12 TH Annual Graduate Research Conference

April 29, 2016
The Hilton UH Hotel & Conference Center
Houston, Texas

Program

8:30 - 8:55 am	Registration, Waldorf Astoria, Ballroom, Lobby
8:55 - 9:00 am	Opening Ceremonies, Plaza Ballroom • Opening Remarks by Dr. Wanda Wosik, Conference Chair
9:00 - 10:00 am	Technical Program - Oral Session A, Plaza Ballroom
10:00 -10:30 am	Welcoming Remarks • Dr. Dmitri Litvinov, Vice Provost/Dean Graduate School • Dr. Suresh Khator, Associate Dean, College of Engineering • Dr. Badri Roysam, Chairman, ECE Department
10:30 - 10:45 am	Coffee Break, Waldorf Astoria, Ballroom, Lobby
10:45- 11:30 am	Technical Program - Oral Session B, Plaza Ballroom
11:30- 12:30 pm	Lunch, Waldorf Astoria, Ballroom
12:30 - 1:00 pm	Plenary Presentation Plenary Presentation "**Follow the Nano Brick Road**", by Professor Teri Odom, Department of Chemistry, Northwestern University
1:00 - 3:00 pm	Technical Program - Poster Session C, Shamrock Ballroom
3:00 – 4:00 pm	Technical Program - Oral Session D, Plaza Ballroom
4:00 - 4:15 pm	Coffee Break, Waldorf Astoria, Ballroom, Lobby
4:15 - 5:30 pm	Technical Program - Oral Session E, Plaza Ballroom
5:30 – 6:00 pm	Elevator Talks by CDC students, Waldorf Astoria, Ballroom
6:00 - 6:30 pm	Awards Ceremony Waldorf Astoria, Ballroom

GRC 2016 TECHNICAL PROGRAM

The Hilton UH Hotel & Conference Center

April 29, 2016

8:30 – 8:55 am Registration, Waldorf Astoria, Ballroom, Lobby

8:55 – 9:00 am **Opening Remarks in Plaza Ballroom**

Session A: Computer Systems for Utilization of Renewable Energies, Localization and Wireless Communication.

Session Type: Oral
Time: 9:00 – 10:00 am
Faculty Chair: Dr. David Jackson

9:00 – 9:15 am **FUZZY CONTROLLED VSC OF BATTERY STORAGE SYSTEM FOR SEAMLESS TRANSITION OF MICROGRID BETWEEN GRID-TIED AND ISLANDED MODE**
Chinmay Shah, Mehdi Abolhassani, and Heidar Malki

9:15 – 9:30 am **A MEDIUM VOLTAGE POWER CONVERTER WITH CASCADED ISOLATED HIGH-FREQUENCY LINKS USING SIC DEVICES FOR INTEGRATION OF RENEWABLE ENERGIES**
Alaba Esho and Mehdi Abolhassani

9:30 – 9:45 am **A TIME DIFFERENCE OF ARRIVAL LOCALIZATION METHOD BASED ON DE-EMBEDDING THE PROPAGATION BACKGROUND**
Mengna Yang, David R. Jackson, Ji Chen, and Jeffery T. Williams

9:45 – 10:00 am **EFFICIENT COMPUTER SYSTEM DESIGNS TO IMPROVE THE MOBILE USER EXPERIENCES**
Kaige Yan and Xin Fu

10:00 –10:30 am **Welcoming Remarks and Addresses in Plaza**

- Dr. Dmitri Litvinov, Vice Provost/Dean Graduate School
- Dr. Suresh Khator, Associate Dean, College of Engineering
- Dr. Badri Roysam, Chairman, ECE Department

