

Southeastern PA Cold War Historical Society

Celebrating
our 16th
year



*Preserving History Through the Memories
of Those Who Created It*

Did you know?

The Greater Philadelphia Region
has a rich aerospace heritage!

To celebrate **America250**, we'll be sharing some of the region's
aerospace heritage throughout 2026!
Look for our monthly posts and Happy Birthday America!

250 AMERICA PA
NONPROFIT AFFILIATE

250 AMERICA PA
BUCKS COUNTY

Did you know?

Gloria T. Chisum
(1930-)

One of the few African American scientists (and women!) to hold leadership positions at the Naval Air Development Center in Warminster, PA



Did you know?



- ✓ Attended Howard University and received an undergraduate degree in psychology in 1951; earned a PhD from the University of Pennsylvania in 1960
- ✓ Worked as an experimental psychologist at NADC, where she initially managed the Life Sciences Research Group, then the Vision Research Laboratory (1965-1980), and eventually headed of the Environmental Physiology Research Team
- ✓ Recognized authority on visual problems associated with the operation of high-performance aircraft
- ✓ Served as a consultant to all branches of the U.S. Department of Defense, as well as NATO and many other organizations worldwide.
- ✓ Authored two books: *AN/PVS-5 Night Vision Laboratory Assessment* (1975), and a book on laser eye protection for flight personnel (1978).
- ✓ First African American woman to serve as a member of the Board of Trustees of the University of Pennsylvania; held multiple other board appointments

Did you know?

Meet Dr. Gloria Chisum, Scientist Plus

by Gwen Dixon

Meet NADC's Award Winning Research Psychologist, Dr. Gloria Chisum. It is easy to understand why Dr. Chisum was recently named as one of the Distinguished Daughters of Pennsylvania. She is poised, gracious, intellectually stimulating, and her inspired scientific endeavors have led to patents in the field of visual perception.

A research psychologist at NADC for 21 years and presently acting manager for Scientists Research Group, she is working on such projects as laser eye protection, advanced display development, and the basic research efforts on the effects of various transparencies on pilots' visual performance.

Dr. Chisum, a graduate of Howard University with a Ph.D. from University of Pennsylvania, became interested in NADC after completing her Ph.D. and learning that NADC was looking for someone to do work in the area of visual science.

Dr. Chisum became interested in psychology after taking scientific survey courses at Howard. She taught psychology at the University of Pennsylvania and the Tuskegee Institute in Alabama. While in graduate school she was a teaching and research assistant.

Besides being selected as one of the Distinguished Daughters of Pennsylvania, she has published a number



Dr. Chisum is one of NADC's outstanding scientists.

of papers and received the Longacre Award from the Aerospace Medical Association as well as an award for outstanding accomplishments in the area of psychology.

Dr. Chisum is a member of such professional organizations as: The American Psychological Association, Optical Society of America, New York Academy of Sciences, Chairman of the Board of Overseers at University of Pennsylvania, Board of Directors for Philadelphia Saving Fund Society, Trustee for Free Library of Philadelphia, Life Member of NAACP and a member of the World Affairs Council, to name a few.

Dr. Chisum is a resident of Philadelphia. Her husband Dr. Melvin Jackson Chisum, is the Associate Medical Director for Bell of Pennsylvania.

On Center, Dr. Chisum is felt to be the type of person who is always willing to extend a helping hand. She immediately makes you feel at ease and no matter how small or trivial the problem might seem, she handles it as if it were a major concern.

When asked what gives her personal gratification, she replied, "When I am able to provide some insight or shed some light on a problem that is difficult to solve, or when I am recognized by my peers, I find that personally rewarding." This appears to be a very modest response for such a dynamic personality.

Did you know?



Reflector,
November 1983

Dr. Gloria Chisum Wins Ninth Annual Barnaby Award

Dr. Gloria T. Chisum has been named by the Naval Civilian Administrators Association as the winner of its ninth annual Ralph S. Barnaby Award. Dr. Chisum, who manages the Life Sciences Research Branch and heads the Environmental Physiology Research Team in the Aircraft and Crew Systems Technology Directorate was recognized at the award ceremony by NCAA President Frank Drummond for 23 years of "outstanding technical and administrative accomplishment."

