



Almanack



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PHILADELPHIA SECTION of the IEEE

Membership in these counties: Pennsylvania: Bucks, Chester, Delaware, Montgomery, Philadelphia.
New Jersey: Burlington, Camden, Gloucester

IEEE SECTION MEETING

May 17, 2016

Dinner: 6 pm

Speaker: 7 pm

Sheraton University City Philadelphia

3549 Chestnut St., Philadelphia, PA

19104

Meal Cost: \$25.00 (students \$15.00)

Parking cost paid by section

NOTE: In the event of bad weather please call the Sheraton after 1:00 PM the day of the meeting at 215-387-8000. Ask the front desk if the meeting has been canceled.

May 2016

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IEEE SECTION NIGHT

Philadelphia Section Meeting

Tuesday, May 17, 2016

Note: In the event of bad weather please call the Sheraton after 1:00 PM the day of the meeting at 215-387-8000. Ask the front desk if the meeting has been canceled.

Joint with: Professional communications (PC) and Magnetics (MAG) Societies.

Tuesday, May 17, 2016.

Dinner at 6:00 PM,

Speaker at 7:00 PM.

Sheraton University City,
3549 Chestnut St, Philadelphia, PA
19104, (215) 387-8000

Meal Cost: \$25.00 (students \$15.00).

Parking cost paid by the IEEE Philadelphia Section, make sure you have your parking ticket stamped at the meeting.

First Talk

Fires in PV Systems

Dr. Finley Shapiro, P.E.
Consultant at Rimkus Consulting Group Inc.,

Abstract: This talk will discuss grounding and ground faults in commercial scale rooftop PV systems, the type of system found on the roofs of large stores and warehouses. It will then discuss three examples of fires in these systems.

Two of these were blamed on "double ground faults" and the cause of the third is undetermined.



Biography: Finley Shapiro is a principal consultant at Rimkus Consulting Group, Inc. where he provides forensic engineering analysis, re-

porting and testimony for accidents, fires, and failures with special focus on electrical design and failure analysis. He is a senior member of I.E.E.E., a member of the National Fire Protection Association, and a licensed professional engineer in electrical engineering in Pennsylvania, New Jersey, Delaware, Maryland, and the District of Columbia.

Dr. Shapiro completed his B.S., M.S., and Ph.D. in electrical engineering at the Massachusetts Institute of Technology, and has been the author of over 20 technical papers on photovoltaic materials and devices, computer modeling, and solar energy systems. He has taught engineering at Drexel University, Temple University, and The Pennsylvania State University.



IEEE SECTION NIGHT
Second Talk
**Issues Impacting Arc Flash
Hazard Risk**
Dr. Frank Mercede, PE,
Senior Engineer
Current Solutions, P.C.

Abstract: This presentation will cover by way of examples the impact of design and operational issues on the level of arc-flash hazard risk in commercial and industrial power systems. Such issues include type and location of protective devices, protective device settings, size and length of feeder conductors, and construction of electrical equipment.



Biography: Frank Mercede is Senior Engineer with Current Solutions, P.C. in White Plains, NY. Since 1998, Current Solutions has provided specialized

electrical power system studies, electrical engineering, construction cost estimating, electrical consulting and training services for electrical power distribution systems in buildings and facilities across the U.S. and Canada. Frank received the BSEE (first honors), MSEE, and Ph.D. degrees in Electric Power Engineering in 1981, 1983, and 1989, respectively, from Drexel University and is a licensed Professional Engineer in the states of Pennsylvania, New Jersey, Delaware and Maryland.

SECTION CHAIR'S MESSAGE



Philip M Gonski, P.E
IEEE Philadelphia Section Chair

Thank you to everyone that was able to attend this year's IEEE Annual Award Banquet. We are still determining the final count in attendance, but certainly drew one of the largest crowds in recent memory. Congratulations again to all of our award winners, our sponsors, and especially to our keynote speaker, Will Agate of the Navy Yard.

This May is also the upcoming IEEE Radar Conference here in Philadelphia at the Loews Hotel. If you have not already registered, this event is drawing attendees from countries all over the world, as well as leading experts and companies in the area. It will certainly be an event to remember.

