



**VIRGINIA TECH™**

Kevin T. Crofton Department of  
Aerospace and Ocean Engineering

**Fall 2019**

College of Engineering  
Undergraduate Major/Minor  
Information Session

# Aerospace Engineering & Ocean Engineering



# GREETINGS AND WELCOME



**Dr. Eric Paterson**  
Dept. Head



**Dr. Bob Canfield**  
Assistant Dept. Head,  
Academic Affairs



**Mr. Brian Kastner**  
Academic Advisor




**Ms. Emily Metzgar**  
Academic Advisor

# Agenda

- Where to get Information
- What do Aerospace and Ocean Engineers do?
- Facilities & Rankings
- Professional Societies & Design Teams
  - AIAA
  - SNAME
  - Ambassadors:  
Jayme Goode
  - DBF (David Shane)
  - HPS (Matt Cris)
  - Rocketry (Johnny Jaffee)
  - RockSat-X (Nicholas Jones)
- Q&A

# AOE Online

## www.aoe.vt.edu




Kevin T. Crofton Department of Aerospace Engineering

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ives Department of Defense  
entation awards


### Technical Tracks




Aero / hydrodynamics




Dynamics, control, and estimation




Energy and the environment




Naval engineering




Foundational option




Propulsion



Space engineering



Structures and materials



Vehicle and system design

### Checksheets

#### Aerospace engineering

Courses specific to aerospace engineering majors are shaded in gray.

- > Class of 2018 curriculum
- > Class of 2019 curriculum
- > Class of 2020 curriculum

#### Ocean engineering

Courses specific to ocean engineering majors are shaded in gray.

- > Class of 2018 curriculum
- > Class of 2019 curriculum
- > Class of 2020 curriculum

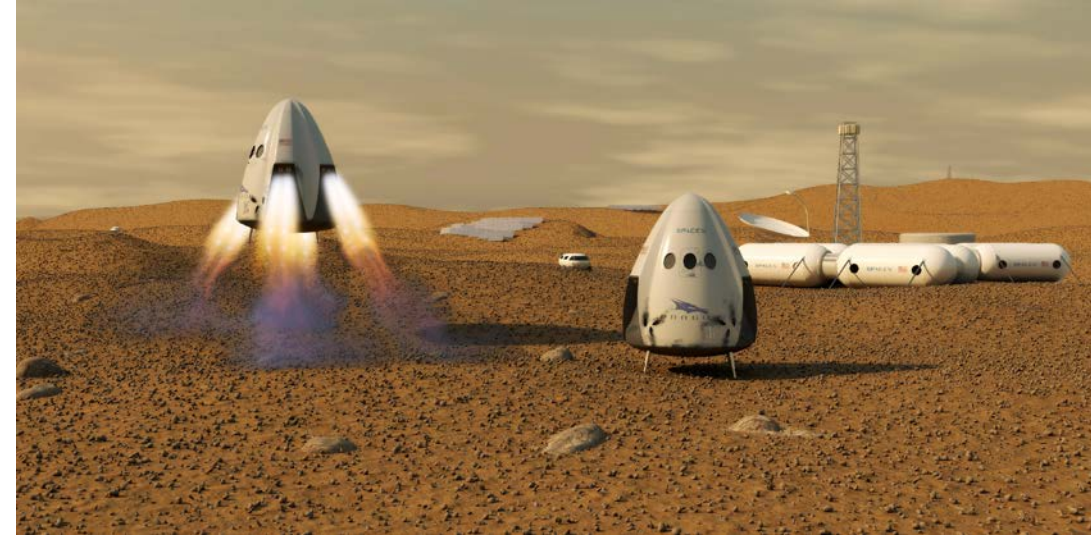


# What is AEROSPACE ENGINEERING?

**Aerospace = AERONAUTICS + ASTRONAUTICS**



**Aeronautics** is the science and engineering involved with the analysis, design, and manufacturing of air-flight capable machines that operate within the atmosphere for exploration, recreation, transport, and defense.



**Astronautics** is the science and engineering involved with the design, and manufacturing of machines which operate beyond Earth's atmosphere for exploration, recreation (!?), transport, and defense.

