

his desk is in the kitchen

Expansion goes hand-in-hand with progress, a familiar story at Lewis.

Continued growth of the Center requires planning for future facilities and land on which to build them. So it was that Congress granted us the privilege of purchasing 115 acres of land adjacent to our main area, west and somewhat south of the Center off Grayton Road.

West of the South Gate, past much construction (Watch future issue of Orbit for this story) on top of the hill is part of this new area.

Utilizing existing buildings on this property, the main house is being used as offices for the Heat Transfer Branch of the Nuclear Reactor Division. Relocated in the Mitchell House, as it is presently referred to, branch head Robert Deissler has his office in the downstairs bedroom; Albert Loeffler and Alden Presler share the diningroom; Clive Usisken, Joseph Savino and Robert Siegel have their desks in the livingroom; Ephraim Sparrow's office is in one of the upstairs bedrooms; and Morris Perlmutter's desk is in the kitchen.

The Mitchell house is presently being redecorated to suitable office conditions.



The Mitchell house



M. Perlmutter - A. Presler



A. Presler - A. Loeffler



C. Usisken - R. Siegel

Advanced Study Program Classes Begin Next Week

Classes will begin next week for most students in the Center's Advanced Study Program.

Eleven of the 12 courses offered this year will get underway on Oct. 19, 20, and 21. The initial class of the twelfth course will be held Oct. 29.

The Training Branch reports that 431 staff members are registered for the courses.

The largest class will be Introduction to Solid State Physics, which will have 47 students. Introduction to Modern Physics will have an enrollment of 46, while 43 students will be studying Advanced Materials Technology.

Lewis staff members will serve as instructors and coordinators for the program. Classes will meet one day per week for 24 weeks.

Textbooks for the courses have been ordered. The instructors are responsible for notifying individual students of class times, meeting places, etc.

Class hours are 3 to 5 p.m., except for Solid State Physics, which meets from 1 to 3 p.m.

The starting days, classes, instructors and coordinators, and locations are:

Monday, Oct. 19

Introduction to Modern Physics; Dr. John L. Need; Room 100, 10 x 10 SWT.

Turbomachinery Fundamentals and Applications; Arthur J. Glass-

man, coordinator; Observation Room, 8 x 6 SWT.

Mathematical Statistics; Dr. Burt M. Rosenbaum; Room 101, ROB.

Mission Analysis; Richard J. Weber, coordinator; Room 3102-06, DEB.

Tuesday, Oct. 20

Introduction to Solid State Physics; Dr. Gabriel Allen; Room 100, 10 x 10 SWT; 1-3 p.m.

Introduction to Nuclear Engineering; Robert E. Sullivan; Room 100, 10 x 10 SWT.

Thermostatics and Thermodynamics; Dr. Robert M. Inman; Lower-level classroom, Mitchell House.

Wednesday, Oct. 21

Heat Transfer II; Dr. Robert Siegel; Room 100, 10 x 10 SWT.

Advanced Engineering Mathematics II; Dr. John N. Livingood; Observation Room, 8 x 6 SWT.

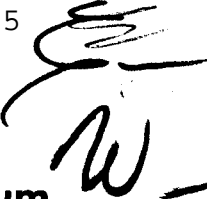
Advanced Engineering Mathematics I; Charles W. Putt; Room 101, ROB.

Atmospheric and Space Environments and System Problems; Dr. Anthony L. Julius, coordinator; Room 133-34, ECL.

Thursday, Oct. 29

Advanced Materials Technology; Dr. Hubert B. Probst, coordinator; Room 100, 10 x 10 SWT.

"Conference On Selected Technology For The Petroleum Industry" To Be Held Dec. 8-9



A unique briefing for executives and technical managers of the petroleum industry will be held at Lewis December 8 and 9.

The "Conference on Selected Technology for the Petroleum Industry" is the first such conference planned by NASA to acquaint a specific non-aerospace industry with knowledge gained from aerospace research and development.

More than 350 petroleum industry representatives from around the country are expected to attend.

James E. Webb, NASA Administrator, and Frank N. Ikard, president of the American Petroleum Institute, will highlight the conference with special presentations on space technology and the petroleum industry.

A series of planning meetings between technical representatives of the petroleum industry and Lewis staff members helped to select areas in which aerospace technology might contribute substantially to the petroleum industry.

The conference is part of NASA's Technology Utilization Program, which seeks to transfer to the general economy the scientific and technical results of the aerospace program.

Dr. Walter T. Olson, Assistant Director for Public Affairs, said: "In a sense, the conference is a partial report on our stewardship of men and money."

The conference will be opened with remarks by Dr. Abe Silverstein and Dr. Olson.

Panel discussions and survey paper presentations on the program are:

Combustion; Richard S. Brokaw, Chief, Physical Chemistry Branch, chairman.

Storage and Handling of Liquids and Gases; Donald L. Nored, Head, Propulsion Systems Section, Advanced Rocket Technology Branch, chairman.

Heat Transfer; Robert Siegel, Head, Analytical Section, Fundamental Heat Transfer Branch.

Technology Utilization; Breene M. Kerr, Assistant Administrator for Technology Utilization, NASA Headquarters.

Pump Technology; Irv Pinkel, Chief, Fluid System Components Division.

Bearings, Seals and Lubricants; Edmond E. Bisson, Assistant Chief, Fluid System Components Division.

Survey Papers:

Magnetics and Superconductivity; Edmund E. Callaghan, Assistant Chief, Electromagnetic Propulsion Division.

Physics and Chemistry of Surfaces; Robert A. Lad, Chief, Chemical Physics Branch.

Hydrodynamics of Liquid Surfaces; Edward W. Otto, Chief, Space Environment Branch.

On-site Training Tailored to Fit Needs

Three on-site graduate level programs are being conducted at Lewis to better equip staff members with the knowledge necessary to meet today's challenges and those of the future.

These three — the Advanced Study Program, the University of Toledo and John Carroll University degree programs — are a part of the Center's broad training and development effort. Each contains the ingredients which foster the pursuit of learning: applicability to the job, quality instruction, convenience, and low cost.

