

The Second NSF Enhancing Access to the Radio Spectrum (EARS) Principal Investigator Meeting

A National Science Foundation Event Co-Located with
WinnComm 2016 Conference

15 March 2016, Reston, Virginia



PI Meeting Co-Chairs:

Thomas Hou, Virginia Tech
Daniela Tuninetti, University of Illinois at Chicago

PI Meeting Support Team:

Lee Pucker, Wireless Innovation Forum
Robert Dziuban, Drohan Management Group

NSF EARS Program Directors:

Wenjing Lou, CISE/CNS
Thyagarajan Nandagopal, CISE/CNS
Chengshan Xiao, ENG/ECCS
Hao Ling, ENG/ECCS
Lawrence S. Goldberg, ENG/ECCS
Glen Langston, MPS/AST

2016 NSF EARS PI Meeting Agenda

- 7:30am Registration opens (Foyer)
- 8:30am – 9:30am Opening Session (Diamond Ballrooms ABC)
Welcome
Tom Hou & Daniela Tuninetti, Co-Chairs of EARS PI Meeting
Lee Pucker, Wireless Innovation Forum
Andrew Clegg, WinnComm Conference Chair
Keynote talk by Ira Keltz, FCC
- 9:30am – 10:00am Break (Foyer)
- 10:00am – 11:00am Oral Project Presentation I (Diamond Ballrooms ABC)
(12 projects, 5 min. each, see page 3)
- 11:00am – 12:00pm Poster Presentation I (Rooms 1-2 and 9-10)
(see pages 4-5)
- 12:00noon – 1:30pm Lunch (Diamond Ballrooms ABC)
Address by Pramod P. Khargonekar, Assistant Director of NSF ENG Directorate
- 1:30pm – 2:00pm EARS Workshop Report and New EARS Solicitation (Diamond Ballrooms ABC)
Jeff Reed (Virginia Tech): EARS workshop report briefing
Thyaga Nandagopal (NSF): New EARS program solicitation
NSF EARS PDs: Q&A about EARS program
- 2:00pm – 3:00pm Oral Project Presentation II (Diamond Ballrooms ABC)
(12 projects, 5 min. each, see page 6)
- 3:00pm – 4:00pm Poster Presentation II (Rooms 1-2 and 9-10)
(see pages 7-8)
- 4:00pm – 4:30pm Break (Foyer)
- 4:30pm – 5:30pm Poster Presentation III (Rooms 1-2 and 9-10)
(see pages 9-10)
- 5:30pm – 6:00pm PI meeting report and wrap-up (Diamond Ballrooms ABC)

Oral Presentation I (10:00am – 11:00am, Diamond Ballroom ABC)

Oral Presentation Order & Time	Project
1 10:00am	A Modern Evolvable Architecture for Spectrum Regulation Sahai, Anant (University of California-Berkeley)
2 10:05am	Collaborative Research: Dynamic Exclusion Zones: Balancing Incumbent Protection and Spectrum Utilization Efficiency Park, Jung-Min (Virginia Polytechnic Institute and State University) Lehr, William H. (Massachusetts Institute of Technology)
3 10:10am	Collaborative Research: EARS: Crowd-based Spectrum Monitoring and Enforcement Zheng, Haitao (University of California-Santa Barbara) Zhou, Xia (Dartmouth College)
4 10:15am	Collaborative Research: Enhancing Access to Radio Spectrum for Real-time Monitoring and Control Modiano, Eytan (Massachusetts Institute of Technology) Berry, Randall A. (Northwestern University)
5 10:20am	Collaborative Research: Measurement-Augmented Spectrum Databases for White Spaces Das, Samir R. (SUNY at Stony Brook) Roy, Sumit (University of Washington)
6 10:25am	Collaborative Research: Radio Frequency Interference Aware Radio Astronomy Systems Torlak, Murat (University of Texas at Dallas) Creighton, Teviet (University of Texas at Brownsville)
7 10:30am	EARS: Modeling and Analysis of Radar / Communications Spectrum Sharing Opportunities Roberson, Dennis A. (Illinois Institute of Technology)
8 10:35am	Policies for Cellular Television Peha, Jon M. (Carnegie-Mellon University)
9 10:40am	Realtime GHz-Wide Spectrum Sensing and Acquisition Using the Sparse FFT Katabi, Dina (Massachusetts Institute of Technology)
10 10:45am	Collaborative Research: Overcoming Technological Challenges for Spectrum Trading Ding, Zhi (University of California-Davis) Li, Geoffrey Ye (Georgia Institute of Technology)
11 10:50am	EARS: Adaptive Behavioral Responses for Dynamic Spectrum Access-Based Connected Vehicle Networks Wygliński, Alexander (Worcester Polytechnic Institute)
12 10:55am	EARS: Collaborative Research: Laying the Foundations of Social Network-Aware Cellular Device-to-Device Communications Han, Zhu (University of Houston) Saad, Walid (Virginia Tech) Thai, My T. (University of Florida)

