1. **Research Title:** Engineering Qubit-Phonon Interactions in Ultra-wide Bandgap Semiconductorsfor Room Temperature Quantum Technologies

2. **Individual Sponsor:**

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3. **Academic Area/Field and Education Level:**
Physics, Quantum Optics, Solid State Physics, Electrical Engineering, Computer Science (MS or PhD level)

4. **Objectives:** The objectives of the proposal would be, broadly, to demonstrate decoupling of delicate quantum systems from the lattice environment through phonon-engineering.

5. **Description:** The control, generation, and manipulation of light within solid-state materials has been an active area of research for many decades, leading to a plethora of photonics-based technologies over wide frequency bands of the electromagnetic spectrum. This same level of control does not exist for phonons, however, which play a dominant role in the optical and thermal properties of many materials. The focus of this topic will be on ultra-wide bandgap semiconductors which have the advantage of hosting qubit states that can persist to room temperature, but still suffer from uncontrolled phonon interactions thus reducing their coherence lifetimes and mitigating their usability in real-world quantum technologies. The topic calls for proposals aimed at developing computational and experimental tools to explore phononic metamaterials designs to mitigate qubit-phonon interactions, as well fabrication and testing of designs.

6. **Research Classification/Restrictions:** Unclassified and unrestricted. Eligible for public release.

7. **Eligible Research Institutions:** All DAGSI institutions.