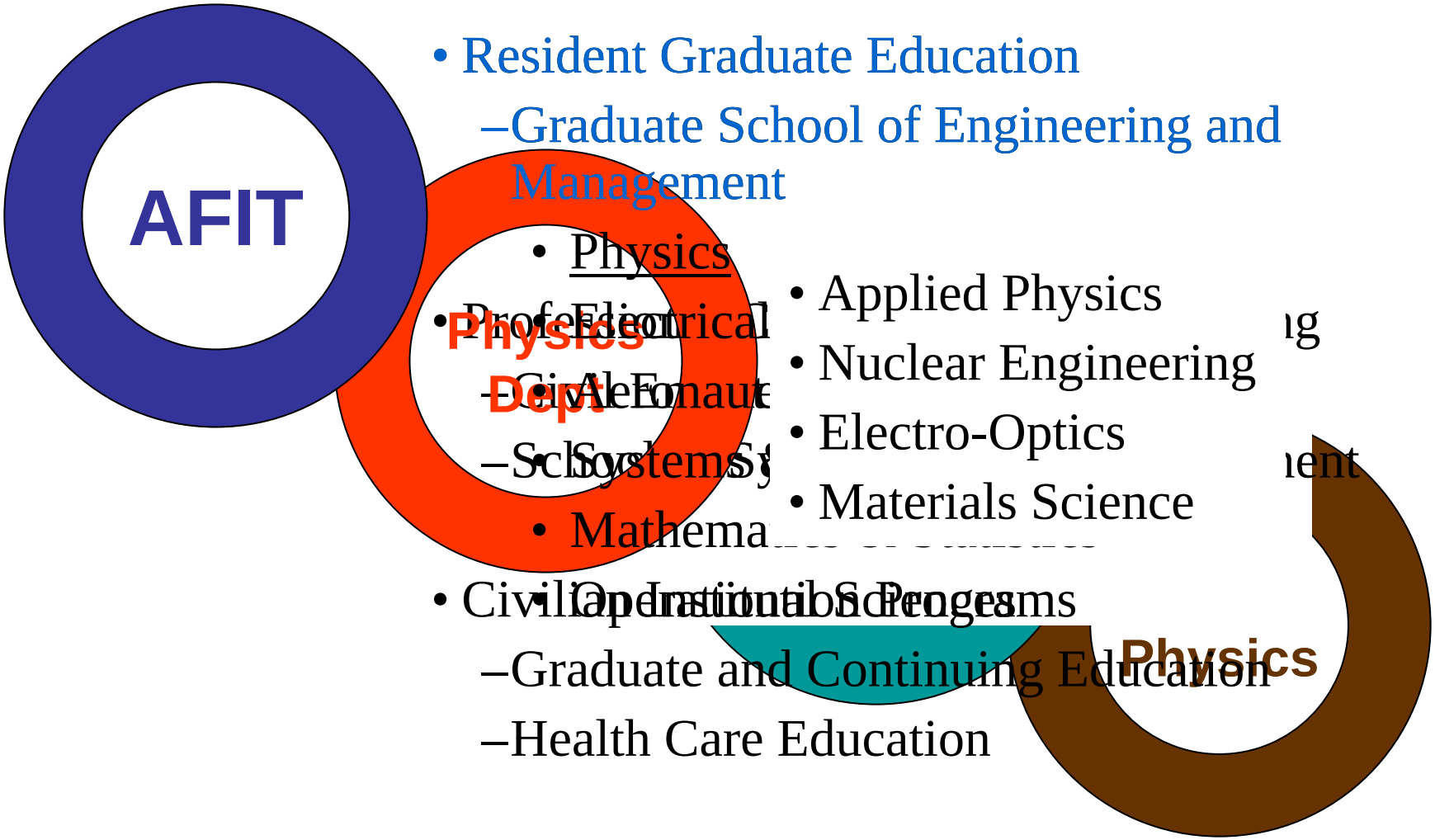
Air Force Institute of Technology
CCMC Interaction

Maj Christopher Smithtro
Asst Professor of Atmospheric Physics
christopher.smithtro@afit.edu

Educating the World's Best Air Force

AFIT Space Physics



- Resident Graduate Education
  - –Graduate School of Engineering and Management
    - Physics
    - Applied Physics
    - Nuclear Engineering
    - Electro-Optics
    - Materials Science
- Civilian Institutional Programs
  - –Graduate and Continuing Education
  - –Health Care Education

