National Aeronautics and Space Administration

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The Next Generation of Explorers

Space Grant Western Regional Meeting
Armstrong Internships:
Past, Present, and Future

September 12, 2019

Overview

- My Background
- Armstrong's Research Interests
- Armstrong's Approach to Internships
- Internship Highlights
- Areas to Improve and Collaborate
- Questions

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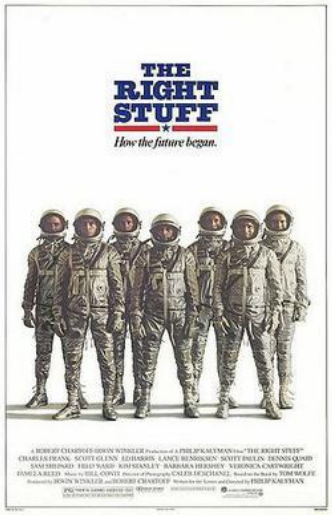
My Background (Past)

- Grew up on a farm just north of Nappanee, Indiana
- Encyclopedia
- 10 year 4H Member
  - Swine Club
  - Rocketry
- Did not know an engineer before I went to college
- High School US history class-”The Right Stuff”
- Attended Purdue University and University of Michigan
- Came out to Dryden as a student over 18 years ago



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My Background

- NASA Dryden
  - Propulsion Health Management and formation flight on C-17s
  - Propulsion Engineer
  - Flight Test Engineer
  - Systems Engineer
- NASA Johnson
  - Orion Vehicle-Exploration Flight Test 1
- F-15 Deputy Chief Engineer
- Education

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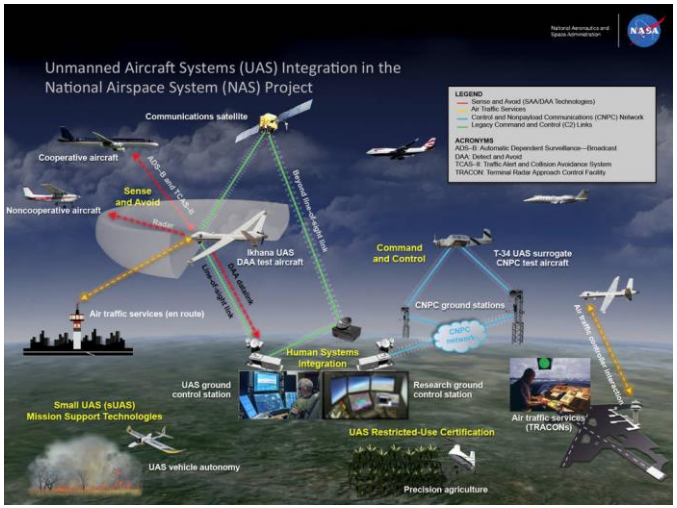
Armstrong's Research Interests

- Urban Air Mobility
  - Unmanned Aerial Systems in the National Airspace
  - Autonomy
- Sensor and Systems Development
- Flight Test and Integration



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Armstrong's Research Interests

- Supersonics and Lowering Sonic Boom Impacts

NASA Dryden Flight Research Center Photo Collection
http://www.dfrc.nasa.gov/Gallery/Photo/index.html
NASA Photo: EC03-0210-13 Date: August 4, 2003 Photo By: Jim Ross

Northrop Grumman Corporation's modified U.S. Navy F-5E Shaped Sonic Boom Demonstration (SSBD) aircraft flies over Lake Isabella, Calif., on Aug. 4, 2003.

NASA Dryden Flight Research Center Photo Collection
http://www.dfrc.nasa.gov/Gallery/Photo/index.html
NASA Photo: ED06-0149-20 Date: August 10, 2006 Photo By: Tony Landis

NASA's F-15B testbed aircraft lands after the first flight of the Quiet Spike project.

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Armstrong's Research Interests

- Electric Propulsion Systems and Aircraft

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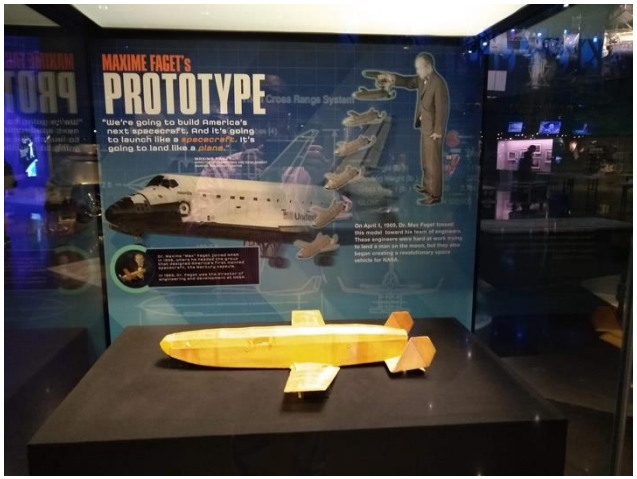
Armstrong's Research Interests

