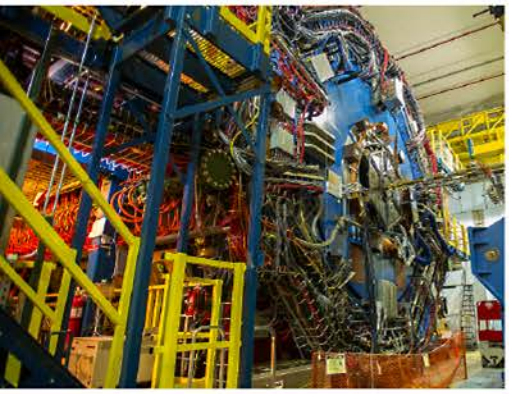
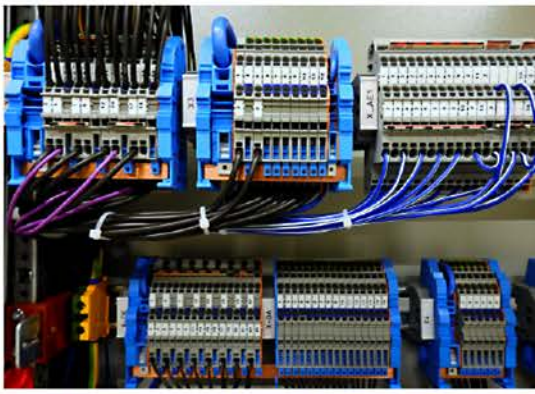
PRODUCED BY THE LONG ISLAND SECTION OF THE INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS

IEEE | LONG ISLAND SECTION

THE PULSE OF LONG ISLAND

NOVEMBER 2022 | VOL. 69, NO. 9





INSIDE THIS ISSUE

November brings us falling leaves and the start of the holiday season for many and the section has some exciting events upcoming during this time. This week, **The Power Electronics Symposium** kicks off November. By the time this issue arrives in your email, it will have been a big success; well-deserved after a long hiatus.

Another milestone for the section is the creation of the Section's **Robotics and Automation chapter**, thanks to the persistence and leadership of Bill Wilkes. The chapter began with an introduction to programming and using the Raspberry Pi.

Given the popularity of the Raspberry Pi platform, the Section is also supporting the Stony Brook student chapter in their purchase of several of them for continued use in their student lab. I want to thank Lonni Chu for her efforts in securing a PACE contribution that will cover half the Section's outlay in purchasing them. Lonnie's position as our section representative to the PACE committee has paid off well for us.

Please see the article in this issue by Don Bruno of Brookhaven National Laboratory on the power engineering requirements for construction of the **BNL's Electron Ion Collider**. We recall Dr. Michiko Minty's introduction to the EIC at this year's awards banquet last March. In conjunction with the article is the announcement of a BNL job fair for prospective hires. Lastly, stay healthy everyone and enjoy your Thanksgiving.

Arnold Stillman
IEEE Long Island Section Chair, 2022

THE PULSE OF LONG ISLAND

The Pulse of Long Island is produced by the **Long Island Section** of the **Institute of Electrical & Electronics Engineers**. It is published monthly except during July & August.

Arnold Stillman, *Editor*
pulse@ieee.li

Anthony Giresi, *Graphic Designer*
pulse@ieee.li

INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS
445 Hoes Lane, Piscataway, NJ 08855-1331

Phone (USA & Canada): 1-800-678-4333
Phone (Worldwide): 1-732-981-0060
Website: www.ieee.org
E-mail: contactcenter@ieee.org

IEEE LONG ISLAND SECTION OFFICERS

Chair
ARNOLD STILLMAN
CHAIR@IEEE.LI

Vice Chair
RHONDA GREEN

Treasurer
SANTO MAZZOLA
TREASURER@IEEE.LI

Secretary
RHONDA GREEN
SECRETARY@IEEE.LI

Junior Past Chair
LOU D'ONOFRIO

Senior Past Chair
MARJANEH ISSAPOUR

AFFINITY GROUPS and COMMITTEES

Awards Committee
RHONDA GREEN
AWARDS@IEEE.LI

Educational Activities
MARJANEH ISSAPOUR
EDUCATION@IEEE.LI

Employment Assistance
CHARLES PLECKAITIS
EAC@IEEE.LI

Entrepreneur Network
BILL WILKES SR.
EN@IEEE.LI

Legal Affairs
JOHN VODOPIA
LEGAL@IEEE.LI

Life Members
DON GRIECO
LIFE@IEEE.LI

Membership Development
CARL MESHENBERG
MEMBERSHIP@IEEE.LI

Professional Society & Industry Liaison
BILL WILKES SR.
LIAISON@IEEE.LI

Student Development Activities
JAMES MARTINO
STUDENT@IEEE.LI

Women in Engineering (WIE)
MIHAELA RADU
WIE@IEEE.LI

Young Professionals
LONNI CHU
YP@IEEE.LI

www.ieee.li

THE IEEE LONG ISLAND SECTION WEBSITE

The IEEE LI Section website is regularly updated to reflect recent section activity and upcoming events. Each Society and Affinity Group has a dedicated page that describes their function and includes contact information.

www.consult-li.com

CONSULTANT'S NETWORK OF LONG ISLAND

The Consultant's Network of Long Island maintains a referral service of engineering, computer, managerial and technical professionals.

