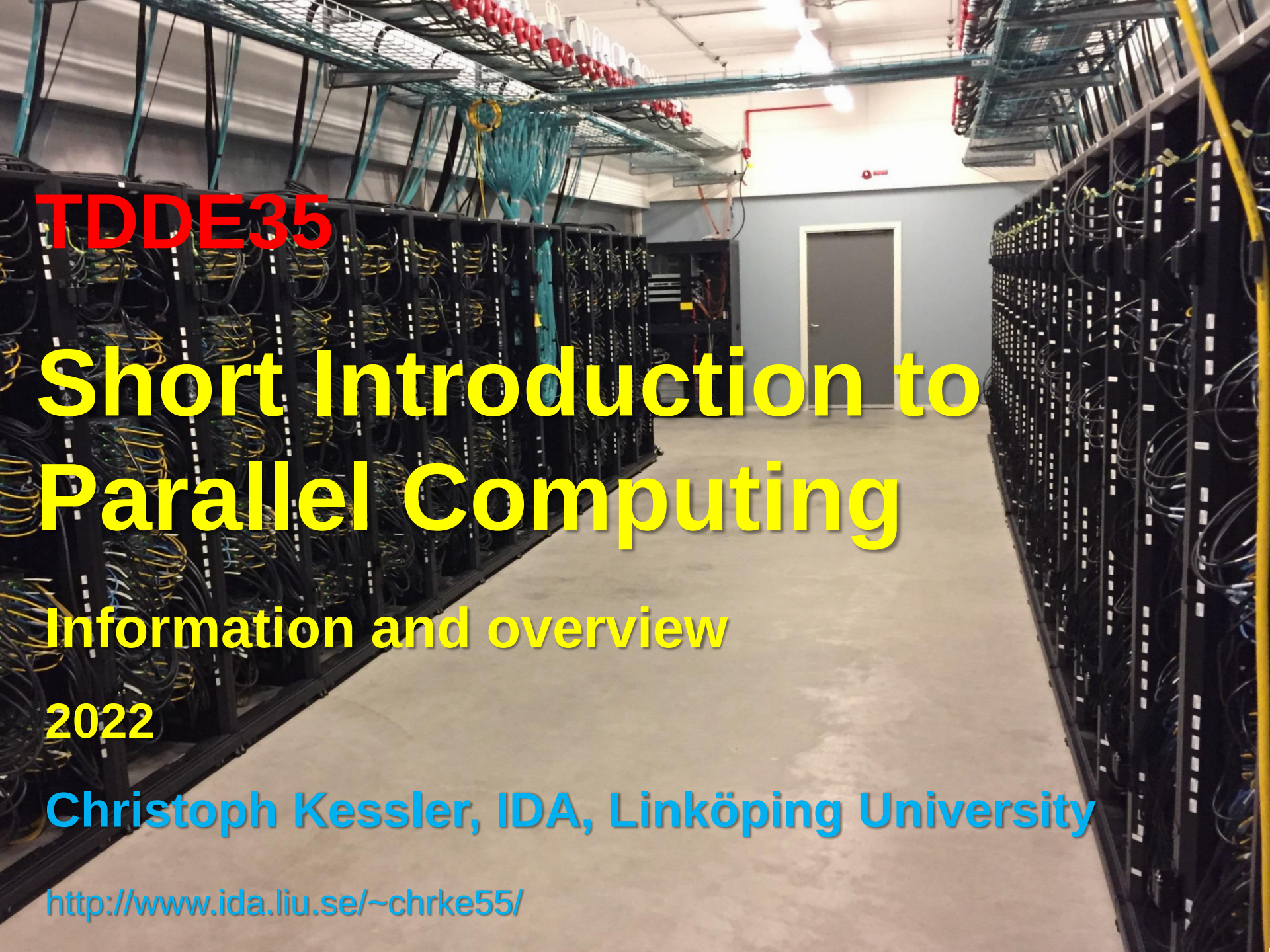


TDDE35

Short Introduction to Parallel Computing

Information and overview

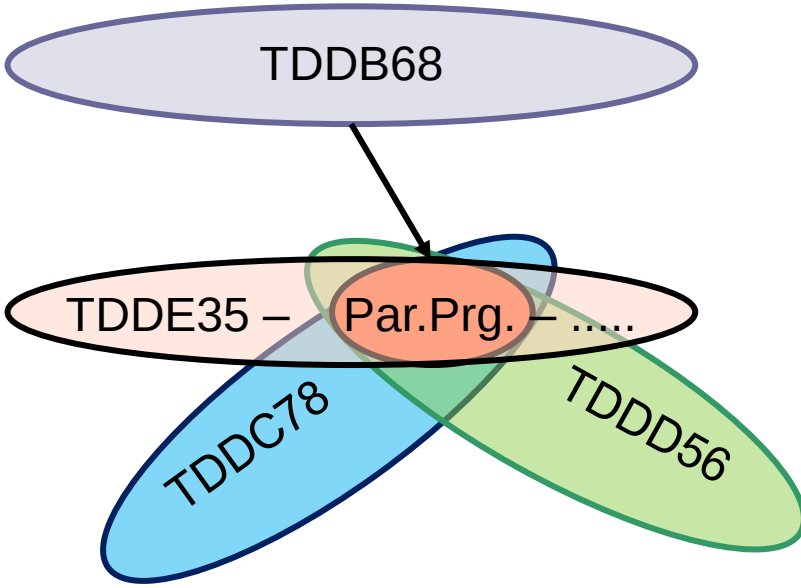
2022

Christoph Kessler, IDA, Linköping University

http://www.ida.liu.se/~chrke55/

Setup and Objectives

- 4 lectures
- Some questions in the exam*
- Roughly matching 1hp



- **Introduction** of parallel computer architectures, programming techniques and algorithmic concepts
- Details to follow in subsequent master-level courses
  - **TDDC78** Programming parallel computers – methods and tools, 6hp
  - **TDDD56** Multicore and GPU Programming, 6hp
  - These can be taken stand-alone or both in arbitrary order

Lectures

- **Lecture 1:** Organization, Overview.
  Motivation, Parallel computer architecture concepts
- **Lecture 2a:** Parallel programming with threads
- **Lecture 2b:** Parallel programming with message passing
- **Lectures 3-4:** Design and analysis of parallel algorithms

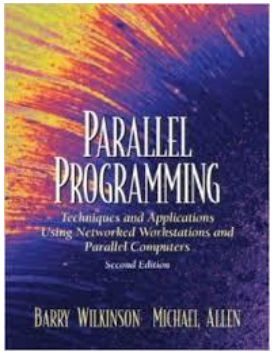
- No exercises, no labs
  → follow-up courses

Literature

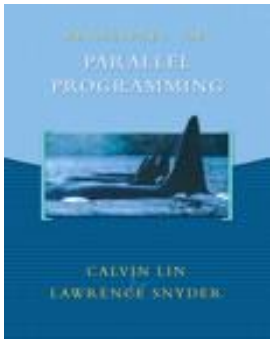
- Slide sets will be made available on the course homepage

