

The construction of vacuum electronic devices is an artisan process; it requires extremes of high-precision machining and assembly and the tolerances and feature sizes become more exacting as the operating frequency increases. Designs are currently limited by conventional manufacturing processes, requiring components to be manufactured individually, then stacked into assemblies, and brazed. Additive manufacturing offers the ability to achieve vacuum integrity, enclosed complex cavity shapes, and high-power handling capability all at once. Additive manufacturing can be implemented for construction of fully integrated vacuum electronic devices, starting the next generation for low-cost and high-capability RF vacuum devices.

Dr. Diana Gamzina serves as CEO of Elve, Inc., developing millimeter-wave power amplifiers. Prior to that Diana was staff scientist at the SLAC National Accelerator Laboratory for five years and a development engineer at the UC Davis millimeter-wave research group for over eight years, leading research and development programs in millimeter-wave vacuum electronics. Her expertise includes micro to nano scale as well as additive fabrication techniques, multiscale multifunctional materials design and analysis, and development of compact high-frequency and high-power RF sources.