Poster Presentation I (11:00am – 12:00pm)*Posters 1 to 17 in Rooms 1-2, Posters 18-33 in Room 9-10*

Poster Board & Room	Project
1 Room 1-2	A Modern Evolvable Architecture for Spectrum Regulation Sahai, Anant (University of California-Berkeley)
2 Room 1-2	Collaborative Research: Dynamic Exclusion Zones: Balancing Incumbent Protection and Spectrum Utilization Efficiency Park, Jung-Min (Virginia Tech); Lehr, William H. (MIT)
3 Room 1-2	Collaborative Research: EARS: Crowd-based Spectrum Monitoring and Enforcement Zheng, Haitao (University of California-Santa Barbara); Zhou, Xia (Dartmouth College)
4 Room 1-2	Collaborative Research: Enhancing Access to Radio Spectrum for Real-time Monitoring and Control Modiano, Eytan (MIT); Berry, Randall A. (Northwestern University)
5 Room 1-2	Collaborative Research: Measurement-Augmented Spectrum Databases for White Spaces Das, Samir R. (SUNY at Stony Brook); Roy, Sumit (University of Washington)
6 Room 1-2	Collaborative Research: Radio Frequency Interference Aware Radio Astronomy Systems Torlak, Murat (University of Texas at Dallas) Creighton, Teviet (University of Texas at Brownsville)
7 Room 1-2	EARS: Modeling and Analysis of Radar / Communications Spectrum Sharing Opportunities ----- Roberson, Dennis A. (Illinois Institute of Technology)
8 Room 1-2	Policies for Cellular Television Peha, Jon M. (Carnegie-Mellon University)
9 Room 1-2	Realtime GHz-Wide Spectrum Sensing and Acquisition Using the Sparse FFT Katabi, Dina (Massachusetts Institute of Technology)
10 Room 1-2	Collaborative Research: Overcoming Technological Challenges for Spectrum Trading Ding, Zhi (University of California-Davis) Li, Geoffrey Ye (Georgia Institute of Technology)
11 Room 1-2	EARS: Adaptive Behavioral Responses for Dynamic Spectrum Access-Based Connected Vehicle Networks ----- Wyglinski, Alexander (Worcester Polytechnic Institute)
12 Room 1-2	EARS: Collaborative Research: Laying the Foundations of Social Network-Aware Cellular Device-to-Device Communications Han, Zhu (University of Houston); Saad, Walid (Virginia Tech) Thai, My T. (University of Florida)
13 Room 1-2	EARS: Paving the way to dynamic spectrum sharing: Understanding regulatory and enforcement mechanisms Reed, Jeffrey H. (Virginia Polytechnic Institute and State University)
14 Room 1-2	Collaborative Research: Virtualized Wireless Networks and Their Impact on Capacity Markets Weiss, Martin B. (University of Pittsburgh) DaSilva, Luiz A. (Virginia Polytechnic Institute and State University)
15 Room 1-2	EARS: A TV Whitespace Communication System for Connected Vehicles Banerjee, Suman (University of Wisconsin-Madison)
16 Room 1-2	EARS: Collaborative Research: Let's share CommRad -- spectrum sharing between communications and radar systems Tuninetti, Daniela (University of Illinois at Chicago) Bell, Mark R. (Purdue University)
17 Room 1-2	Strategies for Co-existence of Radio Telescope Arrays with Broadcast Stations and Wireless Communication Systems ----- Amin, Moeness G. (Villanova University)

