

Photonics

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Chapters	University	Contributor	Number of pages	e-Mail
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Introduction	BSU	A.Tolstik	5	tolstik@bsu.by
Chapter 1: Laser physics	BSU	A.Tolstik		tolstik@bsu.by
1.1. Principles of lasers operation and characteristics of laser radiation. Methods of the active medium pumping. Optical resonators.	BSU	A.Tolstik	15	tolstik@bsu.by
1.2. Continuous mode of laser operation. Power generation. The lasing threshold. Free-running mode	BSU	A.Tolstik	10	tolstik@bsu.by
1.3. Active and passive Q-switched modes. Power, energy and duration of the laser pulse. Methods of solid-state lasers resonators quality factor modulating.	BSU, GSU	A.Tolstik, V. Myshkovets	10	tolstik@bsu.by myshkovets@gsu.by
1.4. Generation of Mode-locked picosecond pulses	BSU	A.Tolstik	5	tolstik@bsu.by
1.5. Methods of radiation frequency tuning	BSU	I. Agishev	10	agishev@bsu.by

1.6. The types of lasers and their applications	BSU	D. Gorbach	10	gorbachdv@bsu.by
1.7. Industrial lasers.	BSU, GSU	D. Gorbach, V. Myshkovets, A.Maksimenko	10	gorbachdv@bsu.by myshkovets@gsu.by
1.8. Laser processing of materials	BSU, GSU	D. Gorbach, V.Myshkovets, E.Baevich	15	gorbachdv@bsu.by myshkovets@gsu.by
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Chapter 2: Laser physics and nonlinear optics	BSU	A.Tolstik		tolstik@bsu.by
2.1. Nonlinear medium and mechanisms of nonlinearity	BSU	A.Tolstik	15	
2.2. Self-focusing and beam autocollimation	BSU	A.Tolstik	5	
2.3. Second harmonic generation. Phase-matching conditions.	BSU	A.Tolstik	10	
2.4. Parametric amplification and generation.	BSU	A.Tolstik	10	
2.5. Stimulated Raman scattering. Stimulated Brillouin scattering.	BSU	A.Tolstik	10	
References	BSU	A.Tolstik		
Chapter 3: Coherent Optics and Holography	BSU	A. Melnikova		melnikova@bsu.by
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3.2. Types of holograms: thin and volume, amplitude and phase, reflective and transmissive.	BSU	A. Melnikova	15	melnikova@bsu.by
3.3. Diffraction efficiency.	BSU	A. Melnikova	5	melnikova@bsu.by
3.4. Spectral and angular selectivity.	BSU	A. Melnikova	5	melnikova@bsu.by
3.5. Denisyuk holograms, Fourier hologram, rainbow hologram.	BSU	A. Melnikova	10	melnikova@bsu.by
3.6. Dynamic holography.	BSU	A.Tolstik	10	tolstik@bsu.by
3.7. Holographic interferometry.	GrSU	A. Ljalikov	25	amlialikov@grsu.by
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Chapter 4: Optoelectronics				
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4.3. Solar cells	BSU	M. Tivanov	12	Tivanov@bsu.by
4.4. Applications of photovoltaic systems	KU Loven	Joan Peuteman	15	joan.peuteman@kuleuven.be
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6.2. Density of states and modified density of states in system of low dimensionality	GrSU	N. Strekal	20	nat@grsu.by
6.3. Breaking through the difraction limit and near-field optics	GrSU	N. Strekal	15	nat@grsu.by
6.4. Quantum dots and basic ideas of nanophotnic devices	GrSU	N. Strekal	25	nat@grsu.by
6.6. Molecular electronics and photonics devices	GrSU	G. Vasilyuk		vasilyuk@grsu.by
6.5 Metamaterials	GSU	I. Semchenko	16	isemchenko@gsu.by
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