If you prefer to work with a textbook, one of the following introductory books might be useful:

- B. Wilkinson, M. Allen:
  ***Parallel Programming**, 2e*.
  Prentice Hall, 2005.
  (general introduction; pthreads, OpenMP, MPI)
  - Course book for TDDC78



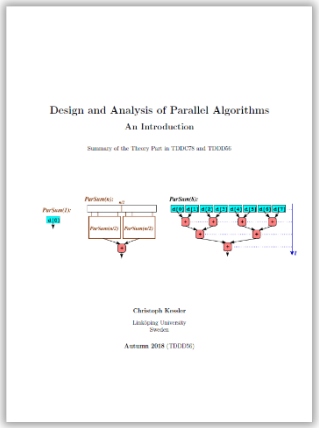
- C. Lin, L. Snyder:
  Principles of Parallel Programming.
  Addison Wesley, 2008.
  (general introduction; Pthreads)



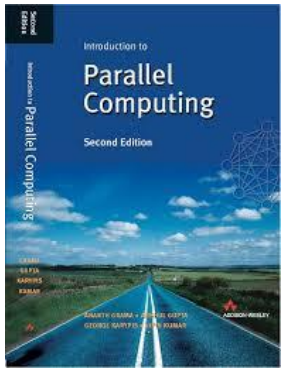
(available in the Campus-Valla library as refcopy and for loan)

Further Reading

- C. Kessler: ***Design and Analysis of Parallel Algorithms: An Introduction***.
  Compendium (PDF), Spring 2020 edition,
  see TDDC78 web page handouts
  - http://www.ida.liu.se/~TDDC78/handouts.shtml
  - login: parallel, password: see whiteboard
  - Chapter 2 is about Lectures 3+4



- A. Grama, G. Karypis, V. Kumar, A. Gupta:
  Introduction to Parallel Computing, *2nd Edition.*
  Addison-Wesley, 2003.
  (design and analysis of parallel algorithms)



See also the course homepages of TDDC78 and TDDD56 for further references and links to web documents