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# POLISH-AMERICAN ENGINEERS ASSOCIATION

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IN 1934

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All members and friends of Polish-American Engineers Association are cordially invited to attend our meeting.

- DATE:** Friday, January 17<sup>th</sup>, 2020
- TIME:** Doors Open 7:30 p.m.; Business Meeting begins 8:00 p.m.
- PLACE:** Our Lady Mother of the Church  
8747 W Lawrence Ave.  
Chicago, IL 60656
- SPEAKERS:** Mr. Luciano Elementi
- TOPIC:** The Mu2e AC-Dipole Magnet and its Ni-Zn Ferrites
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## Mr. Luciano Elementi

Luciano Elementi was born in 1966 in Genova, Italy, where he received his undergraduate and graduate MS in Electrical Engineering. He also holds an MBA from the St. Ambrose University in Iowa.

He has been working as a control and system engineer at Fermilab for almost 20 years both in his work and life he is versatile in and enjoy solving problems. He leads a support group in the magnet department and has been recently involved with issues concerning ferrite selection for the AC-Dipole.

### ABSTRACT

Fermilab is in the process of building a charged-lepton flavor violation search experiment that will have a sensitivity 10,000 times higher than previous CLFV experiments. The Mu2e experiment is designed to look for the direct conversion of muons-to-electrons with a precise and complex apparatus that will be able to produce 200 million billion muons per year!

The Fermilab Magnet Systems Department is preparing to build three AC-Dipole magnets for the Mu2e Beam Extinction system. Magnets and consequently their ferrite bricks have demanding properties that must be measured and understood. We measured similar ferrite material, from different batches, and different vendors, focusing on their AC Losses and  $\mu$  characteristics, uncovering interesting responses at two frequencies of interest: 300 kHz and 4.5 MHz.

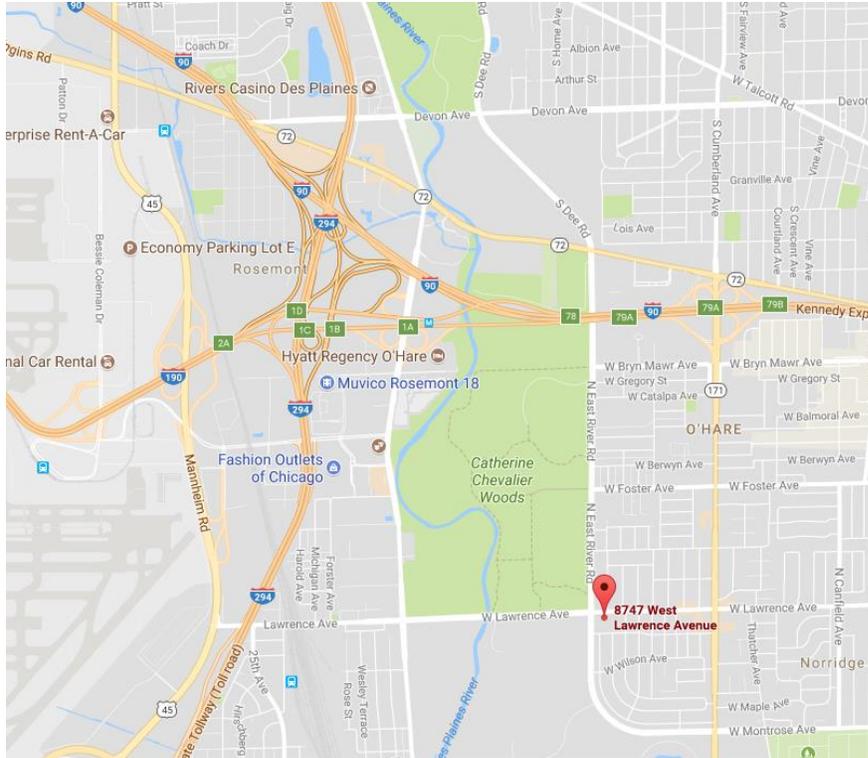
Although nothing unusual was observed at 4.5 MHz, the behavior of the same ferrite at 300 kHz is shown to be highly nonlinear with implications for both predicting the magnet power consumption and the effectiveness of the cooling.

We will briefly look at what the Mu2e Project is about, outlining the layout and some of its challenges. We look at the construction of the magnet, its prototypes, and then describe the ferrite characteristics challenges and present our analysis.

