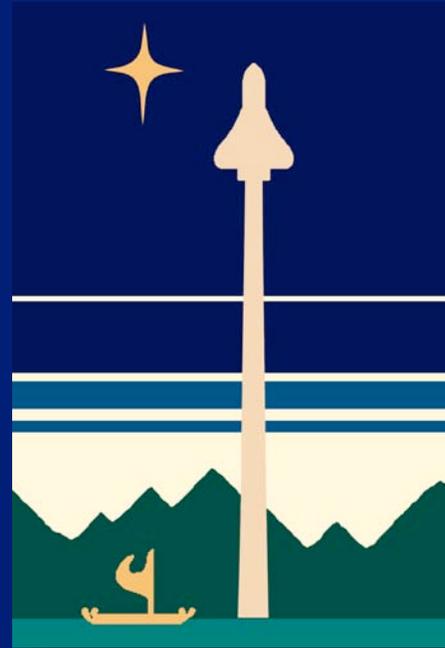


*Windward Community  
College*



**Center for Aerospace  
Education**

# Center for Aerospace Education



**Windward**  
**Community College**

- ❖ manages 4 aerospace facilities:
  - Imaginarium*
  - Lanihuli Observatory*
  - Aerospace Exploration Lab*
  - NASA Flight Training Center*
- ❖ supports WCC's astronomy credit program, Hawaii Space Grant Consortium (HSGC) & K-12 community outreach
- ❖ over 10,000 visitors annually
- ❖ K-12 science teacher workshops
- ❖ celebrating its 22<sup>nd</sup> anniversary in Fall 2008

