



THE TEAM



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MESSAGE FROM THE VICE-PRESIDENT A²P²

Our association is changing but it needs **you!**
- How can each of us contribute

The Association for the Advancement of Pulsed Power, A2P2, is growing, and this includes the A2P2 webpage upgrading. We have begun sharing significant technical information related to Pulsed Power Technology and Applications, such as, tutorial videos, conference presentations & proceedings, papers, links.

But in order that you can access all of this, and be able to contribute also, you must register and login, don't worry it is all free.

So if you haven't done so yet, please go to <https://a2p2pulsepower.org> and LOG IN on the top right corner, and register. After that you can see all the information that is there already and share also. To contribute, after login, please go to Technical Data/Submission, and give us your input.

If you want to make a difference, help us reaching more people, share your own data with us, so that more people can see and read what you are doing.

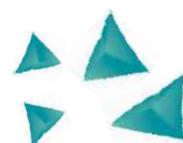
Our aim is that our webpage can be a platform where each one can see what is being done in this field as well as share their own data. So, help us make this a useful tool to change the world.

Luís Redondo
A2P2 Vice-President

OUR PARTNERS



ENERGY PULSE SYSTEMS
DESIGNING ENERGY FOR LIFE





**The Pulsed Power, Beams, and Microwaves Laboratory
at the University of New Mexico (UNM)**

Edl Schamiloglu, Distinguished Professor
Department of Electrical and Computer Engineering

The high-power microwave (HPM) community is celebrating its 50th year in 2019. The field began with the appearance of modern pulsed power technology on the technical scene [1]. During the early years the HPM field was dominated by researchers in the US and USSR in competition to generate ever larger powers (those years are referred to as the power derby). Today the HPM field is very highly international with perhaps the most developments taking place in China. HPM systems are beginning to leave the laboratory and find applications in the field.

The UNM program has been performing research and educating students in HPM studying backward wave oscillators, reltrons, relativistic magnetrons, and other devices. UNM holds the record for power generated from a double negative (DNG – permittivity $\epsilon < 0$ and permeability $\mu < 0$) metamaterial Cherenkov oscillator, 100 MW in L-band [2]. Sophisticated particle-in-cell (PIC) simulations are performed (referred to as *virtual prototyping*) to identify an HPM source configuration that merits testing in the laboratory. Experiments are then performed to validate the simulation results. The author recently published a review of the relativistic magnetron coauthored with two of his Ph.D. students [3].



UNM has two accelerators in its Pulsed Power, Beams, and Microwaves Laboratory: a modified PI-110A Marx generator with pulse forming line, and a SINUS-6 Tesla-transformer with a pulse forming line, a low impedance version to study relativistic magnetrons and a high impedance one to study Cherenkov devices. The photograph below shows both of these accelerators. UNM also has a complete array of advanced instrumentation for pulsed power, plasma, and electromagnetic diagnostics.

References

1. E. Schamiloglu, R.J. Barker, M. Gundersen, and A.A. Neuber, "Modern Pulsed Power: Charlie Martin and Beyond," Proceedings of the IEEE, vol. 92, 1014-1020 (2004).
2. Z. Duan, M.A. Shapiro, E. Schamiloglu, N. Behdad, Y. Gong, J.H. Booske, B.N. Basu, and R.J. Temkin, "Metamaterial-Inspired Vacuum Electron Devices and Accelerators," IEEE Trans. Electron Dev., vol. 66, 207-218 (2019).
3. D.A. Andreev, A. Kuskov, and E. Schamiloglu, "Review of the Relativistic Magnetron," Matter Radiat. Extremes, vol. 4, 067201-1-19 (2019).



PULSED POWER TECHNOLOGY AND APPLICATIONS

In the Pulsed Power, Beams and Microwaves Laboratory
at the University of New Mexico

Edl Schamiloglu



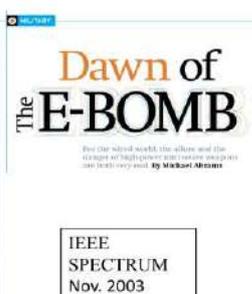
Distinguished Professor; Special Assistant to the Provost for Laboratory Relations; Associate Dean for Research and Innovation School of Engineering University of New Mexico.

Prof. Schamiloglu has been principal investigator on sponsored research >\$45M over his career at UNM. His main sponsors have been the Air Force Office of Scientific Research (AFOSR), the Office of Naval Research (ONR) and the Defense Advanced Research Projects Agency (DARPA). He has mentored 30 Ph.D. and 34 M.S. students.