18 Room 9-10	Collaborative Research: Cog-TV: Business and Technical Analysis of Cognitive Radio TV Sets for Enhanced Spectrum Access Ekici, Eylem (Ohio State University) Vuran, Mehmet C. (University of Nebraska-Lincoln)
19 Room 9-10	Collaborative Research: Design, Analysis and Implementation of Social Interactions in Cognitive Radio Networks Qiu, Robert C. (Tennessee Technological University) Li, Husheng (University of Tennessee Knoxville)
20 Room 9-10	Collaborative Research: EARS: Cognitive and Efficient Spectrum Access in Autonomous Wireless Networks Wang, Xin (SUNY at Stony Brook) Mao, Shiwen (Auburn University) Viswanathan, Harish (Lucent Technologies Bell Laboratories)
21 Room 9-10	Collaborative Research: EARS: Large-Scale Statistical Learning based Spectrum Sensing and Cognitive Networking Cui, Shuguang (Texas A&M University) Shu, Tao (Oakland University) Yang, Liuqing (Colorado State University)
22 Room 9-10	Collaborative Research: Extreme Densification of Wireless Networks Johari, Ramesh (Stanford University) de Veciana, Gustavo A. (University of Texas at Austin)
23 Room 9-10	Collaborative Research: Spectrum Efficient Waveform Design with Application to Wireless Networks Liang, Qilian (University of Texas at Arlington) Wang, Jie (University of Massachusetts Lowell) Choi Hyeong-Ah (George Washington University)
24 Room 9-10	EARS: Achieving Spectrum Efficient Broadcast under Cross-Technology Interference He, Tian (University of Minnesota-Twin Cities)
25 Room 9-10	EARS: CogCloud: A Spectrum-efficient and Green Cloud Platform for Radio-as-a-Service Over a Cognitive Radio Substrate ----- Tang, Jian (Syracuse University)
26 Room 9-10	EARS: Collaborative Research: Full Duplex for Cognitive Networks Srinivasan, Kannan (Ohio State University) Qiu, Lili (University of Texas at Austin)
27 Room 9-10	EARS: Collaborative Research: Intelligence Measure of Cognitive Radio Networks Li, Xiaohua (SUNY at Binghamton) Zeng, Kai (George Mason University)
28 Room 9-10	EARS: Efficient Spectrum Allocation Auctions in Secondary Markets with Dynamic Random Supply and Demand ----- Xiao, Li (Michigan State University)
29 Room 9-10	EARS: Enhanced Spectrum Availability and MU-MIMO Coordination for High Spatial-Spectral Efficiency ----- Knightly, Edward W. (Rice University)
30 Room 9-10	EARS: Enhancing Spectrum Efficiency of Autonomous and Agile Hybrid FSO/RF Systems ----- Li, Jing (Lehigh University)
31 Room 9-10	EARS: Joint Optimization of RF Design and Smartphone Sensing: From Adaptive Sniffing to WAZE-Inspired Spectrum Sharing ----- Zhang, Junshan (Arizona State Univ.)
32 Room 9-10	EARS: Millimeter Wave Massive MIMO: A New Frontier for Enhanced Radio Access Swindlehurst, Arnold L. (University of California-Irvine)
33 Room 9-10	EARS: Novel Beam Steering Apertures and Waveforms for High Capacity Broadband Wireless Nodes ----- Ali, Mohammad (University South Carolina)

Oral Presentation II (2:00pm – 3:00pm, Diamond Ballroom ABC)

