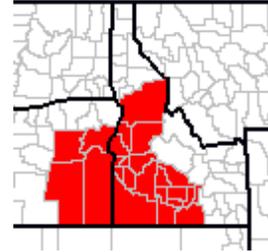# IEEE Boise Section
ieeeboise.org
Newsletter
January 2015

Upcoming Events

Electrostatic Nano Electromechanical Switches (NEMS) for Energy-Efficient Digital Systems
Date: 13 February 2015

Time:	9:00-11:00
Location:	Micron Technology, 8000 S. Federal Way, Bldg 17C, Boise 83716
Time:	13:30-14:30
Location:	Micron Engineering Center, 1060 Manitou Ave., Boise 83702

Abstract: Micro and nano-fabricated sensors and actuators have become commonplace in recent years and have transformed the interfaces between the physical world and the Internet. Nano-electromechanical switches (NEMS), by contrast, are intended for augmenting the performance of digital systems at the core of information technology. This talk will summarize recent research in NEMS, with a focus on designs using electrostatic actuation. The performance characteristics of NEMS are well-suited for a promising system application – implementing the programmable routing in field-programmable gate arrays (FPGAs). At Stanford, we have developed processes for fabricating lateral (in-plane) electrostatically actuated, multi-terminal switches on top of CMOS. I will review the fabrication challenges, contact phenomena, and scaling of lateral NEMS, as well as their micro-encapsulation and potential applications in charge-biased resonators and sensors.

About the Speaker: Roger T. Howe is the William E. Ayer Professor in Engineering at Stanford University. He received the B.S. degree in physics from Harvey Mudd College and the M.S. and Ph.D. in electrical engineering from the University of California, Berkeley in 1981 and 1984. After faculty positions at CMU and MIT from 1984-1987 and Berkeley from 1987-2005, he joined Stanford's Electrical Engineering Department. His research interests include nano/microelectromechanical system design and fabrication technologies, with applications in energy conversion and biomolecular sensing. He was elected an IEEE Fellow in 1996 and a member of the U.S. National Academy of Engineering in 2005. He serves as Faculty Director of the Stanford Nanofabrication Facility (SNF) and since 2011, as Director of the U.S. National Nanotechnology Infrastructure Network (NNIN).

National Engineers Week IEEE Boise Section Annual Banquet

Date: 24 February 2015
Time: 17:30-20:30
Location: Boise State University Student Union Building Lookout Room

You are invited to observe National Engineers Week by attending the IEEE Boise Section annual banquet with invited speaker Dr. Forrest Bao from the University of Akron, who will be presenting his brain image processing and signal processing research that can be used for the diagnosis and treatment of several neuropsychiatric disorders. This annual event is a unique opportunity to network with other technology-minded professionals and foster innovation within the Treasure Valley. IEEE Membership is *not required* to register, so encourage colleagues, friends and family to participate in this community happening.
Take advantage of early registration pricing, available now until 15 February 2015, and note that IEEE Senior Members receive an additional discount. Final registration ends February 22, 2015. Refer to this link, https://meetings.vtools.ieee.org/m/29601, for registration and speaker details.

IEEE Ski Day in Utah

The Utah and south Idaho sections are currently making plans for an IEEE Ski Day in the Salt Lake City area during the weekend of 7-8 or 14-15 March 2015. If you are interested in attending this event, please contact Chris Gunning at cgunning@ieee.org.

Boise Code Camp, March 21, 2015

Date: 21 March 2015
Time: Refer to http://boisecodecamp.com
Location: Boise State University

Boise's premier annual software development technical event will occur 21 March 2015 at Boise State University. IEEE will be one of the sponsors this year for this free event put on by the

community for the community. Boise Code Camp will have a full day's worth of sessions on topics including mobile technologies, web development, Open Source, database technologies, DIY, professional development, and more. Be sure to register in advance for this very popular event at http://boisecodecamp.com.

Northeast Area Meeting
Date: 21 March 2015
Time: Refer to www.ieeeboise.org
Location: Boise State University
IEEE Region 6 consists of the western US, and the Northeast Area of Region 6 consists of southern Idaho, Montana, and Utah. Volunteers from the six geographic sections that comprise this area as well as Region 6 officers will gather at Boise State University on March 21st for their spring planning meeting. The annual Northeast Area awards ceremony will also be held at this time.

Section News

Employment Network
Are you:
- Unemployed and looking for work?
- Employed but looking for a better job?
- Wanting to hire someone?
- Willing to advise a job seeker?
- Willing to represent your company to a job seeker?
- Interested in plugging into a job network "just in case"?

IEEE Boise Section is assessing membership interest in forming an Employment Network. The purpose of such a Network is to provide more local networking opportunities and group support for IEEE members seeking employment opportunities. If interested in participating in such a network, in any capacity, contact Dave Scott at djscott@micron.com.

