

Attachment 1 – Research Topic Template

1. **Research Title:** Atmospheric Plasma Deposition for Nanoelectronics
2. **Individual Sponsor:**

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3. **Academic Area/Field and Education Level**
 Physics, Materials Engineering & Science, Chemical Engineering, Electrical Engineering, Chemistry (BA/BS, MS or PhD level)
4. **Objectives:** Objectives of this research are to develop new processes and materials capable of deposition by atmospheric plasma.
5. **Description:** Atmospheric plasma deposition for semiconducting electronics provides unique opportunities. Pencils/jets enable additive manufacturing, customization and in-field manufacturing of electronics. The plasma will to enhance adhesion, provides chemical vapor reactions of precursors and deposition of nanowires and carbon nanotubes. Several oxide and chalcogenide semiconductors although lacking perfect crystallinity are emerging nanoelectronic semiconductors. This simple simple approach will lead to lower cost for additive manufacturing of electronics. In addition, investigate controlling the process, material feed, and plasma to control the grain size of the deposited material which will allow band gap engineering for nanoparticles.
6. **Research Classification/Restrictions:** There are no anticipated classification levels and restriction associated with this research.
7. **Eligible Research Institutions:** Indicate to what organizations this topic should be provided

DAGSI (Wright State University, AFIT, Ohio State University, University of Dayton, Miami University, Ohio University, University of Cincinnati) NOTE: Topics submitted to DAGSI must be approved for public release. PA Approval # 88ABW-2015-3566

AFIT (only)

USAFA (only)

If you are submitting a topic for the USAFA, indicate if you are also interested in sponsoring a USAF Cadet in summer 2015 (Average cost for USAF Cadet for 33 days is \$5000)

Yes

No