Ideas Into Products.
Products Into Production.

NASA GSFC: SBM has provided on-site and off-site support of the NASA Goddard Space Flight Center (GSFC) in the development of x-ray detectors for ground and space-based telescopes. The technical constraints for these systems are tremendous, requiring operation at cryogenic temperatures under vacuum conditions, and involving exotic materials and non-standard fabrication and assembly techniques. All systems must be manufactured in a way that is consistent with the need for eventual flight qualification. SBM is providing on-site support in the development of Transition Edge Sensors (TES) in micro-calorimeter detector arrays where a requirement of precision and uniformity in their superconducting critical temperatures (Tc) is essential. SBM has helped NASA to engineer the Tc of Mo-Au superconducting thin film bilayers on two different substrates: SiN-coated silicon wafers and thin-film SiO2 over an embedded heat-sinking layer. The SBM team was central to the effort to improve processing methods and increase the yield and reliability of these devices, and also in the development of a successful methodology to fabricate superconductive Niobium-on-polyimide flex cables to function in a sub-Kelvin temperature environment. SBM also led the development of practical integration and packaging approaches, and has supported the development of silicon-based soft x-ray optics. In order to execute successfully on all aspects of these projects, SBM has provided on-site engineering staffing support as well as off-site design, testing and fabrication support to NASA/GSFC.

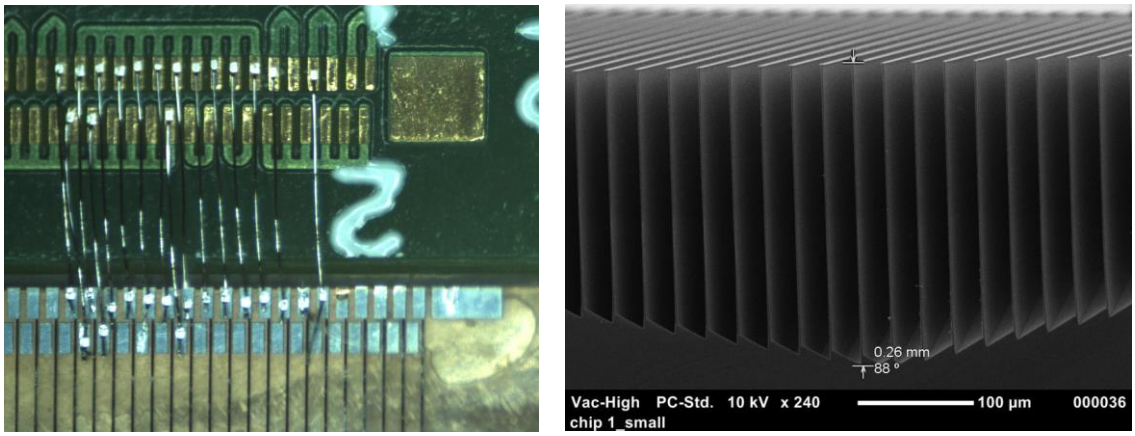

Figure 1. (Left) This figure shows wedge bonded aluminum pads of a 15 micron thick Niobium flex board suitable for sub-Kelvin temperatures. (Right) SEM picture of Silicon slots which SBM helped develop using a fan arrangement wafer with 0.1 degree increments in Silicon Nitride masking layer

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