## Workshop 1: Energy-Efficient Networks of Computers (E2NC): From the Chip to the Cloud

**Keynote:** Power and Performance Considerations in the Data Center • Partha Kundu

**Workshops:**

### Workshop 1: Energy-Efficient Networks of Computers (E2NC): From the Chip to the Cloud

- **9:00 am – 10:00 am**
  - **Keynote:** Power and Performance Considerations in the Data Center • Partha Kundu

- **10:00 am – 10:30 am**
  - **Break**

- **10:30 am – 12:00 pm**
  - **Session 1**
    - **Chair:** Abhishek Agrawal
    - **Talks:**
      - Improving Linearity in Class-AB Power Amplifiers Using a Body-Biased NMOS Predistortion Stage • Hooman Rashtian and Shahriar Mirabbasi
      - Drowsy Cache Partitioning for Reduced Static and Dynamic Energy in the Cache Hierarchy • Brendan Fitzgerald, Sonia Lopez Alarcon, and Julio Sahuquillo
      - An Efficiency Enhancement Technique for CMOS Rectifiers with Low Start-Up Voltage for UHF RFID Tags • Pouya Kamalinejad, Kamyar Keikhosravay, Shahriar Mirabbasi, and Victor C.M. Leung

### Session 2

- **12:00 pm – 1:30 pm**
  - **Lunch**

- **1:30 pm – 3:00 pm**
  - **Session 2**
    - **Chair:** Amlan Ganguly and Partha Pande
    - **Talks:**
      - Management of Large-Scale Wireless Sensor Networks Utilizing Multi-Parent Recursive Area Hierarchies • Johnathan Cree and Jose Delgado-Frias
      - Vector Repacking Algorithms for Power-Aware Computing • Mario Consuegra, Giri Narasimhan, and Raja Rangaswami
      - Dynamic Task Graph Scheduling on Multicore Processors for Performance, Energy, and Temperature Optimization • Hafiz Fahad Sheikh and Ishaq Ahmad

## Workshop 2: Power Measurement and Profiling (PMP)

**Session Chair:** Abhishek Agrawal

- **9:00 am – 10:30 am**
  - **Session 1**
    - **Chair:** Abhishek Agrawal
    - **Talks:**
      - Temperature Effects on On-Chip Energy Measurements • Juan M. Cebran and Lasse Natvig
      - PowerInsight - A Commodity Power Measurement Capability • James Laros, Phil Pokorny, and David Debonis
      - Granular CPU Power Measurement for SMP Clusters • David Newsom, Ahmad Anbar, Tarek El-Ghazawi, and Sardar Azari

- **10:30 am – 11:00 am**
  - **Break**

- **11:00 am – 1:00 pm**
  - **Session 2**
    - **Chair:** Abhishek Agrawal
    - **Talks:**
      - Statistical Modeling of Power/Energy of Scientific Kernels on a Multi-GPU System • Sayan Ghosh, Sunita Chandrasekaran, and Barbara Chapman
      - Auto-Tuning Multi-Programmed Workload on the SCC • Brian Roscoe, Mathias Herlev and Chen Liu

### Workshop 3: Computing for Water Sustainability

**Session Chair:** Carol J. Miller and Shawn P. McElmurry

- **1:00 pm – 3:00 pm**
  - **Session 1**
    - **Chair:** Carol J. Miller and Shawn P. McElmurry
    - **Talks:**
      - Optimizing Water Distribution System Storage and Its Influences on Pollutant Emission Reduction • Steven Jin, Carrie Loya-Smatley, and Aami Qaqish
      - Energy Cost Optimization in Water Distribution Systems using Markov Decision Processes • Paulo Fracasso, Frank Barnes, and Anna Costa
      - A Case Study of Energy Optimization in Monroe Water Distribution System • Fatemeh Alighalehbakhani, Carol J. Miller, Shawn McElmurry, and Seyed Moshen Sadatiyan Abkenar
      - Optimizing Pumping System for Sustainable Water Distribution Network by Using Genetic Algorithm • Seyed Moshen Sadatiyan Abkenar, Samuel Dustin Stanley, Donald Chase, Carol Miller, and Shawn P. McElmurry
      - A Smart-Phone Application for Home Emissions Estimates • Guoyao Xu, Michelle Rogers, Carol Miller, Shawn McElmurry, Weisong Shi, Caisheng Wang, Yang Wang, and Cheng-Zhong Xu
FRIDAY, JUNE 28TH

