

Optical Biopsy XVII: Toward Real-Time Spectroscopic Imaging and Diagnosis

Tuesday - Wednesday 5 - 6 February 2019

Conference Sessions At A Glance

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- 1: Optical Bioassay Platforms I
- 2: Optical Bioassay Platforms II
- 3: Optical Histology I
- 4: Optical Histology II
- Posters-Tuesday
- 5: Spectroscopic Methods I
- 6: Spectroscopic Methods II
- 7: SWIR and IR Methods I
- 8: SWIR and IR Methods II

Important Dates

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- Abstract Due:
25 July 2018
- Author Notification:
1 October 2018
- Manuscript Due Date:
11 January 2019

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TUESDAY 5 FEBRUARY[Show All Abstracts](#)**Session REM:
Opening Remarks**

Tuesday 5 February 2019
 8:00 AM - 8:10 AM

Session Chair: [Robert R. Alfano](#), The City College of New York (United States)

**Session 1:
Optical Bioassay Platforms I**


Tuesday 5 February 2019
 8:10 AM - 10:00 AM

Session Chair: [Nicusor V. Iftimia](#), Physical Sciences Inc. (United States)

Chip-based Raman spectroscopy for microbial sensing *(Invited Paper)*


Paper 10873-1

Author(s): Jürgen Popp, Leibniz-Institut für Photonische Technologien e.V. (Germany)

[Add To My Schedule](#) **Cytopathology diagnosis by multiplexed plasmonic biomarkers**


Paper 10873-2

Author(s): Sergiy Patskovsky, Mengjiao Qi, Cécile Darvot, Lu Wang, Audrey Nsamela, Daniel Tomasso, Michel Meunier, Ecole Polytechnique de Montréal (Canada)

[Add To My Schedule](#) **Oxygenation based perfusion assessment of diabetic foot ulcers using a breath hold paradigm**


Paper 10873-3

Author(s): Kevin Leiva, Jagadeesh Mahadevan, Kacie Kaile, Richard Schutzman, Edwin A. Robledo, Dinesh Khandavilli, Florida International Univ. (United States); Sivakumar Narayanan, Varalakshmi Muthukrishnan, Mohan Viswanathan, Dr. Mohan's Diabetes Specialities Ctr. (India); Wensong Wu, Anuradha Godavarty, Florida International Univ. (United States)

[Add To My Schedule](#) **Semi-automated machine learning approach to segment and register tissue oxygenation maps onto clinical images of wounds**


Paper 10873-4

Author(s): Edwin A. Robledo, Richard Schutzman, Cristianne Fernandez, Florida International Univ. (United States); Ruogu Fang, Univ. of Florida (United States); Kevin Leiva, Rebecca Kwasinski, Florida International Univ. (United States); Penelope Kallis, Luis Borda, Wound Care Ctr., Univ. of Miami (United States); Francisco Perez-Clavijo, Podiatry Care Partners Inc. (United States); Anuradha Godavarty, Florida International Univ. (United States)

[Add To My Schedule](#) **Study of amides in blood plasma and tissues of oral cancer using polarised Raman spectroscopy**

Paper 10873-5

Author(s): Manjula Gunasekaran, Vijayaraghavan Srinivasan, Paterson Cancer Ctr. (India); Aruna Prakasa Rao, Ganesan Singaravelu, Anna Univ., Chennai (India)

[Add To My Schedule](#) **Session 2:
Optical Bioassay Platforms II**

Tuesday 5 February 2019
 10:30 AM - 11:50 AM

Session Chair: [Jürgen Popp](#), Leibniz-Institut für Photonische Technologien e.V. (Germany)

Cholesterol esterification inhibition suppresses prostate cancer metastasis by impairing the Wnt/ β -catenin pathway *(Invited Paper)*

Paper 10873-6


Author(s): Hyeon Jeong Lee, Ji-Xin Cheng, Boston Univ. (United States)

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Evaluation of variations in plasma collagen in pre and post mastectomy patients using native fluorescence spectroscopy

Paper 10873-7


Author(s): Chithra Krishnamoorthy, Vijayaraghavan Srinivasan, Paterson Cancer Ctr. (India); Aruna Prakasa Rao, Ganesan Singaravelu, Anna Univ., Chennai (India)

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DO-SRS imaging of metabolic dynamics in animals (Invited Paper)

