University of Latvia SPIE Student Chapter annual report  
(January, 2009)

The chapter was established in August 2004.

University of Latvia  
Raina Blvd. 19  
Riga, Latvia-1586

Advisor: Professor Janis Spigulis, director of Institute of Atomic Physics and Spectroscopy, janispi@latnet.lv

List of current Student Chapter members:

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Name</th>
<th>Officers</th>
<th>Expiration date of membership</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ilze Aulika</td>
<td></td>
<td>31 March 2009</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Liga Berke</td>
<td></td>
<td>31 March 2009</td>
<td></td>
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<tr>
<td>3</td>
<td>Olga Docenko</td>
<td></td>
<td>31 March 2009</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Tatyana Dudareva</td>
<td></td>
<td>31 March 2009</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Renars Erts</td>
<td></td>
<td>31 March 2009</td>
<td></td>
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<tr>
<td>6</td>
<td>Ilja Fesenko</td>
<td></td>
<td>31 December 2009</td>
<td>New member</td>
</tr>
<tr>
<td>7</td>
<td>Lāsma Gailite</td>
<td></td>
<td>31 March 2009</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Zanda Gavare</td>
<td>Vice President</td>
<td>31 March 2009</td>
<td></td>
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<tr>
<td>9</td>
<td>Andris Grabovskis</td>
<td></td>
<td>31 March 2009</td>
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<tr>
<td>10</td>
<td>Jurgis Grube</td>
<td></td>
<td>31 March 2009</td>
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<tr>
<td>11</td>
<td>Tatyana Glaskovs</td>
<td></td>
<td>31 March 2009</td>
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<tr>
<td>12</td>
<td>Liga Grinberga</td>
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<td>31 March 2009</td>
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<tr>
<td>13</td>
<td>Linda Kere</td>
<td></td>
<td>31 March 2009</td>
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<tr>
<td>14</td>
<td>Gunta Krumina</td>
<td></td>
<td>31 March 2009</td>
<td></td>
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<tr>
<td>15</td>
<td>Ilona Kuzmina</td>
<td></td>
<td>31 March 2009</td>
<td></td>
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<tr>
<td>16</td>
<td>Elina Laizane</td>
<td></td>
<td>30 June 2009</td>
<td>New member</td>
</tr>
<tr>
<td>17</td>
<td>Aleksejs Lihacouvs</td>
<td></td>
<td>31 March 2009</td>
<td></td>
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<tr>
<td>18</td>
<td>Edgars Nitiss</td>
<td></td>
<td>31 December 2009</td>
<td>New member</td>
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<tr>
<td>19</td>
<td>Roberts Paeglis</td>
<td></td>
<td>31 March 2009</td>
<td></td>
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<tr>
<td>20</td>
<td>Uldis Rubins</td>
<td></td>
<td>31 March 2009</td>
<td></td>
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<tr>
<td>21</td>
<td>Anatolijs Sarakovskis</td>
<td></td>
<td>31 March 2009</td>
<td></td>
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<tr>
<td>22</td>
<td>Jurgis Sipols</td>
<td></td>
<td>31 December 2009</td>
<td>New member</td>
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<tr>
<td>23</td>
<td>Olesja Starkova</td>
<td></td>
<td>31 March 2009</td>
<td></td>
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<tr>
<td>24</td>
<td>Andrey Tokmakov</td>
<td></td>
<td>31 December 2009</td>
<td>New member</td>
</tr>
<tr>
<td>25</td>
<td>Rita Veilande</td>
<td>Secretary</td>
<td>31 March 2009</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Aivars Vembris</td>
<td>President</td>
<td>31 March 2009</td>
<td><a href="mailto:aivars.vembris@gmail.com">aivars.vembris@gmail.com</a></td>
</tr>
<tr>
<td>27</td>
<td>Ilze Vingre</td>
<td>Treasurer</td>
<td>31 March 2009</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Gunita Zalca</td>
<td></td>
<td>31 December 2009</td>
<td>New member</td>
</tr>
</tbody>
</table>

Few members finished their PhD studies.
Chapter activities:

- Renars Erts left a UL SPIE Student Chapter president position and Aivars Vembris became a new president.
- Student Chapter meeting in the Institute of Solid State Physics of University of Latvia. Topics: “UL SPIE Student Chapter activities”
- Aivars Vembris gave a presentation “The advantages to be a member of SPIE student chapter.” in the Institute of Solid State Physics of University of Latvia. After this presentation one student became a member of UL SPIE student chapter and five students were interested in the society offered benefits.
- UL SPIE Student Chapter and UL OSA Student Chapter participation and organizing the **DOC-2008** (Developments in Optics and Communications 2008): http://www.osa-latvia.lv/doc/
- New member – Ilja Fescenko, Elina Laizane, Edgars Nitiss, Jurgis Sipols, Andrey Tokmakov, Gunta Zalca, Jurgis Grube, Anatoljs Sarakovskis, Andris Grabovskis
- Aivars Vembris and Elina Laizane participated in seminar "Optics From young Researchers Perspective" in Latvia with talk “University of Latvia SPIE student chapter”.
- Through personal subscription members of UL student chapter can get papers from SPIE Digital Library.
- The member of the student chapter presented EDUKIT and KHET game in the “Night of Science”. This event gave opportunity non-scientist visit various scientific institute. People of different age (7 – 50) played the laser game.
- We organized a lecture for students and teachers about EDUKIT. During this outreach activity we gave EDUKIT to teachers of physics. At the end participants visited laboratories of Institute of Solid State Physics.
- Rewards for the good done job. (Game of bowling)
- President of student chapter, Aivars Vembris, visited San Diego and participated in Leadership Workshop and Optics + Photonics conference.
- Members of chapter visited St.Peterburge and gave an introduction about UL student chapter to members of St. Petersburg State University of Informational Technologies, Mechanics and Optics chapter. It was a start of two chapter collaboration.
- Several members helped to organize two international scientific conferences: Functional Materials and Nanotechnologies 2008 and Advanced Optical Materials and Devices.
- Prof. Dr. Mauro F. Pereira visited student chapter. He gave a lecture “21st Century Optical Engineering: Manipulating Nonequilibrium Many Body Effects to Create new Devices” (Visiting lecture programme)

