

# THE DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING SPEAKER SERIES

**PRESENTS**

## Per aspera ad astra: channeling light through opaque medium

### Vladislav V. Yakovlev

Department of Biomedical Engineering  
Texas A&M University



**Monday, November 13, 9:55 am**  
**Room W122, Engineering Building 2**

### LECTURE ABSTRACT

Strong light scattering can make even an optically non-absorbing object opaque preventing deep light penetration. Many far-reaching applications, such as deep brain imaging could benefit from a better coupling of light into scattering medium and increased penetration depth resulting into greater transmission through a highly scattering medium. In this talk I will present a simple, but efficient way of increasing light coupling through optical interface engineering. Capitalizing on our prior work [1-6], we provide a theoretical foundation for our experimental findings and discuss potential applications for imaging and sensing [7-8].

#### References:

- [1] B. H. Hokr et al, Opt. Express 21(10), 11757-11762 (2013).
- [2] B. H. Hokr, et al, Nat. Commun. 5, 4356 (2014).
- [3] B. H. Hokr, et al, Proc. Natnl. Acad. Sci. USA 111(34), 12320-12324 (2014)
- [4] B. H. Hork, et al, Opt. Express 23(7), 8699-8705 (2015).
- [5] J. V. Thompson, et al, J. Mod. Opt. 63(1), 80-84 (2016).
- [6] J. V. Thompson, et al, Opt. Lett. 41(8), 1769-1772 (2016).
- [7] J. V. Thompson, et al, Proc. Natnl. Acad. Sci. USA 114(30), 7941-7946 (2017).
- [8] J. V. Thompson, et al, ACS Photonics 4(7), 1790-1796 (2017).

### SPEAKER BIOSKETCH

**Dr. Vladislav V. Yakovlev** is a full professor in the Departments of Biomedical Engineering and Physics & Astronomy at Texas A&M University. He got his PhD in 1990 from Moscow State University. After a short stay with Novatec Laser System, Inc., where he discovered what is now known as bladeless LASIK, he worked in the Department of Chemistry and Biochemistry at UCSD as a postdoctoral researcher and research scientist developing new tools for optical molecular spectroscopy, imaging and control. Dr. Yakovlev started as an assistant professor at the University of Wisconsin – Milwaukee in 1998 and moved to Texas A&M University in 2011. He has more than 150 research publications in leading scientific journals. His research was supported by NSF, NIH, ARO, AFOSR, ONR, and DARPA. Dr. Yakovlev is a Fellow of OSA, AIMBE, APS and SPIE. He is a member of Editorial Board of Journal of Biomedical Optics and Optica. His research interests are in a broad area of optical spectroscopy, imaging and sensing.

UNIVERSITY of HOUSTON

CULLEN COLLEGE of ENGINEERING  
Department of Electrical & Computer Engineering