Introduction to parallel programming

Courses lectured over several afternoons will give an introduction to parallel programming.

All courses are **free** of charge.

All lectures are held in **English**.

All courses are held twice every year (**February** and **September**).

**Registration:** Send an e-mail to: adm@hpc.ntnu.no

(Please add your NTNU User Name in the Registration Email)

Topics covered:

- A walk through of cluster architectures. Amdahl's vs Gustafsons law. Simple MPI-calls, programs with MPI-collective
- OpenMP Programming for CPU and GPU, and hybrid programming (MPI/OpenMP). (OpenMP for GPU is only in September)
- MPI: Programming examples and Algorithms
- (Only in February) Parallel Matlab programming and distributed Matlab using MPI.
- Introduction to Jupyter Notebooks is a tutorial showing the basic use of Python in a Jupyter Notebook

Install a Matlab Client on your laptop. See [http://www.ntnu.no/adm/it/orakel](http://www.ntnu.no/adm/it/orakel) and Programvaredistribusjon

The MPI course consists of two parts: an introduction to MPI and a second part that covers a lot of the examples from the IBM's Redbook "Practical MPI programming". [Practical MPI Programming - IBM Redbook](http://www.redbooks.ibm.com/abstracts/sg248802.html)

**Remember to bring your own laptop.**

(For Window users: Please install a ssh client, like X-Win32 (which you find in [software.ntnu.no](http://software.ntnu.no)), or PuTTY Xming)

**Date and place.**

**Date:** August 29, September 3. to 12. - 2019  
**Location:** Bygg-teknisk, L10, Gløshaugen NTNU - Trondheim, Norway

(Use the smart phone app MazeMap for navigation)

**Registration:** (see above)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Duration</th>
<th>Room</th>
<th>Subject</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 29</td>
<td>15:15</td>
<td>~3hrs</td>
<td>L10</td>
<td>Introduction to Jupyter Notebooks (Optional for HPC users)</td>
<td>Bjørn Lindi (<a href="mailto:bjorn.lindi@ntnu.no">bjorn.lindi@ntnu.no</a>)</td>
</tr>
<tr>
<td>Sep 03</td>
<td>14:15</td>
<td>~3hrs</td>
<td>L10</td>
<td>Introduction to Linux, Optional, very elementary, mostly for newcomers to &quot;command line&quot; linux</td>
<td>Egil Holvik (<a href="mailto:egil.holvik@ntnu.no">egil.holvik@ntnu.no</a>)</td>
</tr>
<tr>
<td>Sep 04</td>
<td>15:15</td>
<td>~3hrs</td>
<td>L10</td>
<td>Introduction to parallel programming</td>
<td>Jan Christian Meyer (<a href="mailto:jan.christian.meyer@ntnu.no">jan.christian.meyer@ntnu.no</a>)</td>
</tr>
<tr>
<td>Sep 05</td>
<td>15:15</td>
<td>~4hrs</td>
<td>L10</td>
<td>Introduction to OpenMP Programming part 1, with exercises in C and Fortran</td>
<td>John Floan (<a href="mailto:john.floan@ntnu.no">john.floan@ntnu.no</a>)</td>
</tr>
<tr>
<td>Sep 10</td>
<td>15:15</td>
<td>~4hrs</td>
<td>L10</td>
<td>OpenMP part 2. Hybrid Programming OpenMP and MPI, with exercises (C and Fortran)</td>
<td>John Floan (<a href="mailto:john.floan@ntnu.no">john.floan@ntnu.no</a>)</td>
</tr>
<tr>
<td>Sep 11</td>
<td>15:15</td>
<td>~3hrs</td>
<td>L10</td>
<td>MPI: Programming and Algorithms</td>
<td>Henrik Nagel (<a href="mailto:henrik.nagel@ntnu.no">henrik.nagel@ntnu.no</a>)</td>
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<tr>
<td>Sep 12</td>
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<td>~4hrs</td>
<td>L10</td>
<td>OpenMP part 3. OpenMP for GPU, with exercises. (C)</td>
<td>John Floan (<a href="mailto:john.floan@ntnu.no">john.floan@ntnu.no</a>)</td>
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</tbody>
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