



Jack Boyd
NASA Ames Research Center

John W. (Jack) Boyd was recently brought back as the Senior Advisor to the Ames Center Director. Prior to this position he was the Ames Historian and the Ombudsman for the Center. As the official historian, Mr. Boyd captured important historical information for future publications concerning significant research accomplishments of this Center.

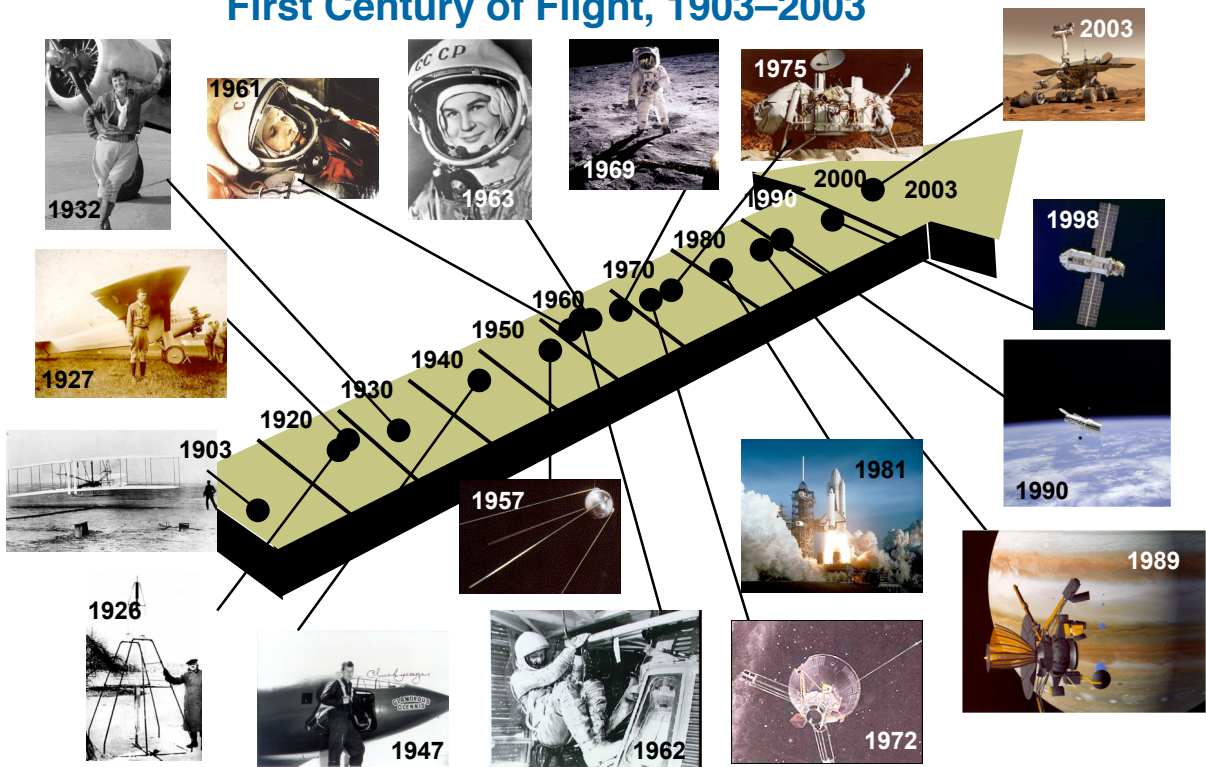
Previous to this position, he was the Executive Assistant to the Director at NASA Ames Research Center for over 8 years. Mr. Boyd began his career at Ames in 1947, when it was still the National Advisory Committee for Aeronautics (NACA) Ames Aeronautical Laboratory, and worked as an aeronautical research engineer conducting wind tunnel studies of the supersonic and subsonic characteristics of fighter/bomber aircraft. He later pioneered early research on the design of unmanned planetary probes to explore Mars and Venus, and helped develop early configurations for the Mercury, Gemini, and Apollo capsules, as well as the space shuttle design. He is a graduate of George Washington High School in Danville, Virginia, Virginia Tech; and Stanford University.

