### L1

Operation semantics, Typing rules.

Progress and Type preservation lemma.

- y2013p6q9
- y2021p4q8
  - stack
- y2015p6q9
- y2022p4q9
  - Evaluation context, anomaly
  - LISP dynamic scoping vs static

# L2 (Function)

- y2009p6q9
- y2018p4q8

### L3

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## **Subtype**

- y2003p6q12
- y2020p4q9
- y2022p4q8
  - o reflexivity or transitivity, structural induction

#### Concurrent

• y2007p6q10

# **Exception**

- y2012p6q9
- y2017p6q9
  - dynamic memory

# **Effect System**

- y2018p4q9
  - {R,W}, also covered in Part II Compiler Opt Lecture 13