Computational Physics **Problem Set 1** **Due 2019/9/24**

Only solutions to questions 4-5 are required to be written up, which should include your source codes, results, and discussions (PDF), all in a gzipped tar file. Please send your homework from your NTU email account to twchiu@phys.ntu.edu.tw before 24:00 of the due date.

1. Setup cygwin

If you are using Window system, set up cygwin as your computing environment.

2. Linux commands

Learn the basic Linux commands, and the editor vi.

3. Compilation of codes and test runs

Compile and execute some simple codes like hello*.c

4. Machine Precision

Write a C/C++ code to determine the machine precision of your computing platform, in single and double precision respectively.

5. Richardson Extrapolation

Write a C/C++ program to calculate the second derivative of $f(x) = x\exp(x)$ at $x = 2$, using the 3-point formula given in the lecture, and the Richardson extrapolation. Generate a table of extrapolates as demonstrated in the class, along with the exact solution.