

UCR SPIE Student Chapter Annual Report 2014-2015

1. Names and email addresses of elected officers

President: Rameez Samnakay rsamn001@ucr.edu
Vice-president: Jack Tang jtang014@ucr.edu
Secretary: Atta Zahedi azahe002@ucr.edu
Treasurer: Thompson Lu tlu001@ucr.edu

2. List of current student chapter members and membership expiration dates

<u>Members</u>	Membership expiration date
Melissa Eberle	8 January 2016
Fariborz Kargar	3 August 2015
Xuye Lang	4 January 2016
Thompson Lu	16 December 2015
Mahesh Neupane	4 August 2015
Carissa Rodriguez	15 January 2016
Rameez Samnakay	9 March 2016
Mohammad Sarshar	20 January 2016
Atena Zahedi	6 May 2015
<u>Alumni</u>	Graduation month
Maziar Ghazinejad	December 2011
Nima Khatibzadeh	September 2012
Shirui Guo	September 2012
Baharak Bahmani	September 2013
Qian Gao	June 2014
Jason Crovisier	June 2014

3. Details of chapter activities

3.1 UCR SPIE General Meeting and guest speaker: Dr. Hyle Park



On December 3rd, 2014, the chapter hosted a general meeting to inform students of a facility tour of TruTouch technologies that happened the next day. Below, Jack Tang is introducing one of the technologies used by TruTouch. The company has developed a self-calibrating biometric blood alcohol sensor that uses interferometric measurements.

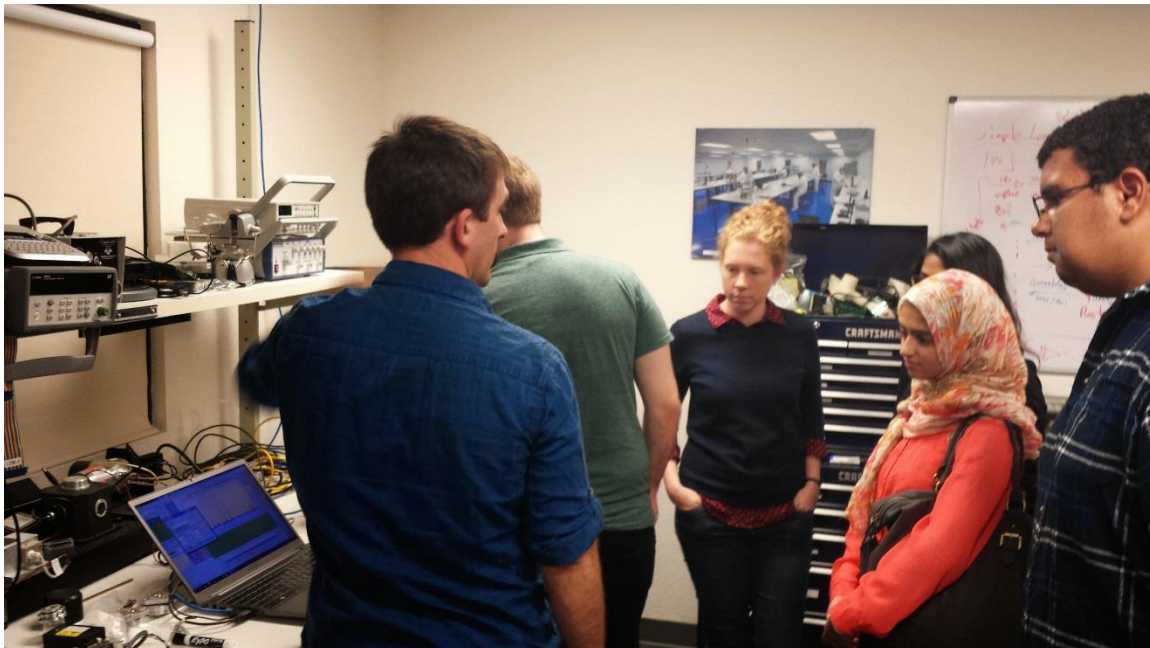


After updating the chapter and announcing upcoming events, Dr. Hyle Park delivered a research lecture on the “Development of label-free optical imaging of neural activity”. His lecture covered OCT imaging of neurons as they fired in the brain. Neural activity results in changes in

the local attenuation coefficient (increase in transparency) and optical phase (swelling of axon) during the action potential. Dr. Park has been able to detect neural activity using micron resolution in three dimensions on a millisecond time scale. Snacks and refreshments were provided.



3.4 Facility Tour of TruTouch Technologies



On December 4th, 2014, the chapter brought a group of students to a company in Riverside called TruTouch Technologies. We had eight attendees for this outreach event and the tour lasted for about two hours. Ben VerSteege the founder and VP of Engineering showed us their

flagship BAC tester and some prototypes, and Stephanie Tehseldar a UCR alumna from the Department of Bioengineering, showed us some of their lab equipment.