10:30 – 10:45 am **Coffee Break**

Session B: Monitoring of Brain Activity; Cellular and Cognitive Studies

Session Type: Oral
Time: 10:45 – 11:30 am
Faculty Chair: Dr. David Mayerich

10:45 – 11:00 am	**FAST AUTOMATED CELL NUCLEI SEGMENTATION IN LARGE KESM IMAGES USING GPU** Laila Saadatifard and David Mayerich
11:00 – 11:15 am	**EXPLORE NEIGHBORHOOD RELATIONSHIP BETWEEN NEURONS AND MICROGLIAS IN TISSUE REMODELING IN THE RAT BRAIN AFTER TRAUMATIC INJURY** Xiaoyang Li and Badri Roysam
11:15 – 11:30 am	**INTERACTIONS BETWEEN ENDOGENOUS AND EXOGENOUS ATTENTION USING STATIC AND DYNAMIC GROUPS** Fahrettin Firat Gonen and Haluk Ogmen
11:30 – 12:30 pm	**Lunch**, Waldorf Astoria, Ballroom
12:30 – 1:00 pm	Plenary Presentation, "**FOLLOW THE NANO BRICK ROAD",** Professor Teri Odom, Department of Chemistry, Northwestern University, Evanston, Illinois Waldorf Astoria, Ballroom

Session C: POSTER PRESENTATIONS

Time: 1:00 – 3:00 pm, Shamrock Ballroom
Faculty Chair: Dr. Aaron Becker

Session P1: Biomedical Imaging from Cells Level to Whole Body Reconstructive Anatomy

MORPHOLOGICAL CONSTRAINT SPECTRAL UNMIXING OF BIOLOGICAL TISSUES USING CONFOCAL MICROSCOPY
M. Megjhani and B. Roysam

IMAGING AND FEATURE SELECTION USING GA-FDA ALGORITHM FOR THE CLASSIFICATION OF MID-INFRARED BIOMEDICAL IMAGES
Rupali Mankar, Vishal Verma, Michael Walsh, Carlos Bueso-Ramos, and David Mayerich

BUILDING A DISCREET FREQUENCY MOLECULAR IMAGING SYSTEM USING A QUANTUM CASCADE LASER
Shihao Ran and David Mayerich

DUAL-WAVELENGTH LINE-SCAN RAMAN MICROSCOPY FOR LABEL-FREE MOLECULAR IMAGING
Jingting Li, Zhengfan Liu, Michael T. Myers, Lori Hathonand, and Wei-Chuan Shih

BIO-INSPIRED PLASMONIC PLATFORM FOR SURFACE-ENHANCED RAMAN SPECTROSCOPY (SERS)
Md Masud Parvez Arnob and Wei-Chuan Shih

AUTOMATION OF HYPERSPECTRAL SCANNING MICROSCOPE USING LABVIEW
Radhika Mahesh Gupta, Wei Chuan Shih, and Jingting Li

THREE-DIMENSIONAL EVALUATION OF BREAST SHAPE AND SYMMETRY CHANGES IN BREAST RECONSTRUCTION
Audrey Cheong and Fatima Merchant

Session P2: The World of Robots; From Macro– to Nano-Scale

NASA SWARMATHON COMPETITION
MULTIPLE-ROBOT SEARCH ALGORITHMS IN AN UNKNOWN AREA
An Nguyen, Mary Burbage, and Aaron T. Becker

COLLECTING A SWARM WITH GLOBAL INPUTS
Arun V. Mahadev , Dominik Krupke , Jan-Marc Reinhardt , S´andor P. Fekete, Aaron T. Becker

OBJECT MANIPULATION AND POSITION CONTROL USING A SWARM WITH GLOBAL INPUTS
Shiva Shahrokhi and Aaron T. Becker

SIMULATING MOSQUITO ELIMINATION WITH ROBOTS CARRYING INSTRUMENTED BUG ZAPPERS
Mary C. Burbage and Aaron T. Becker

Session P3: Measurements and Monitoring of Brain Activity; Memory and Visual Perception

BRAIN ACTIVATION PROFILES IN MTBI: EVIDENCE FROM ERP ACTIVITY OF WORKING MEMORY RESPONSE
Lianyang Li and George Zouridakis

MULTIPOINT SIDE FIRING OPTICAL FIBER BY LASER MICROMACHINING
Hoang Nguyen, Yuankai Yue, Arnob MP, Ousama Zenasni, Greggy Santoz, Aaron Becker, and Wei-Chuan Shih

MINDREADING: PREDICTING THE NUMBER YOU WILL THINK BASED ON YOUR EYE SCAN PATTERN
Alma R. Tijiboy and Bhavin Sheth

