



**Dr. Lionel M Levinson - Consultant
Electronic Materials and Ceramics**

Vartek Associates LLC

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PRIMARY EXPERTISE	-- Description --
varistor metal-oxide varistor overvoltage protection surge arrester surge protection, zinc oxide	Since early 1972 Dr. Levinson has conducted studies of the physical, chemical, and materials aspects of metal oxide varistors (ZnO-based transient protection devices). A recognized authority on the manufacture, operation, and understanding of metal oxide varistors, Dr. Levinson is familiar with the field of arresters and transient protective devices in general and the utilization of metal oxide technology for this purpose.
circuit breaker current-limiting fuse electrically conductive elastomer	Dr. Levinson has developed a fast resettable solid state circuit breaker (multi-use fuse) based on conductive polymer composites. This polymer current limiter can limit surge currents in the 100-kiloamp range in times less than 1 millisecond. He has five patents in this technology area.
sapphire lamp material optical ceramic	Dr. Levinson has invented a technique for transforming polycrystalline alumina to single crystal aluminum oxide (sapphire) while in solid state form (no melting). This allows one to cheaply fabricate sapphire parts in any shape available (tubes, plates, domes, etc.) by standard ceramic techniques. The applications range from lamps to fibers to radomes. Dr Levinson has five patents issued in this technology.
magnetic ceramic Mossbauer spectroscopy	Dr. Levinson has conducted extensive investigations of the behavior of superparamagnetic nanoparticles. This includes critical phenomena and the use of Mossbauer spectroscopy to evaluate magnetic oxides and nanopowders.
nanopowder nanostructured material nanotechnology small-particle ceramic	Dr. Levinson has served on the board of TAL Materials and as a TAL consultant. TAL is a nanotechnology company providing nanopowder-based research and development solutions to corporate customers.
Igniter, silicon carbide	Dr. Levinson has extensive experience in the fabrication and use of silicon carbide materials for gas ignition in appliances such as gas ovens and gas ranges.
electronic material electrochemical-energy generation photovoltaics portable thermoelectric generator thermoelectric material	Dr. Levinson's expertise and activities have included technical and administrative responsibility for teams of scientists and engineers active in electronic ceramics, solid state materials and electronic devices with operating budgets in the \$5 million range. Projects have ranged from fundamental studies to applied device R&D and business development. His technical expertise in this field includes ZnO surge protectors, silicon carbide igniters, photovoltaics, thermoelectric materials, electronic packaging, magnetic devices, organic light emitting diodes, and polymer current limiters. In this regard he has had extensive interactions with a wide range of General Electric businesses and U.S. government agencies.
industrial microwave	Dr Levinson has extensive experience in the application of microwave

**processing
industrial nonfood
microwave processing**

technology to the processing of ceramics (e.g. zinc oxide) and polymer materials (e.g. cyclics).

EDUCATION

<i>Year</i>	<i>Degree</i>	<i>Subject</i>	<i>Institution</i>	<i>Honors</i>
1970	Ph.D.	Solid State Physics	Weizmann Institute of Science	
1966	M.S.	Physics	University of the Witwatersrand	
1964	B.S.	Physics	University of the Witwatersrand	(Hons.)

WORK HISTORY

<i>Years</i>	<i>Employer</i>	<i>Department</i>	<i>Title</i>	<i>Responsibilities</i>
2002 to 2003	Vartek Associates LLC		Consultant	Dr. Levinson is the Principal and owner of a materials consulting company.
1970 to 2002	General Electric Company	Corporate Research and Development	Program Manager and Coolidge Fellow	He provided technical and management leadership of 20 scientists in electronic and optical materials research. Dr. Levinson has held a variety of management and engineering positions at General Electric. His activities included technical and administrative responsibility for teams of scientists and engineers active in electronic ceramics, solid state materials and electronic devices with an operating budget in the \$5 million range. Projects ranged from fundamental studies to applied device R&D and business development. His marketing expertise includes ZnO surge protectors, silicon carbide igniters, photovoltaics, thermoelectric materials, electronic packaging, magnetic devices and polymer current limiters. His duties at GE combined technical leadership and supervision, personnel administration, contract marketing, and interactions with a wide range of General Electric businesses and U.S. government agencies. In 1997 he assumed the position of Manager, Global Programs Development at GE Corporate R&D. In this role Dr. Levinson had direct responsibility for developing strategic relationships between GE businesses and high technology companies in Israel, Singapore, Taiwan, and Australia as well for interactions in materials technologies with GE's R&D centers in Bangalore, India, and Shanghai, China. While Manager of Global Programs, Dr. Levinson developed close relations with GE Equity and played a key role in the evaluation of high technology start-up companies and subsequent GE investment funding.

