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Steven L. Jacques

E. Duco Jansen

William P. Roach

Editors

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Contents

vii	Conference Committee
ix	Introduction

SESSION 1 SPECTROSCOPY, OPTICS, AND SCATTERING I

- 7175 03 **Estimation and measurement of biological tissues using optical simulation method** [7175-02]
G. Jagajothi, S. Raghavan, National Institute of Technology (India)
- 7175 04 **Monitoring changes of proteins and lipids in laser welded aorta tissue using Raman spectroscopy and basis biochemical component analyses** [7175-03]
C. H. Liu, W. B. Wang, A. Alimova, V. Sriramoju, V. Kartazayev, R. R. Alfano, City College, CUNY (United States)
- 7175 06 **Noninvasive in-vivo optical properties of skin tumors** [7175-05]
A. Garcia-Urbe, E. B. Smith, J. Zou, Texas A&M Univ. (United States); M. Duvic, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); L. V. Wang, Washington Univ. in St. Louis (United States)
- 7175 07 **The optical properties of biological tissues in the terahertz wavelength range** [7175-06]
G. J. Wilmsink, Air Force Research Lab. (United States) and National Academy of Sciences (United States); B. D. Rivest, B. L. Ibey, Air Force Research Lab. (United States); L. X. Cundin, Conceptual Mindworks, Inc. (United States); E. C. Haywood, W. P. Roach, Air Force Research Lab. (United States)

SESSION 2 SPECTROSCOPY, OPTICS, AND SCATTERING II

- 7175 09 **Angular distribution of quasi-ballistic light measured through turbid media using angular domain optical imaging** [7175-08]
F. Vasefi, Simon Fraser Univ. (Canada) and Lawson Health Research Institute (Canada); B. Kaminska, G. H. Chapman, Simon Fraser Univ. (Canada); J. J. L. Carson, Lawson Health Research Institute (Canada) and Univ. of Western Ontario (Canada)
- 7175 0A **Spatiofrequency filter in turbid medium enhanced by background scattered light subtraction from a deviated laser source** [7175-09]
P. B. L. Tsui, G. H. Chapman, R. L. K. Cheng, N. Pfeiffer, F. Vasefi, B. Kaminska, Simon Fraser Univ. (Canada)

SESSION 3 SPECTROSCOPY, OPTICS, AND SCATTERING III

- 7175 0C **Mechanical tissue optical clearing devices: evaluation of enhanced light penetration in skin using OCT (Invited Paper)** [7175-58]
C. G. Rylander, Virginia Polytechnic Institute and State Univ. (United States); T. E. Milner, The University of Texas at Austin (United States)

7175 0D **Changes in morphology and optical properties of sclera due to hyperosmotic agent** [7175-11]
R. T. Zaman, H. G. Rylander III, N. Rajaram, T. Wang, N. Asokan, J. W. Tunnell, A. J. Welch, The Univ. of Texas at Austin (United States)

7175 0E **Comparing 2-D screen projections to 1-D goniometric measurements in scattering studies of surface roughness** [7175-12]
L. R. Jones, S. L. Jacques, Oregon Health & Science Univ. (United States)

SESSION 4 PHOTO-THERMAL INTERACTION I

7175 0G **Determination of threshold average temperature for cell death in an in vitro retinal model using thermography (Invited Paper)** [7175-34]
M. L. Denton, M. S. Foltz, G. D. Noojin, Northrop Grumman (United States); L. E. Estlack, Conceptual MindWorks (United States); R. J. Thomas, B. A. Rockwell, Air Force Research Lab. (United States)

7175 0H **In vivo investigation of near infrared retinal lesions utilizing two adaptive optics enhanced imaging modalities** [7175-15]
J. W. Oliver, G. Pocock, R. Vincelette, S. Kumru, Air Force Research Lab. (United States); G. D. Noojin, K. J. Schuster, D. Stolarski, A. Shingledecker, Northrop Grumman (United States); B. A. Rockwell, Air Force Research Lab. (United States)

