

# US Accelerator Industry- Small Business Perspective

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### US-Japan Advance Science and Technology Symposium

**Advanced Energy Systems, Inc.**



Science Projects  
Homeland Security  
Medical Imaging  
Defense

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**Putting Accelerator Technology to Work**

# OUR HERITAGE

- AES is a private company based in Medford, N.Y. with an office in Princeton, N.J. The core team began working together at Grumman Corporation 30 years ago. Among our early projects were the design and construction of the Tokamak Fusion Test Reactor (TFTR). Working with Los Alamos National Laboratory we also designed the Radio Frequency Quadrupole (RFQ) for the BEAR space program.
- Other projects at Grumman include superconducting magnets for the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory, and the RF photogun for the Compact Infrared Free Electron Laser (CIRFEL) at Princeton University.
- With these and many other projects integral to our heritage, we bring unparalleled expertise, innovation and teamwork to solutions we devise in partnership with our clients organizations.

# OUR CAPABILITIES

- Free Electron Lasers
- Photocathode Guns
- RF Cavities: Normal and Superconducting
- Normal Conducting Linacs
- Cryomodules
- RF Power Couplers
- Optical and Particle Beamlines
- Integrated engineering, Physics, and Design Services
- Manufacturing Facilities

# Small Business Perspective

- AES Aspires to partner with scientific institutes to produce the optimum product. We believe that tech transfer is a two way process.
- AES has and continues to work with many scientific organizations worldwide: ANL, BNL, FNAL, JLAB, LANL, ORNL, SLAC, Cornell Univ., New York Center for Structural Biology, Stonybrook Univ. CEA (France), Daresbury (UK), Fritz Haber Institute (Germany), Institute of Modern Physics (China), KEK (Japan), Mc Gill Univ. (Canada)

# Small Business Perspective Cont.

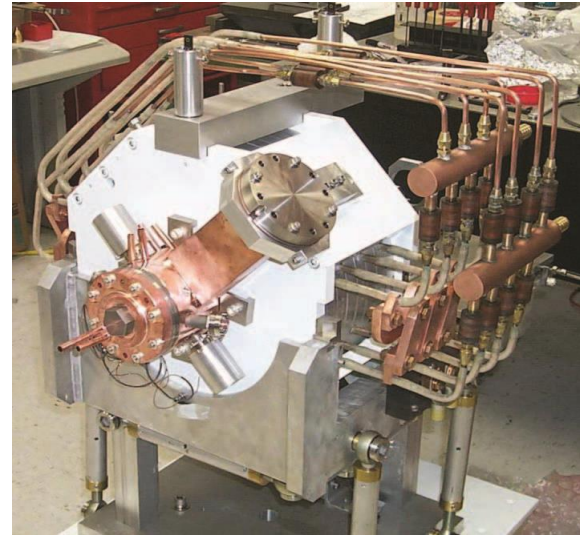
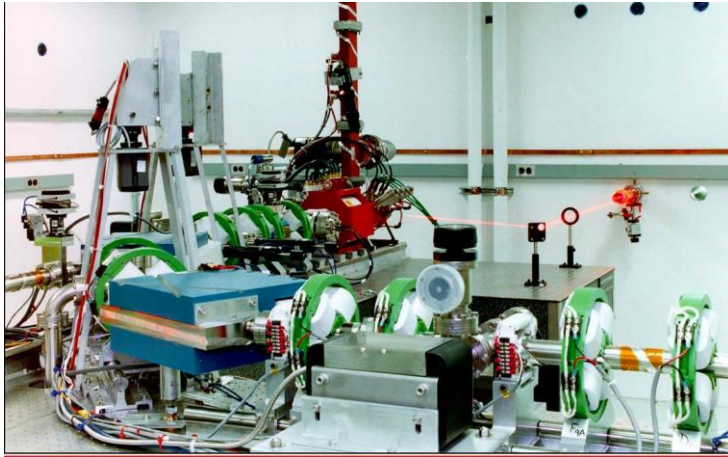
“ AES has the attitude that research is fun. Our working relationship goes beyond commercialization-it feels like a collaboration between two scientific institutes. They have a set of skills, we have a set of skills-and we just complement each other.”