- Access to Space, Earth Science, Flying Astronomy



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Armstrong's Approach to Internships

- ~60-80 summer students
- ~10-20 fall/spring students
- "Classic" Internships
  - Working with mentor on mission project
  - **Exploring a new capability**
- **Student team based internships**
  - New ideas, concepts, aircraft!

Internship Highlights (Present)

- Team internship: Fiber Optic Sensing System (FOSS)
- First aircraft integrated FOSS flight data collection

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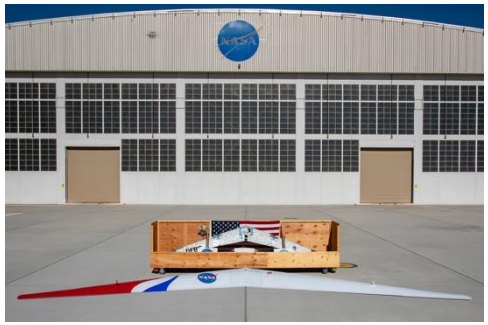
Internship Highlights

- Prandtl: Bell Shaped Lift Distribution
- Team based internships
- ARMD partnerships
- Two museum worthy aircraft! (so far)



- https://www.youtube.com/watch?v=Hr0I6wBFGpY

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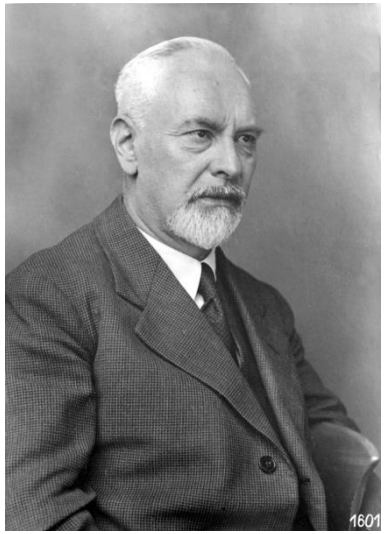
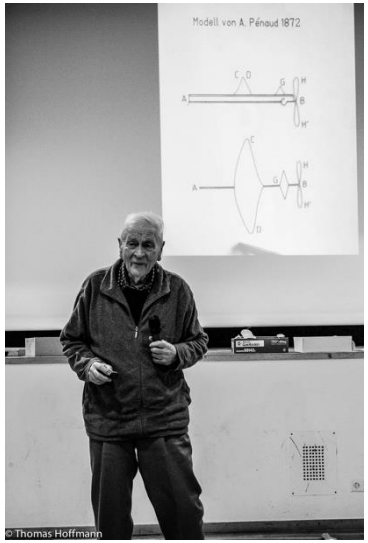
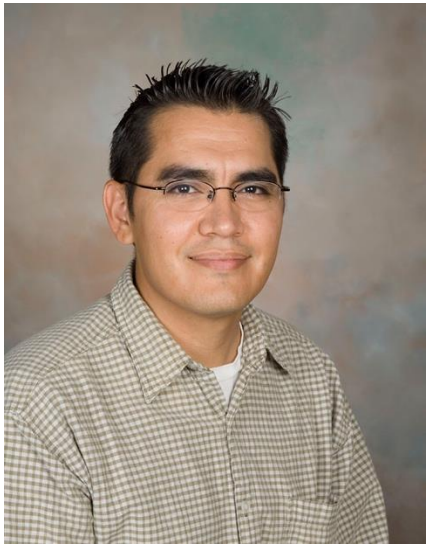
Mentor Legacy