SESSION 5 PHOTO-THERMAL INTERACTION II

7175 0I **Thermal lensing from near-infrared laser radiation in an artificial eye** [7175-16]
R. Vincelette, The Univ. of Texas at Austin (United States); J. Oliver, B. Rockwell, R. Thomas, Air Force Research Lab. (United States); A. J. Welch, The Univ. of Texas at Austin (United States)

7175 0J **Limiting mechanism for NIR laser retinal damage** [7175-17]
B. A. Rockwell, R. Vincelette, J. W. Oliver, S. Kumru, Air Force Research Lab. (United States); G. D. Noojin, K. J. Schuster, D. Stolarski, A. Shingledecker, C. D. Clark, Northrop Grumman (United States); D. Wooddell, R. Thomas, Air Force Research Lab. (United States)

7175 0K **Scar prevention by laser-assisted scar healing (LASH) using thermal post-conditioning** [7175-18]
A. Gossé, G. Iarmarcovai, Ekkyo (France); A. Capon, Ctr. Hospitalier Regional Univ. de Lille (France); A. Cornil, Ekkyo (France); S. Mordon, Ctr. Hospitalier Regional Univ. de Lille (France)

7175 0L **Melanoma thickness measurement in two-layer tissue phantoms using pulsed photothermal radiometry (PPTR)** [7175-19]
T. Wang, J. Qiu, A. Paranjape, T. E. Milner, The Univ. of Texas at Austin (United States)

SESSION 6 PHOTO-THERMAL INTERACTION III

7175 0O **Temperature measurement comparison for laser irradiation** [7175-22]
D. N. Schaaf, T. E. Johnson, Colorado State Univ. (United States)

- 7175 0P **Determination of sensation threshold from small pulse trains of 2.01 μ m laser light** [7175-23]
D. C. Dugan, T. E. Johnson, Colorado State Univ. (United States)
- 7175 0Q **Determination of optical property changes by laser treatments using inverse adding-doubling method** [7175-24]
N. Honda, K. Ishii, A. Kimura, M. Sakai, Osaka Univ. (Japan); K. Awazu, Osaka Univ. (Japan) and Japan Science and Technology Agency (Japan)
- 7175 0R **Development of novel short-term heating angioplasty: thermal denaturation dynamics of collagen in artery wall** [7175-25]
N. Shimazaki, H. Tokunaga, Y. Katou, T. Hayashi, T. Arai, Keio Univ. (Japan)

SESSION 7 CELL BIOLOGY AND PHOTOCHEMISTRY I

- 7175 0U **A signature microRNA expression profile for the cellular response to thermal stress** [7175-28]
G. J. Wilmink, Air Force Research Lab. (United States) and National Academy of Sciences (United States); C. C. Roth, General Dynamics (United States); N. Ketchum, B. L. Ibey, A. Waterworth, Air Force Research Lab. (United States); M. Suarez, Highlands High School (United States); W. P. Roach, Air Force Research Lab. (United States)
- 7175 0V **In vitro study for laser gene transfer in BHK-21 fibroblast cell line** [7175-29]
M. Abdel Aziz, D. S. Salem, National Institute of Laser Enhanced Sciences (Egypt); M. S. Salama, Ain-Shams Univ. (Egypt); Y. Badr, National Institute of Laser Enhanced Sciences (Egypt)

SESSION 8 CELL BIOLOGY AND PHOTOCHEMISTRY II

- 7175 0X **Spectroscopy in single and double layered weakly scattering phantoms with frequency domain OCT** [7175-31]
C. Meier, Cardiff Univ. (United Kingdom) and Bern Univ. of Applied Sciences (Switzerland); B. Hermann, B. Hofer, B. Považay, W. Drexler, Cardiff Univ. (United Kingdom)
- 7175 10 **Selective inactivation of human immunodeficiency virus with an ultrashort pulsed laser** [7175-35]
K. T. Tsen, Arizona State Univ. (United States); S.-W. D. Tsen, C.-F. Hung, T.-C. Wu, Johns Hopkins School of Medicine (United States); K. Kibler, B. Jacobs, Arizona State Univ. (United States); J. G. Kiang, Uniformed Services Univ. of The Health Sciences (United States)

