

JULY 2010
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Special points of interest:

- **IEEE Online Community**

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From the Vice Chair

2010 is off to a great start and is in full swing for the Denver Section.

Welcome to the second edition of the Mile High Spark. We sent Denver section representatives to congressional visits day and the energy fly-in in DC, the IEEE USA annual meeting in Nashville, and had a great turnout at the annual spring event at Fiske planetarium. A PACE activity is being planned for the fall surrounding electric vehicles where you will be able to actually see some cars!

Elections will also be held in the fall and if you are interested in a position, please let us know and we will be happy to discuss it with you. If you would like to volunteer, it is a great way to learn more about the IEEE and to get involved. We can certainly use the help with the technical groups, participating in our government affairs organization (state and national), becoming an officer, promoting education, or just helping out with planned events for the year. I encourage anyone with an interest to

visit one of our Executive Committee (ExCom) meetings held the second Tuesday of each month at the DeVry Institute in Westminster. We are available through our website, www.ieee-denver.org or you can contact anyone on the ExCom directly. IEEE is here for you and is a great avenue for professional development and networking.

Bob Faus,
Denver Section Vice-Chair



Bob Faus
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Corrections

In the April issue, the following societies were incorrectly identified:

The Information Theory chapter
coordinates with Computer Society chapter
The 2010 Computer Society Chair is
Dr. Nicholas Shaw

Industry Applications Society



Denver Section Supports CSEF

The Section took an active role in supporting the annual Colorado State Science and Engineering Fair (CSEF), which was held in Fort Collins this April. The project, as organized by the Section, provided financial support and manpower resources. The Section was able to obtain matching funds from IEEE-USA through a PACE (Professional Activity Committee for Engineers) grant to leverage funds provided by the Denver Section.

In addition, a physical presence at the CSEF in the form of an IEEE display was intended to raise the awareness of science oriented students to the possibilities of an engineering or science career and give them opportunities to interact with professional engineers.

Congressional Visits Day Science-Engineering-Technology Work Group

Rick Robinson, Jennifer Kramer, and Katie Bair, members of the Denver Section of the Institute of Electrical and Electronic Engineers (IEEE) traveled to Washington, D.C. to express thanks and appreciation to Congress for recent appropriations actions in the FY10 spending bill and American Recovery and Reinvestment Act that fund needed research and development projects and to support passage of the re-authorization of the America COMPETES legislation that continues a strong growth for the National Science Foundation, US Department of Energy, and National Institute of Standards and Technology.



Pictured, Left to Right:

Debbie Rudolph, IEEE-USA representative in Washington,
Gloria Day, IEEE member – New Hampshire
Rick Robinson, Chair, IEEE Denver Section
Katie Bair, IEEE Student Member – Denver Section
Congressman Jared Polis
Barbara Bancroft, IEEE member – New Hampshire
Jennifer Kramer, GOLD Representative, IEEE Denver Section

The Denver Section representatives joined with more than 300 scientists, engineers and business leaders who made visits on Capitol Hill as part of the fifteenth “Congressional Visits Day,” an annual event sponsored by the Science-Engineering-Technology Work Group on April 28-29, 2010.

While visiting congressional offices, the Denver Section members discussed the importance of the nation’s broad portfolio of investments in science, engineering and technology to promoting our country’s prosperity and innovation. Most importantly, they provided a constituent perspective on the local and national impact of these programs and their significance to Denver and Boulder areas. They also emphasized the direct benefit that early investment in technology has on the companies in Colorado associated with the defense, communications, and education sectors.

More than 50 percent of all industrial innovation and growth in the United States since World War II can be attributed to advances pioneered through scientific research, with publicly funded R&D the vital foundation for today’s scientific and technological progress. Achievements from federally funded science, engineering and technology include global environmental monitoring, lasers, liquid crystal displays, the Internet, among many other scientific and technical advances.

The federal government supports a unique research and education enterprise that fuels the American economy. This enterprise provides the underpinning of high-technology industries and expands the frontiers of knowledge in every field of science. Much of this research is carried out at academic institutions across the country ensuring knowledge transfer to future generations of scientists, engineers, mathematicians, physicians and teachers. Additionally, technology transfer from academic research adds billions of dollars to the economy each year and supports tens of thousands of jobs.

