

Monday, July 22

*Genome and Biomedical Sciences Facility Room 1005
451 Health Sciences Drive, Davis, CA 95616*

- 8:00 - 8:30 am **Registration and Breakfast**
- 8:30 – 8:45 am **Welcome and Overview of the National Center for Interventional Biophotonics Technologies (NCIBT)**
Simon J. Atkinson, Ph.D. – Vice Chancellor for Research (UC Davis)
Laura Marcu, Ph.D. – Director, NCIBT (UC Davis)
Griff Harsh, M.D., M.B.A. – Deputy Director, NCIBT (UC Davis)
- 8:45 – 9:30 am **Keynote Address A: Label-free Linear and Nonlinear Optical Imaging for Real-Time Intraoperative Assessment of Tumor Margins, Markers, and the Microenvironment**
Stephen Boppart, M.D., Ph.D. (University of Illinois Urbana-Champaign)
- 9:30 - 9:45 am **Introductions: The Need for Interventional Imaging
Overview of CPs and SPs**
Griff Harsh, M.D., M.B.A. – Leader, TTD (UC Davis)

iFLIM

Moderated by Silvia Noble Anbunesan

- 9:45 – 10:00 am **Update on TRD 1 Progress**
Laura Marcu, Ph.D. – TRD1 Leader (UC Davis)
- 10:00 - 10:15 am **AI-enabled Detector Array for Deeper Vision and Sensing Beyond the Limits**
Saif Islam, Ph.D. (UC Davis)
- 10:15 - 10:30 am **Questions and Discussion**
- 10:30 - 11:00 am **Break**
- 11:00 - 11:45 am **Keynote Address B: Spectrally- and Polarization-Resolved Imaging In Vivo - Providing Surgical Guidance Using Vision and Robotics**
Daniel Elson, Ph.D. (Imperial College London)
- 11:45 - 12:30 pm **Panel Discussion: iFLIm CPs and SPs**
Moderator: Laura Marcu, Ph.D. (UC Davis)
Jonathan Sorger, Ph.D. (Intuitive Surgical)
Bogdan Valcu, Ph.D. (BrainLAB)
Jeffrey Southard, M.D. (UC Davis)
Saif Islam, Ph.D. (UC Davis)

Alba Alfonso-Garcia, Ph.D. (UC Davis)
Farouc Jaffer, M.D., Ph.D., *remote* (Massachusetts General Hospital)

12:30 – 1:30 pm **Lunch and Informal Discussion**

iDOS

Moderated by Ben Mattison

1:30 – 2:15 pm **Keynote Address C: Optical Methods for Monitoring Systemic and Cerebral Perfusion in Humans and Marine Mammals**
Jana Kainerstorfer, Ph.D. (Carnegie Mellon University)

2:15 – 2:30 pm **Update on TRD2 Progress**
Vivek Srinivasan, Ph.D., TRD2 Leader, *remote* (NYU Langone Health & UC Davis)

2:30 - 2:45 pm **Transabdominal Fetal Oximetry**
Soheil Ghiasi, Ph.D., TRD2 Co-Leader (UC Davis)

2:45 – 3:30 pm **Panel Discussion -
Optical Imaging for Medical Monitoring: iDOS CPs and SPs**
Moderator: Vivek Srinivasan, Ph.D., *remote*, (NYU Langone Health & UC Davis)
Jana Kainerstorfer, Ph.D. (Carnegie Mellon University)
Arjun Yodh, Ph.D. (University of Pennsylvania)
Wesley Baker, Ph.D. (Children's Hospital of Philadelphia)
Soheil Ghiasi, Ph.D. (UC Davis)
Herman Hedriana, M.D. (UC Davis)
Ryan Martin, M.D. / Jeffrey Robert Vitt, M.D. (UC Davis)

3:30 – 4:00 pm **Break**

4:00 – 4:20 pm **iDOS Assessment of Blood Flow and Tissue Oxygenation**
Santosh Aparanji, Ph.D., *remote*, (NYU Langone Health)

4:20 – 5:00 pm **Mentoring Session I: Working with Industry**
Moderator: Alba Alfonso-Garcia, Ph.D. (UC Davis)
Jonathan Sorger, Ph.D. (Intuitive Surgical)
Marco Arrigoni, Ph.D., *remote*, (Light Conversion)
Ross Keyashian, M.S. (Horiba)

NCIBT Key Personnel only - GBSF NCIBT Office

4:00 - 5:00 pm **TRD Organizational Meeting: TRDs' Progress and Plans**
Laura Marcu, Ph.D., TRD1 (UC Davis)
Vivek Srinivasan, Ph.D. TRD2, *remote* (NYU Langone Health & UC Davis)
Jinyi Qi, Ph.D., TRD3 (UC Davis)

Other Key Personnel (AO, NP, SG, SI, GH)

