Front Matter: Volume 7007
INDLAS 2007: Industrial Laser Applications

Mircea Udrea
Editor

23–25 May 2007
Bran, Romania

Organised by
National Institute for Laser, Plasma and Radiation Physics (Romania)
 Romanian Academy (Romania)
 SPIE Romania Chapter (Romania)
 Romanian Physical Society (Romania)
 The Romanian Territorial Committee of ICO (Romania)
 National Institute of Research and Development for Optoelectronics (Romania)
 University of Bucharest (Romania)
 University Politehnica of Bucharest (Romania)

Cosponsors
Ministry of Education and Research (Romania)
Coherent, Inc. (USA)
Ekspla (Lithuania)

Published by
SPIE

Volume 7007

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.
Industrial Laser Applications

7007 02  Thin films technologies for utility devices [7007-01]
V. R. Medianu, C. Timus, National Institute for Lasers, Plasma, and Radiation Physics (Romania); L. Boroica, National Institute for Glass (Romania)

7007 03  Progress in developing nanophotonic integrated circuits [7007-02]
T. Yatsui, Japan Science and Technology Agency (Japan); G.-C Yi, Pohang Univ. of Science and Technology (South Korea); M. Ohtsu, Japan Science and Technology Agency (Japan) and Univ. of Tokyo (Japan)

7007 04  New optics for industrial laser applications: VariSpot and VariFoc [7007-03]
J. Serna, Univ. Complutense (Spain); G. Nemes, Astigmat (USA)

7007 05  High power continuous-wave Nd lasers under diode pumping directly into the $^4F_{3/2}$ emitting level [7007-04]
N. Pavel, V. Lupei, National Institute of Laser, Plasma, and Radiation Physics (Romania)

7007 06  High power microchip solid state lasers [7007-05]
T. Dascalu, National Institute for Laser, Plasma, and Radiation Physics (Romania)

7007 07  Relativistic nonlinear Thomson scattering as a coherent source of high harmonic generation in interactions between very intense laser beams and plasmas [7007-06]
A. Popa, National Institute of Laser, Plasma, and Radiation Physics (Romania)

7007 08  Optical differential evanescent investigation of nanometric dielectric materials morphology on waveguides [7007-07]
S. Popescu, Univ. Politehnica of Bucharest (Romania); N. Mirchin, I. Lapsker, Holon Institute of Technology (Israel); P. V. Natingher, Univ. Politehnica of Bucharest (Romania); I. Mihai, National Institute for Lasers (Romania); A. Peled, Holon Institute of Technology (Israel)

7007 09  Infrared and visible laser transitions in erbium-doped crystals [7007-08]
S. Georgescu, O. Toma, National Institute for Laser, Plasma, and Radiation Physics (Romania)

7007 0A  Application of whole blood image speckle analysis [7007-09]
D. Chicea, Univ. Lucian Blaga (Romania)
Development of a technological system for manufacturing diamond cutting disks by laser welding procedure [7007-10]
G. I. Gheorghe, P. Beca, C. Marinescu, National Institute of Research and Development for Precision Mechanics (Romania); I. Farcaș, C. Fenic, National Institute for Lasers, Plasma, and Radiation Physics (Romania)

CHODIN: a computer code to simulate coherent light scattering dynamics on biological suspensions [7007-11]
D. Chicea, Univ. Lucian Blaga (Romania)

Determination of the speed / bandwidth for fast photodetectors using picosecond lasers [7007-12]
E. Smeu, Univ. Politehnica of Bucharest (Romania)

Thermal effects in the laser material marking and coloring with industrial applications [7007-13]
P. Sterian, E. Mocanu, Univ. Politehnica of Bucharest (Romania)

The study of heating of transparent liquids for laser-liquids technologies [7007-14]
M. Oane, G. Georgescu, F. Scarlat, R. Medianu, I. Mihaieliscu, National Institute for Laser, Plasma, and Radiation Physics (Romania); A. Peled, Holon Institute of Technology (Israel)

