# Report

## 15th IUVSTA School on
## Lasers for the Nano Engineering of Surfaces - LANES

## 10-17 July 2016, Isola di San Servolo, Venice (LANES 2016)

The School was organized in the framework of the IUVSTA activities within the Surface Engineering Division (SED), in cooperation with the Venice International University (VIU) and the Politecnico di Milano, and it was endorsed by Città Metropolitana di Venezia, by AIV - Associazione Italiana di Scienza e Tecnologia and by SIOF (Italian Society of Optics and Photonics). The LANES2016 was recognized and supported as the 15th IUVSTA School. Among the co-chairmen of the school, from IUVSTA (SED) there was Prof. Paolo Ossi, Milano, Italy (Italian representative to IUVSTA). The 15th IUVSTA International School on Lasers for the Nano Engineering of Surfaces (LANES 2016) was held on Isola di San Servolo, Venice, Italy, from 10th to 17th of July, 2016.

The school also included a presentation of IUVSTA, delivered by Prof. P. Schaaf, Ilmenau, Germany (Vice president of IUVSTA-SED) presenting its structure and its scientific and educational activities. The structure, divisions, conferences, and publications of IUVSTA were illustrated to the students and participants as well.

Although the School has been geared towards the level of a PhD student, advanced undergraduate and Master students, as well as postdoctoral researchers have joined in the school. In total, 32 students, mainly from EU, Russia (3), the USA (11), have attended the School. The main purpose of the School has been to provide graduate students, PhD students and young research scientists working in the field of laser engineering of surfaces with robust fundamental roots that are often lacking in their formation, so that they could profitably interact with colleagues working in areas neighboring, although not coincident, with their own research field. This research area usually involves plenty of questions related to vacuum science and technology.

The School encompassed several activities including a set of lectures imparted by 18 international experts in the field of laser-materials interaction and vacuum science and technology (the program is provided below and also at the web page http://www.slims.polimi.it/). The active participation of students was stimulated through posters and brief (10 minutes) oral contributions. Structured discussions among lecturers and students took place in dedicated sessions. Several “classrooms” enforced the after-lecture discussion and questions of the students. Prices were awarded in a closing ceremony for the best student contributions.

Questionnaires were filled by the students at the end of the school. There was a very positive response about the school, its contents and quality. Particularly appreciated were the time schedule, the role of lectures dedicated to basic topics, the classroom discussions and the possibility to have free discussions with the lecturers throughout the entire school duration. The student participation was extremely active.

The financial report is submitted separately.

Some pictures of the school are attached. More can be found on the school website http://www.slims.polimi.it/

Paolo Ossi

Pictures of the 15th IUVSTA School

**The lecture hall**

**Group picture of LANES-2016 attendees**

**Fireworks at the end of LANES-2016 (Redimeer Festivity in Venice)**

## *LANES Schedule*

15th IUVSTA School on Lasers for the Nano Engineering of Surfaces - LANES
10-17 July 2016, Isola di San Servolo, Venice,

Italy 

***Sunday, July 10***

16.00-19.30: **Registration**

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***Monday, July 11***

07:30: **Breakfast**

08.45-09.15: **Opening Ceremony**

**CHAIR: Reif**

09.30-10.15 **Lecture 1 Haglund**

10.30-11.15: **Lecture 2 Sugioka**

11.30-12.30: **Oral presentations by students 1** (5 presentations, 10 min. each) **CHAIR : Kautek**

12.35: **Lunch**

14.00-15.00: **Poster Session I** **CHAIR: Stagira**

15.15-16.30: **Lecture 3 Kautek** **CHAIR: Phipps**

16.45-17.30: **Lecture 4 Bulgakova**

17.50-18.50: **Oral presentations by students 2** (5 presentations, 10 min. each) **CHAIR : Castillejo**

19.00: **Dinner**

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***Tuesday, July 12***

07:30: **Breakfast**

**CHAIR : Sugioka**

09.00-9.45: **Lecture 5 Reif**

10.00-10.45: **Lecture 6 Stagira**

11.00-12.00: **Oral presentations by students 3** (5 presentations, 10 min. each) **CHAIR : Haglund**

12.10: **Lunch**

13.30-14.50: **Poster Session II** **CHAIR : Stagira**

15.00-15.45: **Lecture 7 Zhigilei** **CHAIR : Bulgakova**

16.00-17.30: **Classroom 1 (for Lectures 1-7; in two locations, for lectures 1-4 and 5-7)**

17.45-18.50: **Oral presentations by students 4** (5 presentations, 10 min. each) **CHAIR : Zhigilei**

19.00: **Dinner**

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***Wednesday, July 13***

07:30: **Breakfast**

**CHAIR : Lippert**

09.00-09.45: **Lecture 8 Phipps**

10.00-10.45: **Lecture 9 Schaaf**

**CHAIR : Ristoscu**

11.00-11.45: **Lecture 10 Leborgne**

12.00-13.00: **Oral presentations by students 5** (4 presentations, 10 min. each) **CHAIR : Miotello**

