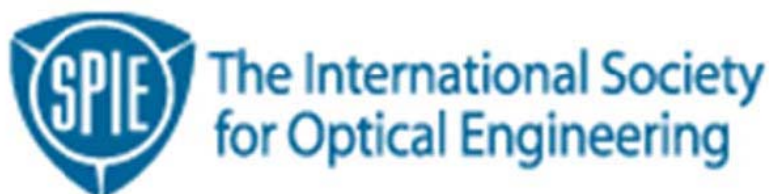


**SAINT-PETERSBURG STATE UNIVERSITY OF INFORMATION  
TECHNOLOGIES, MECHANICS AND OPTICS**



## **Student Chapter Annual Report**

### **Names and e-mail addresses of chapter officers:**

President:	Alexander Alekseev,	<a href="mailto:alekseev@ysa.ifmo.ru">alekseev@ysa.ifmo.ru</a>
Vice-president:	Elizaveta Yankovskaya,	<a href="mailto:adfors@gmail.com">adfors@gmail.com</a>
Secretary:	Olga Mokhnatova,	<a href="mailto:o.mokhnatova@mail.ru">o.mokhnatova@mail.ru</a>
Treasurer:	Elizaveta Buyanovskaya,	<a href="mailto:bu.eliz.m@mail.ru">bu.eliz.m@mail.ru</a>
Chapter Scientific Adviser:	Sergey A. Kozlov,	<a href="mailto:kozlov@mail.ifmo.ru">kozlov@mail.ifmo.ru</a>

### **List of current Student Chapter members:**

1. Alekseev Alexander
2. Antonov Oleg
3. Buyanovskaya Elizaveta
4. Chernov Ilya
5. Tsyarkin Anton
6. Tsygankova Ekaterina
7. Kiselev Alexei
8. Kiselev Andrei
9. Lesnichiy Vasilii
10. Mokhantova Olga
11. Novoselov Evgeny
12. Pantas' Yaroslav
13. Volynskiy Maksim
14. Yankovskaya Elizaveta
15. Zlatov Andrei
16. Gorodetsky Andrei
17. Ivanov Dmitriy
18. Samoilov Leonid

## Chapter activities since last report:

This year our members worked for extending their study to the following directions:

- Investigation of holographic technologies for artificial intelligence creation;
- Optical solitons in optoinformatics;
- Analytical study and numerical modeling of the femtosecond supercontinuum generation;
- Analytical study and numerical modeling of few-cycle pulses propagation and reflection;
- Investigation of few-cycle pulses collision in waveguides and possibilities of received effects' use in ultrafast optoinformatics;
- Modeling of light propagation along rows of nanospheres and nanocylinders;
- Investigation of structures of permitted and forbidden zones in periodical system of intensifying an isotropic layers;
- Modeling of nanotubes growth;

In June several members of our SPIE chapter got bachelor degree. In August E. Buyanovskaya presented our Chapter on the 52<sup>nd</sup> Annual Meeting which took place in San-Diego, California, USA. In October A. Alekseev had the scientific probation in Optoinformatics (University Complutense de Madrid, Madrid, Spain). Most part of the Chapter's members took part in V International conference of young scientists and experts "Optics – 2007". VI SPIE student chapters meeting was held in the conference. During the meeting representatives of chapters presented reports about their SPIE Student Chapters activity.