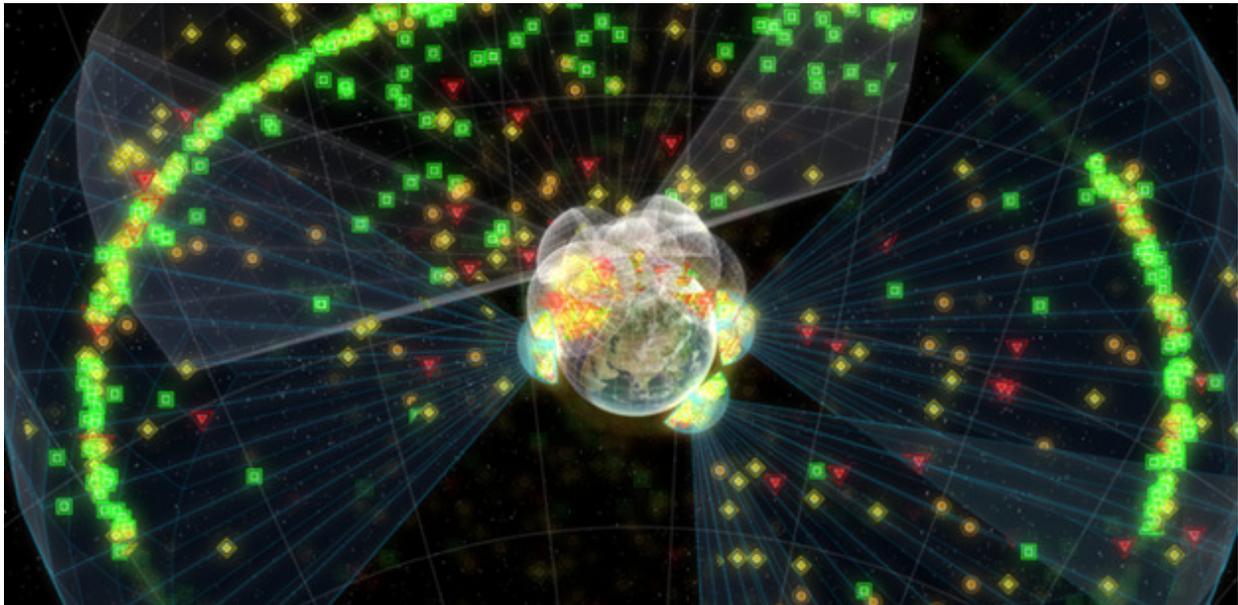


IEEE Radar Conference 2016

May 2 to May 6

**Loews Hotel Philadelphia
1200 Market St.
Philadelphia, PA 19107**

Sponsored by the IEEE Philadelphia Section, the IEEE Aerospace and Electronic Systems Society and also Lockheed Martin as a Premier Supporter.



Lockheed Martin Space Fence 2016 Radar Conference Premier Supporter

Known as birthplace of the country, the dynamic city of brotherly love is also well-known as a science place of firsts. From Ben Franklin's elementary electricity experiments to ENIAC's far more advanced use of electricity, innovators have come to Philadelphia for

centuries and the city has rewarded them. Philadelphia is home to the oldest annual awards for scientific achievement, the Franklin Institute of Philadelphia's gold medals. Also, over a hundred recipients have gone on to win Nobel prizes. The region is also



home to many companies whose products have for over 50 years shaped what the radar community acknowledges as some of the world's most advanced radar technologies.

Join us in this city of science and participate in advancing radar science by participating in the IEEE Radar 2016 conference appropriately themed "*Enabling Technologies for Advances in Radar.*" Original papers describing new technologies and techniques that significantly advance radar system capabilities for ground penetration, land, ocean, air, space and astronomy applications are welcome. Innovative system applications in air-defense, anti-missile, imaging, and mobile are encouraged. Technology areas such as radar, wide-band, MIMO, and antenna signal pro-

cessing, hardware and devices, materials, lasers, scattering, big data processing, architectures, multi-function operation, multi-site coordination and more are appropriate.

In addition to the presentation of contributed technical papers in high quality oral and poster sessions, the committee has planned a conference agenda that includes invited talks from leading experts within our community, an excellent selection of tutorials, exhibits, and informal gatherings for colleagues to share ideas.

