

R1 BOG Committee – 2017 Report

Berkshire Section Report: Prepared by Richard Kolodziejczyk

June 4, 2017

The IEEE Berkshire Section has held five EXCOM meeting to date, one for each month in 2017.

The members of the EXCOM are:

Section Chair:	Richard Kolodziejczyk
Vice Chair:	James McVeigh
Secretary:	David Rueger
Treasurer:	Roger Manzolini
Power Chapter:	David Rueger
Computer and Control Chapter:	Richard Kolodziejczyk
Award Chair:	George Haus
Membership Chair:	George Gela
Education Chair:	Jill McKennon
PACE Chair:	Richard Kolodziejczyk
Consultant Network Chair:	Richard Kolodziejczyk
Life Member Affinity Group:	Bert Prichard
Newsletter:	Richard Kolodziejczyk
Webmaster:	Richard Kolodziejczyk
Past Chair:	James McVeigh

In addition to the monthly EXCOM meetings, the Berkshire Section has held following section meetings:

- **National Engineers Week Dinner Meeting** sponsored by the **Life Member Affinity Group**
 - Speaker 1 – The IEEE and Region 1 by Ronald Tabroff, Region 1 Director
 - Speaker 2 – The Berkshires and the Engineering Workforce of the 21st Century by Carlo Zaffanella, Vice President and General Manager of Maritime & Strategic Systems for General Dynamics Mission Systems
- **Computer and Control Chapter** Dinner Meeting – April 27
 - CCD Technology and Applications in Remote Sensing by Justin Bell, Project Scientist at EPRI High Voltage Laboratory
- **Life Member Affinity Group** Annual Dinner Meeting – May 11
 - 2017 IEEE Berkshire Section STEM Research Challenge, Presentations by Research Challenge Winners
- **Consultants Network** Dinner Meeting – May 18
 - Sports and Media Fans by Neal Pilson, Former President of CBS Sports

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A PACE project titled “2017 IEEE Berkshire Section STEM Research Challenge Contest” was completed. The project plan and the final report were submitted to the Region 1 PACE coordinator and the Berkshire Section has received the PACE funding.

The Berkshire Section expenses to date are in line with the 2017 Budget. A financial audit for 2016 budget was performed by Frank Fisher, Past Treasurer and George Haus, Award Chair and the records were found to be in good order with all transactions accountable.

The 2017 R1 ROB Committee meeting will be attended by Richard Kolodziejczyk Chair and Roger Manzolini Treasurer.

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2016 Accomplishments

The IEEE Berkshire Section has held twelve EXCOM meeting, one for each month in 2016. In addition to EXCOM meetings, the Berkshire Section has held following section meetings:

February

Berkshire Consultants Network Presented National Engineers Week Dinner Meeting:
“PE Licensure for Engineers” by John J. Burke, Ph.D., P.E.

One of the most important decisions one can make early in an engineering career is to enter a professional path and plan to become licensed as a professional engineer (P.E.). The licensure of professional engineers is important to the public because of the significant role engineering plays in society. The profession regulates itself, through the licensing boards, by setting high standards for professional engineers. These high standards help protect the public by requiring that professional engineers demonstrate their competence to practice in a manner that will safeguard the public’s safety and welfare.

Dr. Burke presented a brief history of engineering licensure. The focus of the presentation was the transition to what is a licensed professional engineer, the benefits of obtaining an engineering licensure, and how to become licensed. The four steps required to obtain engineering licensure were explained. The two required exams in the engineering licensure process were outlined. The first exam in the licensure process is the Fundamentals of Engineering or FE exam. The format of the FE was introduced and strategies for passing were presented. The second exam in the licensure process is the Principles and Practice of Engineering or PE exam. The format of this exam was introduced and explained. Lastly, alternative paths to licensure were explored.

Meeting contact: Rich Kolodziejczyk, P.E.

Guest Attendance: 9

IEEE Member Attendance: 14

March

Power Chapter Dinner Meeting: “Electric Power Systems – the Old, the Modern, and the Future” by Dr. George Gela, Berkshire Electric Consulting Company .

Electric power systems have been with us for more than a century, and have evolved significantly over the years. First was the “war of the currents” between ac and dc, then unprecedented growth of ac power systems worldwide, then a slowdown. Because electric power cannot be stored (or, rather, we have yet not found efficient methods of storing it,) electric power has to be consumed as soon as it is produced, and produced just as it is needed. For many decades, the goal was to balance demand versus supply to maintain system stability,

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frequency, and voltage at the customer's end. Now, we see local alternative generation sources and storage system that are tugging the supply-demand picture in various directions, development of localized and large-scale electric energy storage technologies, and re-introduction of dc power systems, not to mention continued increase in voltage levels, capabilities and efficiencies of ac power system. Where is this leading us?

This talk looked at the origins, history and established trends on electric power system, successes that have been achieved, mistakes that have been made, power outages that we lived through, emerging technologies, strategies and materials, demands and technologies that will help drive the future, and new challenges that we will successfully meet.

Meeting contact: David Rueger, Power Chapter Chair

Guest Attendance: 9

IEEE Member Attendance: 16

May

Berkshire Consultants Network Dinner Meeting: "Berkshire Innovation Center" by Rod Jané, Project Director.

Rod Jané, Project Director, provided an overview of the Berkshire Innovation Center (BIC) - a 20,000 sq. ft. facility to be constructed at the William Stanley Business Park in Pittsfield, MA. This exciting project is the result of a \$9.7 million capital grant from the Massachusetts Life Sciences Center to the City of Pittsfield. The mission of the BIC is to "provide a catalyst to enable and accelerate innovation and growth of existing companies in the Berkshire Region – primarily small to medium sized manufacturing companies (SME's) in life sciences, the life sciences supply chain, advanced manufacturing & technology with the ultimate objective of spurring economic growth, job creation, and investment in the region.