Team from St. Mark's School Wins IEEE Award at Future City Idaho Competition
The "Grattogolau" team from St. Mark's School in Boise received the IEEE Best Communications Infrastructure Special Award at the Idaho Future City Regional Competition held 24 January 2015. The award was given to the team with the most comprehensive and creative design for communications within their city as well as to and from other cities.

The Future City Competition is a national, project-based learning experience where students in grades 6-8 imagine, design, and build cities of the future. Students work as a team with an educator and engineer mentor to plan cities using SimCity™ software; research and write solutions to an engineering problem; build tabletop scale models with recycled materials; and present their ideas before judges at Regional Competitions.

This year's competition included 27 teams from 19 different schools. Participants came from all over Idaho including Blackfoot, Boise, Caldwell, Cascade, Homedale, Kuna, Meridian, Nampa, Riggins, and Sandpoint as well as 3 teams from Park City, Utah. The first place team was the Lake Hazel ENAC team from Meridian. Regional winners represent their region at the National Finals in Washington, DC in February.

IEEE Boise Section was proud to be a regional sponsor of Future City again this year. Congratulations to all the teams, and a huge thank you to Mark Rau and Kevin Hess, our IEEE Special Awards Judges, who made our Section's participation in this event a huge success!

2015 Region 6 and Region 4 Joint Meeting in San Diego

Northeast Area Chair and Boise Computer Society Chair Chris Gunning and IEEE Boise Section Chair Sean Collison attended a joint IEEE Region 6 and Region 4 Meeting 23-25 January 2015 in San Diego. This joint meeting between Region 6 and Region 4 was the first of its kind and hosted Section leaders, along with Area and Region leaders. At the meeting Chris and Sean received training on the latest IEEE tools and technologies available for networking and hosting conferences and talks. Each section was given advanced microphone equipment which will allow them to record events—both audio and computer monitor feeds—for later playback by section members. Additionally, the meeting allowed for networking between section leaders to get tips and tricks on best section practices and ideas for events that worked well in other sections. Before the meeting a group of Section Leaders from the Utah Section, SE Idaho Section, Las Vegas Section, and Boise Section met for a tour of the USS Midway Aircraft Carrier across the street from the hotel.

2015 International Consumer Electronics Show

Boise State Student Branch Director of Communications Joe Fercho attended the 2015 International Consumer Electronics Show in Las Vegas 6-9 January 2015. The well-known gadget show was as large and grandiose as Las Vegas itself much like every year. The show spanned multiple locations with the main location being the Las Vegas Convention Center with satellite locations throughout Las Vegas. Every major electronics brand had some sort of presence. Samsung had everything from home appliances to smartphones to gigantic TV's. 4K resolution television was a major theme of the showcase with every manufacturer showing off their television sets and content providers guaranteeing the bright future of 4K content. 3D printing and the DIY maker's movement had a pretty large presence as well. Everyone from big players such as 3D Systems and Makerbot to nano-scale startups were showing off what they could make and how cheaply they could do so. BMW had 4 different models of cars they would allow attendees to drive, including a self-parking car, the I3. The biggest theme of the show though was the Internet of Things. It seemed nearly

every other exhibit was based upon connectivity and communication of everyday objects, whether a thermostat, lighting, or even refrigerators.

2015 IEEE Rising Stars Conference

Boise State Student Branch Director of Communications Joe Fercho attended the 2015 IEEE Rising Stars Conference 2-4 January 2015 in Las Vegas. The meeting hosted students and young professionals from all over Region 6. This Conference was the first in hopefully a long line of opportunities for these young professionals to branch out, network, and learn about how the engineering industry works. At the conference, the participants heard presentations from professionals in varying fields from semiconductors to automotive. They covered topics such as the future of climate research at NASA, how to recognize the products of the future by looking for S-Curves, and how to be entrepreneurial and innovative in an increasingly competitive market. Many of the presentations were recorded and will be put on the conference website sometime in February. These presentations will be free for IEEE members to watch. The conference ended with a tour of the Cirque du Soleil show Kà at the MGM grand. This group of IEEE members was given behind-the-scenes access to see the engineering behind the art.

Rake up Boise

The weather was uncooperative this year, with several inches of snow and sub-freezing temperatures delaying the Rake Up event by a week. Some last-minute overnight rain melted the snow and allowed the clean-up to continue as re-scheduled the following Saturday, November 22. Raking went slower than expected due to only two volunteers showing up. Thanks to Hao Chen and Randy Wolff for representing IEEE and making one senior citizen very happy.

Fireside Chat with George Mulhern of Cradlepoint

IEEE-Boise and Startup Grind Boise partnered to hold a fireside chat with CradlePoint CEO George Mulhern. Mr. Mulhern has 25 years of experience in b2b technology and mobile broadband solutions. He served as General Partner at Highway 12 Ventures. Prior to that, he served as SVP of HP. During his 20 year career at HP, he was responsible for hardware, software and services businesses ranging in annual revenues up to more than $10 B.