The Advanced Study Program now underway offers nine graduate level courses, taught by professional staff members who are experts in their fields. A total of 256 employees, are enrolled in these courses this term. Last year there were 400 enrollees.

This unique program was conceived and instituted in 1951 by Dr. John C. Evvard, associate director for research. "These are courses specifically tailored to the research and development program of the Center as we see it," explained James F. Connors, chief of the Office of Research Plans and Programs and chairman of the Training Committee.

To illustrate the wide range of subjects, the courses offered this term and their instructors are: Computer Concepts, by Ross C. Bainbridge and Charles W. Putt; Microelectronics, William C. Nieberding; Numerical Analysis of Partial Differential Equations, Dr. Theodore Katsanis; Superconductivity, Dr. Gerald V. Brown; Welding-Processes, Applications, and Design, Thomas J. Moore and Kenneth Holko; Heat Transfer II, Dr. Robert Siegel; Introduction to Compressible Flow, Dr. Dudley G. McConnell; Airbreathing Propulsion Technology, Arthur J. Glassman; Intro. to Thermodynamics and Fluid Mechanics, Dr. Robert A. Ellson.

Flexibility is the keynote of the Advanced Study Program. Its curriculum changes from year to year with the changing needs of the Center. The course in microelectronics, for example, reflects an interest in a newly-established technology.

How are courses and instructors selected? James Miser, the research representative on the training committee, is the man charged with the general responsibility for coordinating the program. He explained that all of the Lab's divisions are surveyed, in-

dividual requests and the changing direction of the Center's R & D activities are considered in developing a new curriculum. Competent professionals with a "flare" for

teaching serve as instructors for courses in their specialties.

Employees taking the courses do not receive letter grades or college credit for their work, even

though it is equivalent to advanced degree work. However, they like it that way. Most of the students are not so much interested in the grade or degree as they are in broadening their own capabilities, in learning about new areas or updating their knowledge of a specific field.

Some of the courses offered are not readily available in local universities because of their highly specialized nature, while some serve as pre-requisites for more advanced courses.

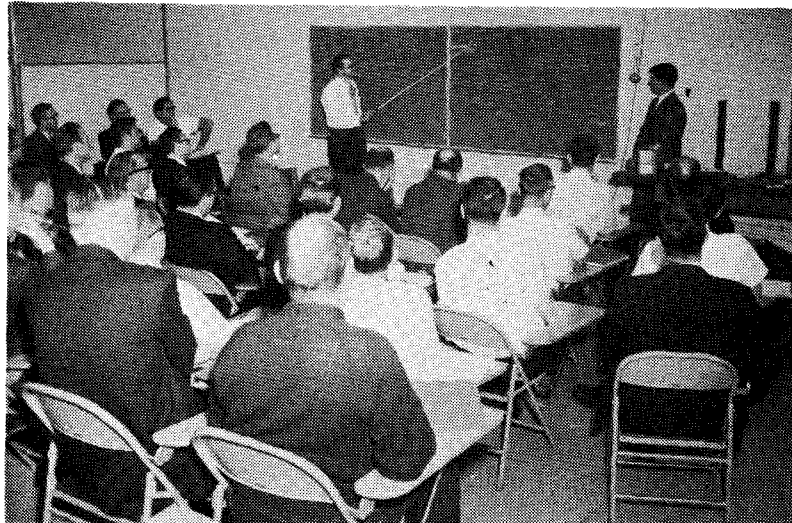
The Advanced Study Program, along with the other on-site graduate programs, is administered by the Training Office. Miss Gertrude Collins administers and implements the programs, but sometimes it isn't easy. Recently, for instance, she had to have 70 students notified when the instructor of two of the University of Toledo courses was unable to meet with his classes because he developed laryngitis.

Miss Collins was instrumental in developing the on-site university programs. Both are new and expanding. The University of Toledo (T.U.) program was first offered at Plum Brook Station in 1961 and was extended to Cleveland in September 1966, the same time that the John Carroll University program began here.

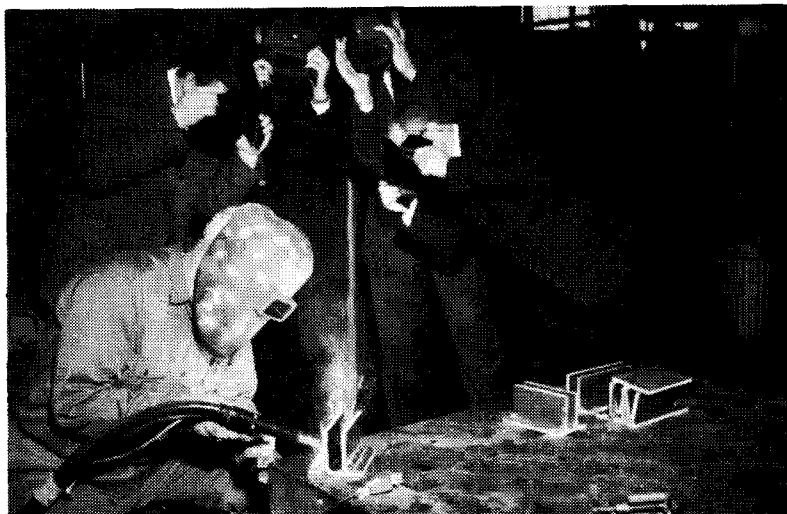
Regular T.U. faculty members visit Cleveland and Plum Brook to teach a total of seven courses, while Lewis professionals serve as part-time faculty members of John Carroll while teaching accredited courses here. Employees serving on the John Carroll faculty in this capacity include: Dr. Ira T. Myers, Dr. Frank J. Zeleznik, Dr. John V. Dugan, and Dr. Gerald V. Brown.

Through the on-site programs students may conveniently take courses leading to advanced degrees. In the John Carroll program, one may take up to half of the course work leading to a master's degree in physics. In the T.U. program, one may earn a master's degree in engineering science, mechanical and electrical engineering, or math — entirely through on-site courses. At present, 132 Cleveland and 24 Plum Brook employees are enrolled in the T.U. on-site program, while there are 27 employees in the John Carroll program.