Paper 10873-8

Author(s): Lingyan Shi, Chaogu Zheng, Yihui Shen, Wei Min, Columbia Univ. (United States)

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Lunch/Exhibition Break 11:50 AM - 1:20 PM

Session 3: Optical Histology I

Tuesday 5 February 2019


1:20 PM - 3:10 PM

Session Chair: [J. Stewart Russell](#), The City College of New York (United States)

Towards the 3D digital optical histology (Invited Paper)

Paper 10873-9


Author(s): Francesco Saverio Pavone, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy)

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Functional vascular imaging by Photoacoustic Microscopy (PAM) and its biomedical application (Invited Paper)

Paper 10873-10


Author(s): Renzhe Bi, Ghayathri Balasundaram, Malini Olivo, Dinish U.S., Singapore Bioimaging Consortium (Singapore); Seungwan Jeon, Pohang Univ. of Science and Technology (Korea, Republic of); Toru Imai, Caltech (United States); Lai Guan Ng, Immunos, Agency for Science, Technology and Research (A*STAR) (Singapore); Chulhong Kim, Pohang Univ. of Science and Technology (Korea, Republic of); Lihong Wang, Caltech (United States)

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Microscale photoacoustic spectroscopy using integrated photonics for lab-on-chip applications

Paper 10873-11

Author(s): Robin Singh, Lionel Kimerling, Anu Agarwal, Brian W. Anthony, Massachusetts Institute of Technology (United States)

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Multi-parametric photoacoustic microscopy (Invited Paper)

Paper 10873-12

Author(s): Song Hu, Univ. of Virginia (United States)

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Session 4: Optical Histology II

Tuesday 5 February 2019


3:40 PM - 5:30 PM

Session Chair: [Stavros G. Demos](#), Univ. of Rochester (United States)

Optical biopsy of vocal folds during phonation using parallel OCT

Paper 10873-13


Author(s): Gopi N. Maguluri, Physical Sciences Inc. (United States); Daryush D. Mehta, James B. Kobler, Ctr. for Laryngeal and Voice Rehabilitation, Massachusetts General Hospital (United States); Jesung Park, Nicusor V. Iftimia, Physical Sciences Inc. (United States)

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OCT for core biopsy guidance: a rabbit study

Paper 10873-14


Author(s): Nicusor V. Iftimia, Gopi N. Maguluri, Jesung Park, Physical Sciences Inc. (United States); Sharjeel Sabir, The Univ. of Texas M. D. Anderson Cancer Ctr. (United States)

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Hyperspectral stimulated Raman scattering microscopy for molecular subtyping of glioblastomas

Paper 10873-15


Author(s): Bae Kideogg, Wei Zheng, Kan Lin, National Univ. of Singapore (Singapore); Carol Tang, Christopher Beng Ti Ang, National Univ. of Singapore (Singapore), National Neuroscience Institute (Singapore); Zhiwei Huang, National Univ. of Singapore (Singapore)

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Deep-UV excitation fluorescence imaging for rapid and accurate detection of lymph node metastasis in human gastric cancer (Invited Paper)


Paper 10873-16

Author(s): Tatsuya Matsumoto, Yasuaki Kumamoto, Kyoto Prefectural Univ. of Medicine (Japan); Hirohiko Niioka, Osaka Univ. (Japan); Hideo Tanaka, Kyoto Prefectural Univ. of Medicine (Japan); Jun Miyake, Osaka Univ. (Japan); Tetsuro Takamatsu, Kyoto Prefectural Univ. of Medicine (Japan)

[Add To My Schedule](#) **Improving intensity-based virtual H&E from fluorescence imaging with deep learning**

Paper 10873-17

Author(s): Faisal Mahmood, Johns Hopkins Univ. (United States); Katherine N. Elfer, Tulane Univ. (United States); Daniel Borders, Johns Hopkins Univ. (United States); Bihe Hu, J. Quincy Brown, Tulane Univ. (United States); Nicholas J. Durr, Johns Hopkins Univ. (United States)

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Session PTues: Posters-Tuesday

Tuesday 5 February 2019


6:00 PM - 8:00 PM

Conference attendees are invited to attend the BIOS poster session on Tuesday 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>.**Optical characterization of peridine and its derivatives: a potential biomarker for oral cancer diagnosis**


