

1. **Research Title:** “Signature Signal Processing Using Information Theory for Improved Radar Sensor Exploitation Systems”
2. **Individual Sponsor:**
Dr. John Malas, AFRL/SNAS,
AFRL/SNAS Bldg 620
2241 Avionics Circle
WPAFB, OH 45433-7333
(937) 904-9058
john.malas@wpafb.af.mil
3. **Academic Area/Field and Education Level:** Electrical Engineering, Radar, Statistical Signal Processing, Information Theory (MS, PhD level)
4. **Objectives:** Radar Signature Database Similarity Measures and Techniques
 - a. Develop physics based theory for the interpretation and development of a subspace signal model of high range resolution (HRR) radar signatures.
 - b. Apply these physics based subspace methods in conjunction with information theory to develop signature similarity science for radar sensors and signature databases.
5. **Description:** Our investigations suggest that it is relevant to seek to define the very notion of a radar signature. With a greater understanding of the physics based theory behind radar signature statistics and subspace structure, we are better positioned to couple the design of signature with that of the sensor. We believe that the powerful ideas of information theory can be used to create a unified frame work for the study of target Identification. Within this framework it is possible to raise and seek answers to the fundamental questions of target identification.
6. **Research Classification/Restrictions:** This research is FOUO and has potential ITAR restrictions. US Citizenship required.
7. **Interest in Summer USAFA Cadet (Avg Cost for USAF Cadet for 33 days was \$4000):**

No applicability to undergraduate level at this time.

Eligible Research Institutions:

- Universities (DAGSI) AFIT (only) USAFA