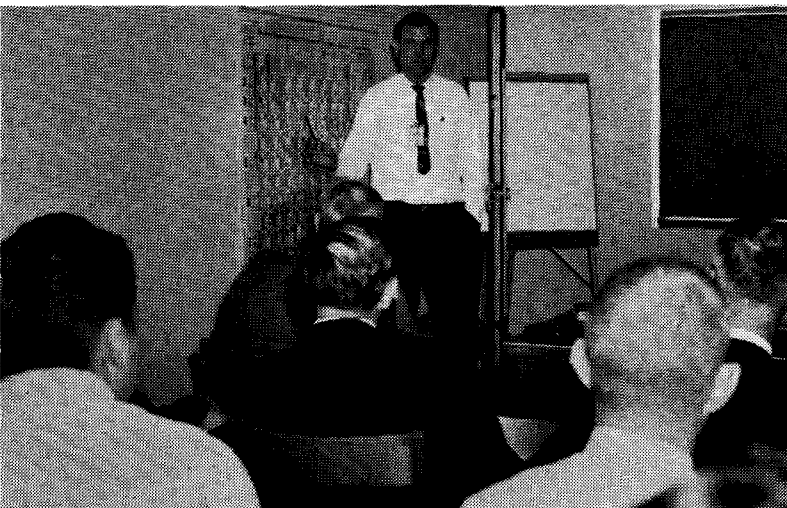
For those engaged in the "practical academics" of our on-site education, it's a commendable effort.



Thomas J. Moore (with pointer) lectures on fusion welding processes as Kenneth Holko, co-instructor in the Welding-processes, Applications and Design class, looks on at right. (John Marton photo)



A group of employees from the class in Welding-Processes visits the Fabrications Shop to get a first-hand understanding of welding processes and procedures. (John Marton photo)



William C. Nieberding conducts a course in microelectronics for Lewis staff members as part of the Advanced Study Program. (Don Huebler photo)

Staffer receives ASME heat transfer award

Dr. Robert Siegel, head of the Analytical Section of the Fundamental Heat Transfer Branch, at NASA's Lewis Research Center, has been selected as the 1970 recipient of the Heat Transfer Division Memorial Award by the American Society of Mechanical Engineers (ASME).

The award recognizes those members whose work best commemorates the memory of pioneers in the science of heat transfer. He will receive the award at ASME's annual winter meeting in New York on December 1.

Dr. Siegel was cited for his "many significant contribu-



tions to the knowledge of boiling, radiation, convection and conduction, including his pioneering experiments under zero-gravity conditions."

Joining the Lewis staff in 1955, he has specialized in fluid dynamics and heat

transfers, including such areas as boiling in reduced gravity, solidification of flowing liquids, heat transfer in rectangular channels and radiation heat transfer. In addition to holding membership in ASME, he is also a member of Tau Beta and Sigma Xi.

Dr. Siegel attended Case Institute of Technology where he earned a bachelor of science degree in mechanical engineering in 1950 and a masters of science degree in mechanical engineering just a year later. He earned his doctorate in mechanical engineering from Massachusetts Institute of Technology. He, his wife, Elaine and their two children live at 3052 Warrington Rd., Shaker Heights, Ohio.

Steep...

(Continued from page 1)

work assignments and aware-



Physics & Chemistry Division reorganizes

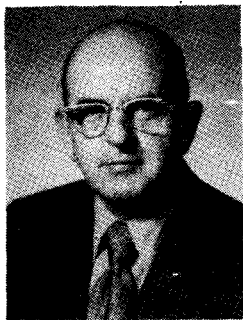
Since the appointment of Dr. Richard S. Brokaw as Chief of the Physics and Chemistry Division last month, a number of organizational adjustments have been made within the division.

Frank E. Belles, formerly Chief of the Kinetics Section, became Chief of the Propulsion Chemistry Branch, Dr. Brokaw's former position. The Kinetics Section was dissolved and its members were absorbed by the two other sections in the branch.

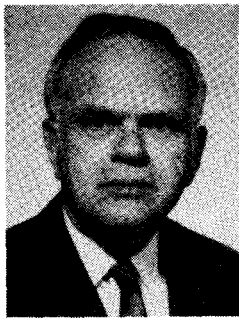
Robert G. Deissler, former Chief of the Fundamental Heat Transfer Branch, was named Senior Fluid Physicist at division level. Robert Siegel becomes Chief of the Fluid Mechanic and Thermal Science Branch. Richard T. Gedney has been appointed as Head of the branch's Analytical Section.

The Chemical Physics Branch, with Dr. Robert A. Lad as Chief, has been renamed the Materials Science Branch.

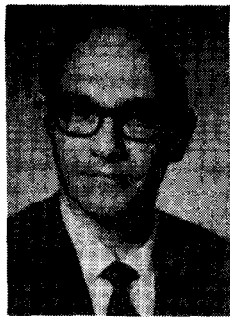
In the Radiation Physics Branch, Howard C. Volkin's Theoretical Physics Section has been absorbed by the two other branch sections, and Volkin has been appointed Branch Consultant to Dr. James W. Blue, Chief of the Branch.



Belles



Deissler



Siegel

Easy retirement beckons six



Leroy V. Humble retired as Chief of the Nuclear Systems Division on December 24 after 31 years service, leaving a string of noteworthy contributions to the field of nuclear energy.

Humble began his career at Langley Research Center in 1940 where he was assigned to work on the development of methods of utilizing energy in the exhaust gases of aircraft reciprocating engines.

In 1943 Humble transferred to Lewis and continued his work on engine-turbine combinations begun at Langley.

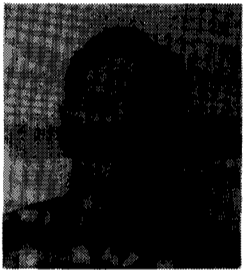
Two years after transferring to Lewis, he was appointed Head of the Composite-Engine Research Section. Under his leadership experimental work was conducted on turbines, single cylinder and full scale engines.

Humble was appointed Chief of the Thermodynamics Branch in 1950. In 1955 he was appointed Assistant Chief, Materials and Thermodynamics Research Division, and just a year later, was appointed to Chief of that division.

When the use of nuclear energy to propel aircraft was beginning to receive attention, Humble entered this field of research. He made cycle studies and instituted research programs on various heat transfer problems associated with nuclear propulsion.

