DAGSI Research Topic

1. **Research Title:** Characterizing Quantum Defects in Silicon Carbide
2. **Individual Sponsor:**

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3. **Academic Area/Field and Education Level**

   Physics, Optics, and Electrical Engineering (BA/BS)

4. **Objectives:** The goal of this proposal is to assess the usefulness of silicon carbide materials for quantum photonics applications.
5. **Description:** Quantum defects are important resources in the field of quantum technology. They can be engineered to send photons carrying quantum information across long distances, as well as quantum memory nodes, holding onto quantum information for later use. The purpose of this topic will be to explore silicon carbide as a material platform for quantum defects. Silicon carbide is a material platform already being used extensively in industry and is poised to be a commercially important material in the quantum technology sector. Students will work in an optics lab learning how to characterize the quantum coherent behavior of defects in silicon carbide and will expose students to many of the basic tools of defect characterization, such as photoluminescence, time resolved photoluminescence, and optically detected magnetic resonance spectroscopy.
6. **Research Classification/Restrictions:** Unclassified and unrestricted. Eligible for public release.
7. **Eligible Research Institutions:** All DAGSI institutions
8. **PA Approval #:** AFRL-2025-4316