Module Name	Introduction to Optical Non-classical Computing: Concepts and Devices
Module Number	EuI-IST-E-ONC, EuI-NES-E-ONC
Responsible Lecturer	Prof. Dr.-Ing. Kambiz Jamshidi kambiz.jamshidi@tu-dresden.de
Qualification Objectives	After completing the module, students master the fundamentals of quantum optics and statistical optics and are familiar with various optical computing methods, such as quantum computing, artificial neural networks, and Ising machines. They understand the different linear and nonlinear photonic components required for optical computing.
Contents	The module covers methods of optical non-classical computing and the fundamentals of relevant photonic components.
Teaching and Learning Forms	4 hours per week of lectures, 2 hours per week of exercises, and self-study. The language of instruction for lectures and exercises is English.
Prerequisites for Participation	In the Master's program Nanoelectronic Systems, knowledge in the areas of electromagnetism, systems theory, and semiconductors at the Bachelor's level is required. In the Diploma program Information Systems Engineering, the competencies to be acquired in the module Systems Theory are required.
Usability	The module is an elective module according to § 6 paragraph 2 of the study regulations and § 33 paragraph 3 of the examination regulations for the specialization Nanoelectronics in the Master's program Nanoelectronic Systems. Furthermore, it is an elective module in the elective area "Competence Deepening" according to § 6 paragraph 3 of the study regulations and § 33 paragraph 3 of the examination regulations for the main study phase of the field of Communication Technology in the Diploma program Information Systems Engineering. The module creates the prerequisites for the modules listed under "Prerequisites for Participation."
Prerequisites for the Award of Credit Points	Credit points are awarded when the module examination is passed. The module examination consists of a complex performance task with a workload of 30 hours.
Credit Points and Grades	7 credit points can be earned through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the Module	The module is offered every summer semester.
Workload	The total workload is 210 hours.
Duration of the Module	The module lasts one semester.
Accompanying Literature	- *Quantum Computations and Quantum Information*by M. Nielsen and I. L. Chuang -*Adiabatic Quantum Computation and Quantum Annealing: Theory and Practice*by C. C. McGeoch -*Principles of Artificial Neural Networks* by D. Graupe