Born in Washington, Iowa, Humble is a graduate of the University of Alabama. He is a member of the Ohio Society of Professional Engineers.

Humble and his wife, Eileen, may buy a motor home and do some traveling. The couple has a grown son living in Hawaii and a married daughter living in Cincinnati.



Richard M. Dagleish, a nuclear engineering technician in the Facilities Service Division at Plum Brook, retired this month after a 32-year government career. He joined Lewis in 1947 and transferred to Plum Brook in 1959. Before that he was with the U.S. Navy. Most recently he worked as a reactor control room operator and a service systems supervisor at the Reactor. He and his wife, Jane, plan to travel. He will keep busy working at his new job as a refrigeration mechanic, and continue his interests in bowling, golfing, and church work.

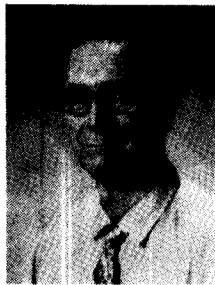
control room operator and a service systems supervisor at the Reactor. He and his wife, Jane, plan to travel. He will keep busy working at his new job as a refrigeration mechanic, and continue his interests in bowling, golfing, and church work.

John Papay, an automatic controls mechanic foreman in the Equipment and Instrument Utilization Branch, Equipment & Supply Division, retired this month after a 31 year government career. He was with the Civil Aeronautics Administration for four years, and the War Assets Administration for another four years. He joined Lewis in 1948 and has held supervisory positions in areas of erection, repair, and automatic controls. For almost eight years he has been supervisor in the valve and control overhaul shop. He and his wife, Ann, plan to vacation in Hawaii this winter. Then they play to take their travel trailer and spend the remainder of the winter in Florida. They have one son.



Entering into the travel business full time after he retires this month will be William A. Green, a welder in the Metallurgical Branch, Fabrication Division. He and his wife, Betty Jane, will manage "High Adventure Tours," a travel agency that plans excursions such as skiing, rafting, kyacking and backpacking.

They also write a travel column for the Cleveland Press. He joined Lewis in 1943 and has done welding in areas of ERB, flight research, fabrication, and most recently in metallurgy.



Ralph B. Miller, a mechanical modelmaker foreman in the Machine Shop Branch, Fabrication Division, retired this month after a 29 year career at Lewis. He joined in September 1943 and for 15 years was responsible for supervising the fabrication of turbines and compressors, and most recently for general machine shop work and special machinery repair. Miller plans to work part time at another machine shop and do some development work on his own. He and his wife, Adelaide, have two sons and one daughter.

Miller plans to work part time at another machine shop and do some development work on his own. He and his wife, Adelaide, have two sons and one daughter.

Now that she has retired from a 24-year government career, E. Ruth Erickson plans to devote more time to sewing, knitting and other handwork. A mathematics technician in the Computer Systems and Operations Section, Instrument and Computing Division, she has been responsible for computing and programming. Before joining Lewis in 1955 Mrs. Erickson was with Ames Research Center for four years and with the Army Ordnance District for four years.



Names in the News

Ms. Holly Hartle, a senior at Westlake High School has been chosen to participate in the Presidential Classroom for Young Americans in Washington, D.C. from March 4-11.

She is the daughter of George H. Hartle, Chief of the Equipment Operations Branch. Hartle's son, Terry, who worked as a summer Wackenhut employee at Lewis, also has received his share of scholastic honors. He won an international study grant last September to attend Cambridge University in England.

Robert Siegel, Head of the Analytical Section, is pleased a special publication he authored has been published as a college textbook and will be used by the University of Houston. Titled "Thermal Radiation Heat Transfer," it contains a comprehensive discussion of heat transfer by thermal radiation. It also contains many examples, with answers, the applications of analytical methods and homework problems, and treats basic definition, nomenclature, and derivation in detail. The nearly 900 page book was published by McGraw-Hill Book Company.

Alvin E. Schultz, Head of Section B in Plum Brook's Rocket Systems Division, was recently elected Worshipful Master, the top office in Science Lodge 50. A Mason for 18 years Schultz's new duties include presiding over the 425-member Lodge, as well as officiating at Masonic funerals, conferring degrees on members and initiating new members.

Dr. Kenneth P. Coffin, a chemist in the Physics and Chemistry Division, was appointed to an eight-member task force by the Breathers' Lobby to analyze the state's new clean air standards.

A report was prepared in December and will be distributed this month at seven clean air workshops sponsored by the Lobby.

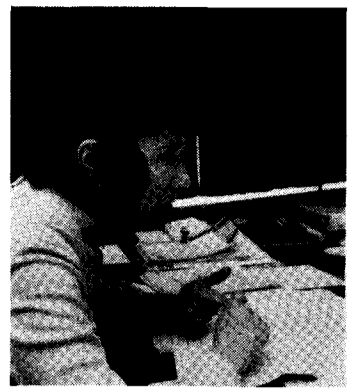
The Breathers' Lobby is made up of members from the Ohio Tuberculosis and Respiratory Disease Association, United Auto Workers union, AFL-CIO, Ohio Council of Churches and various citizens' groups.

LeSAC plans vacations

The Leisure Time Committee of LeSAC is continuing to organize vacation trips for Lewis employees and their families. Nearly 200 vacationers, primarily Lewis and Langley employees and their families, are enjoying the sun in Hawaii right now.

The Leisure Time Committee's next organized jaunt is to Las Vegas for five days, four nights, from May 3 to May 7. \$190 per person includes United Airlines jet fare with champagne and dinner inflight, four nights at the Stardust Hotel, the elegant Lido de Paris dinner-show, two other midnight shows including drinks, complete breakfasts throughout, taxes, tips, transfers and baggage handling. Reservations are due by February 1.

The NASA Employees Club at Headquarters is sponsoring a 3-week Grand Tour of Europe May 28 through June 18. NASA employees can buy the trip to and from Dulles Intercontinental Airport in Washington for \$774.80 per person, or the TWA flight only on those dates for \$179.80 per person. Lewis is trying to run a similar trip in October. For further information call PAX 3284 or 2140.



