SPIE. PHOTONICS WEST BIOS

The Moscone Center
San Francisco, California, United States
2 - 7 February 2019

Optical Interactions with Tissue and Cells XXX

Saturday - Sunday 2 - 3 February 2019

Conference Sessions At A Glance

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1: Novel Applications of Lasers and Light in Biomedicine
2: Optical Properties of Tissues I
3: Optical Properties of Tissues II
4: Ultrafast Pulsed Laser Interactions
5: Cellular Biomolecular Response
Posters-Saturday
BiOS Hot Topics
6: Numerical Approaches Simulating Laser-Tissue Interactions and Response
7: Photothermal Interactions
Laser Tissue Interaction 30th Anniversary Session

Important Dates

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Abstract Due:
25 July 2018

Author Notification:
1 October 2018

Manuscript Due Date:
11 January 2019

Conference Committee

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Conference Chairs

Hope Thomas Beier, Air Force Research Lab. (United States)
Bennett L. Ibey, Air Force Research Lab. (United States)

Program Committee

Joel N. Bixler, Air Force Research Lab. (United States)
Randolph Glickman, The Univ. of Texas Health Science Ctr. at San Antonio (United States)
Steven L. Jacques, Oregon Health & Science Univ. (United States)
E. Duco Jansen, Vanderbilt Univ. (United States)
Beop-Min Kim, Korea Univ. (Korea, Republic of)

Program Committee continued...

Alexander J. Makowski, Prozess Technologie (United States)
Jessica C. Ramella-Roman, Florida International Univ. (United States)
Marissa Nicole Rylander, Virginia Polytechnic Institute and State Univ. (United States)
Zachary D. Taylor, Univ. of California, Los Angeles (United States)
Robert J. Thomas, Air Force Research Lab. (United States)
Alfred Vogel, Univ. zu Lübeck (Germany)

Additional Conference Information

Chair Emeritus: **Duco Jansen**, Vanderbilt Univ. (United States)

SATURDAY 2 FEBRUARY

Show All Abstracts

Session 1: Novel Applications of Lasers and Light in Biomedicine

Saturday 2 February 2019
8:00 AM - 10:00 AM

Session Chair: Bennett L. Ibey, Air Force Research Lab. (United States)

Drug contact time dominates a necessary time for myocardial cells necrosis by a photodynamic reaction
Paper 10876-1
Author(s): Emiyu Ogawa, Kitasato Univ. (Japan); Yuiko Kikuchi, Keio Univ. (Japan); Hiroshi Kumagai, Kitasato Univ. (Japan); Tsunenori Arai, Keio Univ. (Japan)
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Biofabrication of a vascular network by ultra-short laser pulses
Paper 10876-2
Author(s): Isabel Verit, ALPhANOV (France), INSERM, Univ. of Bordeaux (France)
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Photo-mediated ultrasound therapy selective removal of corneal neovascularization in rabbit eyes
Paper 10876-3
Author(s): Yu Qin, Institute of Acoustics, Tongji Univ. (China), Univ. of Michigan (United States); Xinyi Xie, The First Affiliated Hospital, Nanjing Medical Univ. (China), Univ. of Michigan (United States); Wei Zhang, Chinese Academy of Medical Sciences and Peking Union Medical College (China), Univ. of Michigan (United States); Yanxiu Li, Xiangya Hospital Central South Univ. (China); Yannis M. Paulus, Univ. of Michigan (United States); Xinmai Yang, The Univ. of Kansas (United States); Xueding Wang, Univ. of Michigan (United States)

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Investigating breakdown thresholds of picosecond optical pulses and nano-second pulsed electric fields
Paper 10876-4
Author(s): Zachary Coker, Vladislav V. Yakovlev, Texas A&M Univ. (United States)
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Fluorescence spectroscopy of mice internal organs using ultraviolet excitation
Paper 10876-5
Author(s): Marcelo Saito Nogueira, Konstantin Grygoryev, Stefan Andersson-Engels, Tyndall National Institute, Univ. College Cork (Ireland)
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Stretching adherent cells with light
Paper 10876-6
Author(s): Tobias Neckernuss, Daniel Geiger, Jonas Pfeil, Othmar Marti, Institute of Experimental Physics (Germany)
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Session 2: Optical Properties of Tissues I

