National Institute for Aviation Research
Wichita State University
MISSION:

To conduct research, transfer technology and enhance education for the purpose of advancing the nation’s aviation industries that may benefit from aviation-related technologies.

Located on the campus of Wichita State University, in a city recognized as the Air Capital of the World, The National Institute for Aviation Research is a prestigious, state-of-the-art aviation research and development laboratory with global reach and expertise in research, design, testing and certification.

The Institute’s list of clientele includes many of the world’s aerospace manufacturers, NASA and the FAA.

As the largest aviation R&D academic institution in the United States, the Institute encompasses nearly 150,000 square feet with more than a dozen laboratories. It is internationally recognized as a high-tech research, development, testing, certification and learning center.
# Centers of Excellence

The Institute is home to four Centers of Excellence. Together, these centers create a formal structure by which industry, government and academia can promote the safety, research, manufacturing and design elements of today’s aviation industry.

- **Advanced Joining & Processing**
  - The Advanced Joining and Processing Lab focuses on the solid-state joining process of Friction Stir Welding and its variations: Friction Stir Spot Welding (FSSW) and Friction Stir Processing (FSP).
  - Dr. Dwight Burford, Director (316) 978-3204 
dwight.burford@wichita.edu

- **Aerodynamics**
  - The Aerodynamics Lab includes the 7 foot by 10 foot subsonic Walter H. Beech Wind Tunnel, which recently underwent $7 million in renovations, and a 2 foot by 3 foot flow visualization water tunnel.
  - John Laff en, Director (316) 978-5481 
  john.laff en@wichita.edu

- **Aging Aircraft**
  - In the Aging Aircraft Lab, located within ASTEC, capabilities and methodologies are developed to ensure that aging aircraft structures and aircraft systems can be inspected, maintained and upgraded.
  - Tim Hickey, Director (316) 978-8204 
thickey@niar.wichita.edu

- **Composites and Advanced Materials**
  - The Composites and Advanced Materials Lab performs research involving composite materials for aircraft manufacturers and suppliers and provides testing to allow for FAA certification.
  - Tim Aldag, Director of R&D (316) 978-5326 
thomas.aldag@wichita.edu

- **Computational Mechanics**
  - The Computational Mechanics Lab engages in research involving crashworthiness, aerospace structures, biomechanics, virtual product development and applied numerical methodologies.
  - Dr. Gerardo Olivares, Research Scientist (316) 978-2723 
gerardo.olivares@wichita.edu

- **Crash Dynamics**
  - With an MTS crash simulator, accelerator sled and 17 test dummies, the Crash Dynamics Lab provides a facility for research, testing and certification of occupant protection systems.
  - John Laff en, Director (316) 978-5481 
  john.laff en@wichita.edu

- **Environmental Testing**
  - The Environmental Testing Lab provides a full range of RTCA DO-160 certification including magnetic effects, voltage/spike, susceptibility, electrostatic discharge, humidity, waterproofness, salt spray and icing.
  - Wade Davis, Manager (316) 978-6718 
wade.davis@niar.wichita.edu

- **Fatigue and Fracture**
  - The Fatigue and Fracture Lab supports research and testing of materials subjected to fatigue damage due to cyclic loading. The goal is to develop data and methodologies for the materials’ durability.
  - Lamia Salah, Manager (316) 978-5775 
lamia.salah@wichita.edu

- **Full-Scale Structural Testing**
  - The Full-Scale Structural Testing Lab within ASTEC provides static and fatigue testing and certification for full-scale aircraft components and other non-aviation related objects.
  - Tim Hickey, Director (316) 978-8204 
thickey@niar.wichita.edu

- **Human Factors**
  - The Human Factors Lab provides anthropometric and ergonomic expertise for the design and certification of aircraft, aviation technologies and other complex operating environments.
  - Dr. Udo Schultheis, Research Scientist (316) 978-5776 
  udo.schultheis@wichita.edu

- **Structures**
  - The Structures Lab provides static and fatigue testing for articles ranging from material coupons to large-scale structures. The lab is designed to characterize the load-carrying capability of materials.
  - Errick Robles, Manager (316) 978-5232 
erick.robles@niar.wichita.edu

- **Virtual Reality**
  - The Virtual Reality Center acts as a Visualization and simulation tool for engineering and manufacturing processes. This allows researchers to have a better grasp of a project without extensive model testing.
  - Fernando Toledo, Manager (316) 978-8333 
  fernando.toledo@wichita.edu

- **Visual Technology**
  - The Visual Technology Lab produces 3D animations that can be used commercially. The VTL provides these project development services for NIAR, Wichita State University and other organizations.
  - Bill Johnson, Manager (316) 978-6112 
bill@cadcamlab.org

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### Primary Laboratories

- **Advanced Joining & Processing**
- **Aerodynamics**
- **Aging Aircraft**
- **Composites and Advanced Materials**
- **Computational Mechanics**
- **Crash Dynamics**
- **Environmental Testing**
- **Fatigue and Fracture**
- **Full-Scale Structural Testing**
- **Human Factors**
- **Structures**
- **Virtual Reality**
- **Visual Technology**

### Did You Know?

- The National Institute for Aviation Research...
  - has increased its research expenditures by more than 300% in the past decade.
  - performs a majority of the FAA’s composites research.
  - ranks third in aeronautical R&D expenditures among all U.S. universities.
  - has a clientele list that spans 75% of the U.S. and includes more than 100 businesses nationwide.
  - is the largest stand-alone university aerospace R&D laboratory in America.
  - is home to one of the largest university CATIA-based teaching facilities in the United States.
  - employs more than 300 researchers and assistants including:
    - 60 PhDs
    - 17 Masters Degrees
    - 102 Bachelors Degrees (with many pursuing advanced degrees)
    - 163 Undergraduate Research Assistants
    - 13 Associates Degrees
    - 6 Technical Degrees
    - 8 Administrative Staff