Paper 10873-38

Author(s): Brindha Elumalai, Anna Univ., Chennai (India); Dire Dawa Univ. (Ethiopia); Rajasekaran Ramu, Dire Dawa Univ. (Ethiopia), Anna Univ., Chennai (India); Aruna Prakasa Rao, Anna Univ., Chennai (India); Biniyum Girma, Dire Dawa Univ. (Ethiopia); Ganesan Singaravelu, Anna Univ., Chennai (India)

[Add To My Schedule](#) **Near-infrared Raman spectroscopy of tissue and urine samples of normal, oral premalignant and malignant conditions: a comparative study**

Paper 10873-39

Author(s): Brindha Elumalai, Rajasekaran Ramu, Anna Univ., Chennai (India); Dire Dawa Univ. (Ethiopia); Aruna Prakasa Rao, Anna Univ., Chennai (India); Efreng Mengistu, Dire Dawa Univ. (Ethiopia); Ganesan Singaravelu, Anna Univ., Chennai (India)

[Add To My Schedule](#) **Distinguish chromophobe renal cell carcinoma and renal oncocytoma based on analysis of multiphoton microscopic images using convolutional neural network**


Paper 10873-40

Author(s): Michael Icaza, Nicolas Judd, Southern Connecticut State Univ. (United States); Manu Jain, Memorial Sloan-Kettering Cancer Ctr. (United States); Sushmita Mukherjee, Weill Cornell Medicine (United States); Binlin Wu, Southern Connecticut State Univ. (United States)

[Add To My Schedule](#) **Breast cancer diagnosis using fluorescence spectroscopy and machine learning algorithms**


Paper 10873-41

Author(s): Xin Gao, LaGuardia Community College (United States); Binlin Wu, Southern Connecticut State Univ. (United States)

[Add To My Schedule](#) **Circularly polarized light for the screening of brain malformations**


Paper 10873-42

Author(s): Mariia A. Borovkova, Alexander Bykov, Alexey Popov, Univ. of Oulu (Finland); Jens Pahnke, Oslo Univ. Hospital, Univ. I Oslo (Norway); Igor Meglinski, Univ. of Oulu (Finland)

[Add To My Schedule](#) **Deconvolution of Stokes shift spectrum of human blood samples for the identification of potential biomarkers for early oral cancer diagnosis**


Paper 10873-43

Author(s): Brindha Elumalai, Rajasekaran Ramu, Anna Univ., Chennai (India); Dire Dawa Univ. (Ethiopia); Aruna Prakasa Rao, Ganesan Singaravelu, Anna Univ., Chennai (India)

[Add To My Schedule](#) **Quantitative spectroscopy of collagen and water in infrared windows I, III, and IV as an aid to targeted application of skin therapeutics**


Paper 10873-44

Author(s): Vivian Wang, Stewart Russell, Robert R. Alfano, Institute for Ultrafast Laser and Spectroscopy, The City College of New York (United States)

[Add To My Schedule](#) **Optimal NIR and SWIR optical parameters for absorption and SHG detecting deep tissue vessels in intestinal submucosa**

Paper 10873-45


Author(s): Shirley Chan, Min Jing Zheng, The City College of New York (United States); Tiffany Chou, The City College of New York (United States); Stewart Russell, Robert R. Alfano, The City College of New York (United States)

[Add To My Schedule](#) **Human glioma grading by characterization using label free fluorescence spectroscopy**

Paper 10873-46

Author(s): Yan Zhou, The General Hospital of the Air Force, PLA (China); Cheng-Hui Liu, Institute for Ultrafast Spectroscopy and Lasers, The City Univ. of


New York (United States); Ke Zhu, Institute of Physics, Chinese Academy of Sciences (China); Binlin Wu, CSCU Ctr. for Nanotechnology, Southern Connecticut State Univ. (United States); Xinguang Yu, Gangge Cheng, Rui Zong, Mingyue Zhao, Jichun Zheng, The General Hospital of the Air Force, PLA (China); Chunyuan Zhang, Institute for Ultrafast Spectroscopy and Lasers, The City College of New York (United States); Hong Chen, Shenglin Li, Qijun Liang, Mingqian Zhang, China Academy of Space Technology (China); Robert R. Alfano, Institute for Ultrafast Spectroscopy and Lasers, The City College of New York (United States)

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Detecting triple negative breast cancer using second harmonic generation imaging and resonance Raman spectroscopy