Saturday 2 February 2019
10:30 AM - 11:50 AM

Session Chair: Joel N. Bixler, Air Force Research Lab. (United States)

Pathlength distribution of (sub)diffusively reflected light
Paper 10876-7
Author(s): Dirk J. Faber, Nathalie van Sterkenburg, Anouk L. Post, Ton G. van Leeuwen, Amsterdam UMC (Netherlands)
Add To My Schedule

Extraction of tissue optical parameters from diffuse reflectance measurements with a new able to count derivatives inverse Monte Carlo method
Paper 10876-8
Author(s): Alexander V. Lappa, Anastasiya E. Anchugova, Darina Y. Shakaeva, Chelyabinsk State Univ. (Russian Federation)
Add To My Schedule

Multimodal evaluation of tissue engineered cartilage maturation in a pre-clinical implantation model
Paper 10876-9
Author(s): Anne K. Haudenschild, Xiangnan Zhou, Cai Li, Univ. of California, Davis (United States); Jerry C. Hu, Univ. of California, Irvine (United States); J. Kent Leach, Univ. of California, Davis (United States); Kyriacos A. Athanasiou, Univ. of California, Irvine (United States); Laura Marcu, Univ. of California, Davis (United States)
Add To My Schedule

Investigation of optical homodyne detection of phase-conjugators and retroreflectors in tissue
Paper 10876-10
Author(s): Iman Hassani Nia, Skyler Wheaton, Hooman Mohseni, Northwestern Univ. (United States)
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Lunch Break 11:50 AM - 1:20 PM

Session 3: Optical Properties of Tissues II

Saturday 2 February 2019
1:20 PM - 3:00 PM

Session Chair: Adam R. Boretsky, Engility Corp. (United States)

Quantifying optical properties of multi-layered human head model from in-vivo spatially resolved near-infrared spectra
Paper 10876-11
Author(s): Ting-Xuan Lin, Kung-Bin Sung, National Taiwan Univ. (Taiwan)
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Long lived intralipid-infused tissue phantoms: control and characterization of scattering characteristics
Paper 10876-12
Author(s): Glenn H. Chapman, Magda G. Sanchez, Simon Fraser Univ. (Canada)
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Dynamic optical properties of thermally-damaged porcine skin
Paper 10876-13

Author(s): Michael P. DeLisi, Amanda M. Peterson, Gary D. Noojin, Edward A. Early, Engility Corp. (United States); Aurora D. Shingledecker, Semih S. Kumru, Benjamin A. Rockwell, Air Force Research Lab. (United States)

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Spatially resolved spectral 4pi optical scattering goniometry and experimental refractive index autocorrelations
Paper 10876-14
Author(s): Zach J. Simmons, Jeremy Rogers, Univ. of Wisconsin-Madison (United States)

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Implementing low-frequency Raman spectroscopy to study biological molecules
Paper 10876-46
Author(s): Kassie S. Marble, Air Force Research Lab. (United States); Gary D. Noojin, Engility Corp. (United States); Zachary N. Coker, Joshua W. Lalonde, Texas A&M Univ. (United States); Michael L. Denton, Ibtissam Echchgadda, Air Force Research Lab. (United States); Vladislav V. Yakovlev, Texas A&M Univ. (United States)

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Session 4:
Ultrafast Pulsed Laser Interactions

Saturday 2 February 2019
3:30 PM - 4:30 PM

Session Chair: Ibtissam Echchgadda, Air Force Research Lab. (United States)