Mr. Boyd has served as Deputy Director of Dryden Flight Research Center, Deputy and Associate Director of Ames Research Center, and Associate Administrator for Management at NASA Headquarters. Additionally, he was also chancellor for Research for The University of Texas System. He has also been an adjunct professor at The University of Texas (Austin, El Paso, and Pan American campuses) teaching courses in aerodynamics, introduction to engineering, and the history of space flight.





First Century of Flight, 1903-2003



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First Century of Flight, Ames Visitors



Charles Lindbergh



Orville Wright



Neil Armstrong



Chuck Yeager



Wernher Von Braun



John Glenn



Jimmy Doolittle



Edward Teller

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NACA Research Centers

NACA



Joseph S. Ames

Langley

Ames

Dryden

Lewis

NASA

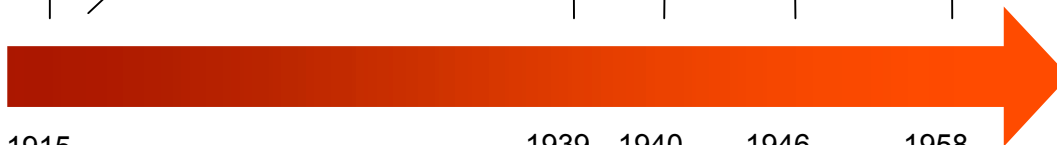
1915

1939

1940

1946

1958



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65 Years of Innovation

NASA Research Park

1950

- Tektites
- Blunt body Concept (H. Allen)
- Transonic Flow
- Flight Research
- Swept-Back/wing
- Conical camber
- Arcjet Research

1960

- Apollo Re-Entry Shape
- Apollo Heat Shield Tests
- Apollo Guidance System
- Hypervelocity Free Flight
- Computational Fluid Dynamics
- Life Sciences Research

1970

- Pioneer
- ER-2
- Lunar Prospector
- Air Transportation System
- Tiltrotor
- Galileo
- Nanotechnology
- Viking
- Pioneer Venus
- Astrobiology
- Kuiper Observatory
- X-36
- 80x120 Wind Tunnel

1980

- World's fastest operational supercomputer
- Human Centered Computing

2000

Ames Projects

1960

- PAET
- Pioneers 10 & 11
- Tilt Rotor
- M2-F2
- Biosatellite

1970

- Kuiper
- Pioneer Venus
- Cosmos / Bion
- Viking Life Detection Experiment

1980

- Infrared Astronomy Satellite
- Psychology Systems Experiment

1990

- Haughton-Mars
- Galileo Probe
- Lunar Prospector
- Neurolab
- 2000
- LCROSS
- SOFIA
- Kepler

Space Station Biological Research

NASA Ames Research Center

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NASA Ames Research Center Today - founded 1939

- Science (Earth-Life-Space): Astrobiology- the study of life in the universe**
- Science Missions**
- Stratospheric Observatory For Infrared Astronomy
 - Kepler Mission-Search for Habitable Planets
- Exploration Systems Development**
- Lunar Crater Observation and Sensing Satellite
 - Thermal Protection Systems
 - Mission Operations
 - Integrated Systems Health Management
 - Autonomy & Reliable Software
- Supporting Technologies**
- Information Technology (Autonomy, Human Factors, High-End Computing)
- Aviation and Aeronautics**
- Air Traffic Management and Control
- Education**
- Innovative Collaborations**
- NASA Research Park
 - University Affiliated Research Center
- 2300 Employees**
- (1200 Civil Service/1100 Contractor and Other)
- \$600+ M Annual Budget**



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Astrobiology

- Scientific study of life in the universe
- Three fundamental questions
 - How does life begin and evolve?
 - Does life exist elsewhere in the universe?
 - What is life's future on Earth and beyond?
- NASA Astrobiology Institute at Ames
 - Dr. Rosalind Grymes, Executive Director
 - Dr. Bruce Runnegar, Science Director
 - 12 lead member institutions