*Let your imagination take flight!*

# 4 A's of Aerospace

AERO

SPACE

SCIENCE

Atmospherology  
*weather & climate*

Astronomy

TECHNOLOGY

Aeronautics  
*aviation*

Astronautics  
*rocketry*

Goddard Space Flight Center

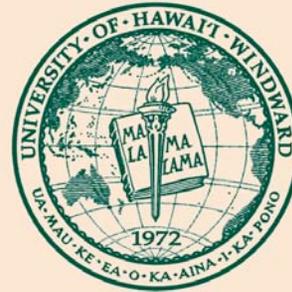


HOA'AINA

RS/GIS Center

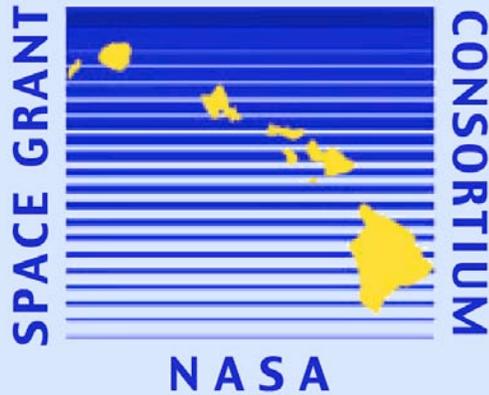
NASA Center of Excellence

Partnerships



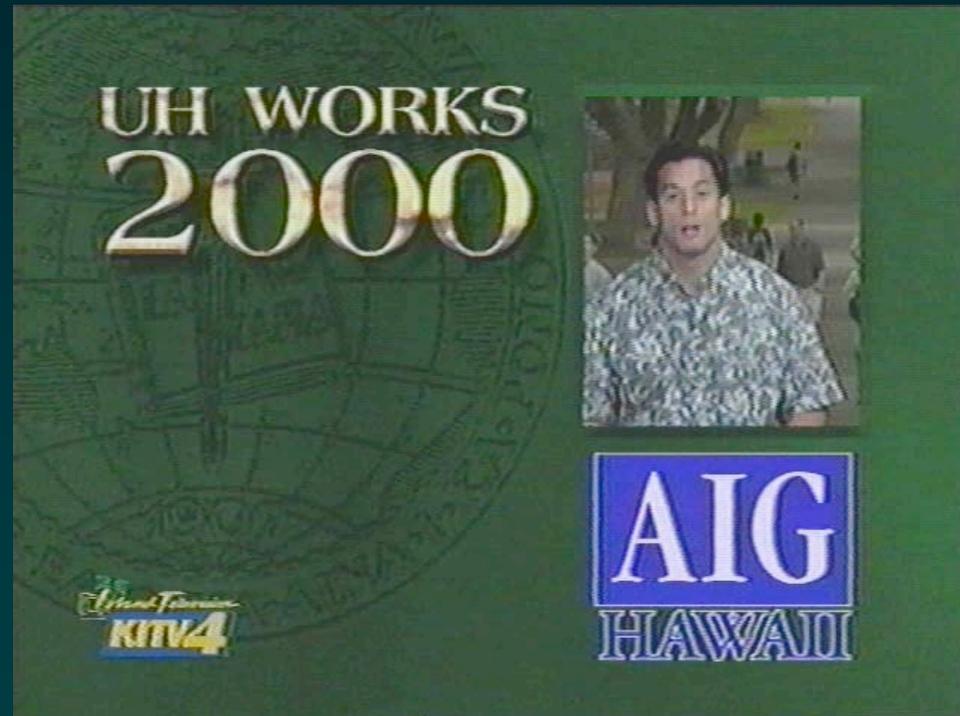
NASA - WCC Connections

HAWAII



# Aerospace Exploration Lab

*hands-on  
exploratorium*



## K-12 STEM

Science – Technology – Engineering – Math



- ✧ to inspire
- ✧ to engage
- ✧ to act as a catalyst
- ✧ for career awareness



*serving ...*

- ❖ **WCC & UH-Manoa astronomy classes**
- ❖ **K-12 & community audiences**
- ❖ **technical consultation, including UH-Hilo 'Imiloa Astronomy Center**
- ❖ **Polynesian Voyaging**

*where the sky is not the limit ....*

**Hokulani Imaginarium**



# Imaginarium Shows



STARS of the PHARAONS  
ΣΤΑΡΣ of the PHARAONS

The Search for Life  
in the Universe



Far Out Space Places



Star of Bethlehem:  
The Magi's Story



Discover the astronomical possibilities  
for this wondrous star

Oceans in Space



Sky Pirates





## Astronomy Labs & HSGC

- NOAA weather satellite station
- Radio Jove telescope  
*NASA Goddard partnership*
- Heliostat (solar telescope)
  - 16-inch optical telescope

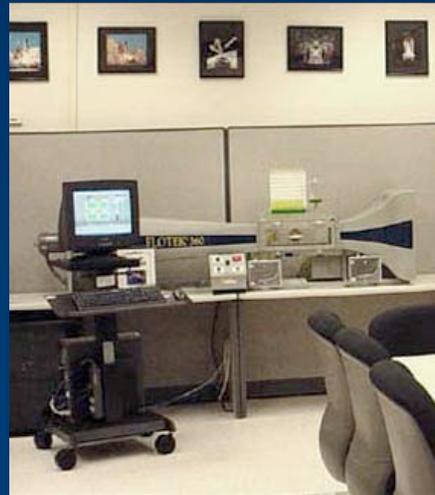


# NASA Flight Training Aerospace Education Lab



Zero-g Drop Tower

- NASA Glenn partnership
- credit program & HSGC student research
- 6<sup>th</sup> - 12<sup>th</sup> grade student outreach
- Upward Bound college credit summer aerospace program
- Windward DOE teacher professional development (No Child Left Behind)



Wind Tunnel



# Hawaii Space Grant



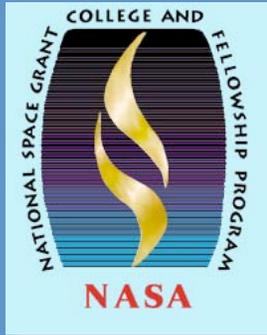
*Teri Schmidt*



*Kauwila Hanchett & Greg Osterman*

Measuring the effects of microgravity on fluid dynamics, magnetic levitation, and rotating bodies.

**NASA KC-135  
Zero-g Flight**



# Hawaii Space Grant

## CanSat ARLISS Project

WCC's CanSat team is developing an entry for ARLISS (A Rocket Launch for International Student Satellites). The CanSat will be launched by a high-powered rocket to a height of over 11,000 feet. At apogee the CanSat will be ejected and must autonomously return to a target location some 8,000 feet away from the launch site—all the while collecting external sensory data.