membership@ieee.li

MEMBERSHIP DEVELOPMENT

For more information on membership with the LI Section of the IEEE, e-mail Carl Meshenberg at: **membership@ieee.li**

THE IEEE LI SECTION HAS 19 CHAPTERS. EACH CHAPTER IS A TECHNICAL SUBUNIT OF THE LI SECTION, ASSOCIATED WITH AN IEEE SOCIETY. THE CHAPTERS, AS WELL AS THE SECTION, ARE ALWAYS WELCOMING VOLUNTEERS. IF YOU WOULD LIKE TO HELP WITH ANY OF THE LI CHAPTER'S STEERING GROUPS, PLEASE DO CONTACT THE RELEVANT CHAPTER CHAIR, VICE CHAIR, OR ONE OF THE SECTION OFFICERS.

AEROSPACE & ELECTRONIC SYSTEMS SOCIETY (AES)
Chair: **Dave Mesecher**
Vice Chair: Vacant
Email: aes@ieee.li

ANTENNAS AND PROPAGATION SOCIETY (APS)
Chair: **Sai Padmanabhan**
Vice Chair: **Bryan Tropper**
Email: ap@ieee.li

CIRCUITS AND SYSTEMS SOCIETY (CAS)
Chair: **James Colotti**
Vice Chair: **Pawel Janczykowski**
Email: cas@ieee.li

COMMUNICATIONS SOCIETY (COMSOC)
Chair: **Howard Hausman**
Vice Chair: **Tony Bowden**
Email: communications@ieee.li

COMPUTER SOCIETY (CS)
Chair: **Barbara Porter**
Vice Chair: **Brian Quinn**
Email: computer@ieee.li

ELECTROMAGNETIC COMPATIBILITY SOCIETY (EMCS)
Chair: **James Colotti**
Vice Chair: **Bob DeLisi**
Email: emc@ieee.li

ENGINEERING IN MEDICINE & BIOLOGY SOCIETY (EMBS)
Chair: **John Vodopia**
Vice Chair: Vacant
Email: emb@ieee.li

INSTRUMENTATION AND MEASUREMENT SOCIETY (IMS)
Chair: **Joe Jordan**
Vice Chair: **Ephraim Adeola**
Email: im@ieee.li

MICROWAVE THEORY AND TECHNIQUES SOCIETY (MTT)
Chair: **Sai Padmanabhan**
Vice Chair: **Eric Darvin**
Email: mtt@ieee.li

NUCLEAR AND PLASMA SCIENCES SOCIETY (NPS)
Chair: **Graham Smith**
Vice Chair: Vacant
Email: nps@ieee.li

PHOTONICS SOCIETY (IPS)
Chair: **Adam A. Filos**
Vice Chair: **M. Nazrul Islam**
Email: photonics@ieee.li

POWER & ENERGY/INDUSTRY APPLICATIONS SOCIETY (PES & IAS)
Chair: **Lou D'Onofrio**
Vice Chair: **Marjaneh Issapour**
Email: power@ieee.li

POWER ELECTRONICS SOCIETY (PELS)
Chair: **Ronald DeLuca**
Vice Chair: **Predrag Hadzibabic**
Email: pels@ieee.li

PRODUCT SAFETY ENGINEERING SOCIETY (PSES)
Chair: **Tom Lanzisero**
Vice Chair: Vacant
Email: safety@ieee.li

ROBOTICS AND AUTOMATION SOCIETY
Chair: **William Wilkes**
Vice Chair: Vacant
Email: robotics@ieee.li

SIGNAL PROCESSING SOCIETY (SPS)
Chair: **Jessica Donaldson**
Vice Chair: **Dave Mesecher**
Email: signal@ieee.li

SOCIAL IMPLICATIONS OF TECHNOLOGY SOCIETY (SSIT)
Chair: **Howard Edelman**
Vice Chair: **John Vodopia**
Email: social@ieee.li

SYSTEMS COUNCIL (SYSC)
Chair: **Stephanie White**
Vice Chair: Vacant
Email: systems@ieee.li

TECHNOLOGY & ENGINEERING MANAGEMENT SOCIETY (TEMS)
Chair: **Brian Quinn**
Vice Chair: **Barbara Porter**
Email: tmc@ieee.li

LET YOUR VOICE BE HEARD

WRITE TO THE PULSE

The Pulse of Long Island is a newsletter for the members of the IEEE Long Island Section. You can let your voice heard by writing to the Editor. How to bring more value to our members? Interesting new technology, or a project? An issue of interest to members of the IEEE Long Island, Long Island engineers and computer professionals, or Long Island technical community at large? Write to the ***Pulse***. Let your letter be read, and your voice heard.

HOW CAN I CONTRIBUTE TO THE PULSE?

Send your letters or articles via email to **pulse@ieee.li.** If selected for publication, the letter or article will be edited before being published.

ADVERTISERS:

Please contact us at **pulse@ieee.li** for advertising rates.

CONTRIBUTION DEADLINE:

20th of a month for the next month edition.

CONTRIBUTIONS FROM LONG ISLAND TECHNICAL & ENGINEERING COMPANIES:

Publish your technology-related press release (up to one page) at no cost. Please send the press release as a PDF file attached to email to **pulse@ieee.li,** addressed to the Editor, with a Subject line *"Pulse -PR"* followed by your company name, and the responsible contact person's name, email and phone number in the email body.