Z-scan measurement of water from 1150 nm to 1400 nm
Paper 10876-15
Author(s): Christopher B. Marble, Texas A&M Univ. (United States), Consortium Research Fellows Program (United States); Joseph E. Clary, Gary D. Noojin, Engility Corp. (United States); Sean P. O'Connor, Dawson T. Nodurft, Texas A&M Univ. (United States), Engility Corp. (United States); Andrew W. Wharmby, Benjamin A. Rockwell, Air Force Research Lab. (United States); Marlan O. Scully, Vladislav V. Yakovlev, Texas A&M Univ. (United States)

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Mid-infrared femtosecond laser damage thresholds in skin
Paper 10876-16
Author(s): Adam R. Boretsky, Joseph E. Clary, Gary D. Noojin, Engility Corp. (United States); Benjamin A. Rockwell, Air Force Research Lab. (United States)

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Near infrared femtosecond laser-induced bacterial inactivation
Paper 10876-17
Author(s): Charles Maphanga, Sello Manoto, Saturnin Ombinda-Lemboumba, Council for Scientific and Industrial Research (South Africa); Olayinka Osualale, Elizade Univ. (Nigeria); Patience Mthunzi-Kufa, Council for Scientific and Industrial Research (South Africa)

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Session 5:
Cellular Biomolecular Response

Saturday 2 February 2019
4:30 PM - 5:50 PM

Cell membrane molecular dynamics under a NIR focused laser
Paper 10876-18
Author(s): Remy Avila, Univ. Nacional Autónoma de México (Mexico); Elisa Tamariz, Norma Medina-Villalobos, Instituto de Ciencias de la Salud, Univ. Veracruzana (Mexico); Jordi Andilla, ICFO - Institut de Ciències Fotòniques (Spain), The Barcelona Institute of Science and Technology (Spain); Maria Marsal, Pablo Loza-Alvarez, ICFO - Institut de Ciències Fotòniques (Spain)

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Characterization of laser-induced retinal lesions using convolutional neural networks
Paper 10876-19
Author(s): Mark A. Keppler, Eddie M. Gil, Texas A&M Univ. (United States); Adam R. Boretsky, Engility Corp. (United States); Vladislav V. Yakovlev, Texas A&M Univ. (United States); Joel N. Bixler, Air Force Research Lab. (United States)

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Variation in epigenetic DNA modifications following the exposure of cells to radiofrequency fields
Paper 10876-20
Author(s): Jody C. Cantu, General Dynamics Information Technology (United States); Xomalin G. Peralta, National Academy of Sciences (United States); Cesario Z. Cerna, General Dynamics Information Technology (United States); Ibtissam Echchgadda, Air Force Research Lab. (United States)

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Investigating cellular response to combination of picosecond optical pulses and nano-second pulsed electric fields
Paper 10876-22
Author(s): Zachary Coker, Vladislav V. Yakovlev, Texas A&M Univ. (United States)

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BiOS Hot Topics

Saturday 2 February 2019
7:00 PM - 9:00 PM

Posters-Saturday

Saturday 2 February 2019
5:15 PM - 6:45 PM

Conference attendees are invited to attend the BiOS poster session on Saturday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions. Poster authors, view poster presentation guidelines and set-up instructions at http://spie.org/PWPosterGuidelines.

Influence of magnetic field exposure on epigenetic regulation in human keratinocytes
Paper 10876-21
Author(s): Xomalin G. Peralta, National Academy of Sciences (United States); Jody C. Cantu, Cesario Z. Cerna, General Dynamics Information Technology (United States); Morgan S. Schmidt, Ibtissam Echchgadda, Air Force Research Lab. (United States)
Add To My Schedule

Bone fracture healing by low level laser therapy (LLLT)
Paper 10876-35
Author(s): Mohammad Nazrul Islam, Shaheed Suhrawardy Medical College and Hospital (Bangladesh)
Add To My Schedule