5:00 - 7:00 pm **Reception and Dinner**

Tuesday, July 23 *GBSF 1005; 451 Health Sciences Drive, Davis, CA 95616*

8:00 - 8:30 am **Check-in and Breakfast**

AI /ML

Moderated by Mohamed Mashood

8:30 – 9:15 am **Keynote Address D: Machine Learning for Personalized Cancer Screening**
Adam Yala, Ph.D. (UC Berkeley and UCSF)

9:00 – 9:20 am **Update on TRD3 Progress**
Jinyi Qi, Ph.D., TRD3 Leader (UC Davis)
Aydogan Ozcan, Ph.D. (UCLA)

9:20 – 9:40 am **Inverse design for optimal digital fabrication**
Julian Panetta, Ph.D. (UC Davis)

9:40 – 10:00 am **Multimodal machine learning**
Thomas Strohmer, Ph.D. (UC Davis)

10:00 – 10:40 am **Panel Discussion: AI in Interventional Biophotonics**
Moderator: Randy Carney, Ph.D. (UC Davis)
Aydogan Ozcan, Ph.D. (UCLA)
Jinyi Qi, Ph.D. (UC Davis)
Adam Yala, Ph.D. (UC Berkeley and UCSF)
Thomas Strohmer, Ph.D. (UC Davis)
Laura Marcu, Ph.D. (UC Davis)

10:40 – 11:10 am **Break**

11:10 – 11:55 pm **Keynote Address E: Raman spectroscopy for medical diagnosis**
Jürgen Popp, Ph.D. (Leibniz Institute of Photonic Technologies)

11:55 – 12:30 pm **Discussion Panel: Raman Spectroscopy in Multimodal Imaging**
Moderator: Randy Carney, Ph.D. (UC Davis)
Jürgen Popp, Ph.D. (Leibniz Institute of Photonic Technologies)
Alba Alfonso-Garcia, Ph.D. (UC Davis)
Constanze Schultz, Ph.D. (Leibniz Institute of Photonic Technologies)

12:30 – 1:00 pm **Poster Pitches**

1:00 – 2:00 pm **Lunch and Poster Discussions**

Biophotonics Pathology

Moderated by Yifei Gu

2:00 – 2:45 pm **Optical Label-free Microscopy and Sensing**
Aydogan Ozcan, Ph.D. (UCLA)

2:45 – 3:05 pm **Digital Pathology**
Richard Levenson, Ph.D. (UC Davis)

3:05 – 3:25 pm **Intraoperative Pathology Guidance for Improved Outcomes**
Farzad Fereidouni, Ph.D. (UC Davis)

3:25 – 4:00 pm **Break**

Optical Brain Imaging and Nanoengineering

4:00 - 4:30 pm **2-Photon Microscopy for Brain Imaging**
Weijian Yang, Ph.D. (UC Davis)

4:30 – 5:00 pm **Optical Microscopy and Computational Algorithms for Brain Imaging and
Optogenetic Stimulation**
Yi Xue, Ph.D. (UC Davis)

5:00 – 5:30 pm **Biophotonics in Cell Nanoengineering**
Jinhwan Kim, Ph.D. (UC Davis)

NCIBT Key Personnel only - GBSF NCIBT Office

4:00 - 5:30 pm **CP/SP Organizational Meeting: Assessment of CP and SP Progress**
Laura Marcu, Ph.D. (UC Davis)
Griff Harsh, M.D., M.B.A. (UC Davis)
NCIBT Key Personnel, CP and SP Partners

5:30 - 7:00 pm **Dinner and Poster Awards**

Wednesday, July 24 *GBSF Room 1005 451 Health Sciences Drive, Davis, CA 95616*

8:00 - 8:30 am **Check-in and Breakfast**

Biophotonics Overview

- 8:30 - 9:20 am **Brief Introduction to Biophotonics**
Randy Carney, Ph.D., TTD Co-leader (UC Davis)
- 9:20 - 9:40 am **Raman Tags for Biomedical Research**
Constanze Schultz, Ph.D. (Leibniz Institute of Photonic Technologies)
- 9:40 - 10:00 am **Science, Sales & Business Development**
Ross Keyashian, M.S. (Horiba)
- 10:00 - 10:30 am **Lasers in Optical Imaging**
Marco Arrigoni, Ph.D. (Light Conversion)
- 10:30 – 11:00 am **Break**