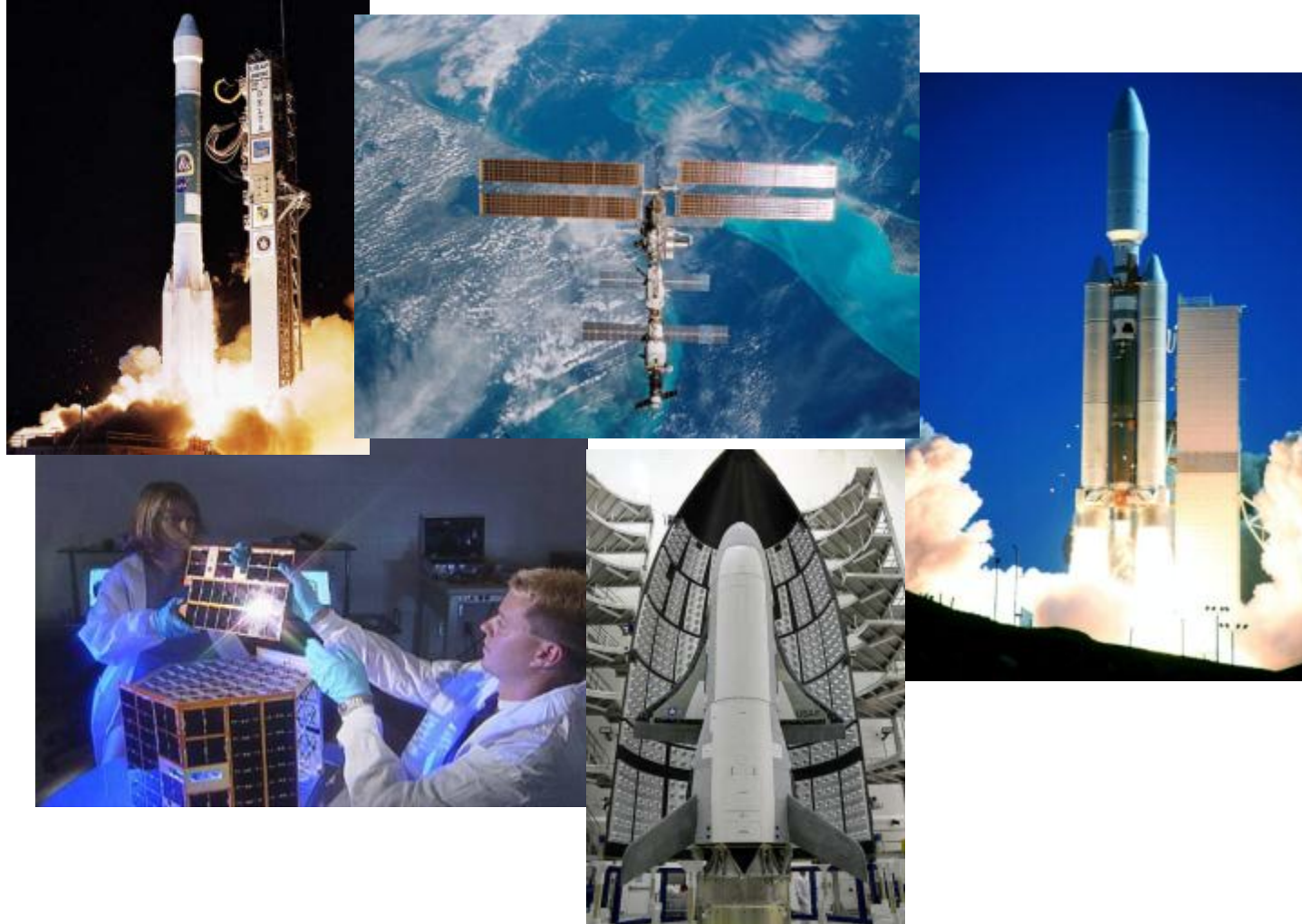
# What do Aerospace and Ocean engineers do?

Design vehicles, including piloted aircraft and crewed vehicles,...





...spacecraft and space launch vehicles,...



...remotely piloted (or autonomous) vehicles, ...



Package delivery drones





Aerospace and Ocean engineers don't do cars...