**DENVER IEEE MEMBERS CALL ON
CONGRESS
TO SUPPORT INVESTMENTS IN
RESEARCH
AND DEVELOPMENT**

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Rick Robinson, Chair of the Denver Section of IEEE, said “In order for our nation to remain competitive in industry, energy, education, and defense, our Government must take the lead in funding the initial investment in research and promote more education in Science, Technology, Engineering, and Math (STEM).”

“Government-funding of initial research in new technologies minimizes the risk to private industry and better enables us to turn those technologies into new products and services thus allowing us to maintain our competitive edge and grow our technology industries in Colorado whether they are in defense, renewable energy, or other technology sectors.”

“It was a great opportunity to participate in this event. Our elected representatives in Washington need to understand the importance of continuing to support Federal R&D programs.”

Jennifer Kramer, IEEE Denver Section member said "Having the opportunity to go to Washington D.C. and meet with my congressman, and staffers for other congressmen and women and senators was one of the best experiences I've had in my life! I got to be a part of something bigger; something that will have a significant impact on the younger generations and the future of the United States."

Highlights of the two-day event included a series of briefings and talks by Member of Congress and Executive Branch officials including Kei Koizumi, Asst. Director for Federal R&D the White House Office of Science and Technology Policy; Patrick Clemins, Director, AAAS R&D Budget and Policy Program; Dixon Butler, Majority Staff Assistant, Commerce, Justice, Science and Related Agencies Subcommittee, House Appropriations Committee; and Dr. Tom Baer, Executive Director of the Stanford Photonics Research Institute.

Also, there was a presentation of the George E. Brown Award for outstanding leadership in support of Federal R&D to *Representative David Wu* and *Representative Ralph Hall*. Both are Members of the House Science Committee. They were recognized for outstanding efforts to advance and promote science, engineering and technology on Capitol Hill. CVD participants had a breakfast meeting with *Representative Vernon Ehlers*. The attendees then made hundreds of visits to their Senators and Representatives.

The Science-Engineering-Technology Work Group is an information network comprising professional, scientific, and engineering societies, institutions of higher learning, and trade associations. The sponsors represent more than one million researchers and professionals in science and engineering. The Work Group is concerned about the future vitality of the U.S. science, mathematics, and engineering enterprise.

Katie Bair, a computer engineering student at the University of Denver, pointed out that in order to remain a competitive force for technological advancement in the world, the United States needs to work to bring engineering curriculum into K-12 classrooms. “Today, it is fairly common knowledge that the United States is falling behind other countries in many areas, including the number of students relative to our population that choose to pursue technical degrees at the college level. In order to reverse this trend, I think that it is extremely important to expose students to skills like programming much earlier in their education, both to get them excited about the possibilities of technical careers and to better prepare them for the rigor required to attain these types of degrees.”

Additional information concerning the 2010 Congressional Visits Day can be found on the Web at: <http://www.setcvd.org>

“Our elected representatives in Washington need to understand the importance of continuing to support Federal R&D programs.”



Fiske Planetarium

Spring Event Recap

On a starry night this May, the IEEE “Night at the Planetarium” spring event was held at Fiske Planetarium in Boulder. A wonderful Fajita Bar was provided by Spice of Life Catering along with some jazz and conversation. The group then made their way into the Planetarium where we saw a laser show set to music. We were all mesmerized (and somewhat comfortably sleepy) when the lights came on. Steve Hartung, President of the Boulder Astronomy and Space Society then treated us all to a wonderful talk on galaxies. The last part of the evening was spent up on the roof of the Sommers-Bausch Observatory looking through the large aperture telescopes. To top it off, at 9:04 PM, the shuttle flew by and was visible to the naked eye. Fun was had by all.

SSCS 2009 Chapter of the Year Award

The Denver Section Chapter of the **Solid State Circuits Society (SSCS)** was selected as the **2009 Chapter of the Year** by the Denver Section awards committee.

Each year, one chapter is selected for this award based on their contributions, activities, and section goals as emphasized in the annual rebate policy. For 2009, the local chapters of the **Signal Processing Society** (Jason Fritz, 2009 Chair), **Power Electronics Society** (Bob White, 2009 Chair), and **Solid States Circuit Society** (Alvin Loke, 2009 Chair) were all very active and deserve accolades for their commitment and contributions.