Ms. Emerling

Consumer

(Continued from page 1)

January 31 in the DEB Auditorium.

Ms. Emerling has served as Regional Director of the Cleveland Office since 1970. This agency is responsible for the enforcement of anti-trust/trade regulation laws and consumer protection statutes. In support of its direct law enforcement responsibilities, the Federal Trade Commission has broad investigatory, rule-making, and litigation authority.

Ms. Emerling graduated summa cum laude from Cleveland Marshall Law School (now part of Cleveland State University) in 1955. She was admitted to practice before the Ohio Bar in 1955 and the Supreme Court of the United States in 1971. She joined the Public Defender's Office where she served as Attorney in Charge before transferring to the FTC.

Her many activities include memberships in numerous groups. She is a member of an Advisory Committee on Criminal Rules for the State of Ohio, member of the Board of Overseers of Cleveland-Marshall Law School, a Trustee of the Legal Aid Society of Cleveland, and member of the Policy Committee of the Federal Executive Board.

All employees are invited to attend the program but are reminded they need tickets for admittance. Tickets are available from division offices. The program also is open to adult members of employee's families.

A shuttle service from the Hangar parking lot to the DEB will be available for those who wish to park at the Hangar lot.

Movies begin next Friday

Next Friday, January 21, the Educational Services Office is sponsoring its first in a series of family night movies in the DEB Auditorium.

The movies begin at 7:30 p.m. and will feature "Apollo 15," by NASA; "Versatility Unlimited," by Sikorsky; and "Dimension 10," by McDonnell-Douglas.

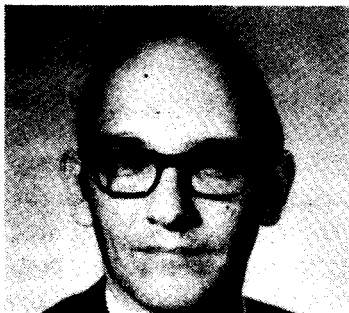
Free tickets are available through division secretaries. Free refreshments will be served in the DEB Cafeteria following the movies.

November 12, 1976

Siegel's book reprinted; sold in Third World

A book written by Dr. Robert Siegel of Lewis in 1972, has been reprinted in paperback edition so it can be within the purchasing range of students in Third World countries.

The book was selected for the McGraw-Hill International Student Edition and has generated considerable interest by students and professors overseas according to Dr. Siegel. The book, "Thermal Radiation Heat Transfer," was originally published and sold for about \$21. The paperback editions are now selling for about \$8 in countries in Asia, Latin America and North Africa.



Dr. Siegel

The paperback editions are not for sale in the U.S. or its territories.

In mem

Emil Zeliznak died in South General Hospital November 11, 1976, suffering a heart attack earlier at his home. He was 50. An aeronautical engineer, Zeliznak worked in the Vibration and Noise Division. He joined Lewis in April 1964. He earned both Bachelor's and Master's degrees from the University of Michigan. He was a member of the American Institute of Aeronautics and Astronautics and the American Society of Mechanical Engineers. He was married to Mrs. Zeliznak and had two children, a son and a daughter. He is survived by his wife and two children. Burial will be in the Jewish Cemetery, Detroit, Michigan.

LEWIS

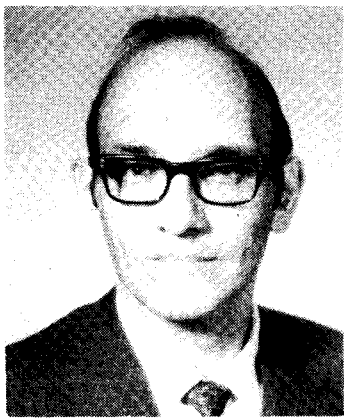
Vol. 14 No. 10

May 13, 1977

Stewart, Siegel earn ASME's highest award



Stewart



Dr. Siegel

Warner L. Stewart and Dr. Robert Siegel of Lewis have received the highest honor the American Society of Mechanical Engineers (ASME) can bestow on its members — election to Fellow.

The two men received the high honor from the Chairman, Cleveland Section, ASME, in ceremonies held at Lewis recently.

Stewart, Director of Aeronautics, has made outstanding contributions in turbines for propulsion and power generating systems and is a recognized authority in the field, noted ASME.

He has written more than 50 papers on the subject and once served as chairman of the Gas Turbine Division of ASME. He also has made significant contributions to the Brayton Cycle electric power generating systems for space applications, the association said.

As Director of Aeronautics, Stewart oversees activities of four research divisions and a major project office with a total staff of over 400 persons.

The directorate is involved in developing technology that will allow future aircraft engines to conserve more fuel, run quieter and produce substantially lower emissions than current engines. The directorate personnel also researches new engine concepts for such advanced applications as supersonic cruise and vertical take-off and landing aircraft.

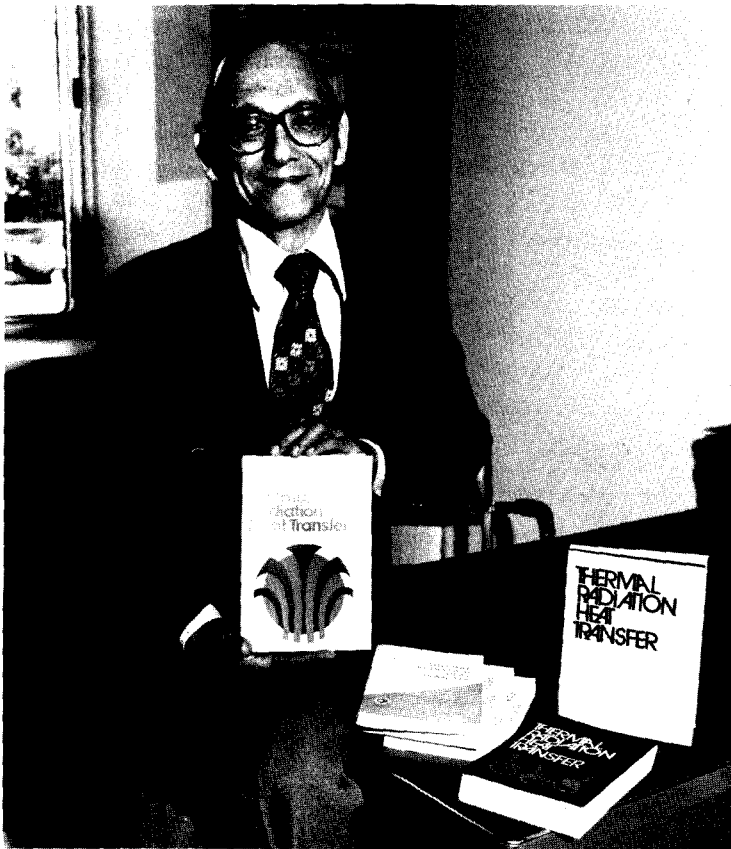
Dr. Siegel has written more than 90 technical papers and is co-author of a widely used college text and reference book entitled "Thermal Radiation Heat Transfer." He is known internationally for the many contributions he has made to heat transfer literature, according to ASME.