Oral Presentation Order & Time	Project
1 2:00pm	EARS: Spectrum and Infrastructure Sharing in Millimeter Wave Cellular Networks Rangan, Sundeep (New York University)
2 2:05pm	EARS: Utilizing Diverse Spectrum Bands in Cellular Networks - A Unified Information Learning and Decision Making Approach Liu, Xin (University of California-Davis)
3 2:10pm	Techno-Economic Models of Secondary Spectrum Use Weiss, Martin B. (University of Pittsburgh)
4 2:15pm	EARS: Joint Circuit and Waveform Optimization for Cognitive, Spectrally Confined Radar Transmission Baylis, Charles P. (Baylor University)
5 2:20pm	Collaborative Research: EARS: Broadband Mobile Wireless Access Using mm-Waves Bands Beyond 100 GHz Reece, Michel A. (Morgan State University) Niknejad, Ali (University of California-Berkeley)
6 2:25pm	EARS: BeamSpace Communication Techniques and Architectures for Enabling Gigabit Mobile Wireless at Millimeter-Wave Frequencies Sayeed, Akbar M. (University of Wisconsin-Madison)
7 2:30pm	EARS: Collaborative Research: Mobile Millimeter-Wave Networking: Distributed Cognition and Coordination Algorithms using Novel On-Chip Phased-Arrays Gursoy, Mustafa C. (Syracuse University) Eryilmaz, Atilla (Ohio State University)
8 2:35pm	EARS: Cross Layering in Full Duplex - from Integrated Circuits to Networking Zussman, Gil (Columbia University)
9 2:40pm	EARS: Future Wireless Broadband Access: Cross-Optimizing Hardware, Physical and Network Layers Psounis, Konstantinos (University of Southern California)
10 2:45pm	EARS: Photonically-Enabled Extremely Wideband Compressive Wireless Spectrum Sensing Foster, Mark (Johns Hopkins University)
11 2:50pm	EARS: Spectrally Aware Interference Tolerant RF Nanosystems Peroulis, Dimitrios (Purdue University)
12 2:55pm	EARS: Enabling local spectrum markets for enhanced access and flexible service Kar, Koushik (Rensselaer Polytechnic Institute)

Poster Presentation II (3:00pm – 4:00pm)*Posters 1 to 17 in Rooms 1-2, Posters 18-33 in Room 9-10*

Poster Board & Room	Project
1 Room 1-2	EARS: Spectrum and Infrastructure Sharing in Millimeter Wave Cellular Networks Rangan, Sundeep (New York University)
2 Room 1-2	EARS: Utilizing Diverse Spectrum Bands in Cellular Networks - A Unified Information Learning and Decision Making Approach Liu, Xin (University of California-Davis)
3 Room 1-2	Techno-Economic Models of Secondary Spectrum Use Weiss, Martin B. (University of Pittsburgh)
4 Room 1-2	EARS: Joint Circuit and Waveform Optimization for Cognitive, Spectrally Confined Radar Transmission Baylis, Charles P. (Baylor University)
5 Room 1-2	Collaborative Research: EARS: Broadband Mobile Wireless Access Using mm-Waves Bands Beyond 100 GHz Reece, Michel A. (Morgan State University) Niknejad, Ali (University of California-Berkeley)
6 Room 1-2	EARS: Beamspace Communication Techniques and Architectures for Enabling Gigabit Mobile Wireless at Millimeter-Wave Frequencies Sayeed, Akbar M. (University of Wisconsin-Madison)
7 Room 1-2	EARS: Collaborative Research: Mobile Millimeter-Wave Networking: Distributed Cognition and Coordination Algorithms using Novel On-Chip Phased-Arrays Gursoy, Mustafa C. (Syracuse University); Eryilmaz, Atilla (Ohio State University)
8 Room 1-2	EARS: Cross Layering in Full Duplex - from Integrated Circuits to Networking Zussman, Gil (Columbia University)
9 Room 1-2	EARS: Future Wireless Broadband Access: Cross-Optimizing Hardware, Physical and Network Layers Psounis, Konstantinos (University of Southern California)
10 Room 1-2	EARS: Photonically-Enabled Extremely Wideband Compressive Wireless Spectrum Sensing Foster, Mark (Johns Hopkins University)
11 Room 1-2	EARS: Spectrally Aware Interference Tolerant RF Nanosystems Peroulis, Dimitrios (Purdue University)
12 Room 1-2	EARS: Enabling local spectrum markets for enhanced access and flexible service Kar, Koushik (Rensselaer Polytechnic Institute)
13 Room 1-2	A New Dimension in Radio Spectrum Sharing through Network Cooperation Reed, Jeffrey H. (Virginia Polytechnic Institute and State University)
14 Room 1-2	EARS: Collaborative Research: Big Bandwidth: Finding Anomalous Needles in the Spectrum Haystack Trappe, Wade K. (Rutgers University New Brunswick) Prucnal, Paul R. (Princeton University)
15 Room 1-2	Spectrum Sharing in the Shadow of Uncertainty: Risk, Incentives and Investment Berry, Randall A. (Northwestern University)
16 Room 1-2	Multi-Tier Spectrum Sharing and Connected Vehicles Peha, Jon M. (Carnegie-Mellon University)
17 Room 1-2	EARS: Collaborative Research: Full-Duplex Cognitive Radio: A New Design Paradigm for Enhancing Spectrum Usage Han, Zhu (University of Houston); Aazhang, Behnaam (Rice University)

