

# New Jersey's 26th Legislative District SENATOR JOE PENNACCHIO



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## Senator Pennacchio to Hold a Fusion Energy Symposium

May 6, 2019 Contact: [Senate Republicans](#) / (609) 847-3600

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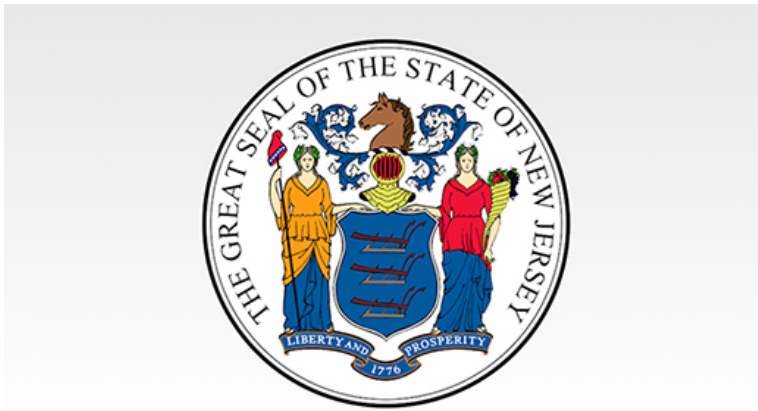


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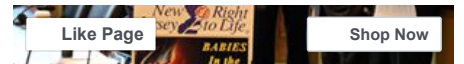
Sen. Joe Pennacchio will hold a symposium on fusion energy with leaders from academia and industry at the State House Annex on Thursday, May 23. Pennacchio is a long-time advocate of the development of fusion as an energy source and has sponsored legislation in the New Jersey State Senate encouraging the support and development of fusion power.



Sen. Joe Pennacchio will hold a symposium on fusion energy with leaders from academia and industry at the State House Annex on Thursday, May 23. ([SenateNJ.com](#))



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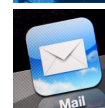
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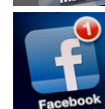
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Achieving commercial development of fusion energy would revolutionize the world economy. It would signal a new era of economic and scientific development worldwide. July 20th is the anniversary of the American achievement of landing men on the moon. What better time to assess the needs and funding for a new great achievement – by the United States, and now with other countries around the world?

**Who:** Senator Joe Pennacchio; experts from national laboratories, businesses, and researchers in the field who will present their work, and share their knowledge of what is being undertaken, and what lies ahead.

**What: Fusion Energy Symposium** – Senator Joe Pennacchio (R-26) will sponsor a hearing on the topic: “What are the Prospects and Requirements for the Early Development of Fusion Energy, and what are the Implications for the U.S., New Jersey, and the World?”

**Where:** State House Annex, Committee Room 6

**When:** Thursday, May 23, 2019 from 9 a.m. to 1 p.m.

The hearing will consider: How can we speed up the prospect of fusion energy development? What are the state, national and international projects now being developed? How do they differ or concur in approach? What businesses in New Jersey are already involved in these projects, and how would a national commitment affect such activity? How would full funding for fusion development play itself out in terms of American education and the training of researchers and scientists in American universities, and the creation of new spin off technologies? What is the implication of the expansion into space – from the Chinese landing on the far side of the moon, to the US commitment to return to the moon in five years – for the work in fusion and associated sciences? What is happening in China, Russia, Europe, and other countries regarding fusion development?

Members of the legislature and academia will be invited to the hearing, as well as the press, students, and the public at large. Such presentations would greatly benefit policy makers, teachers, students, citizens and political figures.