Dr. Siegel also has made significant contributions to several disciplines of heat transfer including forced convections and boiling and radiation.

During his career he has served as consultant to government-sponsored research at NASA and other government agencies, the association said.

As Head, Analytical Fluid Mechanics Section, Siegel manages and participates in basic research programs in heat transfer and fluid mechanics.

Siegel's book considered best on subject of thermal radiation heat



*Dr. Robert Siegel shows the latest revision of his book entitled **Thermal Radiation Heat Transfer**, considered to be the leading college textbook on the subject. (Don Huebler photo)*

When Dr. Robert Siegel of the Fluid Mechanics and Acoustics Division could not find enough material for a course he was teaching in thermal radiation heat transfer, he did what any ambitious scientist might do—he wrote his own

textbook.

That was back in 1960. The course was prompted by NASA's urgent need for more knowledge on the subject.

Notes accumulated over a period of years became the basis for the college text-

book, entitled naturally *Thermal Radiation Heat Transfer*.

Thermal Radiation Heat Transfer was first published as a textbook in 1972 and during the next few years some 10,000 copies were sold, making it the leading text on that subject for engineers in the graduate schools.

In 1976, Siegel and co-author Dr. John R. Howell, former Lewis employee and now a professor at the University of Houston, were asked by the publisher to revise the book for a second edition.

It was also in 1976 that McGraw-Hill Kogakusha, Ltd., of Japan photocopied the book and printed an international student edition that was sold all over the world. "Even a Russian translation was made," Siegel said.

He added, "We spent three years updating and re-writing the book. There is quite a bit of new material, some related to solar use."

The latest edition was in production for almost two years and is now available for the 1980-81 college year.

Special achievement recipients...

lifting delicate instrumentation and executed critical positioning of the crane in support of research and maintenance projects.

George Diedrich, Financial Division, developed a generalized tape retrieval system which resulted in significant savings in programming costs.

Bruce M. Shuman, Acquisition Division, successfully prepared and coordinated award of contracts for developing STS/Centaur vehicle within an extremely compressed schedule.

Helen B. Giomini, Resources Planning and Management Office, warranted special recognition for her performance in accomplishing special projects within her Office.

William A. Olsen, Propulsion Systems Division, compared icing instruments in the Icing Research Tunnel which merited a special recognition.

Henry B. Tryon, Transportation Propulsion Division, provided important new information to support the emerging electric vehicle industry.

Robert P. Migra, Transportation Propulsion Division, skillfully handled all aspects of transferring management responsibility for alternative fuels utilization from the Department of

Energy to Lewis.

Irving Weinberg, Solar & Electrochemistry Division, demonstrated, through research, increased radiation resistance and reduced annealing temperatures in silicon solar cells.

James E. Martz, Solar & Electrochemistry Division, refurbished and upgraded the Tangaye, Upper Volta photovoltaic system.

Victor G. Weizer, Solar & Electrochemistry Division, discovered the cause of solar cell degradation at low temperatures and under low light.

Alexander Mackie, Facilities Operations and Maintenance Division, designed and implemented landscaping at the Center.

Glen A. Boltz, Facilities Operations and Maintenance Division, modified the Center's boiler circuitry.

Rigo A. Solin, Facilities Operations and Maintenance Division, performed exceptionally in carrying out his duties as contracting officer for the painting service.

Joseph S. Orack, Facilities Operations and Maintenance Division, demonstrated excellent performance as contracting officer of the hi-voltage maintenance contract.

John Koch, Fabrication Division, contributed

significantly to the HPF, wind turbine and CTOL program in ECRL.

Richard Kovachik, Fabrication Division, demonstrated extra initiative while installing instrumentation for the wind turbine program.

Elmer J. Petelka, Fabrication Division, was honored for his continuing efforts and outstanding ability in manufacturing a 15cm inert gas thruster engine.

Richard J. Schmidt, Fabrication Division, designed, customized, machines and installed parts for the integral and replaceable blade turbines.

Ronald J. Maret, Equipment and Supply Division, was honored for his high level of dedication to his job as materials inspector.

Jose E. Gonzalez, Equipment and Supply Division, performed his duties as a packer and warehouseman in an exemplary manner.

James P. Malloy, Equipment and Supply Division, coordinated and installed controls modifications to the combustion air system under tight time restraints.

Keith A. Lemley, Computer Services Division, was honored for his excellent work in phasing in support service contractors.

Benson Clymer, Reliability and Quality Assurance Office, prepared joint

NASA/industry document performance assurance requirements for the 30/20 GHz communications satellite.

Ted J. Kipacz, Engineering Design Division, successfully coordinated critical scheduler constraints of the J-57 engine installation in PSL-3.

Mike A. Minichiello, Engineering Design Division, completed two conceptual layouts in two test cells in an unusually short time.

George Foerster, Engineering Design Division, achieved an outstanding on-time completion of major engineering design tasks.

Robert A. Meyer, Facilities Engineering Division, managed the Facilities Planning and Development Office and other responsibilities in addition to his duties as deputy division chief.

Hugh A. Schoeffler, Facilities Engineering Division, managed the very complex and critically important SEB for the engineering and construction services.