Soft tissue wound healing by low level laser
Paper 10876-36
Author(s): Mohammad Nazrul Islam, Shaheed Suhrawardy Medical College and Hospital (Bangladesh)
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Characterization of photophysical properties of curcumin using optical spectroscopy
Paper 10876-37
Author(s): Marcelo Saito Nogueira, Tyndall National Institute (Ireland); Francisco E. Gontijo Guimarães, Vanderlei Salvador Bagnato, Instituto de Física de São Carlos, Univ. de São Paulo (Brazil)
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Phase imaging on a two-photon microscope with up-conversion materials
Paper 10876-38
Author(s): Hao Xie, Tsinghua Univ. (China); Peng Xi, Peking Univ. (China); Qionghai Dai, Tsinghua Univ. (China)
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Photothermal interactions with interstitial thermotherapy of vascular formations by infrared laser radiation of different wavelengths and the possibility of their ultrasonic evaluation
Paper 10876-39
Author(s): Ivan A. Abushkin, South Ural State Medical Univ. (Russian Federation)
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A Monte Carlo light transport simulation package adapted to absorption, fluorescence, elastic and inelastic scattering in complex heterogeneous and for arbitrary illumination/detection geometries
Paper 10876-40
Author(s): Ehsan Edjlali, Catherine St. Pierre, Ctr. de Recherche du Ctr. Hospitalier de l'Univ. de Montréal (Canada), Ecole Polytechnique de Montréal (Canada); Amélie St-Georges-Robillard, Ctr. de Recherche du Ctr. Hospitalier de l'Univ. de Montréal (Canada), Ecole Polytechnique de Montréal (Canada); Joannie Desroches, Frédéric Leblond, Ctr. de Recherche du Ctr. Hospitalier de l'Univ. de Montréal (Canada), Ecole Polytechnique de Montréal (Canada)
Add To My Schedule

Investigating the architectural changes of the tumor cell spheroid with the interaction of gold nanoparticles using a high-resolution inverted optical coherence microscopy system
Paper 10876-41
Author(s): You-Nan Tsai, Ying-Peng Huang, Ting-Hao Chen, Chuan-Bor Chueh, Ting-Yen Tsai, Cheng-Che Hsieh, Xin-Yu Luo, Yi-Ping Hung, Chih-Chung Yang, Hsiang-Chieh Lee, National Taiwan Univ. (Taiwan)
Add To My Schedule

Bubble growth in cylindrically shaped optical absorbers during photo-mediated ultrasound therapy
Paper 10876-42
Author(s): Shuying Li, Univ. of Michigan (United States); Yu Qin, Institute of Acoustics, Tongji Univ. (China), Univ. of Michigan (United States); Xueding Wang, Univ. of Michigan (United States); Xinmai Yang, The Univ. of Kansas (United States)
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Antimicrobial photodynamic therapy applied to inactivation of salmonella enterica and staphylococcus aureus
Paper 10876-43
Author(s): Cintia Teles de Andrade, Ranniele Luíza V. Silva, Iaiy Aparecida A. Moura, Juliana O. Moraes, Instituto Federal de Alagoas (Brazil)

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Teaching light-tissue interactions: using technology for education
Paper 10876-44
Author(s): Marcelo Saito Nogueira, Jacqueline Gunther, Stefan Andersson-Engels, Tyndall National Institute, Univ. College Cork (Ireland)
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Fluorescence spectroscopy analysis of light-induced tooth whitening
Paper 10876-45
Author(s): Marcelo Saito Nogueira, Tyndall National Institute (Ireland); Vitor Hugo Panhóca, Vanderlei Salvador Bagnato, Instituto de Física de São Carlos, Univ. de São Paulo (Brazil)
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SUNDAY 3 FEBRUARY Show All Abstracts

Session 6: Numerical Approaches Simulating Laser-Tissue Interactions and Response

Sunday 3 February 2019
8:00 AM - 10:20 AM

Session Chair: Robert J. Thomas, Air Force Research Lab. (United States)

Polarized light Monte Carlo simulation of cervical collagen ultrastructure
Paper 10876-23
Author(s): Joseph Chue-Sang, Jessica C. Ramella-Roman, Florida International Univ. (United States)
Add To My Schedule

Light propagation in highly scattering biological tissues analyzed by Green's functions
Paper 10876-24
Author(s): Jose L. Ganoza-Quintana, Félix Fanjul-Vélez, Jose L. Arce-Diego, Univ. de Cantabria (Spain)
Add To My Schedule