<i>-Number of Registrants.....</i>	400
<i>-Number of Offered Tutorials.....</i>	23
<i>-Number of Tutorial Registrants.....</i>	153
<i>-Number of Participating Countries...</i>	29



STATUS CHANGE

By Peter Silverberg, Vice Chair

Ask not what you can do for the IEEE. Ask instead what the IEEE can do for you. Specifically, many of you can advance from Member to Senior Member with a little effort. IEEE has some goodies for you when you do: Senior Member plaque, \$25 coupon for joining a new society, letter of commendation to your employer, announcements in local media, and professional recognition. More detail is on the IEEE website including the application form.

Many of you are eligible and just need a helping hand from the Section. This is the summary of requirements:

1. A candidate shall be an engineer, scientist, educator, technical executive or originator in IEEE-designated fields: Engineering Computer sciences and information technology, Physical sciences, Biological and medical sciences, Mathematics, Technical communications, education, management, law and policy
2. Candidates shall have been in professional practice for at least ten years. (If you graduated any year up to 2007, no problem)
3. Candidates shall have shown significant performance over a period of at least five of those years

4. In addition, candidates for Senior Member grade must supply three references from current IEEE members holding the grade of Fellow, Senior Member, or Honorary Member.

I hear many times that references are hard to find. That is where the Section can help. We can identify references in your company who you did not know were Senior Members. We have Senior Members standing by who can interview you and then write a good reference. Later this year we will hold a workshop where you can meet Senior Members who will be references. Also, a reference can be from anywhere in the IEEE – no restrictions in geography.

I was on the Admissions and Advancement Committee for a three-year term, so I can tell you a few extra things. There is a general goal that a Section should advance 1% of its membership each year. For us that is 40. In 2015 we did 8. I think we can do better. Panels meet 10 times a year, so the delay from completed application to approval averages six weeks. Compared to a lot of things you apply for that is fast. So, it is time to advance.



IEEE Life Member Tour

PSEG Mercer Generating Station

June 14, 2016

By Bob Paglee



The Life Member Group, headed by Merrill Buckley, is sponsoring a tour of the PSEG Mercer Generating Station on June 14, 2016 at 2:00 p.m. The large coal-burning facility was upgraded in recent years with advanced technology pollution controls, creating an example that demonstrates what can be achieved.

The Mercer Generating Station of PSEG Power LLC is capable of generating 648 MW of electricity by utilizing steam turbine generators. Steam is produced by two coal-fired natural circulation boilers. Although these boilers are capable of burning natural gas, the primary fuel is bitu-

minous coal. The two steam units have similar equipment supporting each unit, including coal scrubbers, electrostatic precipitators, selective catalytic reduction and flue gas desulfurization, boilers, generators, and mechanical support equipment.





After investing over \$600 million in recent years for pollution control equipment, Mercer Generating Station is demonstrating how 200 tons of coal can be burned per hour for power generation with relative cleanliness. Emissions of sulfur dioxide, mercury, nitrous oxides and soot have been reduced by up to 90 percent according to company officials. Environmental controls include a 14-story dry scrubber, a baghouse with 10,000 fabric filters, a carbon-injection system for mercury reduction, and a catalytic reduction unit where ammonia is injected to convert nitrous oxide into nitrogen and water.



The tour is open to IEEE members and others, but it is necessary to make a reservation by phoning the IEEE office at (484) 270-5136; space may be limited to 25 visitors, so it's best to call early. Each visitor's name and his/her employer's name or affiliation must be stated; retired persons or students can be so listed.

DIRECTIONS

In traveling north from the Philadelphia area, PSEG's Mercer Generating Station is easily reached via either I-95 or I-295. For directions via GPS, use the following address: 2512 Lambertson Rd., Hamilton NJ 08611. To travel on the PA side, use I 95 north to the intersection with U.S. 1 eastbound, then cross the river (as if toward Trenton). But instead take NJ 29 immediately southbound, then exit onto Lambertson Rd., continuing south to the PSEG entrance gate. You will be met there by the PSEG Tour Director, Mark Schwartzkopf, Fossil Compliance and Programs Manager (or his aide) for direction to the parking area.