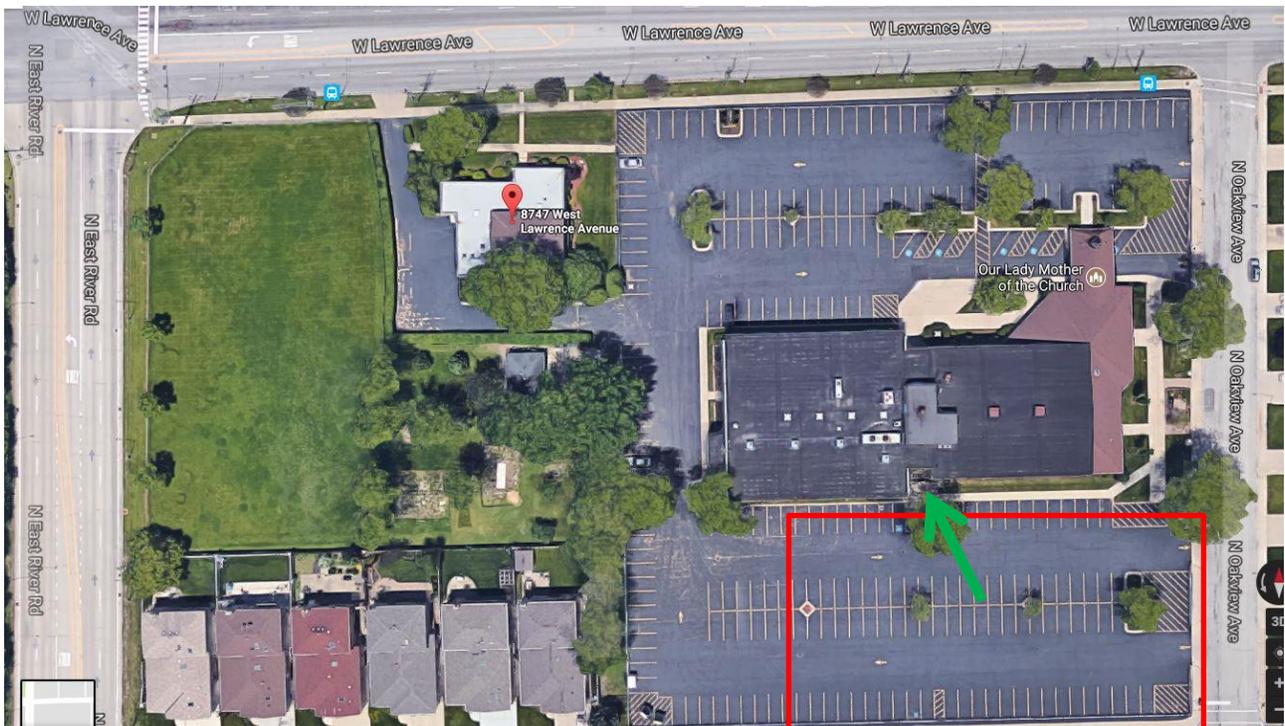
# PAEA Announcements

## MEETING LOCATION

Our Lady Mother of the Church  
8747 W Lawrence Ave.  
Chicago, IL 60656

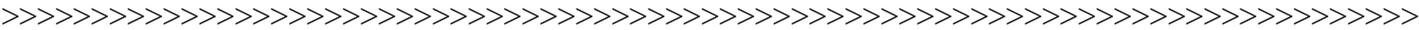


The entrance closest to our room is at the back of the church (Green arrow)- the best parking location is off of Oakview Ave, behind the church (Red box):









**Modjeski Illinois-Iowa Memorial Bridge in Danger!**

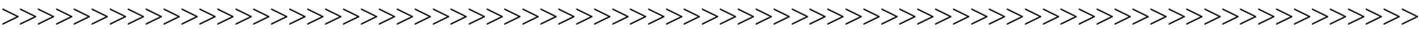
At our Gwiazdka, Daniel Pogorzelski said a few words about the Iowa-Illinois Memorial Bridge, built under Chief Engineer Ralph Modjeski. The bridge, also known as the I-74 Bridge, is the oldest existing suspension bridge over the Mississippi River, as well as a memorial to Illinoisans and Iowans who served in the First World War. And it is scheduled to be demolished in early 2020!

Though there is little time, Mr. Pogorzelski is working to try to save the bridge. And as supporters and promoters of Poles in Engineering, we cannot simply sit by and let it be demolished, if there are viable alternatives.

Precedent solutions include the successful conversion of the Poughkeepsie Railroad Bridge (also designed by Modjeski) into a pedestrian bridge, now known as the Walkway Over The Hudson- the most visited State Park in all of New York State (according to a 2017 update of a 2011 study).

In an email we sent a short article Mr. Pogorzelski wrote on the subject, for more information, and for those who were not able to make it to our Gwiazdka this year. Unfortunately, we neglected to provide proper citation, as this was published in the Warsaw Institute Review- apologies for this oversight.

We will provide more information as it is available.



**Member News/Update**



## **Special Interest**

If anyone has an item of Special Interest to the PAEA Membership and sympathizers, please send the details to [contact@polishengineers.org](mailto:contact@polishengineers.org) for inclusion in the next (monthly except for June-August & December) published Bulletin.

### **Polish American Congress of Illinois Events Calendar**

For a comprehensive and up-to-date listing of events in Polonia, please see the PAC-IL Polonia Calendar (many thanks to Mirek Niedzinski, Roman Korczak and the PAC-IL team for leading!):

<https://www.pacillinois.org/calendar/>

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