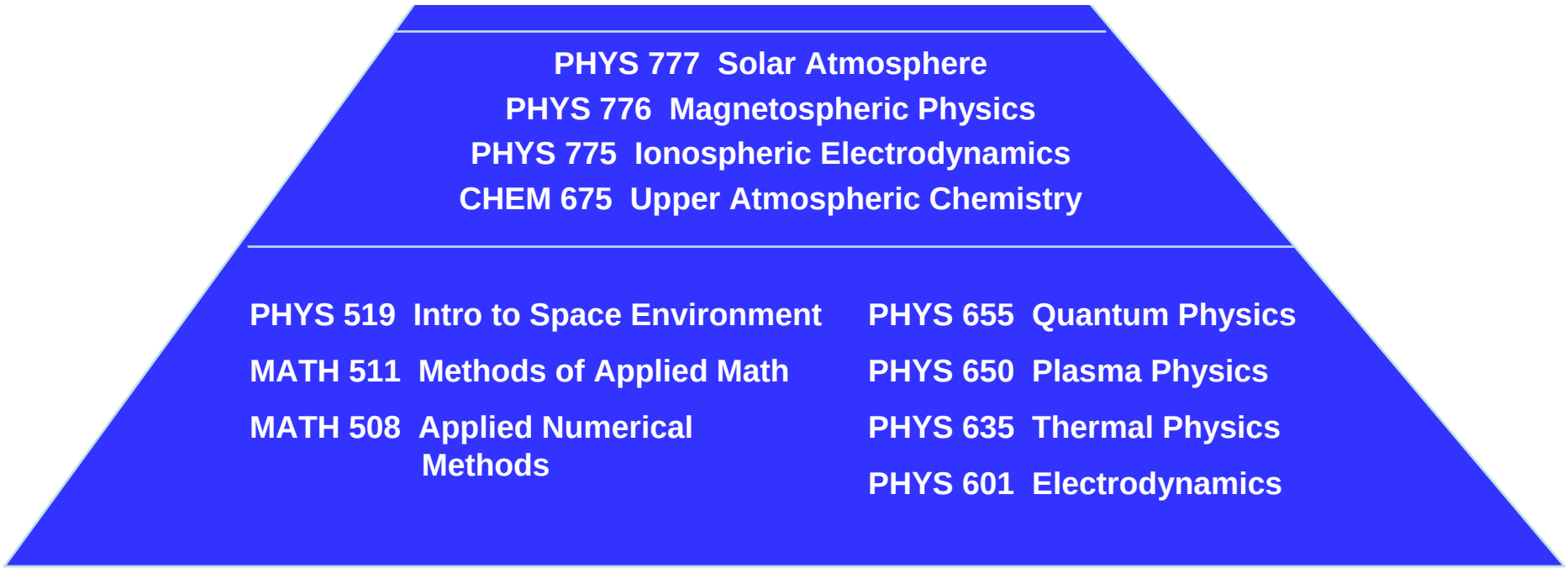
Space Physics Curriculum

- AFIT mission differentiates it from other schools
- Primary mission to educate future space wx officers
  - Breadth of coverage
  - Ops focus to courses & research
  - Faculty field experience
- Also serve cross-over students and civilians

Space Physics Curriculum

PHYS 792

- Space physics tracks also available to other programs (e.g. aero-, astro-, and electrical engineering)



Current Research Guidelines

- Research topics chosen from prioritized list
  - Generated by XOO-W each year; solicited from users
- Samples
  - Improve high-altitude radiation support
  - Evaluation of HAF solar wind model
  - Investigation of ionospheric response to solar flares
  - Ray-tracing applications using GAIM model
- Emphasis on funded research

Traditional Research Areas

Historically, most research in conjunction with AFRL

- V&V new computer models (e.g. PRISM, MSM)
- Validation, assessment, exploitation of new data
- Improve Diagnostics & Forecasting for
  - Spacecraft Hazards
  - HF Comm Outages
  - Scintillation

Previous Thesis Topics

- “A Correlation of Geosynchronous Orbit (GEO) and Low Earth Orbit (LEO) Energetic Electron Events Using Data from the Compact Environmental Anomaly Sensor (CEASE) Instrument
- “A Derivation of the Dst Index from the SSM Magnetometer on board the Defense Meteorological Satellite Program (DMSP)”
- “Estimating Equatorial, F-Region Vertical E×B Drift Velocities from Ground-Based Magnetometer Measurements in the Philippine Sector”
- “Derivation of a Self-Consistent Auroral Oval Model using the Auroral Boundary Index”
- “Spacecraft Charging at Geosynchronous Altitudes: Critical Temperature Analysis for Non-Maxwellian Distributions”
- “Validation and Assessment of DMSP Electron Temperatures in the Topside Ionosphere”
- “Validation and Characterization of Ionospheric Densities measured by DMSP”
- “GPS Vulnerability to High-Latitude Scintillation at Solar Maximum”
- “Testing the New USGS *K* Index Algorithm at Bear Lake Observatory”
- “Penetration of Magnetospheric Storm & Substorm Effects to Mid-Latitudes”

AFIT/CCMC Collaboration

- Existing runs useful as canned classroom examples
- Classroom/laboratory open-ended projects
- Research Opportunities
- Soliciting material/ideas from community
  - An opportunity to influence future AF decision makers!

extra slides…

christopher.smithtro@afit.edu