ESTIMATING THE EMOTIONAL CONTENT OF AN IMAGE FROM THE OBSERVER'S EYE SCAN PATTERN
Shrivatsa Neerkaje and Bhavin. R. Sheth

METRICS ON CROWD CONTROL WITH OVERHEAD VIDEO AND VOCAL COMMANDS
Wei Yao and Aaron T. Becker

Session P4: Applied Electromagnetics and Nanoparticles in Fight of Cancer

ASSESSMENT OF TIME REVERSAL BASED RF FOCUSING TECHNIQUE USED FOR HYPERTHERMIA AND DRUG DELIVERY
Kuang Qin and Jarek Wosik

Session P5: Material Science, Physics, and Technology of Thin Films and Nanodiscs

NEAR SINGLE CRYSTALLINE ORIENTATION-CONTROLLED GE FILMS ON GLASS
Kaveh Shervin, Khim Kharel and Alexandre Freundlich

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Dongjun Wu and Stanko R. Brankovic

MONITORING ADSORPTION OF GOLD NANOPARTICLES ON ELECTRON-BEAM LITHOGRAPHY PATTERNED GOLD NANODISKS USING DARK-FIELD HYPERSPECTRAL MICROSCOPY
Fusheng Zhao, Oussama Zenasni, Suyan Qiu, Jingting Li, and Wei-Chuan Shih

Session P6: Smart Grids and Storage in Energy Systems

REAL-TIME MANAGEMENT OF SMART GRIDS USING MULTI-AGENT SYSTEMS
Tariq Khan and Mehdi Abolhassani

OPTIMAL LOCATION OF PV POWERED SMART CHARGING FACILITIES WITH ENERGY STORAGE FOR PLUG-IN HYBRID ELECTRIC VEHICLES (PHEV'S)
Michael Umeano, Preetham Goli, and Wajiha Shireen

DECENTRALIZED-INVERTER BASED REACTIVE POWER COMPENSATION OF ACTIVE MESHED DISTRIBUTION NETWORK
Prateek Gaure and Mehdi Abolhassani

Session P7: Wireless Cooperation; Multi-Photon Quantum Cryptography; Computational Approach in Applied Electromagnetics; Non-Volatile Processors

ZERO-DETERMINANT STRATEGY FOR RESOURCE SHARING IN WIRELESS COOPERATION
Huaqing Zhang and Zhu Han

MULTI-PHOTON QUANTUM CRYPTOGRAPHY PROTOCOL UNDER LOSSY NOISY CHANNELS
Junchao Wu and Yuhua Chen

EFFICIENT COMPUTATION OF GREENS' FUNCTION FOR LAYERED MEDIUM
Dawei Li, Donald R. Wilton, David R. Jackson and Ji Chen

ENERGY-AWARE DYNAMIC VOLTAGE FREQUENCY SCALING FOR NON-VOLATILE PROCESSORS
Xingyao Zhang, Jinghong Chen, David Mayerich, and Xin Fu

Session D: Recent Advances in VLSI, Communication, and Surveyance Systems

Session Type: Oral
Time: 3:00 – 4:00 pm
Faculty Chair: Dr. Joe Charlson

3:00 – 3:15 pm **A 4-BIT 25GS/S FLASH ADC IN 28 NM SOI CMOS**
Yulang Feng, Yuxuan Tang, and Jinghong Chen

3:15 – 3:30 pm **EMERGING TECHNOLOGY ENABLED ENERGY-EFFICIENT GPGPUS REGISTER FILE**
Chenhao Xie, Jingweijia Tan, and Xin Fu

3:30 – 3:45 pm **MICROSTRIP ANTENNA EXPLORATIONS FOR CUBESATS**
Xinyu Liu, Jingshen Liu, David R. Jackson and Ji Chen

3:45 – 4:00 pm **SIESMIC SURVEYING WITH DRONE MOUNTED GEOPHONES**
Srikanth K.V.Sudarshan, Li Huang, Li Chang, Robert Stewart, Aaron T.Becker

4:00 – 4:15 pm **Coffee Break**

Session E: New Materials for Electron Devices and Circuits, MEMS, and Energy Sources