...unless the car is really fast.



(This one is designed for 1000 mph.)

# Facilities



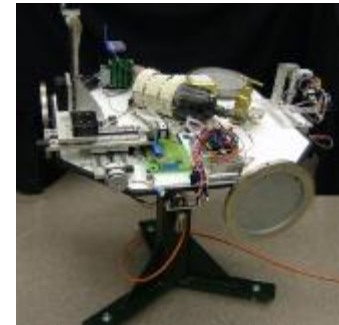
Sub- and supersonic wind tunnels



Machine Shop



Water tunnel and towing tank



Spacecraft Simulator



Autonomous ground, air, and underwater vehicles



# 3D Printing and Additive Manufacturing

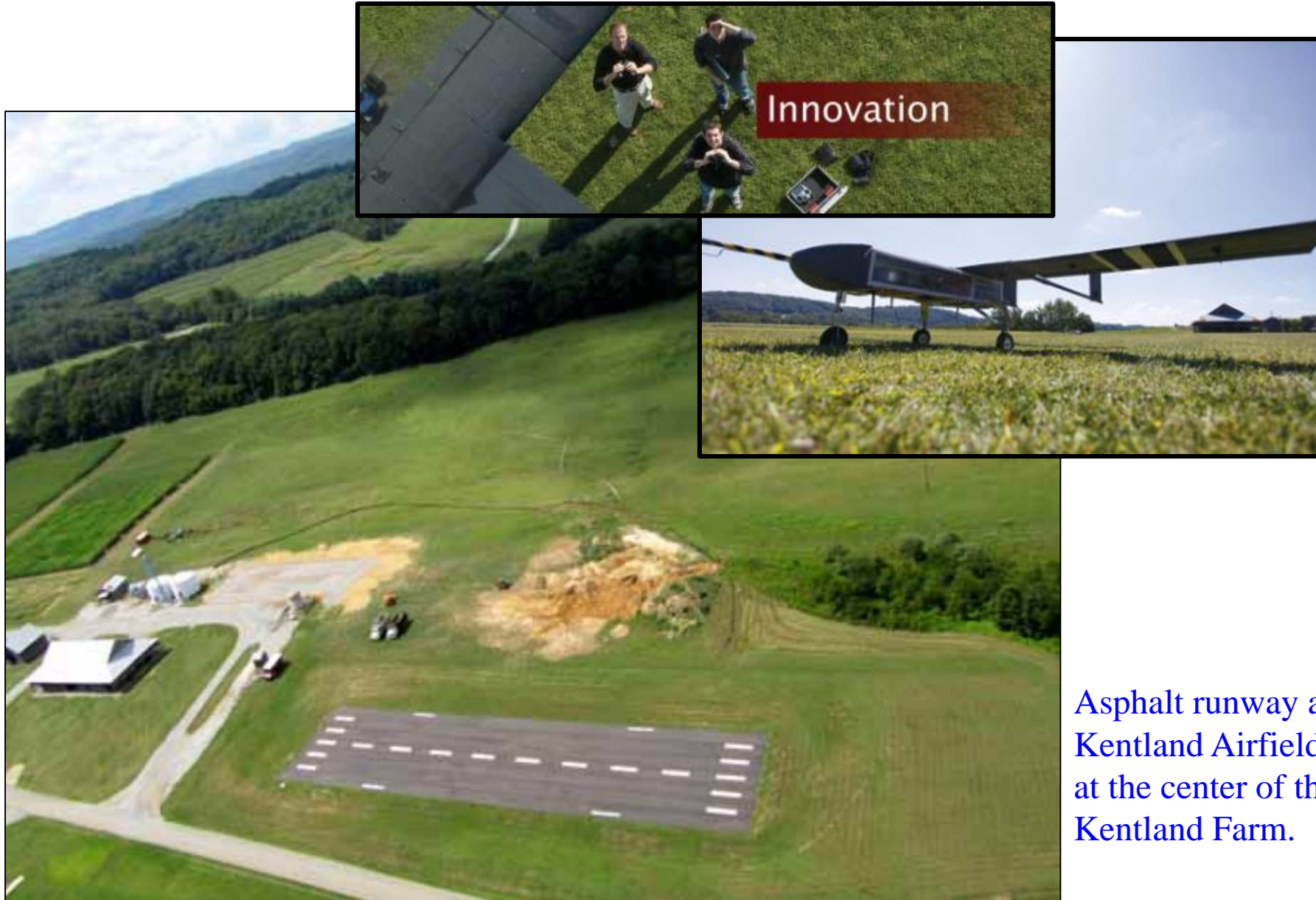
## Wind Tunnel Models



## Static Models and Prototypes

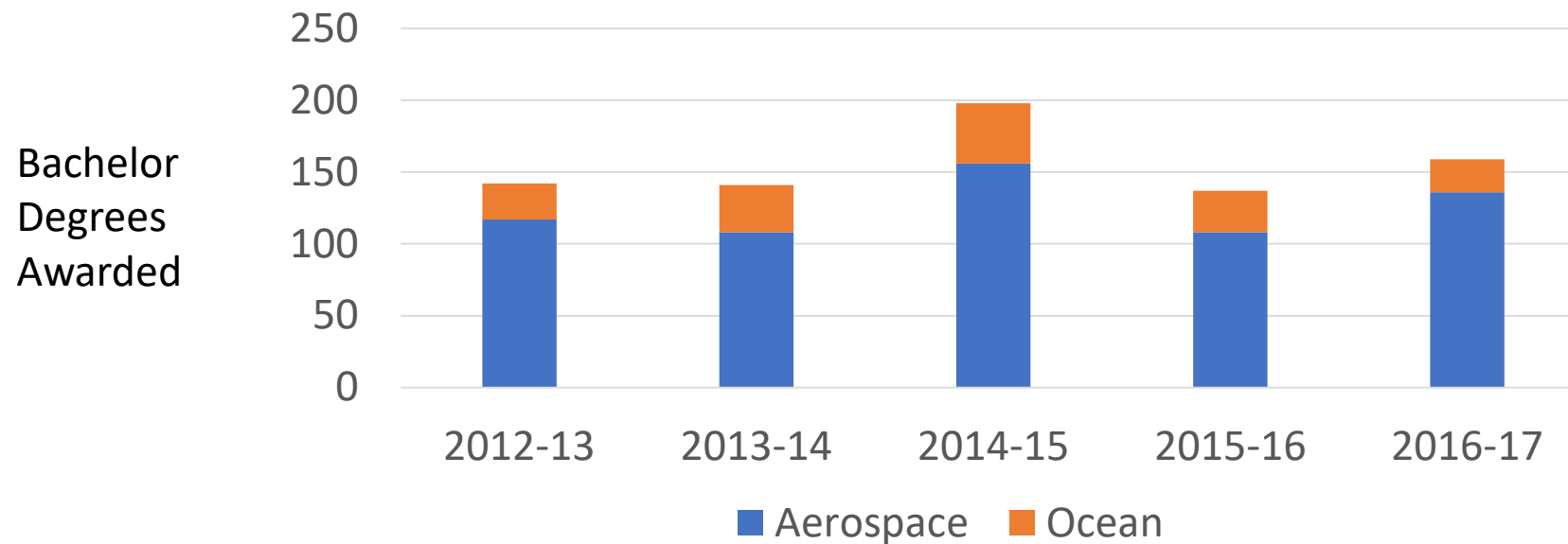
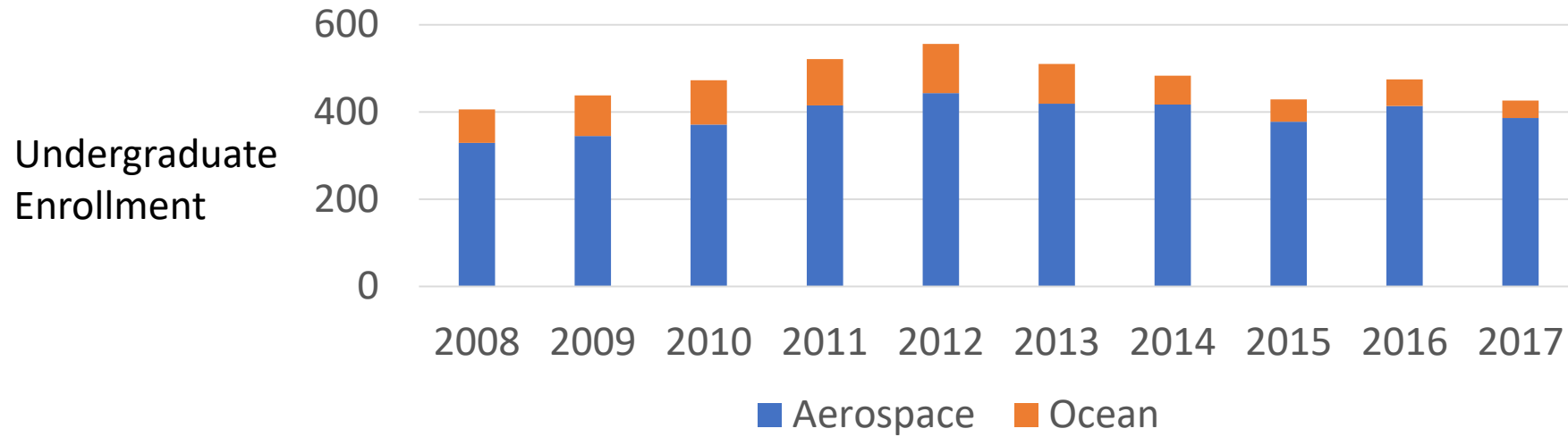