8:30 - 10:00 am  
KEYNOTE: ENERGY-AWARE ROBUST RESOURCE MANAGEMENT FOR PARALLEL COMPUTING SYSTEMS  
H.J. Siegel  
| Vivace A

10:00 - 10:30 am  
BREAK  
| Vivace A

10:30 am - 12:00 pm  
SESSION 1A: POWER-AWARE MULTI-CORE SYSTEMS  
| Vivace A

10:30 am – 12:00 pm session 1A: Power-Aware Multi-Core Systems

Session Chair: Ken Christensen
- REMEDIATE: A Scalable Fault-Tolerant Architecture for Low-Power NoC Cache in Tiled CMPs • Abbas Banaiyannofrad, Houman Homayoun, Vasileios Kontorinis, Dean Tullsen, and Nikil Dutt
- Energy-Aware Task Replication to Manage Reliability for Periodic Real-Time Applications on Multicore Platforms • Mohammad Haque, Hakan Aydin and Dakai Zhu
- A Distributed File System for Intermitent Power • Navin Sharma, David Irwin, and Prashant Shenoy

12:00 - 1:30 pm  
LUNCH  
| Terrace

1:30 - 3:00 pm  
SESSION 1C: GREEN CLOUD COMPUTING AND CONTENT DELIVERY  
| Vivace A

1:30 - 3:00 pm session 1C: Green Cloud Computing and Content Delivery

Session Chair: Rong Ge
- Energy-Efficient Content Delivery Networks using Cluster Shutdown • Vimal Mathew, Ramesh Sitaraman, and Prashant Shenoy
- Providing Green SLAs in High Performance Computing Clouds • Md E. Haque, Kien Le, Inigo Goiri, Ricardo Bianchini, and Thu D. Nguyen
- Implementing Green Technologies and Practices in a High Performance Computing Center • Jay Patel, Salvatore Guercio, Andrew Bruno, Matthew Jones, and Thomas Furlani

3:00 - 3:30 pm  
BREAK  
| Vivace A

3:30 - 5:00 pm  
SESSION 1E: POWER-AWARE TASK SCHEDULING  
| Vivace A

3:30 - 5:00 pm session 1E: Power-Aware Task Scheduling

Session Chair: Shaolei Ren
- Your Cluster is not Power Homogeneous: Take Care when Designing Green Schedulers • Mohammed El Mehdi Dlouyi, Olivier Glück, Laurent Lefèvre, and Jean-Christophe Mignot
- Optimizing Communication and Cooling Costs in HPC Data Centers via Intelligent Job Allocation • Fulya Kaplan, Jie Meng, and Ayse K. Coskun
- Energy-Aware Checkpointing of Divisible Tasks with Soft or Hard Deadlines • Guillaume Aupy, Anne Benoit, Rami Melhem, Paul Renaud-Goud, and Yves Robert

FRIDAY, JUNE 28TH

5:00 - 6:30 pm  
HAPPY HOUR  
| Terrace

SATURDAY, JUNE 29TH

8:30 - 10:00 am  
KEYNOTE: ENERGY ADAPTATION IN STORAGE SYSTEMS  
Krishna Kant  
| Vivace A

10:00 - 10:30 am  
BREAK  
| Vivace A

10:30 am - 12:00 pm  
SESSION 2A: ENERGY MANAGEMENT IN LARGE AND REAL-TIME SYSTEMS  
| Vivace A

10:30 am – 12:00 pm session 2A: Energy Management in Large and Real-Time Systems

Session Chair: Baniasadi Amirali
- Energy Management of Standby-Sparing Systems for Fixed-Priority Real-Time Workloads • Mohammad Haque, Hakan Aydin, and Dakai Zhu
- Locality Aware Power Optimization and Measurement Methodology for PGAS Workloads • David Newsom, Ahmad Anbar, Tarek El-Ghazawi, and Sardar Azari
- Online System for Energy Assessment in Large Facilities: Methodology and a Real-World Case Study • Venkata Ramakrishna P., Gollakota Kaushik, K. Loknath Sudhakar, Geetha Thiagarajan, and Anand Sivasubramaniam

