



## *CAREER: Physical mechanisms & operational effects of ionospheric interference on unencrypted navigation solution parameters*

### RESEARCH TOPICS INCLUDE:

➤ ORBITAL MECHANICS  
➤ GPS DILUTION OF PRECISION

SPACE  
WEATHER

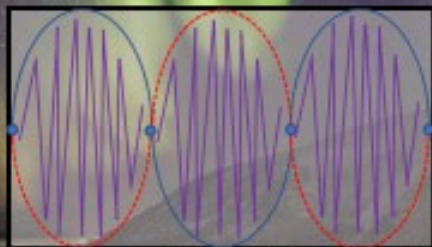
350 KM

150-200 KM

100 KM

AURORAL  
SPECTROSCOPY

PLASMA PHYSICS



SIGNAL ANALYSIS

MODELLING & SIMULATIONS

SPACE POLICY  
& OPERATIONS

➤ RADARS & EXPERIMENTAL  
PROJECTIONS  
➤ RECEIVERS & TEACHING LABS  
➤ RADIO WAVE PHASE  
SCINTILLATIONS

### SPACE WEATHER RESEARCH AT USMA

SPACE WEATHER'S EFFECTS ON GPS SIGNALS IN THE AURORAL OVAL HAVE LED TO NUMEROUS ADVANCES IN HOW WE UNDERSTAND THE BEHAVIOR OF THE HIGH-LATITUDE IONOSPHERE.

#### OVERARCHING RESEARCH QUESTIONS:

- WHAT ARE THE UNDERLYING PHYSICAL MECHANISMS CAUSING OBSERVED UNENCRYPTED NAVIGATION SIGNAL SCINTILLATIONS IN THE AURORAL OVAL?
- CAN A GLOBALLY ACCEPTED METRIC BE DEvised TO REPRESENT THE OPERATIONAL IMPACT OF OBSERVED UNENCRYPTED NAVIGATION SIGNAL SCINTILLATIONS IN THE AURORAL OVAL?