#### PANELISTS INCLUDE:

- **[Dr. Michael Zarnstorff](#), Chief Scientist, Princeton Plasma Physics Lab.** Dr. Zarnstorff is currently the chief scientist at PPPL, and was deputy director of the lab from 2009 to 2014. He has lead projects from the stellarator, tokomaks, and other national and international projects;
- **Dr. Fred M. Levinton, Princeton Plasma Physics Laboratory (PPPL), and President and founder of Nova Photonics, Inc.** [Nova Photonics](#) is a NJ company, located in Princeton,

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NJ, engaged in R&D for advanced plasma diagnostics for fusion, with an emphasis in optics and lasers. Dr. Levinton won the [Dawson Award in 1997](#) for a diagnostic system called the "Motional Stark Effect Diagnostic System". He has been involved in projects with ITER since 2000, and can speak to the benefit to US and NJ companies and researchers from the ITER project.

- **Mr. Michael Paluszek, President, Princeton Satellite Systems.** [Princeton Satellite](#) is a NJ company located in Plainsboro, NJ. The company is involved in fusion and space research, including projects on fusion propulsion systems for space travel, and the "[Direct Fusion Drive](#)."
- **Dr. Eric Lerner, Lawrenceville Plasma Physics, Inc., DBA LPPFusion.** [Lawrenceville Plasma Physics](#) is a NJ company located in Middlesex County, NJ. The company is working on a non-Tokamak approach to fusion called the Focus Fusion, using a hydrogen-boron fuel.
- **Marsha Freeman, Author** – *How We Got to the Moon: The Story of the German Space Pioneers, 21<sup>st</sup> century Science Associates, 1993; Challenges of Human Space exploration, Springer/Praxis, 2000; Krafft Ehricke's Extraterrestrial Imperative, Apogee Books, 2009; Washington Editor for Fusion Magazine, 1980-87; Science and Technology Editor for the Executive Intelligence Review, 1982 – present; Editor of 21 Century Science and Technology, 1988 to the present; Editor of The History of Rocketry and Astronautics, Volume 37, and Volume 46, 2006 and 2014, International Academy of Astronautics History Symposium; Cited in Who's Who in American Women.* Marsha Freeman's presentation at the hearing will focus on China's fusion energy and related space programs.

## Statement by Senator Joe Pennacchio – History of Fusion Energy

The harnessing of energy from fusion reactions would be a tremendous positive force for mankind. Unlike nuclear fission reactions in which energy is released when atoms are "split," fusion releases energy when atoms are "joined" together. When two atoms are fused, the resultant "mass" of the combined atoms is less than the previous two, due to the release of a tremendous amount of energy. The difficulty is that the two atoms naturally repel each other. It takes an enormous amount of pressure and heat (six times the sun's core) to join them together. Look no further than the stars – our own Sun — to witness the occurrence of constant fusion reactions. Unlike fission, fusion produces very little radioactive material. It also does not emit any CO<sub>2</sub> into the environment.

One approach to developing fusion as an energy source involves the use of helium-3 (H<sub>3</sub>) for fuel. This idea was pioneered in the United States at the University of Wisconsin Fusion Technology Institute. Some say H<sub>3</sub> allows for a more containable and safer reaction. Where would we find abundant supplies of H<sub>3</sub>? The Sun creates H<sub>3</sub> through its fusion reactions, and sends it into the




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solar system through the electrically charged solar wind. Because of the Earth’s magnetic field, the H3 is repulsed. The Moon, however, does not have a magnetic field, and so does not have this limitation. The Moon has an estimated 25 million surface tons of H3 available. *Twenty-five tons of H3 could power the entire United States for one year.* It is no coincidence that the Chinese have recently landed a spacecraft on the far side of the moon, and are discussing the mining of helium-3.

Princeton was and is a leader in the study and development of fusion energy. The “Princeton Plasma Physics Lab” (PPPL) was critical to adopting the “Tokamak Fusion Reactor” design in the United States. The US, however, has, for years, been consistently underfunding its research. A seven member ITER (International Thermonuclear Experimental Reactor) program, with the goal of generating “net energy” 10x the input — 500 MW generated in a tokamak fusion device from 50 MW input — is located in France. Why shouldn’t the epicenter of this research remain and continue to be in Princeton, New Jersey?




**Joe Pennacchio**  
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