Robert Siegel, Fluid Mechanics & Acoustics Division, was honored for writing Thermal Radiation and Heat Transfer, which has already become the primary textbook in its field.

Leonard J. Westfall, Materials Division, contributed to developing

equipment and techniques to fabricate and evaluate high temperature composites.

Walter S. Cunnan, Structures & Mechanical Technologies Division, upgraded and brought Lewis Multistage Compressor Experimental Research Facility into sustained operational condition.

Frank P. Behning, Aerothermodynamics & Fuels Division, effectively managed the operational requirements of a large number of turbine and combustion research facilities.

Eric F. Gustke, Aerothermodynamics & Fuels Division, solved several complex design and operational problems in ECRL-1.

Patrick L. Donoughe, Space Communications Division, planned and coordinated the highly successful industry briefing in May, the flight experiments program, and the management reporting system.

Wayne A. Whyte, Space Communications Division, supported the communications satellite frequency and orbit planning which warranted special recognition.

Joseph L. Fiala, Space Communications Division, supported the analysis and definition of the 30/20 GHz experimental system in a

(Continued on page 4)

July 5, 1983

“My sons, the doctors!”

Bob Siegel, a scientist in Lewis' Fluid Mechanics and Instrumentation Division, went to two medical school commencements this past June.

Sons Steven, 28, and Larry, 25, became MD's. Steven graduated from CWRU's school of medicine; Larry received his degree from Harvard Medical School. Bob and wife Elaine went to both graduation ceremonies. “We can now get a second opinion on medical matters,” Siegel joked.

Siegel's in step with patterns of dance

Curly Whip, Chicken Walks, Turkish Towel.

No, these are not the names of distant constellations or code names for future interplanetary space missions. Rather, they stand for dance steps: carefully executed movements which are as much fun as they sound.

And it is probably the creative challenge of engineering these sophisticated dance steps that lured Lewis' Robert Siegel into the world of international style ballroom dancing.

Bob, a research scientist in the Office of Chief Scientist, enjoys the challenge of learning and executing the multi-dimensional patterns of the Swing, Fox Trot, Waltz, Rumba or the Cha Cha. In fact, he applies engineer-like study skills and discipline in an effort to master the hundreds of geometric patterns which are required.

"But most of all it's fun," says Bob. "And it has opened the door to many exciting social situations."

Overseas Swing

Bob's ballroom dancing interest has taken him and his dancing partner, wife Elaine, as far as England—world center for ballroom dancing. Last summer the Siegels spent two weeks in London learning more about the art form. They were able to spend two hours each morning with Elizabeth Romain, who is editor of the Latin dance syllabus published by the Imperial Society of Teachers of Dancing.

"This was an excellent educational opportunity for learning the patterns and techniques in such dances as Rumba and Swing," says Bob. "We also had the privilege of receiving



Bob and Elaine Siegel execute a "drop" in a rumba routine. (Move over, Fred and Ginger.)

several hours of instruction with the Hilliers who placed second in the world ballroom championships last October in New York."

For Bob, ballroom dancing is not just a matter of learning interesting patterns and movements; it's a means of social interaction and communication. Bob describes that "When two people dance, the man leads using subtle changes of weight, and, with his arms and body, causes his partner to move through the proper patterns. It is an athletic and social activity rolled into one. Sometimes you are trading energy

back and forth; it can be an elating experience."

More Than A Hobby

To more conveniently practice and perfect their skills, Bob converted his former garage into a dance room. The 20 X 20-foot room adjacent to their kitchen is complete with cushioned parquet floor, heater and a large mirror. In addition, the Siegels have enjoyed collecting many interesting books on ballroom dancing which are kept in their reference library.

The Siegels not only spend time at their favorite dance spots around the

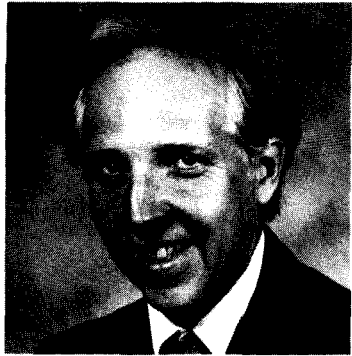
city, but Bob helps his wife teach dance classes at Cleveland State University and the Jewish Community Center in Cleveland Heights.

So if you happen to hear Bob refer to the complexities of "Syncopated Separation," it's not the booster separation in a shuttle launch. It's a Latin dance movement. □

Trivia Contest

If you're a trivia lover and would like to win tickets for the **First Annual St. Patrick's Day Dinner Dance** to be held March 15 in the Main Cafeteria, we've got a contest for you. Below you will find trivia questions which ALL pertain to the color green in some way, shape or form. To enter the ticket drawing, please send your answers and name to Mail Stop 500-319 no later than March 8. And may the luck of the Irish be with you!

1. The Irish Flag contains three colors: white, green and orange. How many other European countries have flags containing the color green?
2. How many major league baseball uniforms contain the color green?
3. How many NFL uniforms contain the color green?
4. In the 1969-70 music year, there was a hit song titled "Spirit in the Sky." Name the artist.
5. Where is the British Royal Observatory located?
6. What actor made his movie debut at the age of 61 in the "Maltese Falcon"?
7. What actor had a No. 1 hit record titled "Ringo" in 1964?
8. What movie won the Academy Award for best picture in 1941?
9. What Danish Island is located northeast of North America?
10. Brit Reid was the secret identity of whom?



Dr. Kenneth Baumeister

Seventeen Lewis employees received NASA's highest medals for excellence in science, engineering and service during the 1986 Honor Awards Ceremony Nov. 19.

Two Lewis researchers were presented with the 1986 Distinguished Paper Award. Three employees received 45-year service pins, and seven employees received 40-year service pins.

NASA Administrator Dr. James Fletcher and Deputy Administrator Dr. Dale Myers joined Acting Director Dr. John Klineberg in presenting the awards.

Exceptional Scientific Achievement Medal

There were two recipients of Exceptional Scientific Achievement Medals.

Dr. Kenneth Baumeister, of the Internal Fluid Mechanics Division, was honored for his pioneering research in the field of numerical duct acoustics and the development of innovative techniques which make possible the use of numerical methods for



Dr. Robert Siegel

analyzing noise suppression obtained from realistic aircraft inlets.