The award was presented to Dr. Chisum by Captain Ralph Barnaby, USN-Retired, the first Commander of the Naval Air Development Center.

Dr. Chisum, the award citation noted, holds several patents and has received numerous honors including the Aerospace Medical Association's Raymond F. Longacre Award, the designation of "A distinguished Daughter of Pennsylvania", and honorary degrees from the Medical College of Pennsylvania and Ursinus College.

You've come a long way . . .



Reflector, March 1985

Photo by Chuck Fichera

Dr. Gloria Chisum of the Aircraft and Crew Systems Technology Directorate is the first woman in the Center's history to act as Technical Director. The momentous occasion took place on 14 Feb. 1985

Did you know?



Reflector, August 1981

(PHILADELPHIA, PA) Gloria Twine Chisum, Ph.D., head of the Life Sciences Research Group, Naval Air Development Center, is hooded by Alton I. Sutnick, Senior Vice-President for Health Affairs and Dean, after receiving the honorary degree of doctor of science at the 129th Commencement of the Medical College of Pennsylvania (MCP). Rosalie A. Burns, M.D., professor and chairman of MCP's department of neurology, who presented Dr. Chisum for her degree, looks on.



Reflector, March 1990

Photo by NADC Photo Lab

Dr. Gloria Chisum is presented the Navy Meritorious Civilian Service Medal by CAPT Curtis Winters, Center Commander.

Dr. Gloria Chisum is Outstanding in MPS

Dr. Gloria T. Chisum, as a result of her research work, management ability and professional involvement, has been awarded the merit pay system's rating of one.

A MPS rating of one indicates that an employee has achieved above and beyond target goals for their job's critical elements.

During the period for which Chisum received her one rating, she served as head of the Center's Vision Laboratory. Still under her direction, the laboratory is involved in researching solutions to the visual problems faced by Navy and Marine personnel during aircraft operations.

The project the Vision Lab is currently working on is the development of a holographic diffraction protection visor. This visor will be used to protect crew members' eyes from lasers.

In addition to heading the Vision Laboratory, Chisum, who has been at NADC for 21 years, is also responsible for managing the Life Sciences Research Group.

This group is broken down into areas of study, such as biochemistry research, acceleration research and environmental physiology.

A biochemistry research team is studying PGBX, a hormone that holds great promise for saving lives and improving the healing process, Chisum said.

The environmental physiology team studies biophysiology, the effects of exposure to high temperatures, and thermal physiology, the effects of exposure to low temperatures.

Acceleration physiology is the study of the effects of acceleration, or G-forces, on air crew member performance.

The function of these groups is basically to develop the



Dr. Gloria Chisum holds many honors, among which is a number "1" MPS Rating.

knowledge to be used by engineers in equipment development, rather than the development of actual equipment, Chisum said.

Professionally, Chisum serves as treasurer of the Eastern Psychological Association, the most research-oriented of the psychological associations. She is also the chairman of the program committee for the Aerospace Medical

Association, and a winner of that association's Longaker award. She is also a member of the American Psychological Association.

Though it was not during the rating period for which she received her MPS one rating, Chisum has been named a fellow of the American Psychological Association and a fellow of the Aerospace Medical Association.

Chisum also serves as a technical advisor to the Navy's Laser Safety Review Board, which reviews the safety of laser projects. As a member of the Army's Technical Review Board, she helps evaluate research proposals and makes recommendations to the Army on which proposals to support.

Besides professional involvements, Chisum is also involved in various civic activities. For the past seven years, she has been a member of the University of Pennsylvania Board of Trustees. She is also chairman of Penn's Board of Overseers at the School of Social Work.

In addition, she is a member of the boards of the Free Library of Philadelphia, the Philadelphia Orchestra Association and the Arthritis Foundation. Her civic commitments also include serving as chairman of an advisory committee to the World Affairs Council and as a member of the Philadelphia Foreign Relations Committee.