### Publications:

- *Gorodetsky A.A., Bepalov V.G.* Modelling of non-reference holographic terahertz pulse imaging// *Optics Journal*, 2007, vol 74, No 11, p. 30-35
- *Tsygankova E.V., Ignatiev A.I., Nikonorov N.V., Tsekhomsky V.A.* Effect of antimony on photo-thermo-induced formation of colloidal silver nanoparticles in glass// *Collection of works V International conference of young scientists and experts « Optics - 2007 »*, on October, 15-19th, 2007, St.-Petersburg, Russia,, p.388.
- *Alekseev A.M., Konstantinov A.M., Pavlov A.V.* Realization of nonmonotonic reasonings at integration of logic and figurative thinking by a method of Fourier-holography // *News of the Russian Academy of Science. A series physical*, 2007, V.71, №2, pp. 180-184
- *Alekseev A.M., Pavlov A.V.* About an opportunity of realization of logic with exceptions by a method of Fourier-holography // *Collection of works of IV International forum «Holography EXPO-2007»*, on September, 25-27th 2007, Moscow, Russia, pp. 159-161
- *Pavlov A.V., Alekseev A.M.* Realization of indistinct logic with exceptions by a method of Fourier-holography // *Collection of works of International scientific and technical conference IEEE AIS ' 07 CAD-2007*, on September, 3-10rd 2007, Divnomorskoe, Russia, M.Fizmatlit, V.2., pp. 155-160
- *Alekseev A.M., Pavlov A.V.* Modeling of nonmonotonic logic with exception by technique of Fourier-holography // *Collection of works V International conference of young scientists and experts « Optics - 2007 »*, on October, 15-19th, 2007, St.-Petersburg, Russia, pp.94 – 95
- *Chernov I., Chivilikhin S.A., Popov I.Yu., Blinova I.V., Kirilova S.A., Konovalov A.S., Oblogin S.I., Tishkin V.O., Gusarov V.V.* Simulation of nanoscrolls' formation// *Glass physics and chemistry*, 2007, V.33, N4, p.442-450
- *Buyanovskaya E.M., Kozlov S.A.* Generation of multiple frequencies during the interaction of counter-propogating pulses consisting of few field oscillations in nonlinear dielectric mediums// *In materials of V International Conference for Students, Young*

Scientists and Engineers "Optics-2007", on October, 15-19th, 2007, St.-Petersburg, Russia, pp.44 – 45

- *Buyanovskaya E.M., Kozlov S.A.* Dynamics of counter-propagating few-cycle light pulses' field in dielectric media// JETP Letters, 2007, V. 86, №5, p. 349-353.
- *Mokhnatova O.A., Kozlov S.A.* Nonlinear reflection of superposition of femtosecond spectral supercontinuum// In materials of V International Conference for Students, Young Scientists and Engineers "Optics-2007", on October, 15-19th, 2007, St.-Petersburg, Russia, pp.70 – 72
- *Mokhnatova O.A., Kozlov S.A.* Nonlinear Reflection of a femtosecond spectral supercontinuum// JETP, 2008, V.133, N.1 (in print)
- *Gurov I., Volynsky M., Zakharov A.* Evaluation of multilayer tissue in optical coherence tomography by the extended Kalman filtering method // Proc. SPIE. – 2007. – V. 6734. 67341P.
- *Volynsky M., Zakharov A.* Removal of Variable Background Component of Low-Coherence Interferometric Signal// Proceedings of V International Conference of Young Scientists and Specialists «Optics-2007». Saint Petersburg. – 2007. PP. 50-51.
- *Volynsky M., Gurov I., Zakharov A.* Statistical approach to interpretation of signal processing results in optical coherence tomography// Proceedings of The first Saint Petersburg Congress «Professional education, science and innovations in XXI century», October 26-27, 2007, Saint Petersburg.
- *Zlatov A.S., Aseev V.A., Nikonorov N.V., Przhhevskii A.K., Fedorov Y.K.* Spectral properties of ytterbium metaphosphate glasses doped with erbium ions// Journal of Optical Technology, 2007, V. 74, N9, p. 630-632
- *Zlatov A.S., Aseev V.A., Zhukova M.N., Nikonorov N.V., Przhhevskii A.K., Fedorov Y.K.* Is the influence of ytterbium concentration on the inversion of the population of erbium in the phosphate laser glass// Journal of Optical Technology, 2007, V. 74, N11

