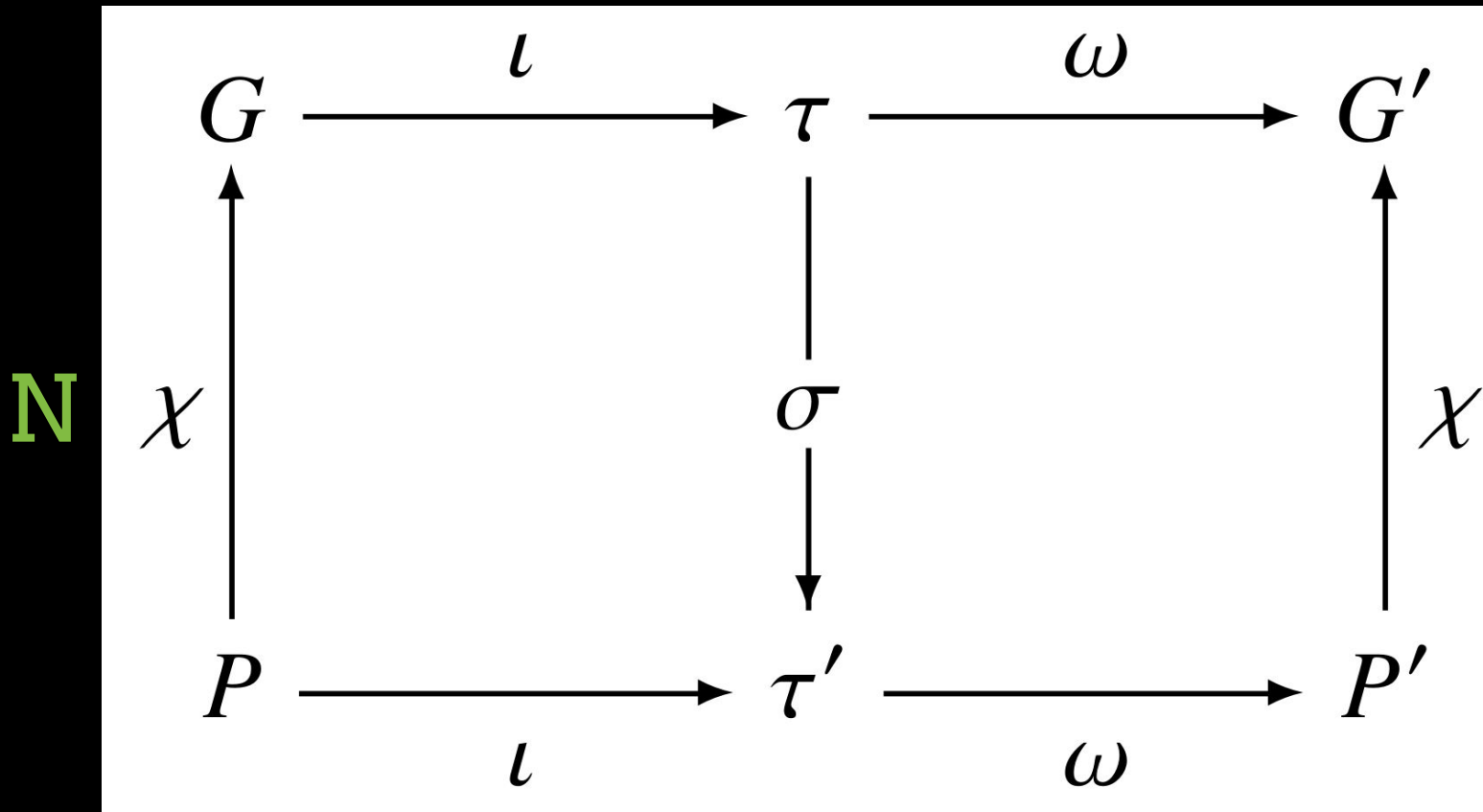


~~A~~

A



# E4: Cotransformation





# Concluding remarks

- useful
- powerful
- expressive
- underresearched
- TO DO
  - figure out how to “zoom in” A-views
  - formalise N to G refinement
  - N-A models