Elective Advanced Lectures - physics700

Module No.	**physics700**
Category	Elective
Credit Points (CP)	
Semester	7.

Module: Elective Advanced Lectures

Module Elements:

Nr	Course	Course No.	CP	Artkurz	Teaching hours	Semester
1	Transport in mesoscopic systems (T)	physics762	5	Lect. + ex.	2+1	WT/ST
2	Relativity and Cosmology I (T)	GR I	8	Lect. + ex.	4+2	WT
3	Relativity and Cosmology II (T)	GR II	8	Lect. + ex.	4+2	ST
4	Topology for Physicists (T)	Topology	6	Lect. + ex.	3+1	ST
5	Geometry in Physics (T)	GiP	8	Lect. + ex.	4+2	ST
6	Quantum Field Theory II (T)	QFT II	8	Lect. + ex.	4+2	ST
7	Quantum Field Theory I (T)	QFT I	8	Lect. + ex.	4+2	ST
8	Groundbreaking experiments in nuclear physics (E)	ExpNuclPhys	3	Lecture	2	ST
9	Particle physics (E)	Particles	4	Lecture	3	ST
10	Physics of Detectors (E/A)	Detectors	4	Lecture	3	ST
11	Nuclear physics II (E)	Nucl. physics II	5	Lecture	3	WT
12	Optical Spectroscopy (E/A)	Optical Spectr.	3	Lecture	2	WT/ST
13	Introduction to neutron scattering (E/A)	Neutron Scatt.	3	Lecture	2	ST
14	Physics of Surfaces and Nanostructures (E/A)	Surfaces	3	Lecture	2	WT
15	Experimental methods in condensed matter physics (E/A)	Meth CondMatt	3	Lecture	2	WT
16	Magnetism (E/A)	Magnetism	3	Lecture	2	WT
17	Superconductivity (E/A)	Supercond	3	Lecture	2	ST
18	Semiconductor Physics and Nanoscience (E/A)	Semicond. Phys.	3	Lecture	2	ST
19	Condensed Matter Physics II (E)	CondMatter II	4	Lecture	3	ST
20	Fundamentals of Molecular Symmetry (E/A/T)	FundMolSym	4	Lecture	2	ST
21	Astrochemistry (E/A)	Astrochemistry	4	Lecture	2	ST
22	Probability theory and stochastic processes for physicists (T)	Probability	4	Lecture	3	WT
23	Nonequilibrium physics with interdisciplinary applications (T)	Nonequilibrium	4	Lect. + ex.	2+1	ST
24	Disordered systems (T)	Disorder	8	Lect. + ex.	4+2	ST
25	Statistical physics far from equilibrium (T)	StatPhysNE	8	Lect. + ex.	4+2	ST

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26	Statistical physics of soft matter and biomolecules (T/A)	SoftMatter	8	Lect. + ex.	4+2	ST
27	Physical biology (T/A)	PhysBio	8	Lect. + ex.	4+2	ST
28	Courses from Cologne marked "E", "A", or "T"	see catalogue	3-8	see catalogue		WT/ST
29	Modern Spectroscopy (E/A)	physics741	4		2+1	WT/ST
30	Advanced Topics in Field and String Theory (T)	physics764	7	Lect. + ex.	3+2	ST
31	Advanced Topics in Quantum Field Theory (T)	physics765	7	Lect. + ex.	3+2	ST
32	Computational Methods in Condensed Matter Theory (T)	physics767	7	Lect. + ex.	3+2	WT/ST
33	Internships in the Research Groups	physics799	4	internship		WT/ST
34	General Relativity for Experimentalists (T)	physics768	7	Lect. + ex.	3+2	WT/ST
35	Lattice QCD (T)	physics769	7	Lect. + ex.	3+2	ST/WT
36	Ultracold Atomic Gases (E/T)	physics742	6	Lect. + ex.	3+1	WT
37	Advanced Gaseous Detectors - Theory and Practice (E)	physics722	6		3+1	ST
38	Random Walks and Diffusion (T)	physics7502	3	Lect. + ex.	1+1	ST
39	Physics in Medicine: Physics of Magnetic Resonance Imaging (A)	physics776	6	Lect. + ex.	3+1	WT
40	Selected Topics in Modern Condensed Matter Theory (T)	physics7503	7	Lect. + ex.	3+2	WT
41	Theory of Superconductivity and Superfluidity (T)	physics7504	5	Lect. + ex.	2+1	WT/ST
42	Selected 700-courses from catalogue	physics711-729	4-6	see catalogue		WT/ST
43	Selected 700-courses from catalogue	physics731-749	3-6	see catalogue		WT/ST
44	Selected 700-courses from catalogue	physics751-769	5-7	see catalogue		WT/ST
45	Selected 700-courses from catalogue	physics771-779	3-6	see catalogue		WT/ST
46	Also possible classes from M.Sc. in Astrophysics					
47	Particle Astrophysics and Cosmology (E)	physics711	6	Lect. + ex.	3+1	WT
48	Advanced Electronics and Signal Processing (E/A)	physics712	6	Lect. + ex.	3+1	ST
49	Particle Detectors and Instrumentation (E/A)	physics713	6	Lect. + lab.	3+1	ST
50	Advanced Accelerator Physics (E/A)	physics714	6	Lect. + ex.	3+1	ST/WT
51	Experiments on the Structure of Hadrons (E)	physics715	4	Lect. + ex.	2+1	WT