13.15: **Lunch**

Afternoon: **Free**

19.00: **Dinner**

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***Thursday, July 14***

07:30: **Breakfast**

09.00-9.45: **Lecture 11 Dinescu** **CHAIR : Leborgne**

10.00-10.45: **Lecture 12 Caricato**

11.00-11.45: **Lecture 13 Castillejo**

12.45: **Lunch**

14.00-15.30: **Oral presentations by students 6** (5 presentations, 10 min each) **CHAIR : Dinescu**

15.45-16.30: **Lecture 14 Lippert** **CHAIR : Castillejo**

16.45-17.30: **Lecture 15 Geohegan**

17.45-18.45: **Classroom 2 (for Lectures 8-14; in two locations, for lectures 8-11 and 12-14)**

19.30: **Barbecue and Social activity at S. Servolo**

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***Friday, July 15***

07:30: **Breakfast**

**CHAIR : Schaaf**

09.00-09.45: **Lecture 16** **Mihailescu**

10.00-10.45: **Lecture 17** **Ossi**

11.00-11.45: **Lecture 18** **Miotello**

12.00 **Lunch**

13.30-14.10: **Oral presentations by students 7** (3 presentations, 10 min each) **CHAIR : Geohegan**

14.45: **SLIMS visit at the Exhibition "Accrochage", Punta della Dogana**
*vaporetto to Venice leaves at **14.50***
*to come back to S. Servolo for dinner take vaporetto either at **18.30** or at **19.10***

19.30: **Dinner**

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***Saturday, July 16***

07:30: **Breakfast**

09.00-09.45: **Classroom 3 (for Lectures 15-18; in two locations for lectures 15-16 and 17-18)**

10.00-10.45: **Questionnaire compilation by students**

11.15-12.30: **R. Kelly Award Ceremony and Closing Remarks** **CHAIR : Co-Directors**

12.40: **Lunch**

END of LANES 2016

**LANES 2016 Lecturers and topics**

R. HAGLUND: LASERS AND OPTICAL PHYSICS FOR MATERIALS SCIENCE

W. KAUTEK: LASER ENERGY DEPOSITION: NON-THERMAL PROCESSES (INCLUDING SURGERY)

J. REIF: LASER ENERGY DEPOSITION: THERMAL+ HYPERTH. PROCESSES

S. STAGIRA: HIGH-ORDER HARMONIC GENERATION AND APPLICATIONS TO MOLECULAR ORBITAL TOMOGRAPHY

A.P. CARICATO: FUNDAMENTALS AND APPLICATIONS OF MALDI AND MAPLE

N.M. BULGAKOVA: MODELS OF PULSED LASER ABLATION BASED ON CONTINUUM METHODS

L.V. ZHIGILEI: MD SIMULATIONS OF LASER-MATERIALS INTERACTIONS

M. CASTILLEJO: NONLINEAR OPTICS IN LASER ABLATION PLASMAS

C. BOULMER-LEBORGNE: DIAGNOSTICS OF LASER INDUCED PLASMAS

I. MIHAILESCU: PULSED LASER SYNTHESIS OF BIOMATERIAL THIN FILMS FOR BIOMEDICAL APPLICATIONS

T. LIPPERT: PLD OF FUNCTIONAL OXIDES-BACK TO THE BASICS

M. DINESCU: LASERS IN SOFT MATERIAL PROCESSING: LASER DIRECT WRITING VIA MULTI PHOTON ABSORPTION AND LASER INDUCED FORWARD TRANSFER

K. SUGIOKA: ULTRAFAST LASER MICRO AND NANO-PROCESSING – BASICS AND APPLICATIONS

P. SCHAAF: INDUSTRIAL APPLICATIONS OF LASER-MATERIALS PROCESSING+

A. MIOTELLO: LASER VS ION INDUCED SPUTTERING

D. B. GEOHEGAN: GAS-PHASE LASER SYNTHESIS OF NANOMATERIALS

P.M. OSSI: NANOPARTICLES FROM LASER-GENERATED PLASMAS

C. PHIPPS: HIGH POWER LASERS TO REMOVE ORBITATING DEBRIS

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## Final balance

### *Income (Euros)*

Student fees : **31200**

IUVSTA sponsorship : **2500**

IEEE Photonics sponsorship: **900**

LLE sponsorship : **3000**

**Total : 37600**

### *Expenses (Euros)*

Lecturers lodging : **7250**

Students lodging : **12050**

Meals : **7790**

Didactic facilities (VIU) : **7650**

Student awards + Lecturers gifts : **580**

Tickets for the Guided tour at the Exhibition "Accrochage", Punta della Dogana: **300**

Barbecue at S. Servolo (Thursday, July 14, dinner) : **1790**

**Total : 37410**

## Grand Total

**37600 – 37410** = +**190** (2016)