IEEE LONG ISLAND SECTION

THE PULSE OF LONG ISLAND

CONTRIBUTE TO THE PULSE – LET YOUR **LETTER BE READ** and LET YOUR **YOUR VOICE BE HEARD**

LOOKING FOR AN UPDATE ON SECTION EVENTS?

FOR UPDATES ON ALL LONG ISLAND SECTION EVENTS, CHECK OUT THE IEEE LONG ISLAND SECTION WEBSITE:

www.ieee.li

IEEE LONG ISLAND SECTION

POWER ELECTRONICS SYMPOSIUM 2022

WHO SHOULD ATTEND:

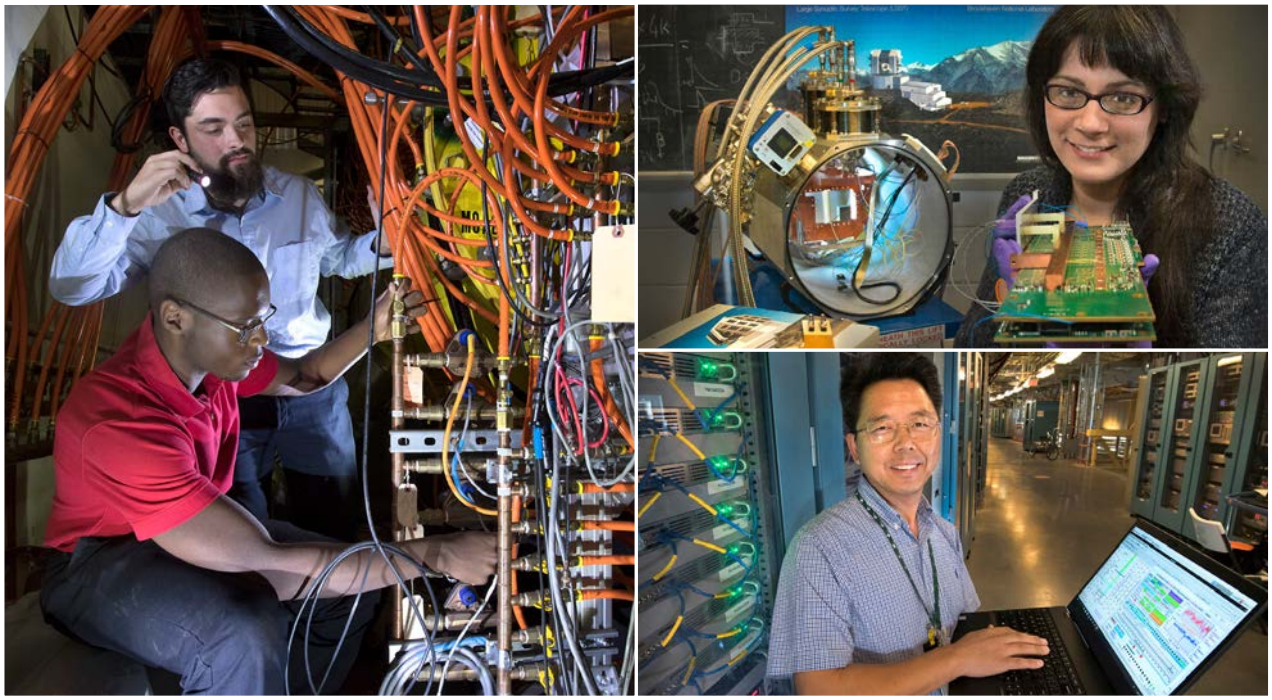
All professionals (engineers, managers, etc.) involved in the use, design, qualification, test, procurement or manufacture of power supplies, power converters, power management, servos or energy storage are invited. All sectors of power electronics are represented including military, industrial, medical, space, consumer and automotive.

TOP 10 REASONS TO ATTEND:

1. Complimentary admission
2. Meet face-to-face with representatives from over 50 companies servicing the power electronics industry
3. Eight complimentary 50-minute technical lectures from 2 to 6 PM (schedule and optional CEU/PDH info on website)
4. Complimentary lunch from noon to 1 PM (to first 200 registered attendees)
5. Complimentary swag bag (to first 200 registered attendees)
6. Complimentary coffee break from 3 to 4 PM
7. Enjoy opportunities to network with your peers
8. Complimentary dinner (with pasta station and hors d'oeuvres) from 6 to 8 PM
9. Accommodating hours so you don't need a full day out of the office (arrive anytime, leave anytime, from Noon to 8 PM)
10. Convenient location with free parking (Radisson Hotel, Hauppauge, LI)

INFORMATION & REGISTRATION:

https://www.ieee.li/pes



Brookhaven National Laboratory
Career Fair on Saturday, Nov. 19

At Brookhaven Lab, everyone has a role in powering and securing the nation's future.

Learn about job opportunities during an in-person career fair at Brookhaven Lab on Saturday, Nov. 19, from 10 a.m. to 3 p.m.

Pre-register at www.bnl.gov/ettcareerfair/

We're hiring:

- Engineers with expertise in electrical, electronics, mechanical, systems, ASICs, computer applications, quality, environment, safety, health, and facility operations
- Technicians in the fields of mechanical, electronic, electro-mechanical, water and steam systems, refrigeration, and HVAC
- CAD drafters and designers
- Tradespeople , including electricians and carpenters

Located just north of Exit 68 of the Long Island Expressway, Brookhaven Lab offers rewarding careers, competitive salaries, comprehensive benefits, and professional development opportunities.