18 Room 9-10	Collaborative Research: Preserving User Privacy in Server-driven Dynamic Spectrum Access System Yang, Yaling (Virginia Polytechnic Institute and State University) Ren, Kui (SUNY at Buffalo)
19 Room 9-10	EARS: Machine Learning and Social Protocols for Enhancing Spectrum Access for Wireless Communications ----- Lindqvist, Janne (Rutgers University New Brunswick)
20 Room 9-10	EARS: SAVANT - High Performance Dynamic Spectrum Access via Inter Network Collaboration ----- Raychaudhuri, Dipankar (Rutgers University New Brunswick)
21 Room 9-10	WiFO: Hybrid WiFi-FSO Network for WLAN Femtocells Nguyen, Thinh P. (Oregon State University)
22 Room 9-10	Cognitive Networking for Wireless Communication in Rural Areas: A Directional Antennas and Propagation Modeling Approach with Low Cost Iskander, Magdy F. (University of Hawaii)
23 Room 9-10	Collaborative Research: EARS: Fundamental Limits of Spectrum Sensing Tajer, Ali (Wayne State University) Poor, Harold Vincent (Princeton University)
24 Room 9-10	Collaborative Research: EARS: Interference mitigation by stream decomposition enabled by liquid-metal adaptive antennas Nosratinia, Aria (University of Texas at Dallas) Ohta, Aaron T. (University of Hawaii)
25 Room 9-10	EARS: Collaborative Research: Cognitive Mesh: Making Cellular Networks More Flexible Fang, Yuguang (University of Florida) Li, Pan (Case Western Reserve Univ.) Pan, Miao (University of Houston)
26 Room 9-10	EARS: Collaborative Research: Spectrum Sensing for Coexistence of Active and Passive Radio Services Tian, Zhi (George Mason University) Kim, Seung-Jun (University of Maryland Baltimore County) Waldrop, Lara S. (University of Illinois at Urbana-Champaign)
27 Room 9-10	EARS: A New Class of Millimeter-wave Phased Arrays for Secure High Data Rate Systems with Low Power Back-Ends ----- Volakis, John (Ohio State University)
28 Room 9-10	EARS: A Wideband Frequency-Agile Silicon Photonic mm-Wave Receiver with Automatic Jammer Suppression via Rapidly Reconfigurable Optical Notch Filters Palermo, Samuel (Texas A&M University)
29 Room 9-10	EARS: Collaborative Research: Enhancing Spectral Access via Directional Spectrum Sensing Employing 3D Cone Filterbanks: Interdisciplinary Algorithms and Prototypes Madanayake, Habarakada (University of Akron) Xin, Chunsheng (Old Dominion University) Devabhaktuni, Vijaya Kumar (University of Toledo)
30 Room 9-10	EARS: Signal processing techniques for enhancing spectrum access in wireless networks using coupled antenna arrays ----- Bahrami, Hamid (University of Akron)
31 Room 9-10	EARS: Spectrum Sharing for Short-Latency Immersive Wireless Applications Nikolic, Borivoje (University of California-Berkeley)
32 Room 9-10	EARS: Energy-Efficient Millimeter-wave Communication via Adaptation and Reconfiguration ----- Paramesh, Jeyanandh (Carnegie-Mellon University)
33 Room 9-10	EARS: Development of tunable frequency selective limiters based on novel magnetic nanomaterials for RFI mitigation in a crowded spectrum environment Papapolymerou, Ioannis (John) (Georgia Tech)