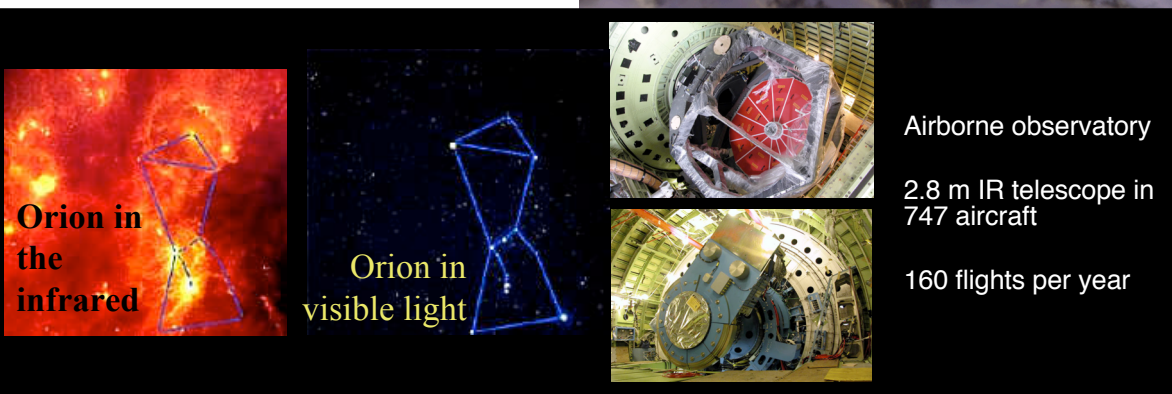
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SOFIA

SOFIA will explore the infrared universe flying above interference from the Earth's water vapor atmosphere

National Academy priority from Decadal Surveys, 1991 & 2001



Orion in the infrared

Orion in visible light

Airborne observatory
2.8 m IR telescope in 747 aircraft
160 flights per year

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Crew Exploration Vehicle/Crew Launch Vehicle

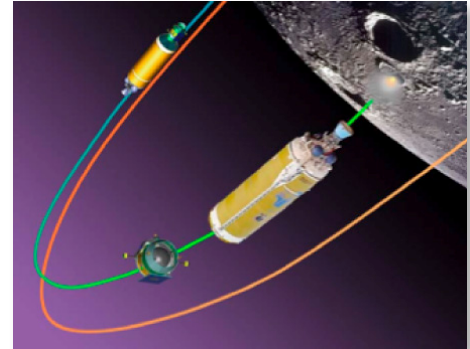
- **CEV Thermal Protection System Advanced Development Project Office assigned to Ames**
 - Primary roles
 - Maturing ablative material technology
 - Developing TPS ablative material response model
 - Down-selection to a single TPS solution by CEV PDR
 - Supporting aerothermal environments and verification (JSC lead)
 - Project management support, systems engineering support for CEV
 - Mult-center team: ARC, JSC, KSC, LaRC, JPL; Lead: James Reuther
 - Industry to lead detailed design, fabrication, test and verification
- **Mission Operations System for CEV/CLV**
 - ARC is part of the team that will design, develop, and implement the Launch Mission Systems, and Command and Control capability for CEV/CLV
 - Team includes JSC, GSFC, JPL, KSC
- **Integrated Systems Health Management for Exploration**
 - ARC leads the ESMD Technology Development Program's R&D effort in Integrated Systems Health Management for Exploration
 - 5 year research effort focused on CEV, CLV, and RLEP
 - Team includes MSFC, JPL, GRC, and JSC
- **Spacecraft Autonomy for Exploration**
 - ARC is leading the ESMD Technology Development Program's R&D effort in Autonomy for Exploration
 - 5 year research effort focused on CEV, CLV, and RLEP
 - Includes additional work at JSC, LaRC, and JPL



Lunar Crater Observation and Sensing Satellite (LCROSS)

Ames – piggy back on LRO

- Lunar Kinetic Impactor Mission employed to reveal the presence and nature of water ice on the Moon's South Pole
 - Delivers a 2000 kg impactor to a lunar crater and measures water signatures with an *in situ* Shepherding Spacecraft that then becomes a 700 kg secondary impactor.
- Mission Objectives
 - Advance the Vision for Space Exploration by confirming the presence or absence of water ice at the Moon's South Pole.
 - Provide technologies and modular, reconfigurable subsystems that can be used to support future RLEP mission architectures.
 - Inspire public interest in NASA's Exploration Vision.