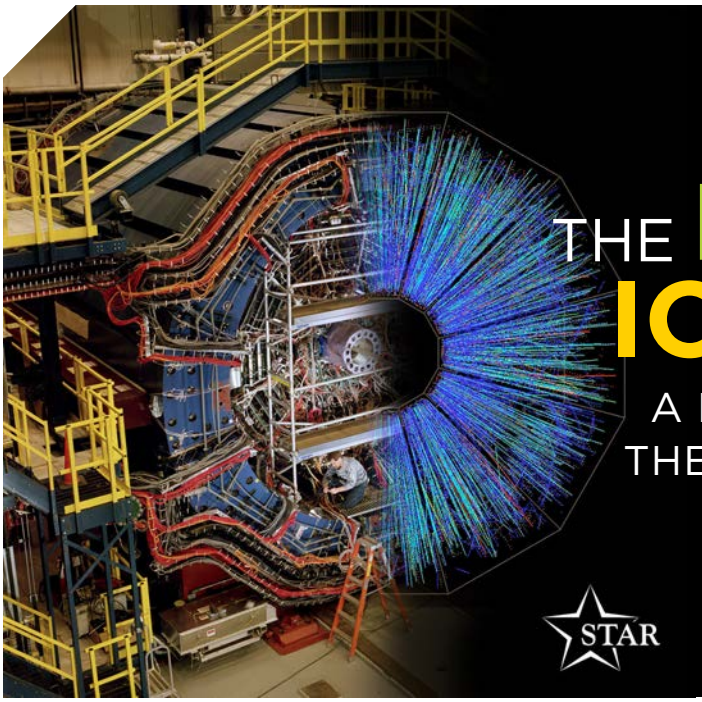
Learn more about career opportunities at Brookhaven Lab, sign up for job alerts, and apply.

jobs.bnl.gov

Brookhaven National Laboratory

75 YEARS

Brookhaven Lab is an equal opportunity employer that values diversity, equity, and inclusion. *VEVRAA Federal Contractor



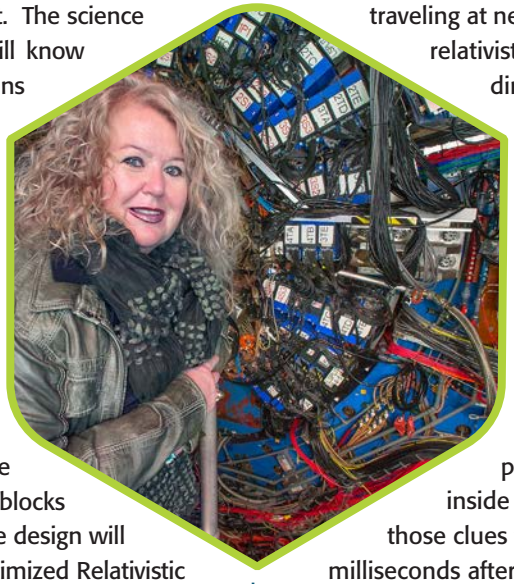
Brookhaven National Laboratory

THE ELECTRON-ION COLLIDER

A MACHINE THAT WILL UNLOCK THE SECRETS OF THE STRONGEST FORCE IN NATURE!

DON BRUNO
PRINCIPAL ELECTRICAL ENGINEER, EIC POWER SUPPLY SYSTEMS
GROUP LEADER, BROOKHAVEN NATIONAL LABORATORY

The computers and smartphones we use every day depend on what we learned about the atom in the last century. All information technology – and much of our economy today – relies on understanding the electromagnetic force between the atomic nucleus and the electrons that orbit it. The science of that force is well understood, but we still know little about the microcosm within the protons and neutrons that make up the atomic nucleus. That's where Brookhaven National Laboratory (BNL) comes in.



Brookhaven National Laboratory (located in Suffolk County, NY, about 60 miles east of midtown Manhattan) was recently chosen as the building site for an Electron-Ion Collider (EIC), a one-of-a-kind nuclear physics research facility. The EIC will be a discovery machine for unlocking the secrets of the "glue" that binds the building blocks of visible matter in the universe. The machine design will take advantage of the existing and highly optimized Relativistic Heavy Ion Collider (RHIC) that's been operating at Brookhaven Lab since 2000.

Beyond sparking scientific discoveries in a new frontier of fundamental physics, the Electron-Ion Collider will trigger technological breakthroughs that have broad-ranging impact on human health and national challenges. Our existing collider, RHIC, is the first machine in the world capable of colliding heavy ions, which are atoms which have had their outer cloud of electrons removed. RHIC primarily uses ions of gold—one of the heaviest common elements—because its nucleus is densely packed with particles.

RHIC collides two beams of gold ions head-on when they're traveling at nearly the speed of light (what physicists call relativistic speeds). The beams travel in opposite directions around RHIC's 2.4-mile, two-lane "racetrack" and collide inside the house-sized STAR and sPHENIX detectors. When ions collide at such high speeds, fascinating things happen. If conditions are right, the collision "melts" the protons and neutrons and, for a brief instant, liberates their constituent quarks and gluons. Just after the collision, thousands more particles form as the primordial matter cools off. Each of these particles provides a clue as to what occurred inside the collision zone. Physicists sift through those clues to help determine the properties of matter milliseconds after the birth of our universe.

