

WHO WE ARE: NC Space Grant

NC Space Grant, established in 1991, is an active member in a national network of university-based consortia. Established by Congress and implemented by NASA, the National Space Grant College and Fellowship Program contributes to the nation's science enterprise by funding research, education, and public service projects through a national network of 52 Space Grant consortia.

Lumbee Tribe

The Lumbee Tribe has occupied the lands around the Lumber River, in Robeson County, for the last 300 years. In 1956, the Congress of the United States passed the Lumbee Act, officially recognizing the Lumbee American Indians of North Carolina. Today, the Lumbees are the largest tribe in North Carolina.

PAST TEAM MEMBERS

Charlotte Branch (UNCP)
Mary Beth Brayboy (UNCP)
Toni Chagolla (UNCP)
Robie Goins (UNCC)
Megan Grimsley (UNCP)
Brandon Locklear (UNCP)
Charlene Locklear (UNCP)
Kiel Locklear (UNCC)
Jenna Mills (WCU)
Ginger Moody (UNCC)
April Oxendine (UNCP)
Joe Oxendine (UNCP)
Janet Sanford (UNCP)

TEAM MEMBERS

UNC Pembroke

Dr. Tim Ritter

tim.ritter@uncp.edu

910-521-6320

Clint Haywood

Education

Samantha Schrock

Chemistry

Tala Smith

Biology/Chemistry

Lisa Walters

Biology/Chemistry



UNC Charlotte

Kathy Nunnelly

NASO Advisor

UNCC Center for Academic Excellence

Website Address

www.uncp.edu/home/ritter/KC135/KC135home.html

The Weightless Lumbees



A Partnership between

The University of North Carolina at
Pembroke



The University of North Carolina at
Charlotte



Supported by
North Carolina Space Grant



REDUCED GRAVITY STUDENT FLIGHT
OPPORTUNITIES PROGRAM

PROGRAM OVERVIEW

NASA's Reduced Gravity Student Flight Opportunities Program is designed to inspire students' interest in science, engineering and technology. The program provides select undergraduate student teams, from around the country, the opportunity to successfully propose, design, fabricate, fly and evaluate a reduced gravity experiment of their choice on board the famous "Weightless Wonder" C-9 aircraft. The overall experience includes scientific research, hands-on experimental design, test operations and educational/public outreach activities. The C-9 reduced gravity aircraft generally flies 30 parabolic maneuvers over the Gulf of Mexico. This parabolic pattern provides about 30 seconds of hypergravity (1.8g) as the plane climbs to the top of the parabola. Once the plane starts to "nose over" the top of the parabola to descend toward Earth, the plane experiences about 25 seconds of microgravity (0g).

The University of North Carolina campuses at Charlotte and at Pembroke have formed a team of students from both universities. The team name was chosen because the majority of the students each year are members of the Lumbee Tribe.

THE EXPERIMENTS

Gravitational Effects on Human Immune Complexes and Flame Dynamics (2007-08)

The first experiment will study the effects of both a micro- and hyper-gravity environment on the reaction between human antigens and antibodies in the immune system. The second experiment will

investigate the reaction of candle flames to different gravitational fields.

The Effects of Gravity on Enzymatic Reaction Rates (2005-06)

Many of the biological materials that are produced are grown in a fluid environment. In order to gain a better understanding of enzyme reaction rates in a microgravity field the team conducted two fluid related experiments in BOTH the 0-g and 2-g portions of the C-9 parabolic flight path.

Fluids in 0-g (2003-04)

This project included two experiments. The first compared the diffusive properties of liquids at 1-g to the diffusive properties of liquids in zero gravity. The second investigated the gravitational effects on enzymatic activity.

Going Aboard the C-9 as an Experiment (2002-03)

This experiment compared the mixing properties of simple liquids with different densities at ground level and in microgravity. The information gained from this experiment is used in our aggressive outreach program.

Aqueous Diffusion Rates (2002-03)

The objective of this experiment was to compare the diffusive properties of liquids. The results increased understanding in applications of fluid transportation, fluid diffusion and fluid mixing in such usages as vehicle propellant storage, on-orbit servicing, and fluid consumption to ultimately help human exploration on the moon and beyond.

SUMMARY

The collaborative effort between these two institutions has produced four accepted proposals that were submitted to NASA's Reduced Gravity Student Flight Opportunities Program in the past five years. Each year the team must resubmit a proposal to NASA as well as secure ALL funding to support the project.

If you wish to learn more about this program, please visit The Weightless Lumbee's website, NASA's Reduced Gravity web site (<http://microgravityuniversity.jsc.nasa.gov>), or contact one of the team members. If you are interested in having *The Weightless Lumbees* present their experiences to your group, please contact Tim Ritter.