The IEEE goes global at the Spring Event



Jim Look (Past Chair) and Rick Robinson (Chair) with the IEEE Large Section Award for our Denver Section

IEEE Large Section Award

The Denver Section was honored to be recognized by Region 5 of the IEEE as the 2010 Outstanding Large Section at the 2010 Region 5 Conference on April 18 for ‘outstanding support to its members, Region 5, the IEEE, and the Denver community.’ The Denver Section Executive Committee extends our most sincere thank you to all of you, the members, for your continued participation and enthusiasm towards making this possible. Congratulations! We're looking forward to many more ‘outstanding’ years to come.



Sandra (Candy) Robinson, Region 5 Director (left) presents Large Section Award to Desiree Gilani, Denver

The Reliability Society

There are many, hundreds of sites that have reliability related events, courses, conferences, meetings of interest to reliability professionals. These activities are all over the world and nearly everyday. The IEEE Reliability Society hosts many events and publicizes broadly - events are easily found within the IEEE site.

Yet, what about those industry or topic specific events that are of particular interest to you and your career? What else is out there?

Rather than conduct web searches, visit the site that has a team of volunteers searching and posting as many relevant events as can be found, into a single Google based calendar site. You can search, sort, and find events specific to your area, travel destinations, topics, subjects, etc. This is a non-profit, non-commercial site created as my frustration grew around simply finding good events for myself and to recommend.

As you will notice in the calendar, IEEE events are well represented. And, you may find other unheard of events of interest - that is the idea. If you find something missing or lacking, please let me know. If you'd like to join the team that is maintaining this calendar (all volunteers) that would be great.

Enjoy and go learn something.

Fred Schenkelberg
fms@reliabilitycalendar.com

Check it out at: www.reliabilitycalendar.com

CSU Best Student Paper Contest

The Denver Section Chapter of the Solid State Circuits Society (SSCS) hosted a student paper contest at Colorado State University. Awards were presented to the winning team on June 3, 2010 at a technical seminar at Advanced Micro Devices (AMD), Fort Collins.

Optical Biosensors, Senior Project of Mohamed Eldeiry, Wesley Fuller, Torsten Kiljan, Ashley Miller, Liesel Mundhenke and Mujahid Naqbi was selected as the winner of the Best Paper Contest. Following the award, the students provided a 20-minute presentation to the SSCS meeting.

ABSTRACT:

Medical diagnostic equipment for early detection of human and canine cancers are of great interest. The proposed optical biosensor is an inexpensive microfluidic chip aimed at detecting cancer cells based on their optical properties. Using dielectrophoretic (DEP) forces, cells are directed



Pictured, Left to Right:
 Tony Maciejewski (CSU Electrical & Computer Engineering Department Head)
 Alvin Loke (IEEE SSCS Vice Chair)
 Ashley Miller
 Torsten Kiljan
 Wesley Fuller
 Olivera Notaros (CSU ECE Department Senior Design Project Coordinator)

Continued on next page

to a region in the chip where they are held stationary while a spectral analysis is performed on them to determine if they are cancerous. Based on the results of the spectral analysis, cancerous cells can be sorted and collected all while maintaining their original state for further analysis. This year, the senior design team successfully automated the collection of individual cell spectra using this chip. The complex nature of the project required collaborative interdisciplinary efforts in order to make the system more robust and practical. Through successful

management and collaboration between biomedical, chemical, and electrical engineers, automation of the system was accomplished this year allowing for hundreds of cells to be processed with the device. This was achieved by optimizing electrode components, creating circuitry for trapping and switching, customizing user interfaces in software for controlling the hardware, optimizing the microfluidic behavior in the channel, and assessing the physiology of the cellular components as they are processed in the device.

Excitation of the Signal Processing Society Chapter

The IEEE Signal Processing Society of the Denver Section is steadily becoming more and more active. We have hosted seven very successful technical talks this year ranging from imaging to coding to communications. These talks provide our members and the surrounding community with a fantastic opportunity to catch a glimpse of current research and industry development in a broad range of fields. Here are a few highlights from those meetings.

