High performance computing: Modern computer architectures and applications in the physical science (T) - physics7505

Degree - M.Sc. in Physics (PO von 2014)

Module	**Elective Advanced Lectures: Theoretical Physics**
Module No.	physics70c

Course	**High performance computing: Modern computer architectures and applications in the physical sci**
Course No.	physics7505

Category	**Type**	**Language**	**Teaching hours**	**CP**	**Semester**
Elective	Lecture	English	2	3	WT/ST

Requirements for Participation: Knowledge of a modern programming language like C/C++

Preparation:

Form of Testing and Examination: oral examination

Length of Course: 1 semester

Aims of the Course: Understanding principles of modern computer architectures and their usage and programming for scientific problems

Contents of the Course:

Computer architectures and system components (CPU, memory, network)

Software environment

Parallel architectures and parallel programming paradigms (MPI, OpenMP/threads)

High Performance Computing

Recommended Literature:

John L. Hennessy, David A. Patterson: Computer Architecture - A Quantitative Approach. Morgan Kaufmann Publishers, 2012

David A. Patterson, John L. Hennessy: Computer Organization and Design - The Hardware / Software Interface. Morgan Kaufmann Publishers, 2013

W.H. Press et al.: Numerical Recipes in C (Cambridge University Press)

Message Passing Interface Forum: MPI: A Message-Passing Interface Standard, Version 3.1

OpenMP Application Programming Interface, Version 4.5, November 2015