RHIC will shut down in 2025 and the construction of the world's first polarized Electron-Ion Collider will begin. BNL's EIC Directorate, in partnership with Thomas Jefferson National Accelerator Facility, is working closely with other domestic and international partners to deliver the $1.7–$2.8 billion construction project and then begin EIC operations in the early 2030s. BNL's EIC engineering staff initially worked with physicists on conceptual designs and now are in the detailed design stage of the project.

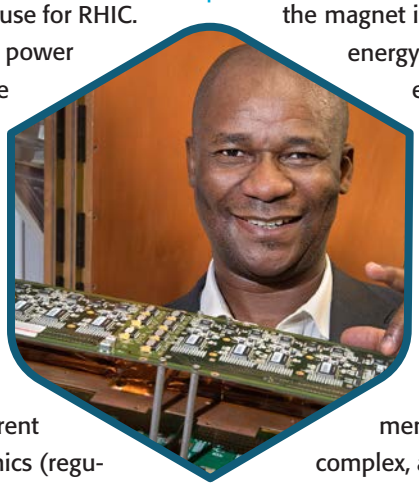
CONTINUED ON PAGE 9

CONTINUED FROM PAGE 8

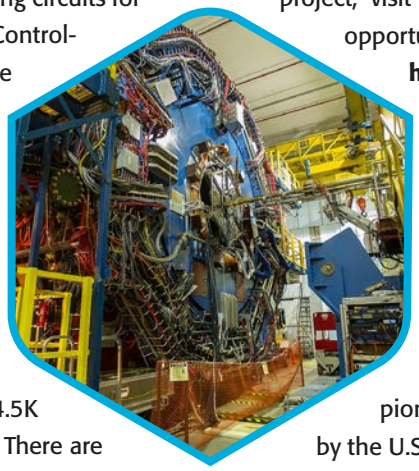
But how does a particle accelerator work, what role do power supplies play, and what do BNL electrical engineers who work on these discovery machines do?

In a particle accelerator, magnets that keep particles travelling in the vacuum chambers without hitting the walls require precision DC, both ramped and pulsed power supplies. Many different power supply topologies will be used in the EIC, including SCR, linear, switch mode, interleaved H Bridge, and multi-level converters.

More than 1000 power supplies are currently in use for RHIC. By the time the EIC is completed, over 2000 power supplies will be in operation. Working in the power supply system means getting involved with power electronics (Silicon Controlled Rectifiers - SCRs, transistors, Insulated Gate Bipolar Transistors - IGBTs, diode rectifiers), power distribution and high-power components (circuit breakers, fused disconnect switches, bus work, transformers, chokes, filter banks, pulse forming networks), high-voltage power supplies (20kV to 600kV), high-current power supplies (up to 20,000A) analog electronics (regulation boards, various analog control boards, op amps), digital electronics (commands and status), Field Programmable Gate Arrays (FPGA) (controlling the power supply), firing circuits for the SCRs, and IGBTs, and Programmable Logic Controllers (PLCs) to control the power supply. The use of circuit simulation programs like PSpice, PSIM or Micro-Cap are essential tools that we use in power supply design and to stabilize power supply regulators.



In addition to powering the warm EIC magnets, we must protect superconducting EIC magnets like we currently protect the existing superconducting magnets in RHIC. These are cooled to 4.5K with liquid helium so they have zero resistance. There are conditions that could make the magnets lose their superconducting properties – what we call a "quench." These quenches must be detected, and the energy in the magnets must be safely removed when they happen.



Quench detection can be done in several different ways. All require precision analog circuits to measure the magnet voltages, as well as a Digital Signal Processor (DSP) or an FPGA to analyze and perform calculations on these voltages to determine if a magnet is quenching. If it is determined that the magnet is quenching, the FPGA or DSP sends a signal to the quench protection system to shut down the power supply, extract the energy from the magnet, and dump the particle beams from the ring before they can cause damage.

The energy in a quenching magnet must be extracted quickly so the magnet is not damaged by the high temperatures that the energy can generate. Power Supply crowbars, IGBT energy extraction switches and energy extraction resistors must be designed and sized properly to protect the magnet.

There are many different projects and technologies an Electrical Engineer can get involved in when working on power supplies at the EIC. AC Power Distribution, DC, Ramped and Pulsed Power Supplies, RF, Vacuum, and Beam Instrumentation are just a few examples. The projects are complex, and the learning is continuous. The fun is in working in an R&D environment with a collaborative team of diverse professionals. If you're interested in learning more about the EIC project, visit bnl.gov/eic. And if you're interested in career opportunities at Brookhaven, visit **jobs.bnl.gov** – **We're hiring!**

About Brookhaven National Laboratory

Brookhaven National Laboratory (www.bnl.gov) delivers discovery science and transformative technology to power and secure the nation's future. Brookhaven Lab is a multidisciplinary laboratory with seven Nobel Prize-winning discoveries, 37 R&D 100 Awards, and 75 years of pioneering research. The Lab is primarily supported by the U.S. Department of Energy's (DOE) Office of Science. Brookhaven Science Associates (BSA) operates and manages the Laboratory for DOE. BSA is a partnership between Battelle and The Research Foundation for the State University of New York on behalf of Stony Brook University.