Paper 10873-47


Author(s): Jason T. Smith, Rensselaer Polytechnic Institute (United States); Ethan Bendau, Lin Zhang, Institute for Ultrafast Spectroscopy and Lasers, The City College of New York (United States); Ellen Ackerstaff, Memorial Sloan-Kettering Cancer Ctr. (United States); Natalia Kruchevsky, Memorial Sloan Kettering Cancer Ctr. (United States); Robert R. Alfano, Institute for Ultrafast Spectroscopy and Lasers, The City College of New York (United States); Jason Koutcher, Memorial Sloan-Kettering Cancer Ctr. (United States), Memorial Sloan Kettering Cancer Ctr. (United States), Molecular Pharmacology and Chemistry Program, Memorial Sloan Kettering Cancer Ctr. (United States); Lingyan Shi, Columbia Univ. (United States), Institute for Ultrafast Spectroscopy and Lasers, The City College of New York (United States)

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Alzheimer's disease: label-free fluorescence shows increases in indoleamine 2,3-dioxygenase (IDO) activity in affected areas of the brain

Paper 10873-48


Author(s): Laura A. Sordillo, The City College of New York (United States); Lin Zhang, Peter Sordillo, Robert R. Alfano, Institute for Ultrafast Spectroscopy and Lasers, The City College of New York (United States)

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Microscopy with ultraviolet surface excitation (MUSE) enables translation of optical biopsy principles to enhance life science education

Paper 10873-49

Author(s): Katherine A. Kopp, Stavros G. Demos, Univ. of Rochester (United States)

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WEDNESDAY 6 FEBRUARY

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Session 5: Spectroscopic Methods I

Wednesday 6 February 2019


8:00 AM - 10:00 AM

Session Chairs: [Min Xu](#), Fairfield Univ. (United States) ; [Yang Pu](#), Memorial Sloan-Kettering Cancer Ctr. (United States)

Innovative and high-performance instrumentation for biomedical Mueller polarimetric imaging in vivo

Paper 10873-18


Author(s): Arvid Lindberg, Jeremy Vizet, Camille Gennet, Camille Petite, Ecole Polytechnique (France); Jean Rehbinder, ICube, Univ. de Strasbourg (France); Jean-Charles Vanel, Angelo Pierangelo, Ecole Polytechnique (France)

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Perspectives of optical diagnosis with vector light beams

Paper 10873-19


Author(s): Alexander Doronin, Victoria Univ. (New Zealand); Nicolas Vera, Juan Staforelli, Univ. de Concepción (Chile); Tatiana Novikova, CNRS (France), Ecole Polytechnique (France), Univ. Paris-Saclay (France); Igor Meglinski, Univ. of Oulu (Finland)

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Functional sensing of tissue samples influenced by optical clearing and induced birefringence by means of circularly polarized light

Paper 10873-20


Author(s): Mariia A. Borovkova, Alexander Bykov, Alexey Popov, Igor Meglinski, Univ. of Oulu (Finland)

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Non-invasive in vivo measurements of muscle stiffness in Drosophila POMT model using Brillouin elastography

Paper 10873-21


Author(s): Maria A. Troyanova-Wood, Vladislav Yakovlev, Texas A&M Univ. (United States)

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Diffuse reflectance spectroscopy biomarkers for biological tissues characterization: application to ex-vivo animal tissues

Paper 10873-22


Author(s): Félix Fanjul-Vélez, José L. Arce-Diego, Univ. de Cantabria (Spain)

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Application of smoothing splines for spectroscopic analysis in hyperspectral images

Paper 10873-23

Author(s): Asgeir Bjorgan, Lise L. Randeberg, Norwegian Univ. of Science and Technology (Norway)

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Session 6: Spectroscopic Methods II

Wednesday 6 February 2019
10:30 AM - 12:00 PM

Session Chair: Francesco Saverio Pavone, LENS - Lab. Europeo di Spettroscopie Non-Lineari (Italy)

Segmented cell data analysis of autofluorescent signal of endogenous molecules in mitochondria vs cytoplasm (Invited Paper)

Paper 10873-24


Author(s): Ruofan Cao, Horst Wallrabe, Ammasi Periasamy, Univ. of Virginia (United States)

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Feasibility of a snapshot hyperspectral imaging for detection of local skin oxygenation