On the NJ side, take I 295 north to its intersection with NJ 29 north (toward Trenton), then exit to southbound NJ 129/Canal Blvd. until it meets Lambertson Rd. next to the river. Turn left onto Lambertson and follow it to the PSEG entrance gate as described above.



YOU ARE
Cordially Invited...

— THE 15TH ANNUAL —
**ACE SCHOLARSHIP
BREAKFAST**



ACE MENTOR PROGRAM
ARCHITECTURE • CONSTRUCTION • ENGINEERING

EASTERN PA

WEDNESDAY MAY 11, 2016

7:30AM REGISTRATION and BREAKFAST

CRYSTAL TEA ROOM
100 E PENN SQUARE
PHILADELPHIA, PA 19107

Our Annual Scholarship Breakfast is fast approaching! Thanks to the success of this event in previous years, the ACE Mentor Program of Eastern Pennsylvania can continue its mission of providing scholarships for student advancement in the design and construction industries. With your generous support, we expect to accomplish more this year than ever before to raise local high school students' awareness of the fulfilling career opportunities in our industry.

The 15th Annual Scholarship Breakfast ACE honorees are local organizations and projects that have positively impacted our community.

This year, we are proud to honor: FTI (See Next Page)



**FINISHING TRADES INSTITUTE
OF THE MID-ATLANTIC REGION**
— ORGANIZATION OF THE YEAR —



**NEW COLLEGE HOUSE,
UNIVERSITY OF PENNSYLVANIA**
— URBAN PROJECT OF THE YEAR —



**KING OF PRUSSIA MALL
EXPANSION**
— SUBURBAN PROJECT OF THE YEAR —

Help us **ENGAGE, EXCITE** and **ENLIGHTEN** students about the design + construction industry!

The **ACE MENTOR PROGRAM** of **EASTERN PA** is an affiliate of a national non-profit organization. The mission of ACE (Architecture, Construction, and Engineering) is to engage, excite, and enlighten high school students to pursue careers in the integrated construction industry through mentoring and to support their continued advancement in the industry through scholarships and grants. Students are recruited from both public and private high schools throughout Philadelphia and the suburbs, with special efforts made to reach the traditionally underrepresented populations of women and minorities.

[READ ABOUT our newest findings based on two major surveys conducted in May 2015!](#)

FOR MORE INFORMATION, please contact our Affiliate Director Tiffany Millner at [easternpa@acementor.org!](mailto:easternpa@acementor.org)

For Registration Information follow the link:

http://acementor.org/index.php/download_file/view/3520/780/



Delaware Valley Science Fairs **Greater Philadelphia Expo Center**

The 68th Delaware Valley Science Fairs was held at Greater Philadelphia Expo Center in Oaks, PA March 30. John Iannuzzi, Robert Lawson, and Peter Silverberg served as judges for the Institute of Electrical and Electronics Engineers Award. This is the list of winners:

- 1. First place (Plaque and \$300)**
“Self-Balancing Vehicle Prototype”
Carter Gassler
Grade 7
Avon Grove Charter School, West Grove PA
Teacher: Jessica Canning

- 2. Second place (Certificate and \$200)**
“Friendly, Useful Hovercraft: How to Make It Great!”
Ore Alao
Grade 7
Moravian Academy, Bethlehem PA
Teacher: Joanne Daniels

- 3. Third place (Certificate and \$100)**
“Highly Efficient Smart Lighting System”
Pradyot Yadav
Grade 10
North Penn High School, Lansdale PA
Teacher: Melody Leithold

- 4. Honorable Mention (Certificate and \$50)**
“Universal Blind Spot Detectors”
Hayden Hotham
Grade 12
Central Bucks High School-West
Teacher: Mark Hayden



Conowingo Dam Hydroelectric Generating Station **May 2016 Tour**

Date and Time: Thursday, May 19th, 2016, 2:45 to 5:00 P.M.