At the March 16, 2010 meeting Brian Kurtz from Altera Corporation presented "*Algorithms in FPGAs: Rethinking System Architecture in the world of the Megachip*". Brian's talk provided an overview on how far FPGA architectures and tool flow has come since the 1990s. The present system-on-a-chip architectures create challenges for tool flow, device utilization, and team design integration. New innovations in tool flow and top down design are beginning to allow for multichannel and block diagram design methods to implement complex signal processing algorithms. Block set folding is a way to allow automated multiplexing of signal processing blocks. Brian demonstrated examples of typical radio and radar applications using these advances in tools.

Chris Lennon from Harris Corporation presented a talk about three dimensional television at our April 7 meeting. The movie "Avatar" had recently been running in theaters and 3DTVs are just beginning to appear on the consumer market, making Chris' presentation "*3DTV: The Tsunami About To Hit*" very timely. Chris explained that the current technology is really stereoscopic. He described how 3D TV is produced, how it works, the differences is

3D technologies, the type of glasses required and the technology that will allow no glasses viewing in the future. 3DTV content will first appear this year in the sports television market with golf, hockey, soccer and football coverage. Chris' presentation can be found on the IEEE SPS Denver Section website at [3DTV presentation \[pdf\]](#).

On May 18, 2010 we hosted Prof. Charles Bouman, a Signal Processing Society Distinguished Lecturer. The talk was entitled "**Model Based Imaging: in Search of the Free Lunch**" based on his research at Purdue University in conjunction with many others. With the use of imaging models and adapting to the subject matter, it is possible to significantly improve the outcome of image reconstruction compared to simpler filtering techniques. Prof. Bouman discussed the algorithms used in computerized tomography to create faster and more detailed image reconstructions. He also talked about using Sparse Matrix Transforms for covariance estimation and JPEG decompression. Prof. Bouman's presentation is also on our website: [2010_05_18_Bouman_Imaging.pdf](#).

As the Signal Processing Society grows we hope to provide more resources to our members and the community including more frequent technical talks by both Distinguished Lecturers and resources from our local community. If anyone has topics of interest or knows someone who can give a technical talk please contact the Denver Section Signal Processing Society. We are always looking for new topics and presenters. For more information and to see our activities and archived presentations, please visit our website at <http://ewh.ieee.org/r5/denver/sp/>.

IEEE Online Community

Visit the IEEE Community Pages at: <http://www.ieee.org/portal/pages/services/communities/listcommunities.html>

Join Denver Section and Region 5 communities; stay updated and get involved.

Things to know: you need to have an IEEE Web Account to update/use the Online Community tools. These community pages amount to a free Wiki tool that can be used to do File sharing, Discussions, Mailing Lists, Calendars, To Do lists, etc.

IEEE Denver Section is also online at LinkedIn.

A Big Thank You to DeVry University, Westminster

At the May ExCom meeting, IEEE Denver Section Ex-Com Chair, Rick Robinson, presented Ash Mahajan, Associate Dean of the College of Engineering and Information Services at DeVry University (Westminster) with an award of appreciation for the years of support and assistance that DeVry has provided to our Section.

IEEE Denver Section and its Society Chapters have had the pleasure of using the DeVry campus for numerous workshops, events, and committee meetings.

Ash Mahajan said “IEEE is near and dear to or heart and mission.” IEEE Denver Section looks forward to growing the relationship with DeVry.



Ash Mahajan and Rick Robinson

IEEE Denver Section

Mission Statement

Enrich the professional and personal lives of the Rocky Mountain Region members, developing them into valued contributors to society through quality programs, continuing education, career development and community service; in collaboration with IEEE, industry, government and academia.



The IEEE Denver Section is comprised of over 3600 engineers and technical professionals in the following counties along the Front Range of the Rockies:

Clear Creek, Delta, Douglas, Eagle, Elbert, Jefferson, Mesa, Montrose, Pitkin, Summit, Washington, Yuma, and all counties north of said counties in Colorado, including the counties as listed in Wyoming, South Dakota, and Nebraska for the Black Hills and Centennial Subsections

<http://www.ieee-denver.org/>