Laboratory research for realizing incremental circular networks masks with laser micro-equipments [7007-15]
G. I. Gheorghe, National Institute of Research and Development for Precision Mechanics (Romania)

Automated generation of incremental linear networks masks by using photocomposition method with multiple microphotographical reductions using laser microsystems [7007-16]
G. I. Gheorghe, National Institute of Research and Development in Precision Mechanics (Romania); O. Donto, Univ. Politehnica of Bucharest (Romania)

Laser removal of thin layers for surface cleaning [7007-17]
I. Apostol, D. Apostol, V. Damian, I. Iordache, F. Garoi, National Institute for Laser, Plasma, and Radiation Physics (Romania); E. Capello, Politechnic Univ. of Milan (Italy)

White light interferometry for vertical artifact calibration [7007-18]
V. Damian, M. Bojan, A. Sima, National Institute for Laser, Plasma, and Radiation Physics (Romania); D. Cristea, A. Dinescu, R. Muller, National Institute for Microtechnologies (Romania)

Laser applications in the field of MEMS [7007-19]
G. M. Moagar-Poladian, IMT-Bucharest (Romania); Z. Illyefalvi-Vitez, B. Balogh, Univ. Politehnica of Bucharest (Romania); D. Ulieru, ROMES S.A. (Romania); A. Coraci, IMT-Bucharest (Romania)

Sub-wavelength resolution laser lithography in the field of MEMS [7007-20]
G. Moagar-Poladian, IMT-Bucharest (Romania)
Effects of the laser beam superficial heat treatment on the gas tungsten arc Ti-6al-4v welded metal microstructure [7007-21]
I. Voiculescu, O. Dontu, V. Geanta, Univ. Politehnica of Bucharest (Romania); S. Ganatsios, West-Macedonia Univ. (Greece)

Laser heat treatment of welds for various stainless steels [7007-22]
O. Dontu, Univ. Politehnica of Bucharest (Romania); S. Ganatsios, West-Macedonia Univ. (Greece); N. Alexandrescu, C. Predescu, Univ. Politehnica of Bucharest (Romania)

Micro-welding of stainless steel by pulsed Nd:YAG laser [7007-23]
O. Dontu, Univ. Politehnica of Bucharest (Romania); S. Ganatsios, Univ. of West Macedonia (Greece); D. Besnea, Univ. Politehnica of Bucharest (Romania); P. Beca, National Institute of Research and Development for Precision Mechanics (Romania)

Continuous-wave diode end-pumped Nd:YAG and Nd:GdVO₄ lasers passively Q-switched by Cr⁺⁺:YAG saturable absorbers [7007-24]
C. Petre, N. Vasile, N. Pavel, T. Dascalu, National Institute for Laser, Plasma, and Radiation Physics (Romania)

Possibilities of increasing the pumping efficiency of solid active medium laser generators by optimizing the pumping cavity profile [7007-25]
O. Dontu, Univ. Politehnica of Bucharest (Romania); S. Ganatsios, Univ. of West Macedonia (Greece); N. Alexandrescu, Univ. Politehnica of Bucharest (Romania)

Author Index
Conference Committees

Conference Chair
Mircea Udrea National Institute for Lasers Plasma and Radiation Physics (Romania)

Scientific Committee Coordinator
Constantin Grigoriu (Romania)

Scientific Committee
S. Bilikmen (Turkey)
D. Dascalu (Romania)
D. Dumitras (Romania)
F. Flory (France)
C. Fotakis (Greece)
V. I. Konov (Russia)
N. Kroo (Hungary)
Gh. Marian (Romania)
A. Peled (Israel)
P. Reinhard Germany
V. I. Vlad (Romania)