Session Type: Oral
Time: 4:15 – 5:30 pm
Faculty Chair: Dr. Jack Wolfe

4:15 – 4:30 pm **DEMOCRATIZATION OF MICRO-IMAGING TECHNOLOGIES**
Yu-Lung Sung and Wei-Chuan Shih

4:30 – 4:45 pm **TWO MISSING COMPONENTS FOR SOLID MEDIA TRANSMISSION: AMPLIFIERS AND MANIFOLDS**
Li Huang, Xin Liu, Nikolaos V. Tsekos, and Aaron T. Becker

4:45 – 5:00 pm **AU SURFACE CHEMO-RESISTIVITY IMPROVEMENT USING METAL DEPOSITION VIA SLRR**
Kamyar Ahamdi, and Dongjun Wu, and Stanko R. Brankovic

5:00 – 5:15 pm **A MAGNESIUM-SODIUM HYBRID BATTERY WITH HIGH OPERATING VOLTAGE**
Hui Dong, Yifei Li, Yanliang Liang, Guosheng Li, Chengjun Sun, Yang Ren, Yuhao Lu, and Yan Yao

5:15 – 5:30 pm	**KINETIC MODELING OF CVD GRAPHENE GROWTH** Sirui Xing and Shin-Shem Pei
5:30– 6:00 pm	**Elevator Talks by CDC Students**, Hosted by Dr. Len Trombetta, Waldorf Astoria, Ballroom, Room 210
6:00 – 6.30 pm	**Awards Ceremony and Reception**, Waldorf Astoria, Ballroom, Room 210

Plenary Presentation “Follow the Nano Brick Road” by

Professor TERI ODOM
Department of Chemistry,
Northwestern University
Evanston, Illinois

ABSTRACT:

The seed ideas for manipulating matter at the nanoscale were planted in Richard Feynman’s famous speech in 1959: There’s Plenty of Room at the Bottom. Nearly 40 years after this prophetic talk, the establishment of nanoscience as a major field of research was well on its way, with major breakthroughs in synthesizing nanomaterials, characterizing their physical properties, and integrating them into devices. This talk will describe my journey into and my contributions to nanoscience. I will discuss how a confluence of resources, environment, and mentoring gave my research lab a jump-start into this exciting field as well as how collaborations and opportunities provide the fuel to continue building our yellow brick road out of nano-gold and structured nanoscale materials.

BIOGRAPHY:

Teri W. Odom is Charles E. and Emma H. Morrison Professor of Chemistry and Professor of Materials Science and Engineering at Northwestern University. She is an expert in designing structured nanoscale materials that exhibit extraordinary size and shape-dependent optical properties. Odom has pioneered a suite of multi-scale nanofabrication tools that has resulted in flat optics that can manipulate light at the nanoscale and beat the diffraction limit, plasmon-based nanoscale lasers that exhibit tunable color, and hierarchical substrates that show controlled wetting and super-hydrophobicity. She has also invented a class of biological nanoconstructs that are facilitating unique insight into nanoparticle-cell interactions and that show superior imaging and therapeutic properties because of their gold nanostar shape.

Professor Odom has received numerous honors and awards, including being named a Fellow of the Royal Society of Chemistry; the Carol Tyler Award from the International Precious Metals Institute; a Blavatnik Young Scientist Finalist; a Radcliffe Institute for Advanced Study Fellowship at Harvard University; the ACS Akron Section Award; an NIH Director's Pioneer Award from the National Institutes of Health; the Materials Research Society Outstanding Young Investigator Award; the National Fresenius Award from Phi Lambda Upsilon and the ACS; the Rohm and Haas New Faculty Award; an Alfred P. Sloan Research Fellowship; a DuPont Young Investigator Grant; a National Science Foundation CAREER Award; the ExxonMobil Solid State Chemistry Faculty Fellowship; and a David and Lucile Packard Fellowship in Science and Engineering. Odom was the first Chair of the Noble Metal Nanoparticles Gordon Research Conference, whose inaugural meeting was in 2010. In addition, Odom was an Associate Editor for RSC's flagship journal Chemical Science (2009-2013) and is on the Editorial Advisory Boards of ACS Nano, Chemical Physics Letters, Materials Horizons, Annual Reviews of Physical Chemistry, and Nano Letters. She serves as founding Executive Editor of the new journal ACS Photonics (2013 -).