Ilan Ben-Zvi

Accelerator R&D

Brookhaven National Laboratory

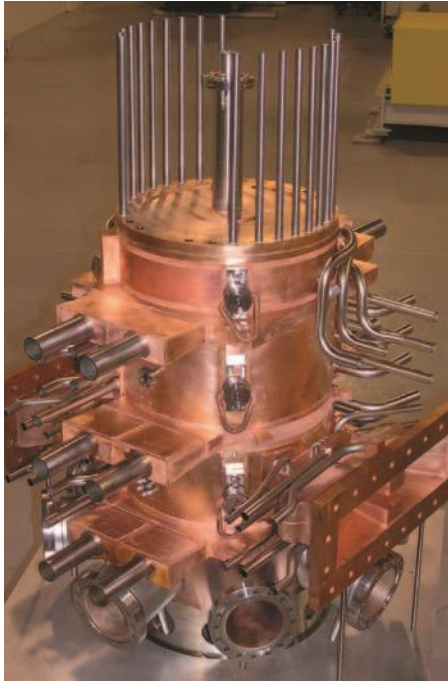
# BNL / AES Projects



# JLAB / AES Project

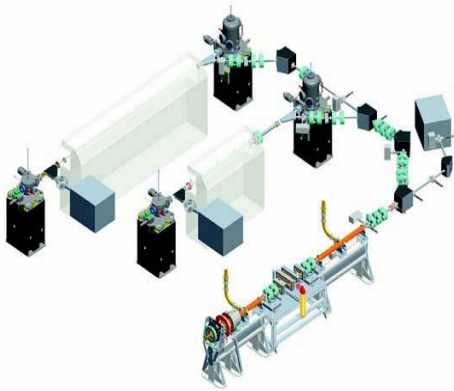


# LANL / AES Project





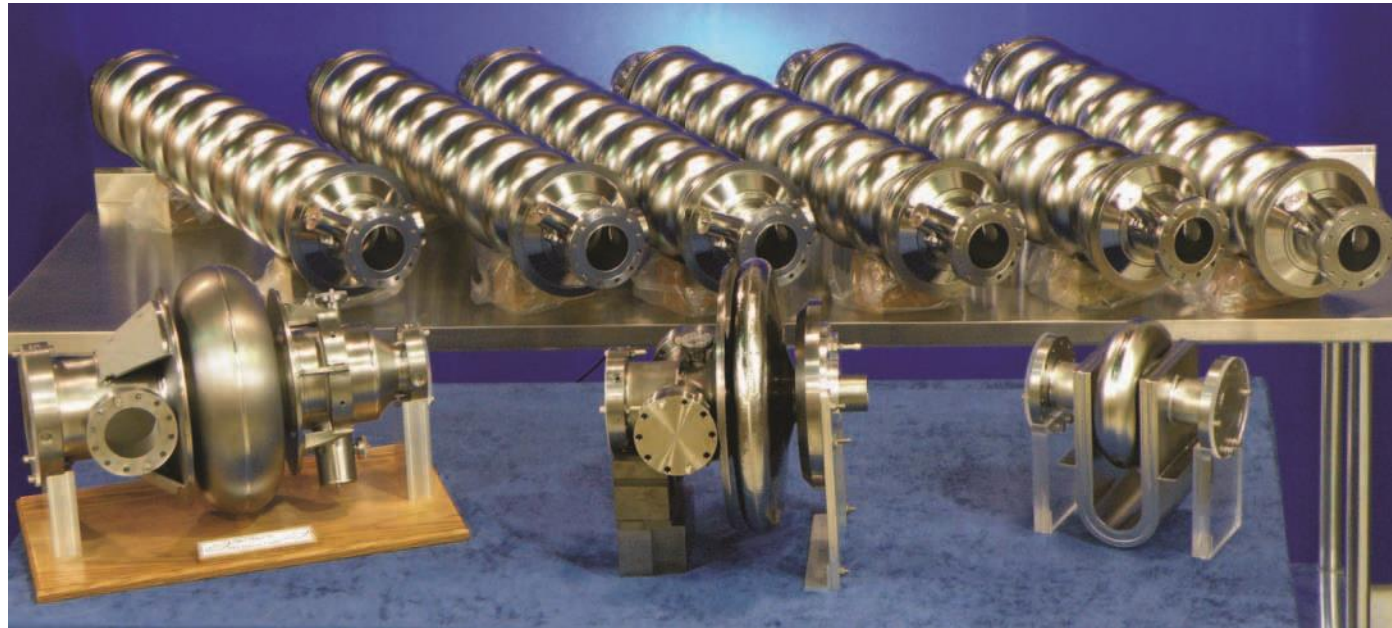
# Fritz Haber Institute / AES Project



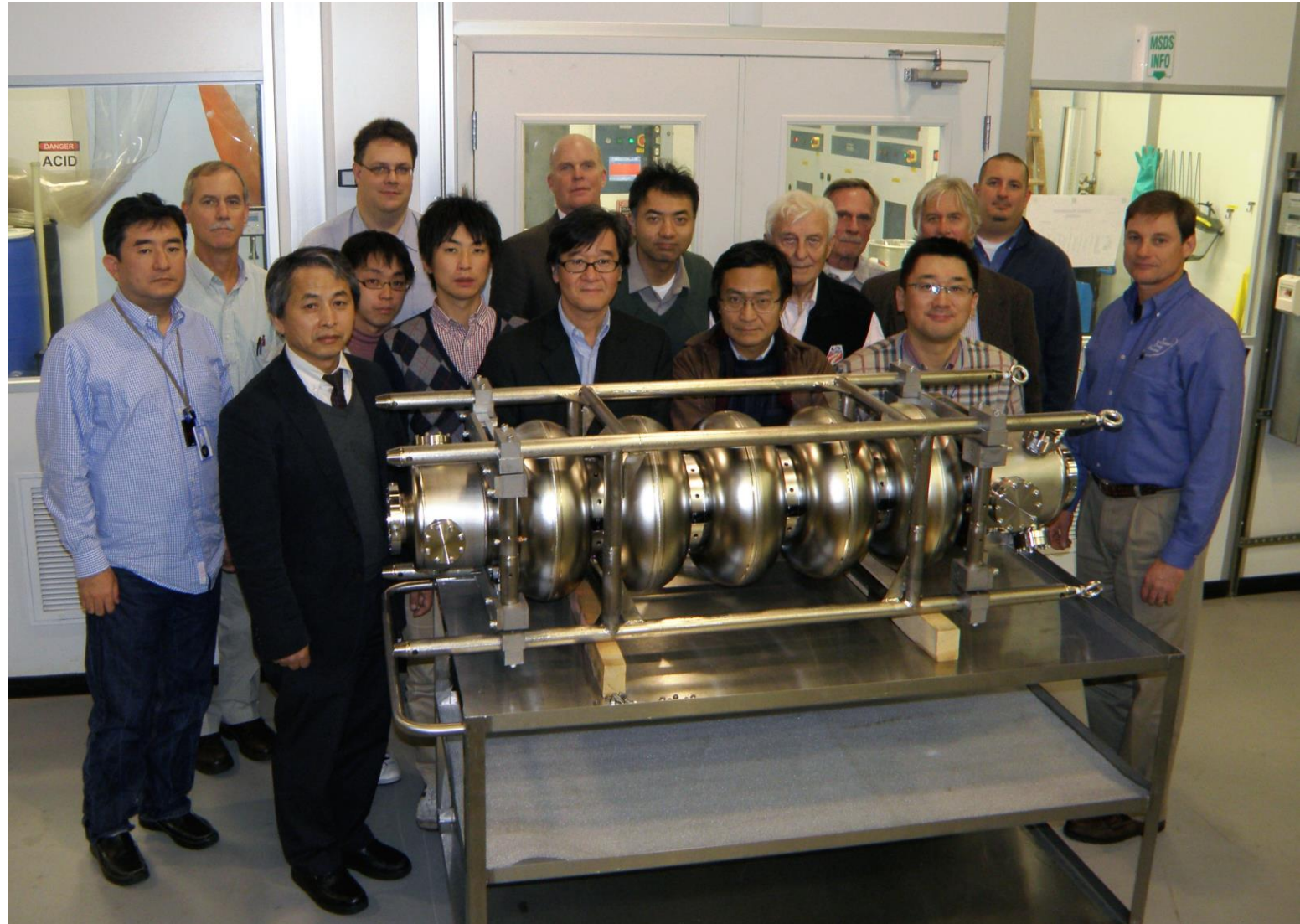
# AES Involvement in the ILC Program

- AES delivered 26-9 cell ILC cavities to Fermilab, and 10 additional are now near completion.
- 14 of these cavities have been tested and 10 have exceeded 35Mv/m with 2 exceeding 40 Mv/m.
- AES will be electropolishing 3-9 cell ILC in MAY 2013.
- AES has completed two Industrial Cost Studies for the GDE

Back Row: 1.3 GHz 9-Cell ILC Cavities for Fermilab  
Front Left: 748.5 MHz Single Cell Cavity for JLAB  
Front Center: 703.75 MHz SRF Photocathode Gun for Brookhaven  
Front Right: 1.3 GHz SRF Traveling Wave Cavity for Euclid Techlabs



# U.S – Japan Cooperation



# Summary

- AES is a small business that partners with scientific institutes worldwide to provide quality products
- AESW has been involved in the ILC from the 2004 meeting at Snowmass
- By the summer of 2013 , AES will have delivered 36 ILC cavities to Fermilab
- AES is the only US qualified producer of ILC cavities along with companies in Japan and Europe
- AES and KEK have had technical exchange meetings on ILC Industrialization