### Conferences:

- *Drozdov A.A., Tsypkin A.N.* Data transmission capability with velocity from on high 10 Tbit/s using quasidiscrete spectral supercontinuum// V the International conference of young scientists "Optics-2007", October 15-19th, 2007, St.-Petersburg, Russia.
- *Gorodetsky A.A., Bespalov V.G.* THz pulse Computational Holography// Topical problems of biophotonics, 02-07 august 2007, Nizhniy Novgorod, Russia
- *Gorodetsky A.A., Bespalov V.G.* THz pulse imaging and its wavefront reconstruction// International Workshop on Quantum Optics, September 18 - 22, 2007, Samara, Russia
- *Gorodetsky A.A., Bespalov V.G.* THz Pulse Amplitude Holography Without Reference Beam// HoloExpo, 25-27 September 2007, Moscow, Russia
- *Gorodetsky A.A., Bespalov V.G.* THz Pulse Amplitude Holography Without Reference Beam Prospectives// V the International conference of young scientists "Optics-2007", October, 15-19th, 2007, St.-Petersburg, Russia.
- *Tsygankova E.V., Ignatiev A.I., Nikonorov N.V., Tsekhomsky V.A.* Effect of antimony on photo-thermo-induced formation of colloidal silver nanoparticles in glass// V the International conference of young scientists "Optics-2007", October 15-19th, 2007, St.-Petersburg, Russia.
- *Alekseev A.M., Pavlov A.V.* Modeling of nonmonotonic logic with exception by technique of Fourier-holography// V the International conference of young scientists "Optics-2007", October, 15-19th, 2007, St.-Petersburg, Russia.
- *Alekseev A.M., Pavlov A.V.* About an opportunity of realization of logic with exceptions by a method of Fourier-holography// IV International forum «Holography EXPO-2007», on September, 25-27th 2007, Moscow, Russia.

- *Pavlov A.V., Alekseev A.M.* Realization of indistinct logic with exceptions by a method of Fourier-holography// International scientific and technical conference IEEE AIS ' 07 CAD-2007, on September, 3-10th 2007, Divnomorskoe, Russia.
- *Novoselov E. V.* Quasi-phasematched the third and fifth order harmonics generation in noble gases, V International Conference for Students, Young Scientists and Engineers "Optics-2007", October 15-19, Saint-Petersburg, Russia.
- *Novoselov E.V., Bespalov V.G., Krylov V.N., Lukomsky G.V., Putilin S.E.* Spectral features of the supercontinuum generation in fused silica by the first and second harmonics of femtosecond Ti: Sapphire laser, V International Conference for Students, Young Scientists and Engineers "Optics-2007", October 15-19, Saint-Petersburg, Russia.
- *Buyanovskaya E.M., Kozlov S.A.* Dynamics of field of two counter-propagating few cycle light pulses in nonlinear dielectric media. ICONO/LAT 2007, May 28-June 1, 2007, Minsk, Belarus.
- *Buyanovskaya E.M., Kozlov S.A.* Generation of multiple frequencies during the interaction of counter-propagating pulses consisting of few field oscillations in nonlinear dielectric mediums, V International Conference for Students, Young Scientists and Engineers "Optics-2007", October 15-19, Saint-Petersburg, Russia.
- *Gurov I., Volynsky M., Zakharov A.* Evaluation of multilayer tissue in optical coherence tomography by the extended Kalman filtering method // International Conference on Coherent and Nonlinear Optics and International Conference on Laser, Applications, and Technologies (ICONO/LAT 2007), May 28 – June 1, 2007. Minsk, Belarus.
- *Gurov I., Volynsky M., Zakharov A.* Tissue evaluation in optical coherence tomography using nonlinear stochastic filtering method // International Conference on Laser Applications in Life Sciences, 11-14 June, 2007. Moscow, Russia.
- *Volynsky M., Zakharov A.* Removal of Variable Background Component of Low-Coherence Interferometric Signal // V International Conference of Young Scientists and Specialists «Optics-2007», October 15-19, 2007. Saint Petersburg, Russia.
- *Mokhnatova O.A., Kozlov S.A.* The nonlinear reflection of fields superposition of two few-cycle light pulses. ICONO/LAT 2007, May 28-June 1, 2007, Minsk, Belarus.
- *Mokhnatova O.A., Kozlov S.A.* Nonlinear reflection of superposition of femtosecond spectral supercontinuum// V International Conference of Young Scientists and Specialists «Optics-2007», October 15-19, 2007. Saint Petersburg, Russia.
- *Mokhnatova O.A., Kozlov S.A.* Nonlinear reflection of superposition of two few-cycle pulses with different spatio-temporal spectrums// International Workshop on Quantum Optics 2007, Samara Russia
- *Zlatov A.S., Korzinin Yu.L., Nikonorov N.V.* Refractive index change in photo-thermo-refractive glasses in near infrared range// V International conference of young scientists and specialists “Optics - 2007”, Optical materials and technologies, October 15-19, 2007, St. Petersburg, Russia.
- *Zlatov A.S., Andreeva N.V.* Educational practice of school students on physical optics as an element of the program “Optoinformatics in school”// V International conference of young scientists and specialists “Optics - 2007”, Optics and education, October 15-19, 2007, St. Petersburg, Russia.

