

Saint-Petersburg State University of Information Technologies, Mechanics & Optics (ITMO)

**National Research University**



**Национальный  
исследовательский  
университет**

**IODS-  
2010**

*program of*

## *International Optical Design Seminar*

September 27-29th, 2010, Saint-Petersburg, Russia

*программа*

## *Международного Оптического Семинара*

27-29 сентября, 2010, Санкт-Петербург, Россия



## ***LAST DRAFT***

*“Take care on optical designers’ GENERATION NEXT”*

### **ADVANCE PROGRAM**

of 2nd International Optical Design Seminar IODS’10

Organized by

National Research University of Information Technologies Mechanics and Optics (Saint Petersburg, Russia) as a project of Engineering Center “Optica”

In cooperation with

- Delft University of Technology, Netherlands
- EPFL, Switzerland
- Korea Polytechnic University, Republic of Korea
- European Optical Society
- Rozdestvensky Optical Society, Russia;

### **Introduction**

The 2-d International Optical Design Seminar , «IODS’10» will be held on September, 27-29, 2010 in Saint Petersburg, Russia.

Optical systems design is the fast developing field of technique, the importance of its further improvement grows constantly and plays important role in the XXI-st century, which determines the necessity of achieving higher results on the quality of a range of modern devices, where optical system is one of the main parts.

The main goal of the seminar is to provide succession from high level professional optical specialists all over the world and young scientists, engineers, including students.

Seminar is devoted to development of international cooperation between Universities, Research Institutes, Companies and independent “free-lance” specialists in the field of optical design.

This seminar helps “the ends meet”: young specialists look for jobs, universities – find future PhD students, companies - pick up their potential employees, etc.

Specialists of all levels have opportunity of qualification promotion by visiting lectures of international leading specialists and exchange of ideas in the friendly atmosphere of city of Saint Petersburg – Russian “capital of optics”, and one of the most beautiful cities in the world.

IODS’09 – seminar attracted 65 participants from seven countries, information of this seminar could be found on <http://global.ifmo.ru>.

**Hosting organization and Seminar location** – Saint Petersburg National Research University of Information Technologies, Mechanics and Optics, 14-16, Birzhevaya line, Saint Petersburg, Russia.

### **Scope of the seminar**

The seminar will consist:

1. invited speakers plenary session (1 day),
2. master-class (1 day)
3. competition on lens design problem for young specialists and discussion of inter-university joint educational activities (1 day).

Working language is English.

Social events, entertainment and cultural programs are prepared by the local organizing committee.

### **Optical Design competition for young specialists**

Main goal of the competition is to improve design skills of students, PhD students, young scientists and engineers with optical design experience less than 5 years and the age under 33 y.o.

All projects will be examined and evaluated by International Program Committee not later than 01<sup>st</sup> September 2010, the winners will be announced at the closing session of the seminar and awarded.

The results of competition and the papers presented by winners will be published in Journal of Optical Technology, Russia.

### **Design period**

Four months: 01<sup>st</sup> April – 15th August 2010

*Final design* has to be presented and defended at the IODS'10.

### ***Presentation has to include:***

- detail explanation of the starting point selection (surface shape, material, focal length);
- how merit function was created;
- achieved results with aberration, MTF and other necessary plots.

### ***Awards:***

- 1-st prize – financial support to visit any Optical Conference;
- 2-d prize (2) – 700 USD;
- 3-d prize (3) – 300 USD.

## **Optical Design Problem for competition**

Proposed by W.Ulrich, Carl Zeiss AG, Optical Design Director.

### **Motivation** (addressed to the students):

This design task is not of any industrial interest, but should give you a lot of pleasure.

You will go through some ups and downs – it would be great if you became hungry not just to win this competition but to become an excellent lens designer.

### **What is the lens for**

The lens is for projecting the Olympic Rings on a screen very sharply.

The object is an infinite thin ring shining in different colours.

The rings shall be projected by a lens, which can be refocused for each colour

### **Specification:**

Ring geometry @ object side: 10mm diameter

NA object side: NA=0.2

Magnification from object to screen: 100x (paraxially calculated)

Wavelength: blue (480 nm), green (546 nm), yellow (587 nm), red (643 nm), all monochromatic

Fokussing mechanism for each wavelength by axial movement of the whole lens, eg. axial colour can be compensated, but take care of lateral colour !

### **Task:**

Optimize a lens with no more than 5 lens elements

It is allowed to use any type of legal optical design software, but the results will be reviewed by International Committee using CODEV.

Maximum allowed free optical diameter of used elements is 100mm

Just refractive elements out of Schott or Ohara glass catalog

Surfaces has to be rotational symmetrical, aspherics allowed

No vignetting, e.g. all ray bundles are determined by the real aperture stop

All air spaces, element thicknesses and edge thicknesses has to be positive

### **Criterion (calculated by CodeV)**

**Winner is the lens design with the sharpest Olympic Rings at the screen at same size**

Rings thickness will be calculated only geometrically by considering all rays for all wavelengths; diffraction effects will be neglected

Good Luck !