3:00 - 3:30 pm  
BREAK  
| Vivace A

3:30 - 5:00 pm  
SESSION 2B: SMART BUILDINGS AND URBAN DEVELOPMENT  
| Vivace B

3:30 - 5:00 pm session 2B: Smart Buildings and Urban Development

Session Chair: Zong Ziliang
- Empirical Characterization and Modeling of Electrical Loads in Smart Homes • Sean Barker, Sandeep Kalra, David Irwin, and Prashant Shenoy
- Distributed Battery Control for Peak Power Shaving in Datacenters • Baris Aksanli, Eddie Pettis, and Tajana Simunic Rosing
- Enabling Advanced Environmental Conditioning with a Building Application Stack • Jay Taneja, Andrew Krioukov, Stephen Dawson-Haggerty, and David Culler
SUNDAY, AUGUST 26TH
12:00 - 1:30 pm LUNCH | Terrace
1:30 - 3:00 pm SESSION 2C: USING I.T. TO REDUCE CARBON EMISSIONS | Vivace A

Session Chair: Matthew Jones
- Towards an Architecture for Integrated Gas District Cooling with Data Center Control to Reduce CO₂ Emission • Jun Okitsu, Ken Naono, Mohd Fatimie Izaq Khaimis, Ahmad Abba Haruna, and Nordin Zakaria
- Effect of Climatic Conditions on Energy Consumption in Direct Fresh-Air Container Data Centers • Hiroshi Endo, Hiroyoshi Kodama, Hiroyuki Fukuda, Toshio Sugimoto, Takeshi Horie, and Masao Kondo
- Session Chair: Matthew Jones
- Towards an Architecture for Integrated Gas District Cooling with Data Center Control to Reduce CO₂ Emission • Jun Okitsu, Ken Naono, Mohd Fatimie Izaq Khaimis, Ahmad Abba Haruna, and Nordin Zakaria
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WIP SESSION 2D: ARCHITECTURE | Vivace B

Session Chair: Ali Hurson
- Adapting Data Quality with Multihop Routing for Energy-Harvesting Wireless Sensor Networks • Nga Dang, Mahnaz Roshanaei, Eli Bozorgzadeh, and Nalini Venkatasubramanian
- Application Specific Low Leakage Data Cache for Embedded Processors • Mostafa Farahani, Fatemeh Eslami, and Amirali Baniasadi
- Energy-Efficient Server Consolidation for Multi-threaded Applications in the Cloud • Can Hanksendi and Ayse Coskun
- Eco-Threading Framework for Commodity Platform • Shouta Nagashima and Shigeru Kusakabe

3:00 - 3:30 pm BREAK | Vivace Foyer
3:30 - 5:00 pm WIP SESSION 2E: POWER ANALYSIS | Vivace A

Session Chair: Behrooz Shirazi
- Operation Cost Minimization for Distributed Data Centers Through Exploring Electricity Price Diversity • Zichuan Xu and Weifa Liang
- The CÉSARA Architecture for an Energy and Thermal-Aware Placement of Virtual Machines • Daniel Versick and Djamshid Tavangarian
- Automatic Estimation of DVFS Potential • Nicolas Triquenaux, Alexandre Laurent, Benoit Pradelle, Jean Christophe Beyler, and William Jalby
- Energy Modeling of Supercomputers and Large-Scale Scientific Applications • Scott Pakin and Michael Lang

WIP SESSION 2F: SUSTAINABILITY | Vivace B

Session Chair: Sahra Sedigh
- Local Power Distribution with Nanogrids: A Position Paper • Bruce Nordman and Ken Christensen
- Green Computing: A Life Cycle Perspective • Alex Jones, Liang Liao, William Collinge, Hai Feng Xu, Laura Schaefer, Amy Landis, and Melissa Bilec
- Towards Green GPUs: Warp Size Impact Analysis • Ahmad Lashgar, Amirali Baniasadi, and Ahmad Khonsari
- A Power-Aware Multi Harvester Power Unit with Hydrogen Fuel Cell for Embedded Systems in Outdoor Applications • Michele Magno, Danilo Porcarelli, Davide Brunelli, and Luca Benini
- Smart Proxying: An Optimal Strategy for Improving Battery Life of Mobile Devices • Raffaele Bolla, Maurizio Giribaldi, Rafiullah Khan, and Matteo Repetto
- Classification of Sidewalks in Street View Images • Virginia Smith, Jitendra Malik, and David Culler
- Granular CPU Power Measurement for SMP Clusters • Thomas Wirtz, Rong Ge, Ziliang Zong, and Zizhong Chen