## AFRL RESEARCH TOPIC CALL FY14

1. **Research Title:** "Space Weather Effects on Global Navigational Satellite Systems (GNSS)."
2. **Individual Sponsor:**
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   RY15-5
3. **Academic Area/Field and Education Level:** Electrical Engineering or Physics (MS level)
4. **Objectives:** AFRL has an on-going effort in developing precision navigation technologies to support advanced distributed sensing techniques. The Multi-INT Reference Optimization for Distributed Sensing (MIRODS) aims to develop distributed navigation sensors that can provide high accuracy and robust position solutions. As we enter a new solar maximum cycle, space weather effects on GNSS are pressing issues that can potentially disrupt space based navigation and surveillance and other sensing systems. This project will 1) establish a multi-constellation, multi-frequency spaced global navigation satellite systems (GNSS) receiver array to collect GNSS signals undergoing ionosphere scintillations; and 2) characterize and eliminate ionospheric error in both GNSS positioning as well as two-way-time-transfer (TWTT) with space based systems. By obtaining full scale data for ionosphere tomography measurements, this proposed project will compliment other GNSS in-house research and collaborative efforts with affiliated universities and industrial partners by providing a thorough understanding of the ionosphere scintillation effect on GNSS receiver's performance.
5. **Description:** This project will enhance existing multi-constellation, multi-frequency spaced global navigation satellite systems (GNSS) receiver array to collect GNSS signals during the upcoming solar max. The project will also analyze the received data for space weather effects on GNSS studies and development of assured GPS and other GNS receivers during active solar periods.
6. **Research Classification/Restrictions:** None at this time.
7. **Interest in Summer USAFA Cadet:** None at this time.
8. **Eligible Research Institutions:** *Place an X in all that apply.*

   x Universities (DAGSI & AFIT) ☐ AFIT (only) ☐ USAFA