SESSION 9 PHOTO-THERMAL ABLATION

- 7175 12 **Ultrasound characterization of cavitation microbubbles produced by femtosecond laser pulses** [7175-38]
A. B. Karpouk, S. R. Aglyamov, F. Bourgeois, A. Ben-Yakar, S. Y. Emelianov, The Univ. of Texas at Austin (United States)
- 7175 13 **Dynamic analysis of laser ablation of biological tissue using a real-time OCT** [7175-39]
M. Ohnishi, D. Takada, M. Ohmi, M. Haruna, Osaka Univ. (Japan)

- 7175 14 **Cell damage extent due to irradiation with nanosecond laser pulses under cell culturing medium and dry environment** [7175-40]
F. G. Pérez-Gutiérrez, Univ. of California, Riverside (United States); G. Guillen, Univ. Nacional Autónoma de México (Mexico); R. Evans, S. Camacho-López, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico); G. Aguilar, Univ. of California, Riverside (United States)

SESSION 10 MODELING AND COMPUTATION

- 7175 15 **Model-based real-time control for laser induced thermal therapy with applications to prostate cancer treatment (Invited Paper)** [7175-41]
Y. Feng, The Univ. of Texas at San Antonio (United States); D. Fuentes, R. J. Stafford, The Univ. of Texas M. D. Anderson Cancer Ctr. (United States); J. T. Oden, The Univ. of Texas at Austin (United States)
- 7175 16 **Empirical comparison of Pennes' bio-heat equation** [7175-42]
L. X. Cundin, Conceptual Mindworks, Inc.; W. P. Roach, Air Force Research Lab. (United States); N. Millenbaugh, General Dynamics (United States)
- 7175 17 **Optical property of human skin** [7175-43]
L. X. Cundin, Conceptual Mindworks, Inc.; W. P. Roach, Air Force Research Lab. (United States); G. Wilmink, National Research Council (United States)
- 7175 18 **Combined Monte Carlo and path-integral method for simulated library of time-resolved reflectance curves from layered tissue models** [7175-44]
R. H. Wilson, Univ. of Michigan (United States); K. Vishwanath, Duke Univ. (United States); M.-A. Mycek, Univ. of Michigan (United States)
- 7175 1A **Generalized Fokker-Planck models of light propagation in layered media** [7175-46]
K. G. Phillips, S. L. Jacques, Oregon Health & Science Univ. (United States)
- 7175 1B **Incoherent and coherent backscattering of light beyond diffusion for subsurface reflectance spectroscopy** [7175-47]
M. Xu, Fairfield Univ. (United States)

POSTER SESSION

- 7175 1C **Propagation of polarized light in anisotropic medium** [7175-48]
W. Li, N. Zeng, Y. He, H. Ma, Tsinghua Univ. (China)

SESSION 10 MODELING AND COMPUTATION (CONTINUED)

- 7175 1F **Finite element model of thermal processes in retinal photocoagulation** [7175-59]
C. Sramek, Y. M. Paulus, H. Nomoto, P. Huie, D. Palanker, Stanford Univ. (United States)

Author Index

Conference Committee

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- 1 Spectroscopy, Optics, and Scattering I
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- 2 Spectroscopy, Optics, and Scattering II
Lihong V. Wang, Washington University in St. Louis (United States)
Ruikang Wang, Oregon Health & Science University (United States)
- 3 Spectroscopy, Optics, and Scattering III
William P. Roach, Air Force Research Laboratory (United States)

- 4 Photo-Thermal Interaction I
William P. Roach, Air Force Research Laboratory (United States)
- 5 Photo-Thermal Interaction II
William P. Roach, Air Force Research Laboratory (United States)
- 6 Photo-Thermal Interaction III
E. Duco Jansen, Vanderbilt University (United States)
- 7 Cell Biology and Photochemistry I
Randolph D. Glickman, The University of Texas Health Science Center
at San Antonio (United States)
- 8 Cell Biology and Photochemistry II
Randolph D. Glickman, The University of Texas Health Science Center
at San Antonio (United States)
- 9 Photo-Thermal Ablation
William P. Roach, Air Force Research Laboratory (United States)
- 10 Modeling and Computation
Robert J. Thomas, Air Force Research Laboratory (United States)