IEEE MEMBERSHIP and MEMBER BENEFITS

IEEE membership offers access to technical innovation, cutting-edge information, networking opportunities, and exclusive member benefits. Members support IEEE's mission to advance technology for humanity and the profession, while memberships build a platform to introduce careers in technology to students around the world.

JOIN IEEE OR RENEW YOUR MEMBERSHIP

Reach your full potential as part of the world's largest technology community. Join professionals, experts, and advisors who can help shape your career, offer resources to acquire new skills, and advance your professional development.

MEMBER BENEFITS

As an IEEE member, you'll be presented with new resources, valuable opportunities, and many discounts that will help you advance your career in the right direction. You can find colleagues who share your vision and commitment—those who are moving technology forward today.

ENHANCE YOUR MEMBERSHIP-JOIN AN IEEE SOCIETY

IEEE Societies provide members with opportunities to connect with experts and network with colleagues locally and abroad—all while staying up-to-date on technology and trends in their industry.

GIFT OF MEMBERSHIP

IEEE membership delivers access to the industry's most essential technical information and provides networking opportunities both locally and globally. Members have the ability to stay current in their chosen profession, connect with peers, and invest in their future.

MEMBER-GET-A-MEMBER

Consider sharing your IEEE membership experience and get rewarded for doing so. Through the Member-Get-a-Member (MGM) program, IEEE rewards your efforts in recruiting new members. Your local IEEE Section can also benefit.

IEEE.tv

Made possible by IEEE members, IEEE.tv is an award-winning, Internet-based television network, producing special-interest programming about technology and engineering for IEEE members and the general public.

Get access with new resources, valuable opportunities, and many discounts that will help you advance your career in the right direction.

WHEN YOU JOIN IEEE, YOU:

- Join a community of over 425,000 technology and engineering professionals united by a common desire to continuously learn, interact, collaborate, and innovate
- Get the resources and opportunities you need to keep on top of changes in technology
- Get involved in standards development
- Network with other professionals in your local area or within a specific technical interest
- Mentor the next generation of engineers and technologists and so much more.

IEEE members can access information on local events and activities by signing in to myIEEE, the members' personalized gateway to IEEE membership. In addition, members can also:

- Access individual Society memberships and subscriptions
- Connect with local IEEE Sections and volunteer leadership
- Find upcoming conferences

Learn more about individual benefits

- Read the latest news from IEEE, IEEE Spectrum, IEEE Standards News, and The Institute

No need to over-engineer this.

Satisfaction will increase with exclusive IEEE member discounts and insurance.

Special, low pricing creates high value for IEEE Members.* Tap into exclusive member discounts on products and services from trusted brands.
*Where available

Leverage your IEEE membership today!
Visit ieee.org/discounts and learn how this inverse relationship can be a proven formula.

You've Always Set Yourself Apart. Now it's Time to make it Official. Nominate Yourself to become a...

IEEE SENIOR MEMBER

Being elevated to senior member recognizes people who have moved beyond entry-level work in their careers. It also encourages them to engage more broadly with engineers and other technical professionals in companies and universities outside their own. To be eligible for senior member status, members must have worked in a professional capacity in a technical field for at least 10 years. Educational experience is partially credited toward that time. Nominees must also have professional references from three IEEE senior members, Fellows, or honorary members. If you're interested in elevation, you don't have to wait to be nominated—you can nominate yourself.

>> APPLY FOR SENIOR MEMBER GRADE

IEEE LIFE MEMBERS, *WRITE FOR THE PULSE!*

life member

The Section is inviting you to record your stories and histories in our monthly publication, the *Long Island Pulse*. An article of approximately 300 – 350 words is recommended.

LET US HEAR FROM YOU.
Send your article to: **pulse@ieee.li**
Life Member Chair: **life@ieee.li**

The **IEEE Long Island Section** has held meetings with many of our Life Members and Senior Engineers, in recent months. Your stories and histories in engineering are interesting, inspiring and should be recorded for future generations. You have served your profession for many years, many have served our country in the military, many as engineers fighting the Cold War. The many contributions are the legacy to this new digital age, space age, environmental age and beyond.

WANTED: IEEE LIFE MEMBER NEEDED TO VOLUNTEER TO SUBMIT A MONTHLY HISTORY ARTICLE FOR THE *PULSE*

The **PULSE** is seeking a IEEE LI Life Member to write the *Long Island Electrical & Electronic History* monthly article for the ***Pulse***. If interested contact **pulse@ieee.li**

WE WANT YOUR STORIES

IEEE LONG ISLAND SECTION

IEEE CONSULTANTS NETWORK OF LONG ISLAND

THE IEEE CONSULTANTS NETWORK OF LONG ISLAND (LICN)

is a nonprofit professional organization affiliated with the Institute of Electrical and Electronics Engineers. Our members include dozens of electrical, electronic, mechanical and software engineers with expertise in over 65 categories of technology and business. All are members of the IEEE and adhere to the IEEE professional codes of ethics.

MEMBER
IEEE L.I. CONSULTANTS NETWORK

PETER BUITENKANT
CONSULTANT

MICROPROCESSOR HARDWARE / SOFTWARE DESIGNS
DIGITAL CIRCUIT DESIGN • TRAINING COURSES

WEBSITE: www.peterbui-consult.com

24 Thorngrove Lane
Dix Hills, NY 11746

VOICE: (631) 491-3414
EMAIL: peterbui@optonline.net

---

(516) 378-0979 ambertec@ieee.org

Ambertec, P.E.,P.C.