### **Awards:**

- Tsygankova Ekaterina the special grant of the Government of St.-Petersburg
- Volinskiy Maxim the special grant of the Government of St.-Petersburg
- Alekseev Alexander the special grant of the Government of Russian Federation



*Andrei Gorodetsky, HoloExpo 2007, Moscow, Russia*



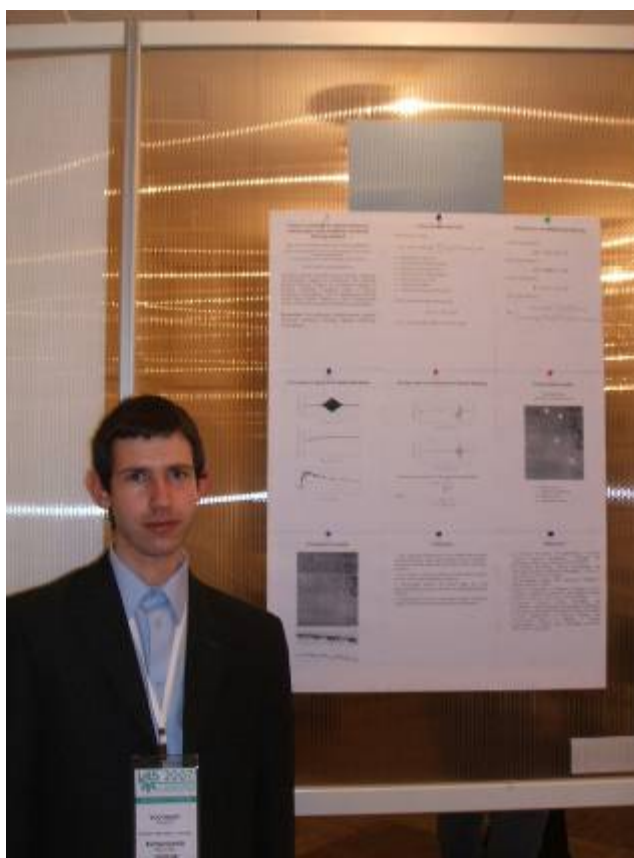
*A.M.Alekseev Realization of indistinct logic with exceptions by a method of Fourier-holography // International scientific and technical conference IEEE AIS '07 CAD-2007, on September, 3-10rd 2007, Divnomorskoe, Russia.*



*A.M.Alekseev* About an opportunity of realization of logic with exceptions by a method of Fourier-holography // IV International forum «Holography EXPO-2007», on September, 25-27th 2007, Moscow, Russia.



*A.M.Alekseev* Scientific training on university Complutense de Madrid, on October, 1-15th 2007 Madrid, Spain



*Volynsky M.*, International Conference on Laser Applications in Life Sciences, Moscow, Russia.