Introduction to the 20th year

Optical Interactions with Tissues and Cells

This 20th year of the laser-tissue Interactions conferences offers a moment to remember the history of this conference. In 1989, a conference called Thermal and Optical Interactions with Biological and Related Composite Materials (SPIE Proceedings 1064) was organized by Michael V. Berry (Rice University) and A. J. Welch (The University of Texas at Austin). It brought together people from the aeronautics and materials science communities and the biomedical optics community, with talks alternating between one discipline and the other. The cross-fertilization of ideas was tremendous. The conference was so successful that the following year I organized a second conference. The first "laser-tissue interactions" conference was held in Los Angeles in January, 1990. So it could easily be said that this 2009 conference is the 21st laser-tissue interaction conference, starting with the Berry/Welch conference.

The conference series has always emphasized three areas of laser-tissue interaction: (1) photochemical, (2) photothermal, and (3) photomechanical. These are mechanisms for how light can cause an effect in a tissue, used for surgical and therapeutic cutting, dissecting, machining, processing, coagulating, welding, and oxidizing tissues and biomaterials. We have also always included a section on (4) optics, where the tissue exerts an effect on the light, used for diagnostic sensing, imaging, and spectroscopy of tissues and biomaterials. The conference emphasis has been on the basic science of such interactions.

In the early conferences, Tayyaba Hasan (Harvard Medical School/Massachusetts General Hospital) organized the photochemistry, Joseph T. (Jay) Walsh (Northwestern University) organized the photothermal, and Thomas J. Flotte (Harvard Medical School/Massachusetts General Hospital) organized the photomechanics. Many others participated in the chairing of sessions, and I thank them all for contributing to the success of the conference. To name a few: Alfred Vogel (Medical Laser Center, Lübeck, Germany), E. Duco Jansen (Vanderbilt University), and Benjamin A. Rockwell (Air Force Research Laboratory, Brooks City-Base, TX) organized mechanical and thermal effects. Lihong Wang (Washington Univ. at St. Louis) and Alexander A. Oraevsky (University of Texas Medical Branch at Galveston, now at Fairway Medical Technologies Inc.) developed opto-acoustic interactions, which spun into a new conference. Wei R. Chen (University of Central Oklahoma) developed PDT/immunologic interactions, which spun into a new conference. Sean J. Kirkpatrick and Donald Duncan (both at Oregon Health & Science University) developed a tissue engineering program, which also spun into a new conference.

William P. (Pat) Roach (Air Force Research Laboratory) became involved in conference IV (1993), bringing a community of Air Force investigators and contractors who reported all their preliminary work. Hence, the conference became a home for much of the early work on pulsed laser effects, especially in the eye. Moreover, Pat annually obtained funding from the Air Force Office of Scientific Research to support invited speakers. Hence, the conference always had a set of fresh faces. Pat became co-chair in conference XV (2004). The name of the 16th conference (2005) was changed to Optical Interactions with Tissue and Cells, which more appropriately encompasses the variety of light sources and biological targets.

Now, Pat and I are stepping down and Duco Jansen and Robert J. Thomas (Air Force Research Laboratory) will carry on as conference chairs. There remains a great deal of work to accomplish. The early investigations have broken the ice, but the foundation of standards and calibration for laser effects in biological tissues and materials still needs to be laid to enable future protocols, devices and techniques, and to provide the professionalism that will facilitate medical community and FDA acceptance of new applications. There is much room for increased sophistication, since the early work has to some degree only surveyed the basic interactions. There is much to be done, and I encourage young investigators in photomedicine to include laser-tissue interactions in their scope of studies.

A handwritten signature in black ink, reading "Steven L. Jacques". The signature is written in a cursive, flowing style with a large, prominent "S" and "J".

Steven L. Jacques