# Kentland Experimental Aerial Systems (KEAS) Airfield



Asphalt runway at the Kentland Airfield located at the center of the Kentland Farm.

# AOE Undergrad Enrollment and Degrees Awarded





# Where do our alumni end up?



Aerospace industry



Ship building industry



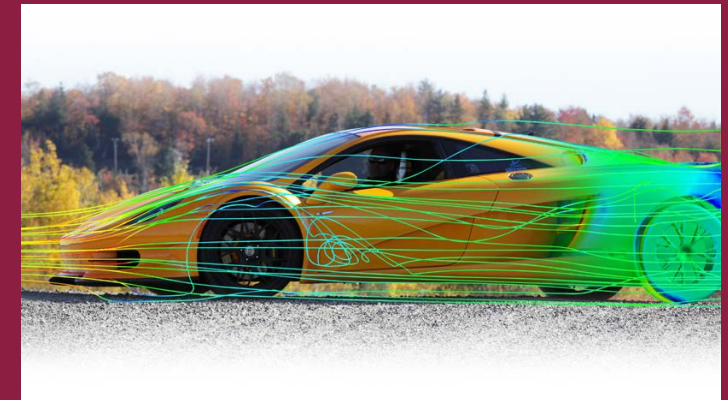
Federal Government  
Agencies



Renewable energy  
industry

Employers range from large, multinational corporations to small consulting firms.

Some of our alumni choose to go into related fields such as automotive engineering, structural engineering, environmental engineering, or into professions such as law or medicine.



## RECENT SURVEYS\* OF AOE GRADUATES INDICATE:

- 57%** expected full-time employment
- 29%** furthered studies in graduate school
- 10%** went into the military or volunteer service

\*conducted by the Virginia Tech Provost Assessment Office and the Office of Career and Professional Development

In 2017-18, AOE graduates median salary was **\$65,000** in Aerospace Engineering, and of those **88%** had jobs related to their major.