*Volynsky M.*, V International Conference of Young Scientists and Specialists «Optics-2007», Saint Petersburg, Russia.



*Volynsky M. and Buyanovskaya E.M. ICONO/LAT 2007, Minsk, Belarus.*



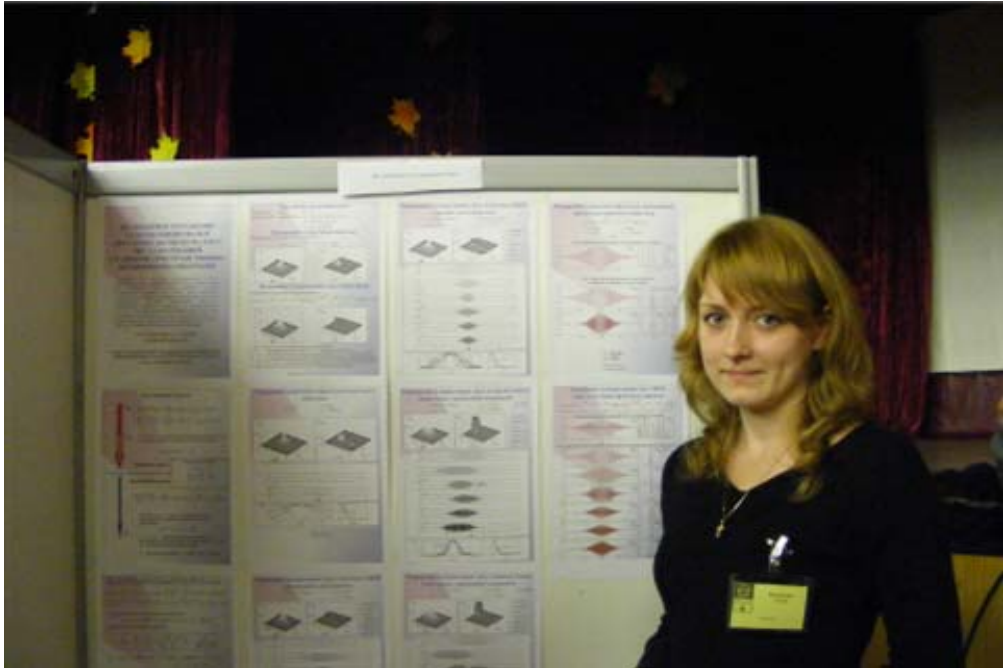
*Mokhnatova O.A. ICONO/LAT 2007, Minsk, Belarus.*



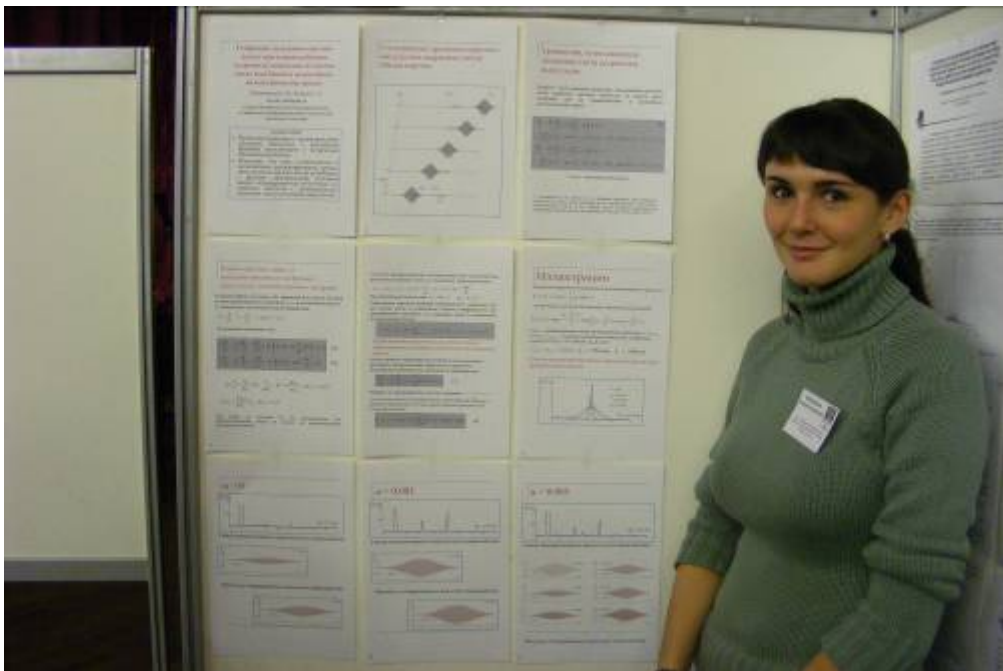
*Mokhnatova O.A.* International Workshop on Quantum Optics 2007, Samara, Russia