Location: Darlington, MD, on the Susquehanna River

Transportation: Private vehicle



Meeting of the Philadelphia Joint Chapter



IEEE Power & Energy and Industry Applications Societies

Join us for this rare glimpse of a historical and operational power plant. Due to expected demand, please note the following:

1. **Registration is on a first registered-first served** basis and closes Thursday, May 12th, 5:00 pm.
No exceptions. We have to submit names to security a week in advance.
2. **Registrants must be IEEE members (or IEEE member guests) and enter their membership number, phone number, and email address when registering on V-tools** Failure to enter required information may result in a delayed or failed registration.
3. **NO Walk-ins**
4. Tour safety and security rules:
 - **You must wear solid shoes like sneakers** – no flip flops, high heels, sandals, or other type shoes that are open either in the front or back
 - Wear long pants and no garments that are loose, like a scarf
 - You cannot bring any bags, backpacks, purses, camera bags, water bottles or drinks of any kind on the tour. Leave all these items in your car and/or bus.
5. Reservations: Register here:

<https://meetings.vtools.ieee.org/m/39472>

or visit

www.ieeephiladelphia.org and find this meeting notice.

If you have problems or cannot register online, e-mail Stanley Muzylowski at smuzylowski@burns-group.com or call 215-979-7700, ext. 7790.



Conowingo Dam Hydroelectric Generating Station

Facts:

Generation capacity: 572 MW;

Number of turbines: 11

Conowingo Hydroelectric Generating Station is a run-of-the-river hydroelectric power plant owned and operated by Exelon Power, a business unit of Exelon Generation.



Located on the Susquehanna River in northern Maryland, Conowingo has been providing electricity to the regional system since 1928. When constructed from 1926 to 1928, Conowingo was the largest power plant ever built and had the largest turbines and generators to date. When the Conowingo Dam was completed in

1928, producing 252 megawatts (MW), it became the second largest hydroelectric project in the United States, behind Niagara Falls.



The original plant had 7 turbines and, in 1964, 4 more turbines were added. The water flow of the Susquehanna River provides the fuel for the 11 current turbine generators, producing 500 MW of electricity. Because water is used to turn the turbines, Conowingo can be used to "jump start" the electric distribution system in the event of a system failure of the PJM connection.



2016 Annual Awards Banquet & Recognition Dinner

By Peter Silverberg

The Awards Banquet is an annual event to recognize those who have been honored for their contributions by both the Institute and the Section. This year it was held at the Union League of Philadelphia on April 2. Our featured speaker was William J. Agate, Jr., Senior Vice President, Naval Yard Energy operations & Initiatives. Greeting the assemblage was Philip Gonski, Chair of the Section. Awards were presented as shown in the photos by Victor K. Schutz and Thomas Fagan. The full awards committee was Chaired by Merrill W. Buckley, Jr. and Donald C. Dunn was the fourth members. The Banquet was arranged by Fulvio E. Oliveto.

These are the awards with photos:

Student Project Award

Think Like a Girl: Engineering Kits

Megan DeGeorge, Gabrielle Rochino, and Alexis Basantis of Rowan University

Citation: For developing a product designed to teach girls ages 6-12+ the fundamentals of engineering.



Alan L. Kirsch Award

Emmanuel Almonte of Villanova University

Citation: For exceptional contributions to IEEE Student Activities, with special attention to perceptiveness to need, originality of ideas, dedication, leadership, peer impact, and scholarship.



Chapter of the Year Award

Women in Engineering (WIE)

Violeta Drury of Wilmington Trust

Citation: For exceptional leadership in developing effective chapter activities and encouraging their growth.





Philadelphia Section Award

Violeta Drury

Citation: For continued and longstanding commitment to the Section and Women in Engineering



Benjamin Franklin Key Award

Brent Baker of Channel Logistics LLC

Citation: For technical innovations to the CATE methodology and improving supply chain security for global trade. His technical contributions led to scaling CATE capability across industry verticals



Philadelphia Section Award

Ben Wolfgram of WE Automation

Citation: For continued and longstanding commitment to the Section and Women in Engineering



Benjamin Franklin Key Award

Li Bai of Temple University

Citation: For his expertise and contributions on computer security, mobile networking, and software development





Benjamin Franklin Key Award

Fotis Koubiadis of Lockheed Martin

Citation: for outstanding innovation in development of a thinned digital array architecture and wideband receiver for a solid state active array radar array resulting in increased track accuracy and improved radar sensitivity while maintaining critical radar requirements at a fixed cost



Philadelphia Section Corporate Technology Innovation Award

Accepting for Tassl – Melissa Schipke and James Maxwell

Citation: For developing an application that drives alumni engagement through innovative technologies



Philadelphia Section Corporate Technology Innovation Award

Silicon Power Corporation

Accepting for SPC – William Hiltner..