# Virginia Tech AOE Global Ranking

■ CENTER FOR WORLD  
UNIVERSITY 2017  
RANKINGS

**#5** AEROSPACE  
ENGINEERING

■ 2017 SHANGHAI GLOBAL  
RANKINGS

**#10** AEROSPACE  
ENGINEERING

AOE Anechoic Wall-Jet Tunnel





# Virginia Tech AOE – USA Ranking



VT Drone Cage

■ 2016 Best Value Schools

**#2** Best Value for  
AEROSPACE  
ENGINEERING

2018 U.S. News and World  
Report

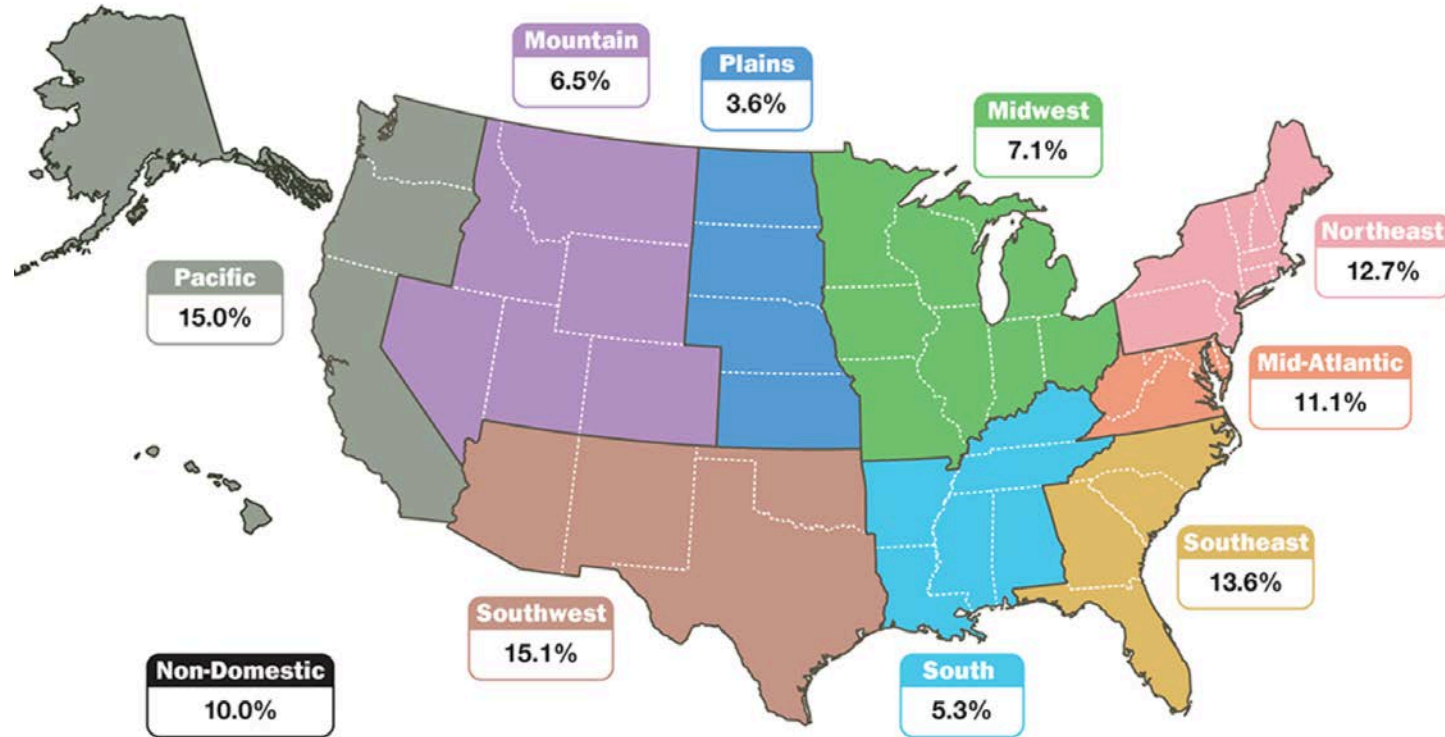
**#13** AEROSPACE  
ENGINEERING  
Undergraduate  
Program

2018 U.S. News and World  
Report

**#11** AEROSPACE  
ENGINEERING  
Graduate  
Program

# Aviation Week's October 2017 U.S. Workforce Study

## Hiring Forecast 2017



Source: Aviation Week 2017 Workforce Study

Where are the Aerospace and Defense (includes Ocean Eng.) jobs?

**Virginia Tech** listed as a “preferred supplier” of talent to the Aerospace & Defense industry, along with Georgia Tech, Purdue, Univ. Colorado-Boulder, & Cornell.



# Design teams – extracurricular (a few examples)



Virginia Tech  
Wind Turbine Team







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# Aerospace and Ocean Engineering Information Session

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Undergraduate Advisors

***Now we are here to answer your questions***