John Dunn – MSEE, PE

Member IEEE Consultants Network of Long Island

www.licn.org/Profile/JDunn

181 Marion Avenue Merrick, NY 11566

Real Time Embedded - Financial Services - Transit
Architecture - Object Oriented Design - Java - C/C++
Full Stack - Internet of Things - Mobile Applications
Unix/Linux - Windows - Compilers - Communications

Early Electronics

EARLY ELECTRONICS
Hardware / Software Consulting Services

Chris Early, BSEE, MSCS, PE
154 Hempstead Avenue
Rockville Centre, NY 11570

unixdev@ix.netcom.com
Voice: (516) 764-1067
Fax: (516) 764-1124

SIGNALS IN MOTION

Len Anderson
President

Product Development
Software Development
Rapid Prototypes
Data Acquisition
Modeling
Simulations

PHONE: 718-279-3953
FAX: 509-471-6496
E-MAIL: LenAnder@SignalsInMotion.com
WEBSITE: www.SignalsInMotion.com

BODNER & O'ROURKE, LLP
PATENTS, TRADEMARKS, COPYRIGHTS AND RELATED MATTERS

GERALD T. BODNER
PATENT ATTORNEY

425 BROADHOLLOW ROAD, SUITE 120
MELVILLE, NY 11747
TEL: (631) 249-7500
FAX: (631) 249-4508
gbodner@bodnerorourke.com

ADVANCE IN TECHNOLOGY, INC.
Electronic Design — Analog, Digital, RF and Systems

JOHN LIGUORI
CEO, MSEE
631-865-2423

82 Westwood Avenue, Deer Park, NY 11729

www.advance-in-technology.com

JLiguori@advance-in-technology.com

Broad Shoulder Consulting LLC
Electronics, Mechanics, Optics, Software
www.broshoco.com

Special Expertise in Medical Imaging
System Design, Prototyping and Productization
Serving Start-ups and Technology Investors

Dmitriy Yavid
Founder
631-706-4696
dy@broshoco.com

Broad Shoulder Consulting, LLC
Long Island High Tech Incubator
25 Health Science Drive
Mail Box 320
Stony Brook, NY 11790-3350

Fred Katz Consulting, Inc.
93 Steven Place West Hauppauge, NY 11788

Proposals, Contracts & Specification Development
Innovative Creation, Electro-Mechanical
Analog & Digital Circuit/System Design
Wireless, Motion, Occupancy Sensors
System Analysis/Documentation
Commercial/Military Product Design
Sonar Systems and Acoustic Signal Processing
Security, Marine & Energy Saving, ROHS, UL Testing
Clever Inventions, Algorithm, IP & Patent Development

fred@fredkatzconsulting.com www.fredkatzconsulting.com

Fred Katz
President
(631) 724-7702
Electronics Consultant

Memberships: IEEE Senior Life Member, IEEE LI Consultants Network, LI Metal Workers, Mensa Society, NYS Professional Inventors, Suffolk County Inventors

---

EXPERT WITNESS TECHNICAL INVESTIGATOR

MARTIN KANNER AE, EE, MEE

PRODUCT LIABILITY
MACHINE INJURY

FIRE DAMAGE INJURY
LIGHTNING DAMAGE

KEMCo

sixxpoppy@juno.com
(516) 681-4346

POWER –CONTROLS DIV.
42 Glenwood Road
Plainview, NY 11803

EEDEngineering - Quality Software/Testing Solutions

Andrew Franklin Baxt
Managing Director of Engineering

Phone: 516-678-6563
Mobile: 561-558-3499
Oceanside, New York 11572
Andrew.Baxt@EEDEngineering.com
www.EEDEngineering.com

Carl Meshenberg

Technology Consulting Services

Electronic Product Development
Project Management
Marketing Strategies
Contract Development & Oversight

Mobile: 516 383-2595
carl.jmesh@gmail.com

PROGRAMMING PLUS®

2503 AVENUE X
BROOKLYN, NY 11235

HARDWARE & SOFTWARE CONSULTING

- ADMINISTRATION
- DEVELOPMENT
- ENGINEERING
- INTEGRATION
- DATABASES
- NETWORKS
- INTERNET
- SECURITY
- UNIX
- LINUX
- VMS
- WINDOWS

For expert assistance, contact ***Robert Weiner***, EE, PE, at:
Tel: (718) 648-6902 Email: info@progplus.com
Fax: (718) 648-7449 Web: www.progplus.com

IEEE Consultants Network of Long Island
PO Box 411, Malverne NY 11565-0411

www.licn.org

(516) 379-1678

Be sure to visit our web Blog at:
licn.typepad.com/my_weblog

IEEE LONG ISLAND SECTION

Affiliated with the Institute of Electrical and Electronics Engineers, Inc.