Citation: For the development and perfected SolidTRON SGTO Solid-State device; a ‘Keystone Building Block’ to support continuous development of high-performance, solid-state components, modules and systems to meet commercial, industrial, defense and national power applications



Philadelphia Section Corporate Technology Innovation Award

Naval Surface Warfare Center

Accepting for NSWC – E. Michael Golda, Ph.D.

Citation: For contributions focused on innovations in the areas of automation and control, power systems, machinery silencing, and machinery and systems design tools and analysis





Delaware Valley Young Electrical Engineer of the Year

David Issadore, Ph.D. of University of Pennsylvania

Citation: *For his creative and talented approach to biomedical problems that have a major impact in the field of point-of-care diagnostics.*



Delaware Valley Young Electrical Engineer of the Year

Brian Quinn of Lockheed Martin

Citation: *For his work in radar systems design and radar systems modeling and simulation*



Delaware Valley Young Electrical Engineer of the Year

Mahmoud Kabalan of Villanova University

Citation: *For his scholarly work quantifying the effect of the operating conditions, system parameters and intermittency of renewable energy sourced on the domain of asymptotic stability of the micro grid*



Delaware Valley Electrical Engineer of the Year

Frank Stoner of Analytical Graphics, Inc.

Citation: *For implementing the Flight Design Library which provides mission planning capabilities that can be used for Aircraft, Helicopter and UAV mission planning*





Ernest's Page

April 11, 2016

Probably the last Ernest's Page (as I approach my 84th birthday).

There are several questions in my mind, some of which I have presented in previous Ernest Pages, and are still awaiting some response by IEEE members. Please respond to ernest.Cohen@ieee.org (preferred) cohenfamily@aol.com.

First: what is the only source of energy which humans have tapped which is not directly, or indirectly from nuclear reactions?

This leads to the second question: what was the longest year on record, and why was that year longer than others.

Third: How did the ancient Greeks conclude that the Earth is essentially a sphere? They estimated the size much too small, so using their numbers, Columbus was right in assuming there was no significant land mass west or Europe on the way to India. While I have read about their work, which had a numerical value for the Earth's size, I also realized that the

Earth's shadow on the moon during a lunar eclipse would also be a clue to the spherical nature of this planet.

Fourth Question: During recent episodes of the television program, "Castle" there was a talking computer in the apartment, which communicated with the humans. Since the British mathematician, Turing, proved in the 1930's that all digital computers are equivalent, except for speed and memory capacity, it is theoretically possible to build an inorganic computer which duplicates the human brain. Now, we all are self-aware of our existence, and even our emotions, what would it take for such a computer to be self-aware, and possibly have emotional responses to humans, or to similar computers?

Last question, since methane is a much more powerful greenhouse gas than carbon dioxide, why is there much more concern among scientists with regard to carbon dioxide and climate change?

Ernest B. Cohen & Elaine H. Cohen
ernest.cohen@ieee.org



PHILADELPHIA SECTION NOTES

IEEE PHILADELPHIA SECTION OFFICERS

Chair: Philip Gonski, P.E.: philip.m.gonski@ieee.org

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Secretary: Chris Vaile: cvaile@burns-group.com

Past Chair: Mark Soffa; msoffa@kns.com

ADMINISTRATIVE COMMITTEE (ADCOM)

ADCOM meets the second Tuesday of the month (Tuesday, May 10) at the Sheraton University City. Members are welcome to attend. Reserve a seat by calling the office by the Friday before the meeting

ALMANACK STAFF

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Deadline for the June issue is May 27, 2016

ADVERTISE IN THE ALMANACK:

The Philadelphia Section of the IEEE encourages placement of technical, professional, promotional and commercial advertisements in the Almanack.

The Almanack is published ten times a year and is read by more than 4,000 members with an average annual salary of over \$70,000 in over 150 key industries. For more information, contact michael.mayor.pe@ieee.org.

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1/8 Page: 2.5 x 2.5: \$12.50

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