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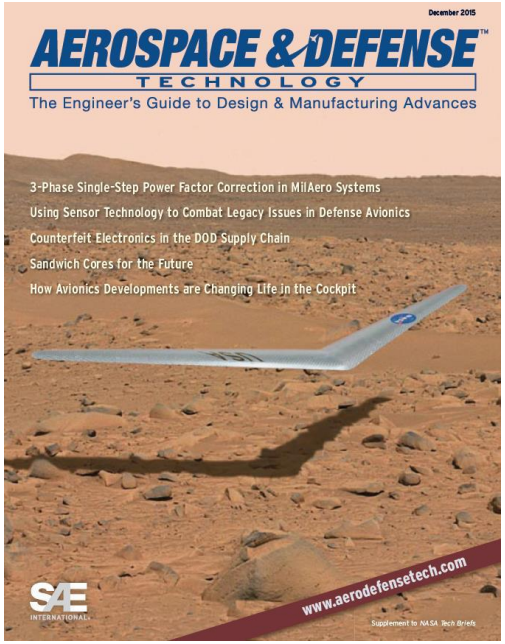
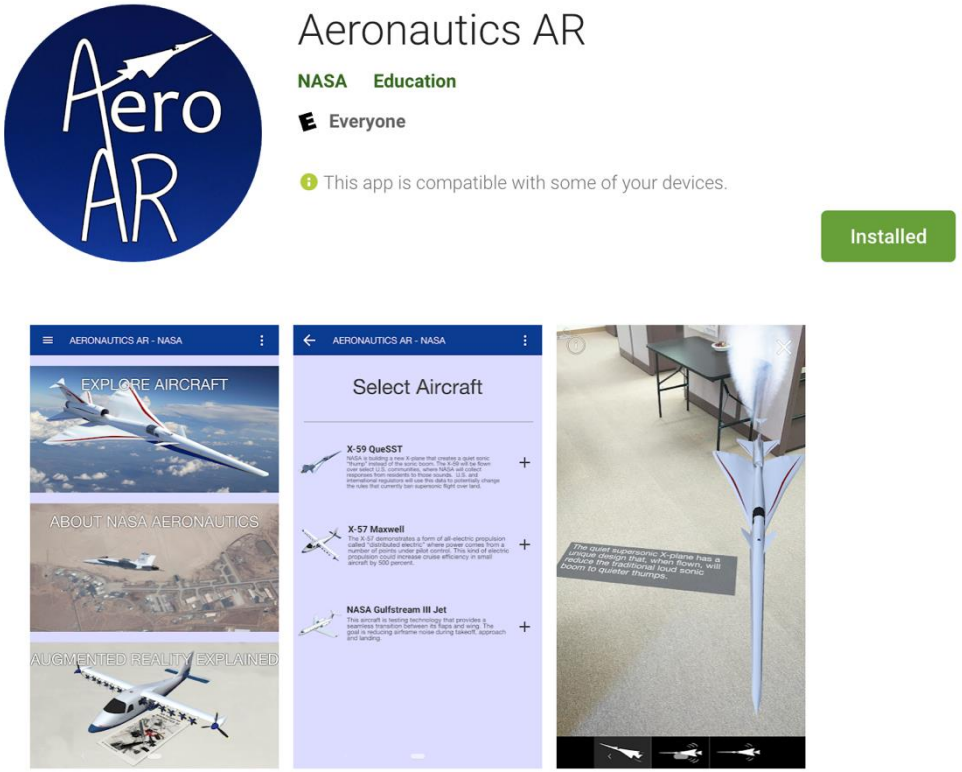
Internship Highlights

- Mars Glider Swarm
- Team Based Internships
- STMD/CIF Partnerships
- Spinoffs and Degrees



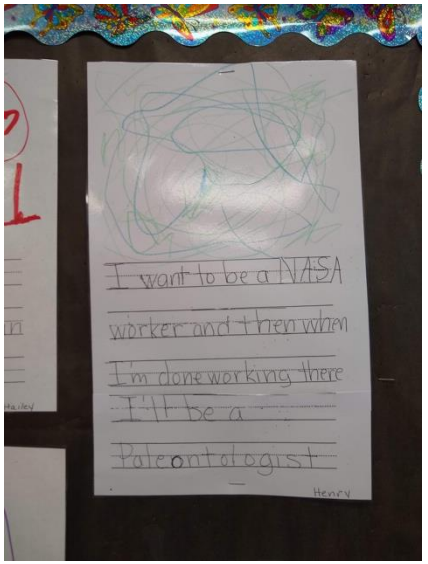
Internship Highlights

- Aeronautics Augmented Reality Education Mobile App



Areas to Improve Collaborate (Future)

- Continual Improvement
  - IT/Reporting
  - Communication
  - Mentor/Student/Project Matching
  - Internship Webinars/SME Seminars
- Internship+
  - Senior Design/Capstone
  - Independent Study
  - Research Experiences for Undergraduates
  - Graduate student research
  - Faculty Research/Seminars/Fellowships
  - Center Innovation Research
  - NASA Early Career Initiatives
  - ARMD Convergent Aeronautical Solutions



Questions

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