HisGoogle Scholar profile is

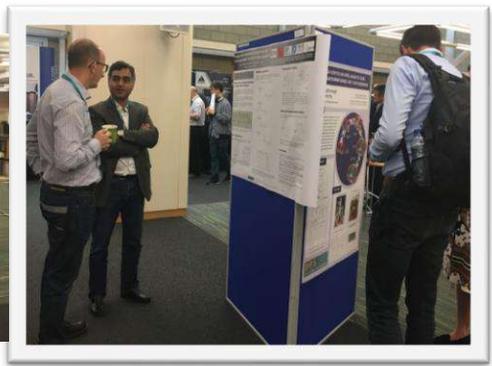
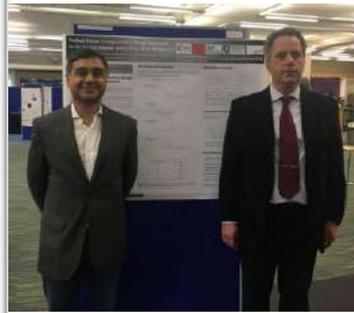
<https://scholar.google.com/citations?user=DXWQnZYAAAAJ&hl=en>.

The Pulsed Power, Beams, and Microwaves Laboratory was founded by Professor Edl Schamiloglu when he arrived to the University of New Mexico's (UNM's) Department of Electrical and Computer Engineering in 1988. Recruited to UNM by Professor Stanley Humphries, Jr., Professor Schamiloglu has established the top academic research laboratory in the United States that studies pulsed power-driven sources of high peak power (extreme) electromagnetics (https://www.youtube.com/watch?time_continue=9&v=o6G3aQfg27k). His group comprises 17 graduate students, several research professors, and several undergraduates. In November 2019 he published a review of the relativistic magnetron with two of his Ph.D. students (Dmitrii Andreev and Artem Kuskov) in the open access AIP journal *Matter and Radiation at Extremes* (<https://aip.scitation.org/doi/10.1063/1.5100028>).





PULSED POWER SYMPOSIUMS



A2P2 actively participated in the 25th UK Pulsed Power Symposiums, which took place at the Loughborough University campus – Science & Enterprise Park with the presence of Marcos Pereira, Luís Redondo, Linda Pereira e Hiren Canacsinh.

The UK Pulsed Power Symposium is a one-day international meeting and an opportunity to meet the leading names in Pulsed Power Physics and Technology and to discuss recent advances in the broad range of applications of pulsed power.

25th April 2019, United Kingdom



Prof. Luis Redondo was invited to visit Xi'an Jiatong University by Prof. Prof. Yongdong Li from the Department of Electronics Science and Technology, to give two lectures oo pulsed power technology and applications, and to talk about the dissemination of this science though A2P2.

"It was really a pleasure and an honour to be in such an important world class University and significant research group in Pulsed Power in China, and I would like to thank them for this opportunity and to extend collaborations with this group. The way I was hosted was really fantastic."

7th July 2019, China





THE ASSOCIATION FOR THE
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PARA O AVANÇO DA
POTÊNCIA PULSADA

MARCH 2020

NEWSLETTER #4

19th International Bioelectrics Symposium 2022

Bioelectrics
Portugal 2022



Great news! It's with immense pride that we announce that our bid to organize the 19th Internacional Bioelectrics Symposium in Portugal from **11 to 14 of September** of 2022 was successful. We hope to welcome you all on the occasion of the Event.

In October of 2019 A2P2 were presented in the Congress of Confederation of Portuguese Business (CIP) where we were honoured with a visit from the President of the Republic.



Avenida Mário Soares – Edifício 35 ISQ - Taguspark
2740 – 119 Porto Salvo | Tel.: (+351) 21 400 35 40
Email: secretariat@a2p2pulsepower.org | <https://a2p2pulsepower.org/>



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NEWSLETTER #4



All of us here at A²P² take this opportunity to wish everyone well at this worrying time where the COVID 19 virus is still spreading across the globe. Our first thoughts are to those who have lost family and friends, and to those who are currently infected. Let us unite efforts, irrespective of our sector in joining together for the good of all humanity. It is a time of coming together, working harder, making sure that science accelerates and focuses even further on providing solutions of benefit for all humanity. We wish each and everyone good health, but also successful experiments and the development of great and innovative solutions for the problems of our time.

The A²P² Board of Directors, March 2020, Portugal

MORE NEWS IN THE NEXT NEWSLETTER

JOIN OUR COMMUNITY AND SUPPORT US



Avenida Mário Soares – Edifício 35 ISQ - Taguspark
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Email: secretariat@a2p2pulsepower.org | <https://a2p2pulsepower.org/>