On Center, she has been on the Technical Qualifications Review Panel and the Federal Women's Program Advisory Committee.

Chisum came to NADC 21 years ago after receiving her doctoral degree in psychology from the University of Pennsylvania. She also received her bachelor's and master's degrees in psychology from Howard University.

A number of honorary degrees have also been granted to Chisum. She has received honorary doctoral degrees from the Medical College of Pennsylvania, Ursinus and York College.

Did you know?



“With the advent of atomic weapons has come the possibility of exposures of the eye to extremely high illumination levels. These may render it virtually blind for a time after illumination has returned to normal levels. In this kind of situation, the problem is termed flash blindness. Flash blindness usually refers to transient blindness which results when natural adaptation processes occur over an extreme range. Such blindness is reversible. Irreversible damage to the eye may result, however, if the amount of irradiation is sufficiently great. The radiation from either an atomic blast or from the sun is great enough to cause irreversible damage to the eye under certain conditions.”

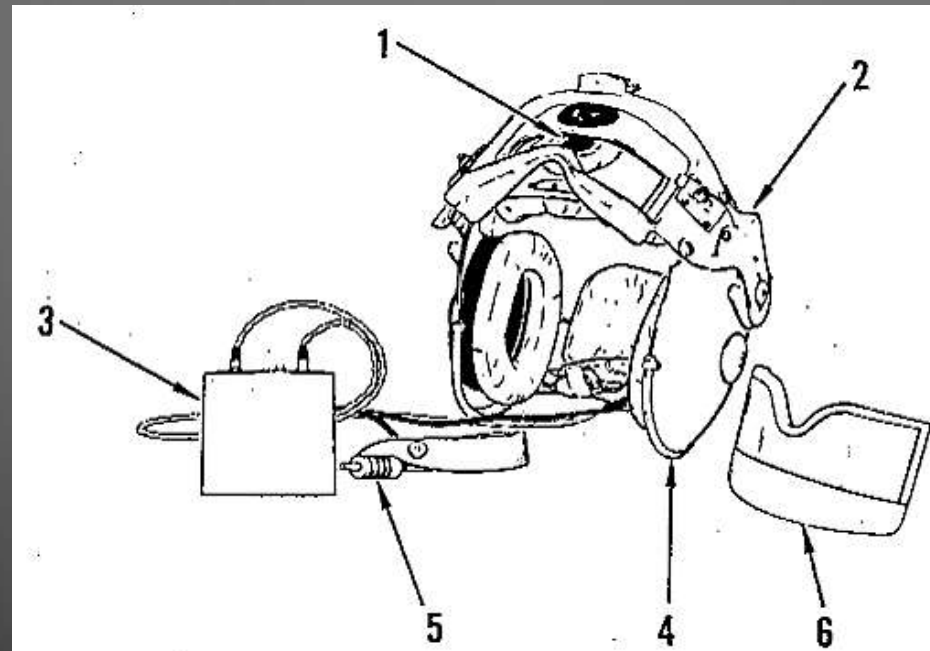
Brown JL. “Flash Blindness” *Am. J. Ophthalmology* 1965; 60 (3): 505-520.

Did you know?

The USN DH-101 Nuclear Flash Pilot Helmet & Assembly

Experimental helmet developed by Gloria Chisum's vision research team the Naval Air Development Center, Warminster, PA (manufactured by Omnitech, Inc.)

The DH-101 was a nuclear flash protective helmet assembly used during the 1960s by the US Navy as an experimental nuclear flash protective helmet. The special visor, automatically darkened after a nuclear flash, operates by opaque ink material sprayed on the inner surface of the two visor lenses. The ink was sprayed by an explosive cord that lies at the sensor at the top of the visor between the two lenses when receiving a trigger pulse initiated from the sensor at the top of the helmet through an electronic box carried in the pilot's pocket. The pilots had to carry extra lenses to replace the old one after experiencing a "blackout."