3.5 Photonics West 2015

From February 7-12, Melissa Eberle, Carissa Rodriguez, Mohammad Sarshar, Jack Tang, and Xuye Lang attended PW15 to present their research in San Francisco, CA.

3.6 Tour of Griffith Observatory

On May 23rd, the chapter will attend a tour of Griffith Observatory in Pasadena, CA.

3.7 Guest Lecture by Mr. Alson E. Hatheway

On May 27th, Mr. Alson E. Hatheway will present a lecture on optomechanics at UC Riverside.

3.8 Facility Tour of Newport Corporation

On May 29th, the chapter will attend a tour of Newport corporation in Irvine, CA.

4. Budget

Up to Dec 2014:

- Advertising, snack and equipment for General Meeting + Hyle Park's guest lecture, and the tour of TruTouch Technologies: \$115.

Total for 2014: \$465

Jan– Mar 2015:

- Transportation for Griffith Observatory tour: \$60
- Transportation and general expenses for Alson E. Hatheway guest lecture: \$150
- Transportation for Newport Corporation tour: \$60
- Gift cards for photo competition winners: \$100

Projected total: \$370

5. Planned activities for next year (May 2015 – June 2016)

Griffith Observatory tour

Newport Corporation tour

JPL tour

IYL UCR symposium

Optics outreach demonstrations

Guest lectures

Poster session

Photo contest

Guest lectures

Dr. Harry Levinson

Dr. James B. Breckinridge

6. List of SPIE award and travel grant recipients

7. List of optics and photonics related publications

Journal articles:

Rodriguez, Szu, Eberle et al., "Decreased light attenuation in cerebral cortex during cerebral edema detected using optical coherence tomography," *Neurophoton.* 1(2), 025004 (2014).

Sarshar et al., "Comparative study of methods to calibrate the stiffness of a single-beam gradient-force optical tweezers over various laser trapping powers", *J. Biomed. Opt.* 19(11) 115001 (2015).

Dhall, Neupane et al., "Bulk Direct Band Gap MoS by Plasma-Induced Layer Decoupling", *Advanced Materials* 27(9) (2015).

Neupane et al., "Effect of strain on the electronic and optical properties of Ge-Si dome shaped nanocrystals", *Physical Chemistry Chemical Physics* 17(4), (2015)

Huang, Sutter, Sadowsky, Cotlet, Monti, Racke, Neupane et al. "Tin Disulfide: An Emerging Layered Metal Dichalcogenide Semiconductor: Materials Properties and Device Characteristics", ACS Nano 8(10) (2014).

Sylvia, Habib, Khayer, Alam, Neupane, Lake, "Effect of random discrete source dopant distributions on nanowire tunnel FETs", Electron Devices, IEEE Transactions 61(6) (2015).

Ionescu, Wang, Chai, Mutlu, Ruiz, Favors, Wickramaratne, Neupane et al. "Synthesis of Atomically Thin MoS₂ Triangles and Hexagrams and their Electrical Transport Properties", IEEE Transactions on Nanotechnology 99 (2014).

Sgouros, Neupane, "Nanoscale photonic interconnects in THz frequencies", Physical Chemistry Chemical Physics 16(42) (2015).

zur Nieden, Turgman, Lang et al., "Fluorescent hydrogens for embryoid body formation and osteogenic differentiation of embryonic stem cells", ACS Appl. Mater. Interfaces (2015).

Lang, Lyubovitsky, "Structural dependency of collagen fibers on ion types revealed by in situ second harmonic generation (SHG) imaging method", Anal. Methods 7 (2015).

Jiang, Ruyantsev, Samnakay et al. "High-temperature performance of MoS₂ thin-film transistors: Direct current and pulse current-voltage characteristics. J. Appl. Phys. 117(6), 064301, (2015).

Samnakay et al. "Selected chemical vapor sensing with few-layer MoS₂ thin-film transistors: Comparison with graphene devices", Appl. Phys. Lett. 106(2), 023115, (2015).

Shur, Ruyantsev, Jiang, Samnakay et al. "Selective gas sensing with MoS₂ thin film transistors", IEEE Sensors (2014).

Samnakay et al. "The Commensurate-Incommensurate Charge-Density-Wave Transition and Phonon Zone Folding in 1T-TaSe₂ Thin Films", Nano Lett. (just accepted) (2015)

SPIE Conference Proceedings:

Kargar et al. "A comparative study of the thermal interface materials with graphene and boron nitride fillers", Proceedings of SPIE Vol 9168, 91680S (2014)

Tang et al. "Effect of ICG concentration on the fluorescence characteristics of erythrocyte-derived optical vectors", Proceedings of SPIE Vol. 9341, 93410H (2015)

Sarshar et al. "Label-free measurements of membrane tether thickness using optical tweezers combined with SLIM", Proceedings of SPIE Vol. 9336, 93361M (2015)