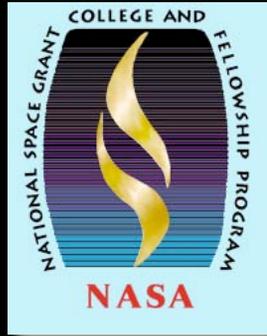
## Preparing for ARLISS





# ARLISS Competition 2007





**ARLISS 2007 Winning Team: UH-WCC**

# Career Awareness & Workforce Training

Internship at NOAA's Wind Tunnel  
Fluid Modeling Facility in North Carolina

Damion Rosbrugh

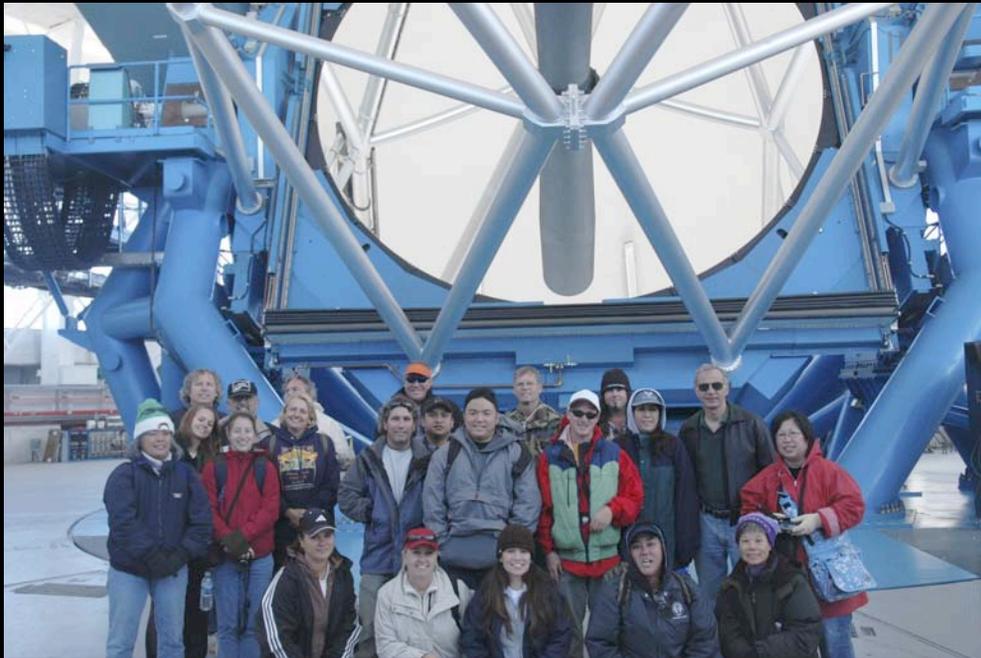


WCC graduate **Tony Matulonis**  
Gemini Telescope Operator



Space Grant students at work  
on ARLISS satellite sensors

# WCC-DOE Teacher Workshops in Aerospace Science



in partnership with the  
Windward DOE complex .....  
providing K-12 teachers  
professional development credit

***No Child Left Behind Grant***



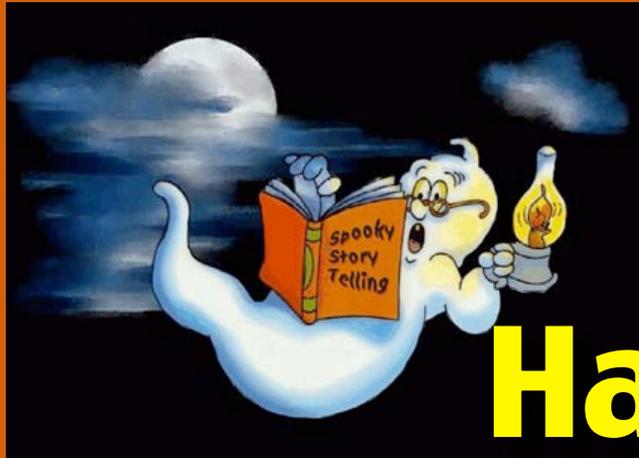
# Families Sharing in Learning



Waiahole Family Night

King Intermediate Family Night





**Family Night**

# Haunted Village

Faster than the  
speed of fright .....

enjoying the spirit  
of Halloween and  
the science behind  
optical illusions  
and magic.