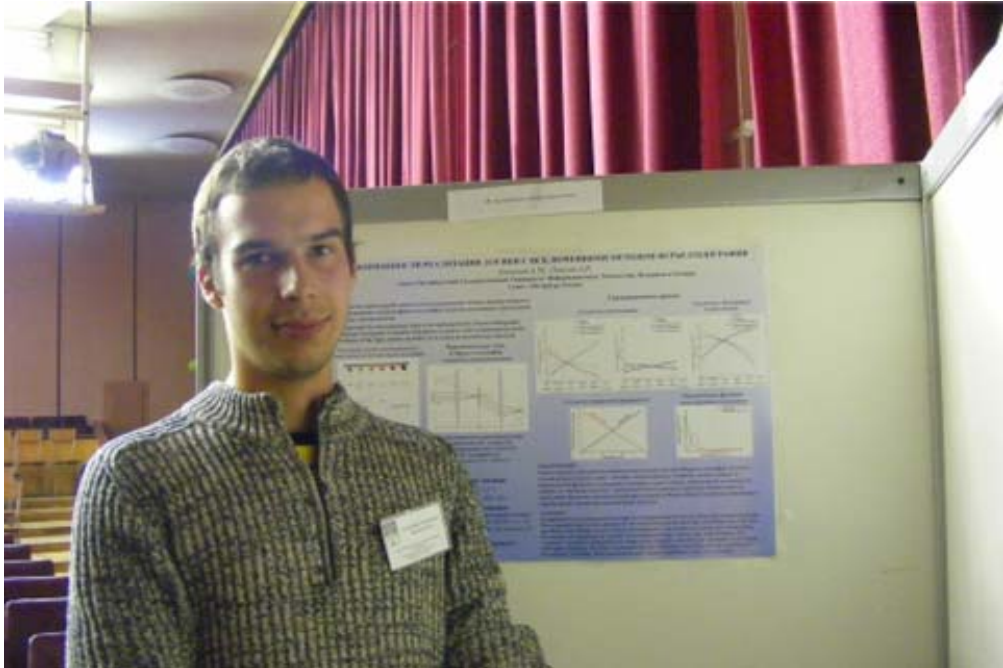
*Gorodetsky A.A.* International Workshop on Quantum Optics 2007, Samara Russia



*Mokhnatova O.A.*, V International Conference of Young Scientists and Specialists «Optics-2007», Saint Petersburg, Russia.



*Buyanovskaya E.M.*, V International Conference of Young Scientists and Specialists «Optics-2007», Saint Petersburg, Russia.



*Alekseev A.M.*, V International Conference of Young Scientists and Specialists «Optics-2007», Saint Petersburg, Russia.



*Volynsky M.*, V International Conference of Young Scientists and Specialists «Optics-2007», Saint Petersburg, Russia.



*Tsykin A.N.* V the International conference of young scientists “Optics-2007”, St-Petersburg, Russia.



Participants of VI SPIE Student Chapters Meeting