Photos of above mentioned activities you can find at the end of the report.
Our grants and award:

- Aivars Vembris received a prestigious K. Morberg scholarship – the highest student’s award from University of Latvia.
- Aivars Vembris received Latvian Academy of Science Ludvigs and Maris Jansons Prize— for the best work in physics.
- Ilze Aulika received L’ORÉAL Latvian scholarship “Women in science”
- Renars Erts received award from Ministry of Science and Education form carrying out pupil scientific work

Scientific activities of chapter member:

- Research of optical gradient and thermo-optical properties of NaNbO₃ thin films, optical properties of Ba₀.₈Sr₀.₂TiO₃ films, thermal expansion studies of PLZT x/85/15 solid solutions, as well as optical investigations of BST/PZT superlattices.
- Research of "up-conversion" processes (multi photon excitation, IR light conversion to VIS) in different materials: crystals, glasses and glass ceramics doped with rare-earth ions
- Synthesis of the materials (glass melting, crystal growth, chemical synthesis), material characterization (X-Ray Diffraction, Differential Thermal Analysis, Scanning Electron Microscopy) and optical properties (stationary and time-resolved luminescence, absorbance).
- Determination of organic material electro-optical coefficients by Mahs – Zender interferometer method.
- Development of new algorithm and software for diagnostic of human health by register of blood pulsation from optical signal.
- Low-temperature, high fervency plasma investigations by spectroscopic methods.
- Study of electroluminescent in organic materials.
- Holographic recording in polymer materials containing azobenzine derivatives.

Reports at the conferences:

In the first half of year 2008 our members presented reports at international and Latvian conferences:

- Zanda Gavare, Atis Skudra, Juris Silinsh, Martins Granats, Determination of helium number densities in electrodeless low-temperature high-frequency
plasma, Abstracts of ESCAMPIG 19, Granada, Spain, July 15-19 (2008), 1-81


- Aulika, A. Dejneka, V. Zaules, K. Kundzins, Optical properties of ferroelectric thin films in the temperature range of 4-820 K, Abstracts of the 24th SCISSO, UL, p. 21,


- Paeglis, R., Gorshanova, I., Bagucka, K., & Lacis, I. Formatting of Pages Needs to be Considered in the Eye Movement Research of Reading. Developments in Optics and Communications (2008), pp. 6-7.


Nordic-Baltic Conf. On Biomedical Engineering and Medical Physics, Riga, (2008) p. 52


- Aivars Vembris, Elina Laizane, Martins Rutkis, Nonlinear optical active guest – host DMABI/PMMA system as optical storage media, *Topical Meeting on Optoinformatics'08*, September 15 – 18, 2008, Santpeterburg, Russia


Publications of year 2008:


Aulika, J. Pokorny, V. Zauls, K. Kundzins, M. Rutkis, J. Petzelt, *Structural and optical characterization of Ba$_{0.8}$Sr$_{0.2}$TiO$_3$ films deposited by PLD on various substrates using micro-Raman and spectral ellipsometry methods*, *Optical Materials* (2008) 30 1017


### Planned activities for the year 2009:

• Work with teachers. Present different scientific-education kits, like EDUKIT, to show possibilities to teach physics in interesting way.

• Involving more Student Chapter members by lecturing in other institutes.

• Organizing of Student Chapter meeting every month with a report on what every member has done in the field of science and where he has been.

• Renovate the website of the University of Latvia SPIE Student Chapter: http://www.spie.times.lv/

• UL SPIE Student Chapter members give opportunity to use SPIE Digital Library through personal subscription. The fees for subscription will be taken from UL SPIE Student Chapter budget.

• Strong collaboration (excursions, organizing conferences, lectures) with students’ from University of Latvia OSA Student Chapter http://www.osa-latvia.lv/

**Financial information:**

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<thead>
<tr>
<th>Object</th>
<th>Amount USD</th>
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</thead>
<tbody>
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<td><strong>Beginning balance in January 2008</strong></td>
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<tr>
<td>SPIE funding</td>
<td>+700</td>
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<tr>
<td>Participation in seminar &quot;Optics From young Researchers Perspective&quot; (2 days)</td>
<td>-150</td>
</tr>
<tr>
<td>Lecture about EDUKIT + coffee break</td>
<td>-70</td>
</tr>
<tr>
<td>Game “KHET”</td>
<td>-50</td>
</tr>
<tr>
<td>Bowling game</td>
<td>-80</td>
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<tr>
<td>Individual subscription of Digital Library</td>
<td>-125</td>
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<tr>
<td>Food and snacks</td>
<td>-110</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
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</table>
Aivars Vembris gave a presentation in the Institute of Solid State Physics of University of Latvia.
Leadership Workshop and Optics + Photonics confer

Presentation of EDUKIT and KHET game in the “Night of Science”

Lecture for teacher about EDUKIT
Game of bowling

16 January 2009

Aivars Vembris
President of University of Latvia SPIE Student Chapter

Janis Spigulis, professor
Faculty Advisor, director of Institute of Atomic Physics and Spectroscopy