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52	Statistical Methods of Data Analysis (E)	physics716	4	Lect. + ex.	2+1	ST
53	High Energy Physics Lab (E)	physics717	4	Laboratory		WT/ST
54	Programming in Physics and Astronomy with C++ or Python (E/A)	physics718	4	Lect. + ex.	2+1	ST
55	Intensive Week: Advanced Topics in High Energy Physics (E)	physics719	4		3	WT/ST
56	Physics with Antiprotons (E)	physics720	3	Lecture	2	WT
57	Intensive Week: Advanced Topics in Hadron Physics (E)	physics721	4		3	WT/ST
58	Low Temperature Physics (E/A)	physics731	6	Lect. + ex.	3+1	WT/ST
59	Optics Lab (E/A)	physics732	4	Laboratory		WT/ST
60	Holography (E/A)	physics734	3	Lecture	2	ST
61	Laser Cooling and Matter Waves (E)	physics735	3	Lecture	2	WT/ST
62	Crystal Optics (E/A)	physics736	6	Lect. + ex.	3+1	WT
63	Intensive Week: Advanced Topics in Photonics and Quantum Optics (E)	physics737	4	Lect. + lab. + sem.	3	WT/ST
64	Lecture on Advanced Topics in Quantum Optics (E)	physics738	4	Lect. + ex.	2+1	WT/ST
65	Lecture on Advanced Topics in Photonics (E/A)	physics739	4		2+1	WT/ST
66	Hands-on Seminar: Experimental Optics and Atomic Physics (E/A)	physics740	3		2	WT/ST
67	Group Theory (T)	physics751	7	Lect. + ex.	3+2	WT
68	Superstring Theory (T)	physics752	7	Lect. + ex.	3+2	WT
69	Theoretical Particle Astrophysics (T)	physics753	7	Lect. + ex.	3+2	ST
70	General Relativity and Cosmology (T)	physics754	7	Lect. + ex.	3+2	ST
71	Quantum Field Theory (T)	physics755	7	Lect. + ex.	3+2	ST
72	Critical Phenomena (T)	physics756	7	Lect. + ex.	3+2	ST
73	Effective Field Theory (T)	physics757	7	Lect. + ex.	3+2	WT/ST
74	Quantum Chromodynamics (T)	physics758	7	Lect. + ex.	3+2	WT/ST
75	Quantum Field Theory for Condensed Matter Physics (T)	physics759	5	Lect. + ex.	2+1	WT/ST
76	Computational Physics (T)	physics760	7	Lect. + ex. + proj.	2+2+1	WT/ST
77	Supersymmetry (T)	physics761	6	Lect. + ex.	3+1	WT/ST
78	Advanced Topics in String Theory (T)	physics763	7	Lect. + ex.	3+2	ST
79	Physics of Higgs Bosons (T)	physics766	7	Lect. + ex.	3+2	WT
80	Environmental Physics & Energy Physics (A)	physics771	3	Lecture	2	WT
81	Physics in Medicine: Fundamentals of Analyzing Biomedical Signals (A)	physics772	6	Lect. + ex.	3+1	WT

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82	Physics in Medicine: Fundamentals of Medical Imaging (A)	physics773	6	Lect. + ex.	3+1	ST
83	Electronics for Physicists (E/A)	physics774	6	Lect. + ex.	3+1	ST
84	Nuclear Reactor Physics (A)	physics775	3	Lecture	2	ST

Requirements:

Preparation:

Content: Special lectures on research topics of the physics section of the Bonn University

Aims/Skills: The students are offered the opportunity to get insight into today's research problems

Form of Testing and Examination: If the lecture is offered with exercises: requirements for the module examination (written or oral examination): successful work with exercises

Length of Module: 1 semester

Maximum Number of Participants: ca. 100

Registration Procedure: s. https://basis.uni-bonn.de u. http://bamawww.physik.uni-bonn.de

Note: Note: The students must obtain 18 CP in all out of the modules physics700, -710, -720, -730.