1. Nuclear Flash Sensor
2. Visor Frame
3. Trigger Unit (kept in pilot's pocket)
4. Approved Protective Helmet
5. To Nuclear Flash Detector (LH Console)
6. ELF Lens

Source: NAVAIR 01-45AAA-1 flight manual A-7A dated April 1967

[Flightgear On-Line](#), the website for the collector of military flightgear

[FlightHelmet.com](#) | Serving Military, EMS, & Civilian Pilots 800-531-4898

[DH-101 nuclear flash goggle helmet](#)

Did you know?

THE NAVY PHOTOCROMIC GOGGLE

NADC brochure, circa 1970

The intense flash of light emitted by a nuclear detonation can cause flash-blindness or even retinal burns in an unprotected eye. To be fully effective, a protective goggle must "close" within 100 microseconds and "reopen" automatically in a few seconds. This photochromic goggle meets requirements.

The active material in the goggle is a small quantity of a photochromic chemical in solution. The solution, which is clear in the unactivated state, becomes colored when exposed to ultraviolet light, then reverts rapidly to the clear state when the exposure ends. This operating cycle can be repeated many times without replacement of materials.

The design principles of the photochromic goggle system can be applied in any optical viewing function in which the observer might be exposed to sudden, intense flashes of light which could impair vision or cause eye damage. Already completed is a photochromic antflash shutter for a fire control periscope.



Chisum was also involved in the research which led to the development of this helmet to protect pilots from atomic detonation "flash blindness"



Did you know?

Chisum's Vision Laboratory also conducted research on the development of pilot eye protection from laser light



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Naval Air Development Center, Warminster, PA

June 1982

New Visor Protects Pilots Eyes From Lasers



Demonstration picture of how visor reflects laser.

Hughes Photo

by Carolyn Riemer

A visor to protect a pilot's eyes from lasers during flight is currently being developed at NADC by the Vision Laboratory under the direction of Dr. Gloria T. Chisum.

With lasers being used more frequently in military situations, development of a device that could protect air crew member's eyes against lasers was undertaken. The diffi-

culty in designing such a device has been in constructing it to protect a pilot's eyes without impairing normal vision to any significant degree.

Lasers used for ranging and detection, for example, are of such an intensity that they can damage the eye. In fact, exposure to any high intensity light source—including a

search light or weapons flash, but especially a laser—poses the threat of causing permanent or temporary damage to a pilot's or crew member's eyes.

The new visor is designed to deflect lasers and protect against other potentially damaging light sources. The visor would use non-imaging holograms in a dichromated gelatin film, which is similar to a photographic film, to deflect these high intensity light sources. Multiple holograms could be used in the visor to diffract various damaging light wavelengths.

In addition, the use of a holographic diffraction protection visor, unlike visors already developed, will not greatly reduce an air crewman's normal vision or color perception. Development of a visor to protect against lasers has been hindered because of these types of difficulties. Besides the problem of constructing a visor to maintain a pilot's normal vision, there is also difficulty in configuring a visor that can be worn in the flight environment.

An efficient visor must be designed to reflect a narrow constant wavelength band of light and to protect against light entry at a wide variety of angles. The visor must also be constructed so it can be worn by crew members under actual flight conditions. This holographic device is being designed to meet all these criteria.

Visors already developed are only marginally acceptable for flight situations since they do greatly reduce pilot vision. In some circumstances, this type of visor, which absorbs light rather than deflecting it, reduces the nonintense light that passes through the visor to such an extent that it is not usable during actual flights.

The use of a holographic diffraction protection device is more suitable to flight situations because it can deflect lasers and other light without significantly reducing normal light. Thus, the visor is able to reject some wavelengths while allowing others to pass through.

The first model of the visor, which is being built under a contract to the Hughes Radar Systems Group, is expected to be ready in about a year. Initial feasibility studies were conducted two years ago and a feasibility model built. Once the prototype is constructed, the visor will undergo further testing.



Chisum's Vision Laboratory also conducted early evaluations of night vision goggle integration into pilot helmets as well

Source- oral history interview, Gloria Chisum, 2014