Poster Presentation III (4:30pm – 5:30pm)*Posters 1 to 17 in Rooms 1-2, Posters 18-33 in Room 9-10*

Poster Board & Room	Project
1 Room 1-2	A New Paradigm for Spectrum Sharing between Wireless Communications and Radio Astronomy ----- Minn, Hlaing (University of Texas at Dallas)
2 Room 1-2	A System Dynamics Approach to Mobile Broadband Spectrum Requirement Analysis Dellomo, Michael (University of Maryland College Park)
3 Room 1-2	Achieving Efficient Spectrum Usage in Active and Passive Sensing Through a Market-Based Approach ----- Johnson, Joel T. (Ohio State University)
4 Room 1-2	Blocker-Tolerant Wideband Cognitive Spectrum Sensor Hoyos, Sebastian (Texas A&M University)
5 Room 1-2	Collaborative Research: Applying Behavioral-Ecological Network Models to Enhance Distributed Spectrum Access in Cognitive Radio Khan, Bilal A. (CUNY John Jay College of Criminal Justice)
6 Room 1-2	Collaborative Research: EARS: Creating an Ecosystem for Enhanced Spectrum Utilization Through Dynamic Market Mechanisms Shakkottai, Srinivas (Texas A&M University); Subramanian, Vijay G. (Northwestern University); Nguyen, Thanh (Purdue University)
7 Room 1-2	Collaborative Research: Investigation of Spectrum Sharing Between Radar and Wireless Communications Systems Deng, Hai (Florida International University)
8 Room 1-2	Collaborative Research: Multi-Input Multi-Output (MIMO) Aware Cooperative Dynamic Spectrum Access Liu, Hang (Catholic University of America); Cheng, Xiuzhen (George Washington University) Chen, Dechang (Henry M Jackson Fdn for Advmt of Military Medicine)
9 Room 1-2	Collaborative Research: Pervasive Spectrum Sharing for Public Safety Kapucu, Naim (University of Central Florida) Saad, Walid (Virginia Tech); Guvenc, Ismail (Florida International University) Yuksel, Murat (University of Nevada, Reno)
10 Room 1-2	Collaborative Research: EARS: Spectrum and Energy Efficient Radio Resource Access in Wireless Networks with Densely Deployed Underlay Devices Qian, Yi (University of Nebraska-Lincoln); Hu, Rose Qingyang (Utah State University)
11 Room 1-2	EARS: Spectrum Efficiency Analysis using Multisite Spectrum Observatory Network Roberson, Dennis A. (Illinois Institute of Technology)
12 Room 1-2	ECCS - EARS: Collaborative Research: Enhanced Radio Spectrum via Information Acquisition and Learning Krishnamachari, Bhaskar (University of Southern California) Javidi, Tara (University of California-San Diego)
13 Room 1-2	Enabling Algorithms, Signal Processing, and Circuits for Agile Cognitive Radio in CMOS Technology ----- Buckwalter, James F. (University of California-San Diego)
14 Room 1-2	Enhancement of Spectrum Decision through Probabilistic Graphical Models Kaabouch, Naima (University of North Dakota Main Campus)
15 Room 1-2	High Dynamic Range Wideband Reconfigurable Receivers Bardin, Joseph (University of Massachusetts Amherst)
16 Room 1-2	Manifold-Based System for Passive-Active Spectrum Sharing Gasiewski, Albin J. (University of Colorado at Boulder)
17 Room 1-2	Spectral Tweets: A Community Paradigm for Spatio-temporal Cognitive Sensing and Access Sidiropoulos, Nikolaos D. (University of Minnesota-Twin Cities)