*Public Displays*

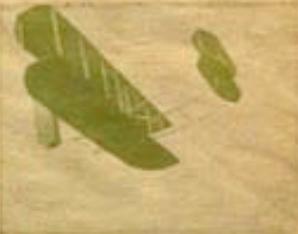
# Wright Flier Exhibit

**THE WRIGHT STUFF**

*The Wright Stuff Exhibit offers visitors a scenic tour of powered flight—first achieved a century ago at Kitty Hawk. Gallery displays include historical images, artifacts, models and interactive kiosks of aviation and space flight milestones.*

*Financed through the generosity of the Hawai'i Committee for the Humanities, Harold K. L. Castle Foundation, Hawai'i Space Grant Consortium, Evans & Sutherland, Aviation Museum Pearl Harbor and Windward Community College.*

**Celebrating 100 years of flight**



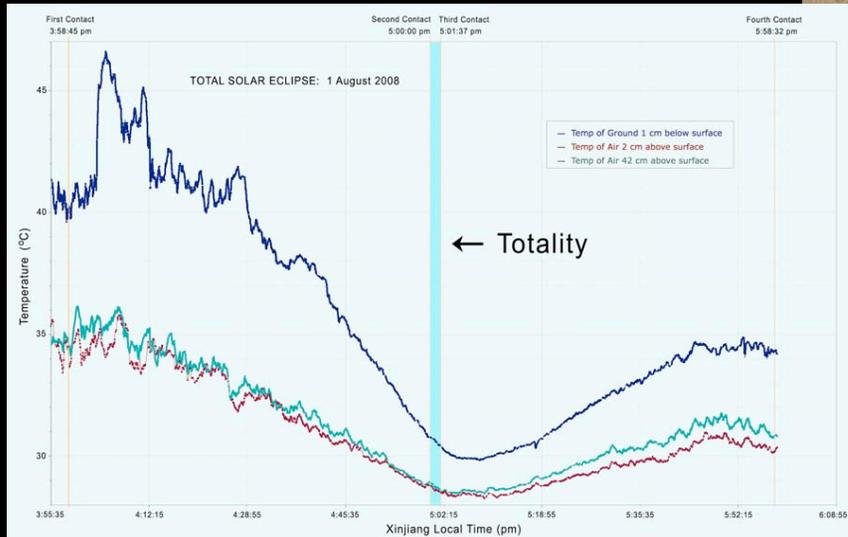
November 14 - December 17, 2003  
Opening Reception  
Friday, November 14, 4-7 p.m.

**Gallery Tolani**  
**WINDWARD**  
COMMUNITY COLLEGE



# Total Solar Eclipse 2008

Altai, China



conducting temperature experiment  
with 8-year old David Friedman

*Future Project*

# Certificate in Astronomy & Space Exploration

## Core Astronomy Courses

ASTR 110 Intro to Astronomy  
ASTR 110L Intro to Astronomy Lab

## Elective Astronomy Courses

ASTR 180 Solar System  
ASTR 281 Space Exploration  
ASTR 130 Archaeoastronomy  
IS 160 Polynesian Voyaging  
ASTR 260 Astronomy of the Pacific  
ASTR 250L Observational Astronomy Lab  
ASTR 294 Special Topics in Astronomy

## Elective Physical Sciences & Math

PHYS (122, 151, 152, 170, 272)  
CHEM (100, 151, 152, 161, 162)  
MATH (100 and above)

## Elective Earth Science

MET 101 Intro to Meteorology  
GEOG 101 Natural Environment  
GG 101 Introduction to Geology  
GG 102 Historical Geology  
GG 103 Geology of Hawaiian Islands  
GIS 150 Introduction to GIS/GPS

## Required HSGC Project

ASTR 299 HSGC project: research, internship, community service

## Director of Center for Aerospace Education



Dr. Joseph Ciotti