During the chat, Mr. Mulhern was interviewed by Jessica Whiting, the director of Startup Grind Boise. Their chat covered Mulhern's vision for CradlePoint as well as his thoughts on leadership, how to create a business culture, the startup environment in Boise, and advice for other startups. The talk was very well attended by entrepreneurs and want-to-be entrepreneurs including many IEEE members. A great summary of the interview is on the Startup Grind site here: http://startupgrind.com/2014/11/george-mulhern-one-of-boises-best/ . A video of the interview is available at YouTube at https://www.youtube.com/watch?v=y8WguRgT24s .

Computer Society Banquet

IEEE Boise Computer Society (BCS) held its annual banquet 23 October 2014. Our featured speaker was Keith Grzelak, a Principal in private practice with an Intellectual Property firm in Spokane and co-chair of the IEEE-USA Intellectual Property Committee. He was a candidate for 2016 IEEE-USA President-Elect. The title of his talk was "New Challenge to Software Patentability." His talk covered:

- Review of recent changes and open questions in how we determine patentable subject matter
- How recent court decisions and patent office changes will affect entrepreneurs and start-ups
- Why proposed legislation could discourage invention, penalize small players, and benefit patent abusers

If you missed Keith's presentation in Boise, you can still watch his talk online! See the BCS chapter website at http://sites.ieee.org/boise-cs for links.

IEEE Conferences

IEEE Workshop on Microelectronics and Electron Devices

Date: 20 March 2015
Time: 8:00AM – 6:00PM
Location: Student Union Building, Boise State University
http://www.ewh.ieee.org/r6/boise/wmed2015/WMED2015.html

Advance Registration Deadline: 6 March 2015

The 2015 IEEE Workshop on Microelectronics and Electron Devices (WMED) will be held at Boise State University Student Union Building on 20th March, 2015. This international workshop is designed to provide a stage for discussion, review and deliberation on different aspects of silicon and non-silicon technologies that include device technology, future and current challenges in IC processing and advanced design techniques. The workshop is divided into different sections that include invited talks from university and industry, tutorials, contributed papers and a poster session. This year's workshop is a perfect opportunity for students and professionals to share their ideas and technical know-how with technologists and engineers from all around this region. WMED will host some of the distinguished professors and technologists who have spearheaded some of the most exciting technologies and ideas in their respective fields.

Speakers:
- Dr. Lakshman Krishnamurthy, Intel – New Technologies Enabling Wearable Devices
- Dr. Guohan Hu, IBM – Materials Challenges in Spin Torque MRAM
- Dr. Bradley Howard, Applied Materials – Materials and Patterning Challenges in 3D Device Architectures
- Joe Jeddeloh, Micron – SSD Controller Technology in Main Memory and Storage Systems
- Dr. Rajiv Joshi, IBM – Technology and Circuit Co-design in nm Era for Low Power Conundrum
- Dr. Rao R Tummala, Georgia Tech – New Era for Highly Integrated, Reliable Low Cost Packaging
- Dr. Mozhgan Mansuri, Intel – Clocking Architecture & Circuit Techniques for Multi-Gb/s I/O (Invited tutorial)
- Dr. Chenming Hu, UC Berkeley – From Concept of FINFET to the Future (Invited tutorial)

WMED–2015 will include a High School program in conjunction with the main conference in order to encourage STEM education among High School students in the Treasure Valley. WMED has

successfully conducted the High School program for the last eight years. This year's High School program will be a half day event which will include the keynote talk, hands-on activities, and a panel discussion consisting of engineers of all ages who will relate their experiences and take questions from students about careers in engineering.

Membership Referral

Do you know any colleagues that might be interested in IEEE membership? Check out the programs below, where they can get discounts on membership, and you can earn incentives for helping them sign up.

- The Member-Get-A-Member (MGM) program is back. Referring members earn incentives that can be used towards IEEE products, services and membership fees.
- The IEEE-USA incentives program is also back for 2015. Referring members can choose from IEEE-USA branded merchandise in addition to the MGM incentives. There is a $25 new member discount for new members whom you help sign up through the USA program.

Company Liaisons

Do you work at a company that employs engineers within our section? We invite each company to have one 'Company Liaison' to join our section's operational committee. These Liaisons provide a point of contact to send information from the Section OpComm to members working at these companies and to return information as to how the needs of their engineers can be met by the section. Company Liaisons are included in e-mail discussions from the OpComm, and are encouraged to help advertise section events to members and non-members at their place of employment beyond the Section newsletters. They are invited along with all the section members to attend OPCOMM meetings and give us input. If you are interested in being a company liaison, please contact ieee.boise.chair@gmail.com.

Your 2015 Officers

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You make a difference when you join the IEEE.