18 Room 9-10	Collaborative Research: A multi-layer approach towards reliable cognitive radio networks Trappe, Wade K. (Rutgers University New Brunswick) Thomas Hou (Virginia Polytechnic Institute and State University)
19 Room 9-10	Dynamic Behavior and Coexistence of Intelligent Radio Spectrum Access Systems Li, Xiaohua (SUNY at Binghamton)
20 Room 9-10	EARS: Accelerating Spectrum Access in Cognitive Radio Networks via Social Analysis of Secondary Users ----- Xie, Jiang (Linda) (University of North Carolina at Charlotte)
21 Room 9-10	EARS: Collaborative Research: Crowdsourcing-based Spectrum Etiquette Enforcement in Dynamic Spectrum Access Yang, Dejun (Colorado School of Mines); Li, Ming (University of Arizona)
22 Room 9-10	EARS: Collaborative Research: Maximizing Spatio-Temporal Spectrum Efficiency in the Cloud Akyildiz, Ian F. (Georgia Tech Research Corporation) Wang, Pu (Wichita State University)
23 Room 9-10	EARS: Collaborative: Comprehensive Network State Inference for Robust and Policy-Cognizant Spectrum Access Giannakis, Georgios B. (University of Minnesota-Twin Cities) Baxley, Robert J. (Georgia Tech Applied Research Corporation)
24 Room 9-10	EARS: Compact Adaptive MIMO Receivers Floyd, Brian A. (North Carolina State University)
25 Room 9-10	EARS: Providing Predictable Service and Spectrum Access With Realtime Decision in Cognitive Multihop Wireless Networks Li, Xiang-Yang (Illinois Institute of Technology)
26 Room 9-10	EARS: Directional Spectrum Sensing and Communications Utilizing Beam- and Frequency-Agile Parasitic Antenna Arrays ----- Vosoughi, Azadeh; Gong, Xun (University of Central Florida)
27 Room 9-10	EARS: Enhancing Radio-Frequency Spectrum Through Interference Resilient Cognitive Radio Systems: Design, Performance Analysis and Optimization Narayanan, Krishna (Texas A&M University)
28 Room 9-10	EARS: GOALI: Low-Power, Multi-Tiered, Shared-Spectrum Access Terminals using Compressive Scanning and On-Top-of-CMOS BAW Filter Banks Kinget, Peter R. (Columbia University)
29 Room 9-10	EARS: Intelligent and Cross-Layer Attack and Defense in Spectrum Sharing Dai, Huaiyu (North Carolina State University)
30 Room 9-10	EARS: Interference-Aware RF Theory and Design Avestimehr, Amir S. (Cornell University)
31 Room 9-10	Reconfigurable Bandpass Sampling Receivers for Software-Defined Radio Applications Liu, Xiaoguang (University of California-Davis)
32 Room 9-10	Efficient Temporal-Spatial Spectrum Sharing through Voluntary Exchange Zhou, Xiangwei (Southern Illinois University at Carbondale)
33 Room 9-10	MEMS Reconfigurable Radios: System Development and Entry Costs in Wireless Phones Rais-Zadeh, Mina (University of Michigan Ann Arbor)

SALES & CATERING OFFICE

SALON D

DIAMOND BALLROOM C

DIAMOND BALLROOM B

**Oral Presentations
and Luncheon Reg**

DIAMOND BALLROOM A

MAIN BALLROOM

SALON E

FRONT DESK

LOBBY

SALON F

FOYER

FITNESS CENTER

LINK@SHERATON

MAIN ENTRANCE

CRAVINGS & GIFT SHOP

TEN NINE
Posters
#18 - #33

EIGHT

SEVEN

SIX

CONFERENCE LOBBY

POOL

FIVE

FOUR

THREE

Posters

ONE TWO

#1 to #17