Convolutional deep network for light propagation in heterogeneous bio-tissues
Paper 10876-25
Author(s): Xiang Fang, Chinese Academy of Medical Science and Peking Union Medical College (China); Ting Li, Chinese Academy Of Medical Sciences and Peking Union Medical College (China)
Add To My Schedule

Monte Carlo weighted algorithms for calculation of radiation characteristics and their derivatives in the biomedical optics problems
Paper 10876-26
Author(s): Alexander V. Lappa, Anastasiya E. Anchugova, Chelyabinsk State Univ. (Russian Federation)
Add To My Schedule

MCmatlab: an open-source fast MATLAB-integrated 3D Monte Carlo light transport solver with heat diffusion and tissue damage
Paper 10876-27
Author(s): Peter E. Andersen, Dominik Marti, Rikke N. Aasbjerg, Anders K. Hansen, Technical Univ. of Denmark (Denmark)
Add To My Schedule

Modeling subdiffusive scattering and absorption for an overlapping source-detector geometry, e.g. single fiber reflectance spectroscopy (SFR)
Paper 10876-28
Author(s): Anouk L. Post, Amsterdam UMC (Netherlands), The Netherlands Cancer Institute (Netherlands); Fransien Woltjer, Amsterdam UMC, Univ. van Amsterdam (Netherlands); Steven Jacques, Tufts Univ. (United States); Dick H. J. C. M. Sterenborg, Amsterdam UMC, Univ. van Amsterdam (Netherlands), The Netherlands Cancer Institute (Netherlands); Dirk J. Faber, Ton G. van Leeuwen, Amsterdam UMC, Univ. van Amsterdam (Netherlands)
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Comparison of various convolution neural network based models for retinal lesion analysis
Paper 10876-29
Author(s): Eddie M. Gil, Texas A&M Univ. (United States)
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Session 7: Photothermal Interactions

Sunday 3 February 2019
10:50 AM - 12:30 PM

Session Chair: Michael L. Denton, Air Force Research Lab. (United States)

A polymeric silicone hydrogel with adjustable characteristics for laser-assisted tissue capturing
Paper 10876-30
Author(s): Shahrouz Taranejoo, Wellman Ctr. for Photomedicine (United States)

Add To My Schedule

Interaction of thulium fiber laser with urinary stone: effect of laser parameter on fragmented particle size and retropulsion
Paper 10876-31
Author(s): Atasi Pal, Central Glass and Ceramic Research Institute (India)
Add To My Schedule

Primary investigations on defined thermal effects on soft tissue using a diode pumped Er:YAG laser system
Paper 10876-32
Author(s): Karl Stock, Institut für Lasertechnologien in der Medizin und Messtechnik (Germany)
Add To My Schedule

Thermal welding of the porcine myocardium and aorta by 1450 nm laser with parallel vital tissue fluorescence measurements
Paper 10876-33
Author(s): Sergei G. Sokolovski, Aston Univ. (United Kingdom); Dmitriy Pushkarev, Moscow State Univ. (Russian Federation); Lopson Frolov, Novosibirsk State Univ. (Russian Federation); Larisa Sokolovski, Vladislav Dvorin, Aston Univ. (United Kingdom); Olga Bibikova, art photonics GmbH (Germany); Evgeny Zherebtsov, Aston Univ. (United Kingdom); Alexander E. Moskalensky, Novosibirsk State Univ. (Russian Federation); Amit Yadav, Edik U. Rafailov, Aston Univ. (United Kingdom)
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Basics of laser-tissue interaction for dummies (and experts too)
Paper 10876-34
Author(s): Rudolf M. Verdaasdonk, VU Univ. Medical Ctr. (Netherlands), Univ. Twente (Netherlands)
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Lunch Break 12:30 PM - 2:20 PM

Laser Tissue Interaction 30th Anniversary Session

Sunday 3 February 2019
2:20 PM - 5:20 PM