FY22/23 DAGSI Research Topic

1. **Research title:** Ga_2O_3 for high power devices
2. **Individual Sponsor:**

Dr. Kevin Leedy, AFRL/RYDD
AFRL/RYDD, Bldg. 600
2241 Avionics Cir
Wright-Patterson AFB, OH 45433-7322
Kevin.Leedy@us.af.mil

3. A**cademic Area/ Field and Educational Level:**

   Physics, Applied Physics (MS or PhD level)
   Materials Science Engineering (MS or PhD level)

4. **Objectives:** Recent investigations have revealed the great potential of β-Ga_2O_3 films for high power devices due to its high breakdown voltage and large band gap. The goals of this project are to investigate the fundamental properties of epitaxial β-Ga_2O_3 and related oxide thin films, and develop high quality n-type films to be implemented in high power transistors.
5. **Description:** Epitaxial β-Ga_2O_3 and related oxide films will be grown homoepitaxially and heteroepitaxially and their structural, optical and electrical properties will be investigated. The research intends to expand our understanding of the fundamental electronic properties and the role of defects and dopants. We are interested in applying a wide range of characterization methods and experimental techniques to provide information about defects and electronic properties. Based on the obtained knowledge, growth parameters will be optimized with the goal of producing high quality films for use in transistor devices.
6. **Research Classification/Restrictions:** No restrictions
7. **Eligible Research Institutions:** Universities (DAGSI), AFIT

PA Approval #: AFRL-2022-3212