2000 Rensselaer Physics Adjunct Professor
to Polytechnic Institute Department
2002

CAREER ACCOMPLISHMENTS

Associations/Societies

Dr. Levinson is a member of the Materials Research Society, and a Fellow of the American Ceramic Society.

Professional Appointments

In 1996 Dr. Levinson was Vice-President for Programs, Meetings and Expositions of the American Ceramic Society. In 1991 Dr. Levinson was named Vice President for Research of the American Ceramic Society, and in 1987 he was elected to the Board of the American Ceramic Society, representing the Electronics Division as trustee. In 1983 he was elected as Chairman of the Electronics Division of the American Ceramic Society and was elected to the post of Chairman of the Electronics Division of the American Physical Society in 1982. In 1989 Dr. Levinson chaired the "Second International Varistor Conference." In 1988 he chaired the Engineering Foundation Conference on "Advanced Interconnects for High Density Packaging". In 1986, he was co-chairman of an Engineering Foundation Conference on "Applications of Ceramics to Microelectronic Interconnect Technology." In 1982 he was Chairman, of the International Conference on Grain Boundary Phenomena in Electronic Ceramics. He is Associate Editor of the Journal of the American Ceramic Society.

Awards/Recognition

In 1994 Dr. Levinson took a position as Visiting Fellow at the National Institute of Science and Technology in Washington, DC. In 1993 Dr. Levinson was named a Coolidge Fellow, the highest honor conferred on the staff of GE Corporate Research and Development. In 1983, he was named a Fellow of the American Ceramic Society. He was a recipient of the Dushman Award in 1984 for his achievements in the "Science and Technology of Zinc Oxide Varistors." In 1980 he was co-recipient of an IR-100 award for the development of a Varistor-Switched Liquid Crystal Display.

Publications and Patents

Dr. Levinson has written or edited 4 books, approximately 87 technical papers and articles pertaining to his fields of work, and has been awarded 61 U.S. patents.

SELECTED PUBLICATIONS

Author	Year	Title	Publisher
Levinson, L.M., Editor	1994	Grain boundaries and interfacial phenomena in electronic ceramics	Ceramic Transactions, 41
Levinson, L.M., Editor	1988	Electronic ceramics: properties, devices and applications	Marcel Dekker
Levinson, L.M. and H.R. Phillip	1990	Oxide non-linear conductors: a review	MRS Proceedings, 195, 639 (1990)
Levinson, L.M., H.A. Comanzo, and W.N. Schultz	1992	Microwave sintering of ZnO varistor ceramics	Mat. Res. Soc. Symp. Proc. 269, 311 (1992)
Levinson, L.M., C.W. Eichelberger, R.J. Wojnarowski, and R.O. Carlson	1988	High density interconnects using laser lithography	Proc. of the 1988 ISHM Annual Meeting, p 301

CONSULTING SERVICES

Dr. Levinson is a consultant to Sandia Laboratories. The project relates to operational functionality and production of an

electronic ceramic device.

He consults with General Electric company on materials technology development for flexible solar cells.

Dr. Levinson consults with TAL Materials, Inc. on program opportunities in nanomaterials technology.

INTERNATIONAL EXPERIENCE

Years	Country / Region	Summary
1997 to 2000	Israel, Singapore, China, India, and Australia	In 1997 Dr. Levinson assumed the position of Manager, Global Programs Development at GE Corporate R&D. In this role Dr. Levinson had direct responsibility for developing strategic relationships between GE businesses and high technology companies in Israel, Singapore, Taiwan, and Australia as well for interactions in materials technologies with GE's R&D centers in Bangalore, India, and Shanghai, China. While Manager of Global Programs, Dr. Levinson developed close relations with GE Equity and played a key role in the evaluation of high technology start-up companies and subsequent GE investment funding.
1996 to 1996	U.K.	In 1996 he acted as Adjunct Director for the U.S. Office of Naval Research in London, England.

ADDITIONAL EXPERIENCE

Marketing Experience

Dr. Levinson has held a variety of management and engineering positions at General Electric. His marketing expertise includes ZnO surge protectors, silicon carbide igniters, photovoltaics, thermoelectric materials, electronic packaging, magnetic devices and polymer current limiters.

Other Relevant Experience

He holds both DOD and DOE clearances.