Programme Committee
D. Apostol (Romania)
A. Andriesh (Moldavia)
R. Bobulescu (Romania)
V. Ciupina (Romania)
B. Comanescu (Romania)
R. Dabu (Romania)
T. Dascalu (Romania)
M. Dinescu (Romania)
O. Donu (Romania)
S. Georgescu (Romania)
I. Gruia (Romania)
A. Lupascu (Romania)
V. Lupei (Romania)
R. Medianu (Romania)
I. Mihaiescu (Romania)
G. Moagar Poladian (Romania)
I. Morjan (Romania)
T. Necsoiu (Romania)
G. Nemes (USA)
I. Nica (Moldavia)
Doina Nicolae (Romania)
A. Petris (Romania)
Angela Piegari (Italy)
N. Puscas (Romania)
Roxana Savastru (Romania)
D. Sporea (Romania)
G. Stanciu (Romania)
P. Sterian (Romania)
T. Tudor (Romania)

Organising Committee Coordinator
Petronela Doia (Romania)

Organising Committee
Tatiana Bazaru (Romania)
Mariana Buzatu (Romania)
Florenta Craciun (Romania)
Ioan Dancus (Romania)
S. Georgescu (Romania)
Sanda Olteanu (Romania)
C. Stan (Romania)
E. Smeu (Romania)

Treasurer
Alexandra Olteanu (Romania)
Introduction

The international conference INDLAS 2007 held in Bran, Romania is the first edition of an annual series of conferences dedicated to laser applications. The topics of this conference reflect applications in material processing, optoelectronics, biology and medicine, and sensing and metrology. Our event expresses the more and more obvious role of lasers in the progress of modern society. Far from being only a scientific domain, the laser has become a familiar tool in many applications.

INDLAS offers an opportunity to share experiences, discuss the newest results, stimulate interdisciplinary research, and consider the realm of laser applications. Since Romania is a country under continuous and rapid development, a jump to the newest technologies, as laser is, even skipping some steps, seems to be attractive for different institutes and companies all over the world. Another stimulating factor is the participation of Romania in the frame of EU Research and Development programmes.

INDLAS 2007 benefited from the support of several national and international institutions. We thank and SPIE-RO (the Romanian Chapter), the Romanian Academy, the National Institute of Optoelectronics (INOE 2000), the University of Bucharest, and the University Politehnica of Bucharest. And special thanks to the National Institute of Laser, Plasma, and Radiation Physics (NILPRP).

Thanks are due to the co-sponsoring institutions: The Romanian Ministry of Education and Research, Coherent, Inc. (USA), and Eksipa (Lithuania).

Scientific papers by authors from 7 different countries have been selected for presentation at INDLAS 2007, in plenary lectures, invited lectures, oral presentations, and posters. Some of these papers, reviewed by the international referee board, are published in this SPIE Proceedings volume. We express our gratitude to the referees, to the invited professors, and to the participants for their valuable work.

I would like to express my thanks to the members of the International Scientific Committee, Programme Committees and Organising Committees of INDLAS 2007 for their hard work. A special address and thanks are due to Dr. R. Medianu, the General Director of NILPRP, Dr. A. Petris, Ms. Petronela Doia, and Mrs. Mariana Buzatu, who were the key members of the Organizing Committees. We thank them for their efforts and support of this conference. We acknowledge Mrs. Doina Nicolae and Ms. Camelia Talianu for the design and updating the conference web site. The preparation of the conference programme and of this volume is largely due to the hard work of Ms. Petronela Doia, who deserves our gratitude and the appreciation of our community.
I hope that the participants in INDLAS 2007 have enjoyed the scientific sessions, have reconnected with their friends, and have had the opportunity to start new scientific collaborations.

Since most of the participants have already expressed their wish to participate at INDLAS 2008, I consider our first attempt as a success to be continued in the years to come.

Mircea Udrea
Organised by

NILPRP—National Institute for Laser, Plasma, and Radiation Physics (Romania)

Romanian Academy – Division of Physics

SPIE Romania Chapter

Romanian Physical Society, Division of Optics and Quantum Electronics

Romanian Physical Society, Division of Optics and Quantum Electronics, The Romanian Territorial Committee of ICO

INOE 2000—National Institute of Research and Development for Optoelectronics (Romania)

University of Bucharest, Faculty of Physics (Romania)

University Politehnica of Bucharest (Romania)

Cosponsoring Institutions

Ministry of Education and Research (Romania)

Coherent, Inc. (USA)

Ekspla (Lithuania)