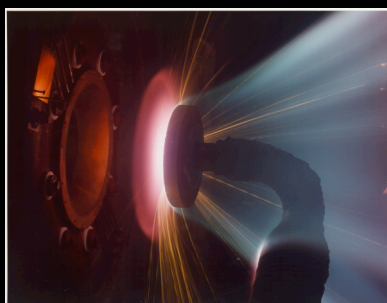
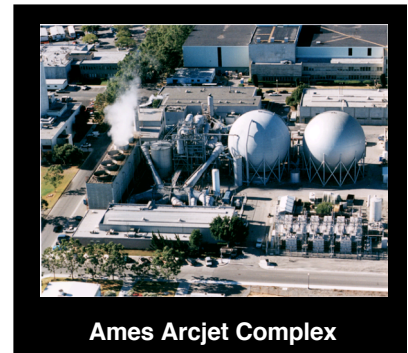


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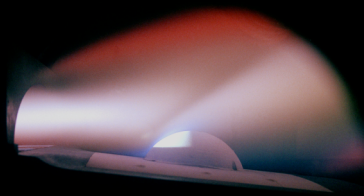


Thermal Protection Materials and Arc-Jet Facility

Testing and/or materials for all US Planetary entry systems; Support for Apollo, Shuttle, and Crew Exploration Vehicle



Ablative Thermal Protection Testing



Mars Rover Entry System Test



Human rated vehicle design & test (X-37)

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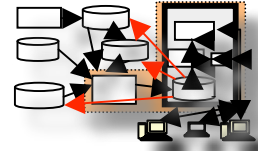


Information Science & Technology

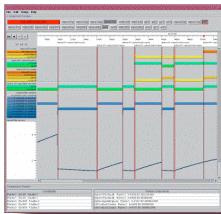
Intelligent Adaptive Systems
Human/machine Interface
Large Data Sets and Datamining



Mars Science Laboratory '09

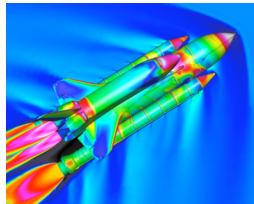


Project Columbia:
One of the world's fastest super computers

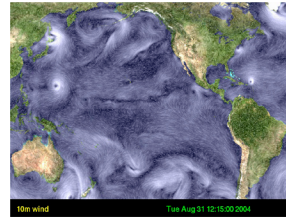


Integrated Systems Health Management

Super Computing



Designing the next generations



Global Climate modeling

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Project Columbia Integration and Installation



- Provides 61 TFLOPs (10/20/04)
- Conceived, designed, built, and deployed in just 120 days
- Largest SGI system in the world with over 10,000 Intel Itanium 2 processors
- Computation and simulation for Crew Exploration Vehicle, Crew Launch vehicle, Earth Science, Astrophysics, and more

Record Time and Budget!!

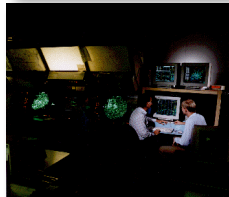
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Air Traffic Management/Air Traffic Control



Impact: Surface Management System (SMS)
Estimated annual savings of \$315M/year to airlines



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New Models-UARC

NASA's first University Affiliated Research Center

- 10 year, \$330 M contract between NASA Ames and University of California.
- UC Santa Cruz is lead UC institution-Ranked 1st in Space Science by ISI
- Beyond grants and support contracts
- Tasks that are part of NASA's critical milestones
- Flexibility to change tasks as needs arise
- UC: 10 Campuses, 3 National Laboratories
- \$18B annual budget
- 4 UC campuses rated among top 15 worldwide



UC President Robert Dynes

3 Bay Area Campuses



UC System