## **INTERNATIONAL COMMITTEE**

**CHAIR - Dr. K.Tatsuno – OITDA, Japan**

**Members:**

**Dr. M. Isshiki – Isshiki Optics, Inc., Japan**

**Dr. T.Dohi – OptiWorks, Japan**

**W.Ulrich – Zeiss, Germany**

**Prof. P. Urbach – TU Delft, Netherlands**

**Prof. J. Braat – TU Delft, Netherlands**

**Prof. F. Bociort – TU Delft, Netherlands**

**Prof. Y. Kim – KPU, S.Korea**

**Dr. D.Dilworth – OSD, Inc., USA**

**Prof. P.Benitez – UPM, Spain**

**Dr. L. Cheng – BASO Ltd., Taiwan**

**Dr. A-M Berg – AM Berg Ltd. Sweden**

**Prof. Hans Peter Herzig – EPFL, Switzerland**

**Prof. L.Halonen – Univ. Aalto, Finland**

## **TIME TABLE & TECHNICAL PROGRAM**

<b>September 27<sup>th</sup> (Mon.) Plenary session day</b>		<b>September 28<sup>th</sup> (Tue.) Master-class day</b>	<b>September 29<sup>th</sup> (Wed.) Discussion day</b>
<i>Presiders: Dr. I.Livshits, Prof. Y.Kolesnikov, Prof. S.Stafeev, ITMO, Prof. A. Shehonin Russia</i>		<i>Professor Florian Bociort, TU Delft, Netherlands</i>	<i>Presider Dr. Alexander Serebryakov, ASML, Netherlands</i>
09:00	<b>Opening Session</b> Opening remarks: V.N.Vasilyev, rector	<b>Introduction Basics of Zemax</b>	<b>Overview of the projects, Presentations by the winners</b>
09-10	<b>Plenary Session I</b> Presider: Dr.I. Livshits  (9:10) Dr. K.Tatsuno, OITDA, Japan (9:35) EPFL, Switzerland (10:00) Prof. V. Zverev, University ITMO, Russia		
10:25	<b>Coffee break</b>	<b>Coffee break</b>	<b>Coffee break</b>
10:45	<b>Plenary Session II</b> Presider: Prof.Y. Kolesnikov  (10:45) Prof. YI Kim, KPU, Republic Korea (11:10) Prof. L.Halonen, University Aalto, Finland (11:35) Prof. M. Gan, University ITMO, Russia	<b>Optimization in Zemax</b>	<b>Presentations of joint activities</b>
12:00	<b>Lunch break</b>	<b>Lunch break</b>	<b>Lunch break</b>
13:00	<b>Plenary Session III</b> Presider: Prof.A. Shehonin  (13:10) Prof. P.Urbach, TU Delft, Netherlands (13:35) Prof. P.Benitez, UPM, Spain (14:00) W.Ulrich, Carl Zeiss, Germany (14:35) Prof. Kolesnikov, University ITMO, Russia	<b>Examples</b>	<b>Closing session</b>
15:10	<b>Coffee break</b>	<b>Coffee break</b>	<b>Coffee break</b>
15:25	<b>Optical museum/university</b>	<b>Boat trip/ sightseeing</b>	<b>Hermitage</b>
17:30	<b>End</b>	<b>End</b>	<b>End</b>
18:00	<b>Reception</b>	<b>Theater</b>	<b>Farewell party/concert of participants</b>
20:00			

*Notice:*

*All participants are very welcome to prepare not only presentation, but song, dance, poem, etc. to be presented at the farewell party*

## **How to participate in the seminar**

To participate in the seminar it is necessary to complete application form and pay seminar fee (150 Euros/person, excluding speakers).

### ***APPLICATION FORM FOR THE SEMINAR***

To confirm your participation in the seminar, please, complete the attached form and send it by e-mail to the secretariat not later than 30<sup>th</sup> August 2010.

Name: \_\_\_\_\_

Affiliation: \_\_\_\_\_

Phone: \_\_\_\_\_

e-mail address: \_\_\_\_\_

## **How to participate in the Competition**

To participate in the competition it is necessary to complete Competition Application Form and send it by e-mail together with your project not later than August, 15<sup>th</sup>, 2010.

Name: \_\_\_\_\_

Age \_\_\_\_\_

Affiliation: \_\_\_\_\_

Phone: \_\_\_\_\_

e-mail address: \_\_\_\_\_

I participated in the competition myself/with a group of students/with the help of my teacher (underline, please, correct answer).

Secretariat «IODS'10»:

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