Intellectual Property Law Firm

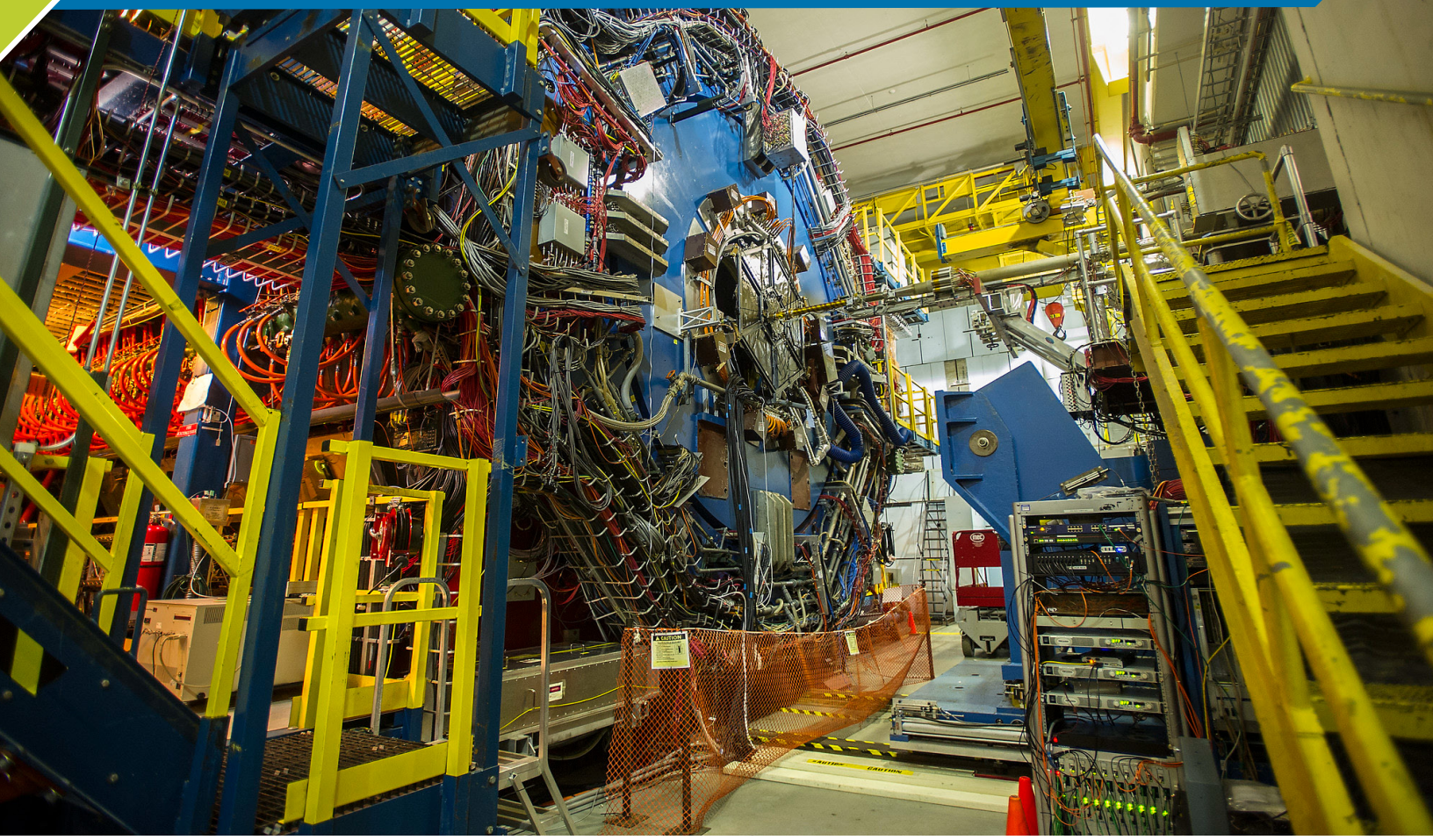
133C New York Avenue
Huntington, NY 11743

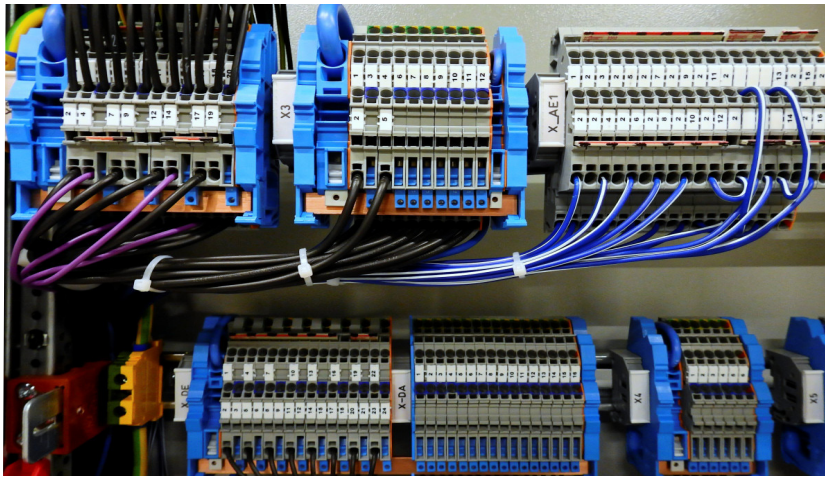
631-673-7555 ext: 5
631-327-6197 (Mobile)
631-425-7030 (Fax)

John F. Vodopia, Esq.

jvodopia@gmail.com
jvodopia@ieee.org

PRODUCED BY THE LONG ISLAND SECTION OF THE INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS





IEEE | LONG ISLAND SECTION

THE PULSE OF LONG ISLAND