Meeting contact: Richard Kolodziejczyk, P.E.

Guest Attendance: 13

IEEE Member Attendance: 13

May

Life Member Affinity Group Presented Annual Dinner Meeting: "2016 IEEE Berkshire Section STEM Research Challenge" Presentations by Research Challenge Winners

We recognized this year's winners by giving the students a few minutes to talk about their project: how they chose their topic, their research, and any interesting discoveries.

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Grades 9/10 prizes:

- 1st - “The Discovery of an Ostrich-like Dinosaur Strengthened the Theory of the Dinosaurian Origin of Birds”
- 2nd - “The Discovery of and Research Behind Homo Naledi”
- 3rd - “The Ravaging of the Roach: An Overstepping of the Human Mind”

Grades 11/12 prizes:

- 1st – “Genes and Alzheimer’s”
- 2nd – ““Superman” Memory Crystal: The Eternal Vessel for Human Knowledge”
- 3rd – “Autism Reversal Using Shank3 Gene”

Meeting contact: Jill McKennon, Education Chair

Guest Attendance: 13

IEEE Member Attendance: 11

August

Computer and Control Chapter Dinner Meeting: “High Performance GPU Computing” by Justin McKennon, Senior Electrical Engineer, NTS Lightning Technologies.

In today’s world, it’s nearly impossible to imagine life without computers. They have become so delicately intertwined with every facet of our day to day lives. Computers have enabled us to solve problems that without them would be nearly unsolvable. However, as the complexity of these problems increase, so do the performance demands on computers. Until recently, it was commonplace for CPU manufacturers to simply add more transistors and increase the clock frequency of the CPU to increase performance. This approach however is not sustainable. We’re very nearly at the feasible limit for clock speeds, yet the never ending demands for increased performance exist. This has forced the computing industry to turn to alternative means to solve problems. This talk focused on one of the most hotly researched areas in computers today: Graphics cards. GPU-accelerated computing is the use of a graphics processing unit (GPU). Since their inception, many of us have been wholly unaware that sitting inside this little card that makes your PC games run is actually a programmable supercomputer. If used properly, these can provide tremendous performance increases for a wide variety of problems.

Meeting contact: Richard Kolodziejczyk, P.E.

Guest Attendance: 11

IEEE Member Attendance: 14

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October

Power Chapter Dinner Meeting: “NET ZERO RESIDENCE” by Roger Manzolini.

A new threshold for residential building surpassing the goal of low energy use, is now net-zero energy. Net Zero energy homes seek to produce as much energy as they consume, using smart designs that incorporate renewable energy sources.

In a nation where buildings contribute a substantial portion of the country’s total fossil fuel consumption, the interest in net zero construction is increasing enormously. Consumers are looking for ways to improve the energy efficiency and long-term savings in their home.

This presentation provided a look at one example of a net zero energy design made possible by today’s modern construction techniques.

Meeting contacts: David Rueger

Guest Attendance: 9

IEEE Member Attendance: 15

November

Computer and Control Chapter (C&C) Meeting: “Data Storage From Traditional Hard Drives to Flash Memory – The many ways to store data” by Michael Glaberman, MSG Computers + Genesis10.

If you own a Computer, Cell Phone, or another form of Technology that relies on communication, chances are you are generating Bytes, Mega-Bytes, Gigabytes, or Terabytes of Data! This data can come in the form of communication, logs, reports, files, or any other number of technology related items. Regardless of its origin, this data has to be stored somewhere and somehow. This presentation targeted the different types of Data Storage Devices and the hardware/infrastructure needed to host them.

Meeting contacts: Richard Kolodziejczyk, P.E.

Guest Attendance: 6

IEEE Member Attendance: 9

December

Life Member Affinity Group Luncheon Meeting: “Electromagnetic Simulation Supporting Aircraft Certification (Recorded Webinar)” by Dr. Marco Kunze & Dr. David Johns, Computer Simulation Technology (CST)

Electromagnetic environments, such as those produced by lightning, can cause failures on aircraft safe operation and even catastrophic effects if precautions are not taken. The risk is elevated for modern aircraft because they have an increased number of flight control,

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communication and guidance systems, and incorporating structures made of carbon-fiber composite (CFC).

Aircraft certification by testing with respect to different electromagnetic environments is both costly and time consuming. Today, electromagnetic (EM) field simulation offers the possibility to predict vulnerabilities to electromagnetic environments early in the design process and reduces the number of tests required for certification. Simulation may be used to assess the impact of changing a component at a later time in the product life cycle. As such EM simulation is ideally suited to complement testing.

In this webinar the application of CST STUDIO SUITE® to simulate aircraft exposed to various electromagnetic environments was presented. The discussion was provided of the use of CST EM STUDIO® for lightning attachment zoning characterization and CST CABLE STUDIO® for indirect lightning effect analysis including coupling into cable harness systems.

Meeting contacts: Bert Pritchard, Life Member Affinity Group Chair

Guest Attendance: 4

IEEE Member Attendance: 7

Plans for 2017

The Berkshire Section is planning to continue with:

- Two meetings per chapter and two meetings per affinity group
- Host the National Engineers Dinner in February
- Host the Annual Dinner in May
- Conduct PACE project titled: the 2017 IEEE Berkshire Section STEM Research Challenge