Clinical Optical Imaging

- 11:00 - 11:25 am **iFLIm Identification of Brain Tumor Margins**
Orin Bloch, M.D. (UC Davis)
- 11:25 - 11:50 am **iFLIm Identification of Head and Neck Cancer**
Andrew Birkeland, M.D. (UC Davis)
- 11:50 - 12:15 pm **Optical Assessment of Intraarterial Pathology**
Andrew Thrapp, Ph.D.
- 12:15 - 12:40 pm **iDOD Assessment of Fetal Blood Flow**
Herman Hedriana, M.D. (UC Davis)
- 12:40 – 1:00 pm **Q&A, Clinical Optical Imaging Panel**
Moderator: Griff Harsh, M.D. (UC Davis)
Andrew Birkeland, M.D. (UC Davis)
Orin Bloch, M.D. (UC Davis)
Herman Hedriana, M.D. (UC Davis)
Andrew Thrapp, Ph.D. (Massachusetts General Hospital)
- 1:00 - 2:00 pm **Lunch, disperse to Laboratories.**

Laboratory Demonstrations and Hands-On Training *GBSF Room 3406 415 Health Sciences Drive*

Group 1

2:00 - 3:30 pm **Demo 1: iFLiM Training and Data Collection**
3:30 - 5:00 pm **Demo 2: iDOS Demonstration**

Group 2

2:00-3:30 pm **Demo 2: iDOS Demonstration**
3:30 - 5:00 pm **Demo 1: iFLiM Training and Data Collection**

All

5:30 – 7:00 pm **Dinner**

Thursday, July 25

GBSF Room 1005 451 Health Sciences Drive, Davis, CA 95616

8:00-8:30 am **Bus to UC Davis Medical Center in Sacramento/Breakfast provided in route.**

Biophotonics in Surgical, Endovascular, and ICU Workflows

Imaging in the OR

Jennifer Macatangay R.N. (UC Davis)
Griff Harsh, M.D., M.B.A. (UC Davis)

Imaging in the ICU

Ryan Martin, M.D. (UC Davis)
Vivek Srinivasan, Ph.D., *remote* (NYU Langone Health & UC Davis)

Imaging in the Endovascular Suite

Stephen Palacio (UC Davis)
Jeffrey Southard, M.D. (UC Davis)

All Participants

9:00 - 9:20 am **Change into Scrub Suits - Main OR Locker Rooms, Pavilion 3, UCDH**

Group 1

9:20 - 9:50 am **Demo 1: Imaging in the OR - NSICU Foyer, Pavilion 3, UCDH**
9:50 - 10:20 am **Demo 2: Imaging in the ICU - NSICU Foyer, Pavilion 3, UCDH**
10:20 - 10:50 am **Demo 3: Imaging in Endovascular Suites - Entry Foyer, UCDH**

Group 2

9:20 - 9:50 am **Demo 2: Imaging in the ICU - NSICU Foyer, Pavilion 3, UCDH**
9:50 – 10:20 am **Demo 3: Imaging in Endovascular Suites - Entry Foyer, UCDH**
10:20 – 10:50 am **Demo 1: Imaging in the OR - NSICU Foyer, Pavilion 3, UCDH**

Group 3

9:20 - 9:50 am **Demo 3: Imaging in Endovascular Suites - Entry Foyer, UCDH**
 9:50 - 10:20 am **Demo 1: Imaging in the OR - NSICU Foyer, Pavilion 3, UCDH**
 10:20 - 10:50 am **Demo 2: Imaging in the ICU - NSICU Foyer, Pavilion 3, UCDH**

All Participants

11:00 - 11:30am **Change Clothes - Main OR Locker Rooms, Pav 3, UCDH**

11:30 - 1:30 pm **Board bus (lunch boxes will be provided), drive to South Lake Tahoe**

1:30 - 7:30 pm **Lunch, Leisure, Dinner about Lake Tahoe, Casinos**

7:30 - 9:30 pm **Bus back to Davis**

Friday, July 26 *GBSF Room 1005 451 Health Sciences Drive, Davis, CA 95616*

8:00 - 8:30 am **Check-in and Breakfast**

8:30 - 9:30 am **Introduction to Artificial Intelligence**
Randy Carney, Ph.D., TTD Co-leader (UC Davis)

9:30 - 10:15 am **Lecture: Practical Aspects of iFLim Measurement**
Katjana Ehrlich, Ph.D. (UC Davis)
Xiangnan Zhou, Ph.D. (UC Davis)
Alba Alfonso-Garcia, Ph.D. (UC Davis)

10:15 - 10:30 am Walk to *Academic Surge 2323*

10:30 – 12:30 pm **Artificial Intelligence Lab I - iFLim Hands-on Analysis A – *Academic Surge 2323***
Randy Carney, Ph.D. (UC Davis)
Alba Alfonso-Garcia, Ph.D. (UC Davis)
Katjana Ehrlich, Ph.D. (UC Davis)

12:45 - 2:00 pm **Lunch**

2:00 - 4:00 pm **Artificial Intelligence Lab III - iDOS Hands-on Analysis – *Academic Surge 2323***
Mingjun Zhao, Ph.D. (NYU Langone Health)
Randy Carney, Ph.D. (UC Davis)

4:00 pm **Adjourn. Thank you for coming!**