International Workshop on Optics, Biology, and Related Technologies (IWOB2022-2023)
https://uu-core.com/iwob/2022_2023/

Date : Dec. 5 to 6, 2022
Place: Workstation room, Nikko Kanaya Hotel
(1300, Kamihatsuishimachi, Nikko, Tochigi, 321-1401 Japan)
https://www.kanayahotel.co.jp/eng/nkh/
https://www.knt-kt.co.jp/ec/2021/nikko_kanaya/

Hybrid workshop
Online registration オンライン申込先：https://uu-core.com/iwob/2022_2023/

Organized by
Center for Optical Research and Education (CORE), Utsunomiya University (UU)

Co-sponsors
Center for Bioscience Research and Education (C-Bio), UU

Introduction
Utsunomiya University's Center for Optical Research and Education (CORE) received support from the Ministry of Education, Culture, Sports, Science and Technology (MEXT) for the project "Synthetic promotion project in Bioimaging technologies" from 2012 to 2017. One of the key goals for the project was "**live imaging**", which was performed by using X-ray, digital holography, spectroscopic imaging, thermal imaging, and other optical imaging technologies. Many important results were obtained through this project. A second project goal was to foster interdisciplinary **collaboration** between researchers in engineering, especially optical engineering, and researchers in biology and agriculture. As a result of the project, interesting, innovative work was performed that established many new collaborations were born. On Feb. 18, 2019, International workshop on Bioimaging (IWBI) was successfully held for ensuring the collaborations. As a key achievement, "Optics program" including with tight cooperation with "Molecular agriculture program" in master course was started, furthermore from spring in 2021, **Optics and Bio-design program** in the graduate school will start. A PhD student in this program will get the degree of Optical Engineering.

The workshops **IWOB2021** and **IWOB2022** have been held by online during the COVID19 by online. It is to communicate research achievements and provide an opportunity for open discussion among the invited researchers, collaborators, colleagues, and students in response with the establishment of new graduate school. Open discussion also fosters the continued development of our interdisciplinary collaborative research in bioscience, agriculture, and optical technologies.

Committee

General Chairs

Yukitoshi Otani (CORE, UU), Co-chair,
Yoshio Hayasaki (CORE, UU), Co-chair,

Advisory Committee

Kazutaka Yokota (UU) Chair,
Tsukasa Ikeda (UU) , Yukihito Kabuyama (Director of C-Bio, Agri, UU)
Akinobu Irie (Dean of Engineering, UU) , Kenji Yamane (Dean of Agriculture, UU)
Toyohiko Yatagai (CORE, UU), Miyoshi Ayama (CORE, UU)
Mitsuo Takeda (CORE, UU), Kazuo Kuroda (CORE, UU)

Organizing Committee

Okihiro Sugihara (Eng, CORE), chair
Ryushi Fujimura (Eng, CORE UU) , Kota Kumagai (CORE), Hirotsugu Yamamoto (Eng, CORE),
Nathan Hagen (Eng, CORE), Masaru Matsuda (C-Bio)

Secretary:

Tomoko Kikuchi (CORE) , Mari Takeshige (CORE)

Final Program

Monday, 5 December
Opening Session (Chair: Yukitoshi Otani)
12:40(Online) Opening talk
Kazutaka Yokota, Utsunomiya University
12:50 Introduction of IWOB, Yukitoshi Otani

Invited Session 1 (Chair: Yoshio Hayasaki)
13:00 (onsite) Fringe projection profilometry: theoretical aspects
Qian Kemao, Nanyang Technological University, Singapore
13:30 (onsite) Snapshot RGB full Stokes imager by microgrid polarization cameras and its application for bio-imaging
Yukitoshi Otani, Utsunomiya University
14:50 (Online) Visualization of medaka fish lymphocytes
Norimasa Iwanami , C-Bio, Utsunomiya University
14:10 (10:40am, India) Use of wire-grid polarizer for phase shifting interferometry and microscopy
Kallol Bhattacharya, Calcutta University, India
14:40 (onsite) Suppression and utilization of inter-pixel crosstalk noise in holographic data storage systems
Ryushi Fujimura, Utsunomiya University

15:00 *Coffee break*

Invited Session 2 (Chair: Qian Kemao)
15:20(8:20am, Finland) Medical spectral imaging and spectrally optimal illuminations
Markku Hauta-Kasari, University of Eastern Finland
15:50 (onsite) In-process OCT monitoring for precise holographic laser processing
Satoshi Hasegawa, Utsunomiya University
16:10(9:10am, Finland) Retinal spectral imaging, oral and dental spectral imaging, and applications of spectrally optimized illuminations for medical imaging
Pauli Fält, University of Eastern Finland

16:40 (onsite) Reducing tissue photodamage in fluorescence microscopy through snapshot imaging spectroscopy
Nathan Hagen, Utsunomiya University
17:00(onsite) 4D modelling of soil surface by Integrated 2D Lidar in the excavator
Ilpo Niskanen, University of Oulu, Finland
17:30 (8:30am, Senegal) The development of optics and photonics in Africa.
Ahmadou Wague, Universite Cheikh Anta Diop, Senegal
18:00 End of session

19:00-21:00 Informal meeting for future MOU (Involve only those affected)

Dec. 6 Dec. (Tuesday)

Invited Session 3 (Chair: Nathan Hagen)
8:00 (16:00 on 5 Dec, Tucson) Imaging through Scattering Media and around Corners with high resolution using Synthetic Wavelength Holography
Florian Willomitzer, Univ. Arizona, USA
8:30 (18:30 on 5 Dec, Florida) Chip Scale Optical Frequency Combs for Applications in Communications and Signal Processing
Peter J. Delfyett, Univ. of Central Florida, USA
9:00 (18:00 on 5 Dec, Mexico) Profilometry measurement error using color fringe projection
Amalia Martinez, L.J.Quintero-Rodríguez*, A.Sicardi-Segade, J.A.Rayas-Álvarez
CIO, Mexico , *Dublin City University, Ireland
9:30 (18:30 on 5 Dec, Mexico) Retardance measurements employing a rotating polarizer-analyzer polarimeter.
David Ignacio Serrano Garcia : Universidad de Guadalajara, Mexico
10:00(onsite) Near-infrared light-induced self-written optical waveguides: recent progress and perspectives
Okihiro Sugihara, Utsunomiya University

10:20 *Coffee break*

Invited Session 4 (Chair: Prathan Buranasiri)
10:50 (9:50am, China) Polarization holography with linear polarized light
Xiaodi Tan : Fujian Normal University, China
11:20 (10:20am, Taiwan) From ZnO nanostructure to Lithium Niobate nanostructure
Shih-Shou Lo: Feng-chia Univ., Taiwan
11:50 (Online) Three-dimensional nanoscale analysis of light-dependent organelle changes in Arabidopsis mesophyll cells
Keiko Midorikawa, C-Bio, Utsunomiya University
12:10 (onsite) Epsilon-near zero phase-matching assisted second-harmonic generation in nanowire hyperbolic metamaterial
Prathan Buranasiri, King Mongkut's Institute of Technology Ladkrabang, Thailand
12:40(onsite) Holographic optical engine (HolOE)
Yoshio Hayasaki, Utsunomiya University
Closing session
13:10 Closing talk