Paper 10873-25


Author(s): Labrinus van Manen, Leiden Univ. Medical Ctr. (Netherlands); Willem Birkhoff, Ctr. for Human Drug Research (Netherlands); Jeroen Eggemont, Oleh Dzyubachyk, Leiden Univ. Medical Ctr. (Netherlands); Koos Burggraaf, Ctr. for Human Drug Research (Netherlands); Alexander Vahrmeijer, Sven Mieog, Jouke Dijkstra, Leiden Univ. Medical Ctr. (Netherlands)

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Fluorescence and Raman spectroscopy based on a CMOS SPAD TCSPC line sensor for transplant surgery application

Paper 10873-26

Author(s): Andrea Usai, Neil Finlayson, Christopher D. Gregory, Colin Campbell, Robert K. Henderson, The Univ. of Edinburgh (United Kingdom)

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Machine learning assisted blood vessel segmentation in laser speckle imaging

Paper 10873-27

Author(s): Audrey Benmergui, Jonas Drotleff, Tony Pan, Josh Zwiebel, Ilya Kuznetsov, Weizmann Institute of Science (Israel); Igor Meglinski, Univ. of Oulu (Finland); Alon Harmelin, Vyacheslav Kalchenko, Weizmann Institute of Science (Israel)

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Lunch/Exhibition Break 12:00 PM - 1:20 PM

Session 7: SWIR and IR Methods I


Wednesday 6 February 2019
1:20 PM - 3:00 PM

Session Chair: [Lingyan Shi](#), Columbia Univ. (United States)

Advances in medical applications using SWIR light in the wavelength range from 1600 to 2350 nm (Invited Paper)

Paper 10873-28


Author(s): Laura A. Sordillo, Lingyan Shi, Diana Sordillo, Peter Sordillo, Robert R. Alfano, Institute for Ultrafast Spectroscopy and Lasers, The City College of New York (United States)

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Mid-infrared spectroscopic imaging of tissue health at cellular level

Paper 10873-29


Author(s): Ben O. Mellors, Hamid Dehghani, The Univ. of Birmingham (United Kingdom); Abigail M. Spear, Chris R. Howle, Defence Science and Technology Lab. (United Kingdom)

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Metasurface enhanced infrared reflection spectroscopy for the observation of live cancer cells

Paper 10873-30


Author(s): Steven H. Huang, Shourya Dutta Gupta, Robert Delgado, Kelly Hume, Gennady B. Shvets, Cornell Univ. (United States)

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Near-infrared deep brain stimulation via upconversion nanoparticle-mediated optogenetics (Invited Paper)

Paper 10873-31

Author(s): Shuo Chen, RIKEN Ctr. for Brain Science (Japan); Xiaogang Liu, National Univ. of Singapore (Singapore); Thomas McHugh, RIKEN Ctr. for Brain Science (Japan)

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Session 8: SWIR and IR Methods II


Wednesday 6 February 2019
3:30 PM - 6:00 PM

Session Chair: [Angela B. Seddon](#), The Univ. of Nottingham (United Kingdom)

Hyperspectral characterization of tissue in the SWIR spectral range: a road to new insight? (Invited Paper)

Paper 10873-32


Author(s): Lise L. Randeberg, Norwegian Univ. of Science and Technology (Norway)

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Spectral cytopathology in a rapidly flowing cell mixture: combining cell-selective dielectrophoresis with metasurface-enhanced infrared spectroscopy (*Invited Paper*)

Paper 10873-34


Author(s): Gennady B. Shvets, Glen Kelp, Joy Li, Junlan Lu, Robert Delgado, Cornell Univ. (United States); Shourya Dutta Gupta, Cornell Univ. (United States), Indian Institute of Technology Hyderabad (India)

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Widefield measurements of water and lipids with label-free short-wave spatial frequency domain imaging (*Invited Paper*)

Paper 10873-35


Author(s): Darren M. Roblyer, Yanyu Zhao, Matthew Applegate, Boston Univ. (United States); Mark Pierce, Rutgers, The State Univ. of New Jersey (United States)

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Mid-infrared fiber sources for real-time biomedical sensing (*Invited Paper*)

Paper 10873-36

Author(s): Robert I. Woodward, Matthew R. Majewski, Stuart D. Jackson, Macquarie Univ. (Australia)

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Spectroscopy and imaging with NIR and MIR supercontinuum light (*Invited Paper*)

Paper 10873-37

Author(s): Angela B. Seddon, The Univ. of Nottingham (United Kingdom)

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