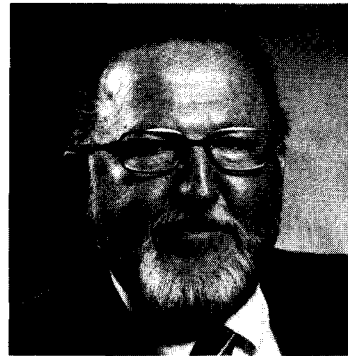
Dr. Robert Siegel, of the Office of Research and Technology Assessment, was recognized for his numerous important and wide-ranging contributions to the field of heat transfer, including some of the earliest work on zero gravity boiling, radiation heat transfer in porous media, and transient natural convection heat transfer.

Exceptional Engineering Achievement Medal

Three Lewis employees received Exceptional Engineering Achievement Medals.

Calvin Ball, of the Propulsion System Division, was recognized for his exceptional creativity, insight, and technical leadership in developing technology for cryogenic pumps, multi-stage compressors, and small gas turbines which has been widely applied in government and industry.

Dr. Christos Chamis, of



Calvin Ball

the Structures Division, was honored for his exceptional insight and creativity in developing advanced analysis methods and computer codes for predicting and verifying the structural response and durability of advanced composites components and structures, including those for several major NASA hardware programs.

Delmar Drier, of the Engineering Design Division, was recognized for his creative and innovative engineering contributions to the successful de-



Margaret Appleby



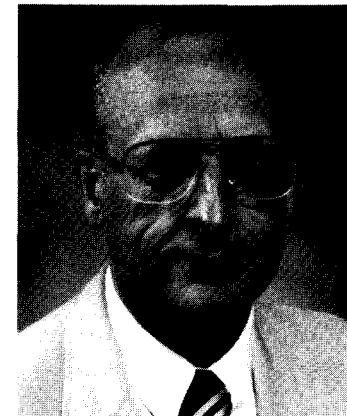
Dr. Christos Chamis

velopment of advanced turbomachinery for aeronautical propulsion.

Exceptional Service Medal

Twelve employees received Exceptional Service Medals.

Margaret Appleby, chief of the Editorial Branch of the Technical Information Services Division, was honored for her exceptional contributions and continuing achievements in developing the high standards in editorial services which have enhanced



Salvatore Grisaffe



Delmar Drier

Lewis' reputation in providing quality research publications.

Salvatore Grisaffe, chief of the Materials Division, was recognized for his significant contributions and outstanding leadership in the advancement of materials technologies for aeropropulsion, space propulsion and power, microgravity science and applications, and research productivity.

Robert Hoffman, chief of the Test Installations Division, was recognized for his outstanding leadership of Lewis' largest

(Continued on p. 2)



Robert Hoffman

Lewis News: May 20, 1989

Lewis Newsmaker

Author's Textbook Translated Into German

Back in 1960, Dr. Robert Siegel, formerly of the Fluid Mechanics and Acoustics Division and now of the Office of Chief Scientist, wrote a textbook entitled "Thermal Radiation Heat Transfer." The book was first published in 1972, and during the next few years about 10,000 copies were sold, making it the leading text on that subject for engineers in graduate school.

In 1976, Siegel and coauthor Dr. John Howell, a former Lewis employee and now a professor at the University of Texas at Austin, were asked by the publisher to revise the book for a second edition. In 1979, McGraw-Hill Kogakusha, Ltd., of Japan, photocopied the book and printed an international student edition that was sold all over the world. A Russian translation was even made.

In 1988 the book was translated into German, allowing that country's engineering students to study from Siegel's and Howell's textbook "Warmeübertragung durch Strahlung"

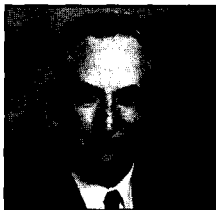
People

Lewis News: March 26, 1990

Barrett Receives FLC Award:

Richard T.

Barrett, a senior design engineer in the Structural Systems Division, was recently honored with the Federal Laboratory Consortium (FLC) Award of Excellence in Technology Transfer for 1993. Barrett's recognition was based on his preparation of the first comprehensive fastener design manual, crated for use by design engineers in the aerospace and construction industries. FLC awards recognize federal laboratory employees who have done an outstanding job of transferring technology developed in the laboratory to outside users such as other government agencies or the private sector.



Barrett

Siegel To Receive AIAA Thermophysics

Award: Dr. Robert Siegel, Lewis Research Academy, was selected to receive the American Institute of Aeronautics and Astronautics (AIAA) Thermophysics Award for 1993. Dr. Siegel was chosen "for outstanding contributions to thermophysics including

boiling in low gravity, transient forced and free convection, solidification and thermal radiation." Dr. Siegel will receive this award in July during an awards luncheon of the AIAA Thermophysics Conference.

Walters will lead NAFIS: Tom Walters has been selected to lead the newly formed NASA Accounting and Financial Information System (NAFIS) Project Office (org. code 0201). In his new position, Walters will report to the comptroller. The NAFIS is an Agency-wide



Walters

system that will be installed at Lewis in FY96. Walters is responsible for coordinating the development of this system with the interests of the Center, ensuring that our present systems will accommodate NAFIS, and for the overall implementation here at Lewis. Walters brings 25 years of experience in software and implementation. He is an electrical engineer who earned his degree from Cleveland State University.

April 12, 1991

Dr. Robert Siegel Named Prestigious AIAA Fellow

Dr. Robert Siegel, a member of the research group in the Office of the Chief Scientist, was recently elevated to Fellow by the American Institute of Aeronautics and Astronautics (AIAA). According to AIAA guidelines, Fellows must be persons of distinction in the profession and must have made notable and valuable contributions. Only one member out of every 1,000 can be promoted to the grade of Fellow.

Dr. Siegel is a specialist in heat transfer. During his 35 years at Lewis, he has worked on a wide variety of problems including transient forced convection, boiling in reduced gravity, solidification processes, and thermal radiation analysis. He has written numerous research papers, a textbook on radiation heat transfer, and consulted on many projects. For 15 years he was a section head and then a branch chief for a group that did analytical and experimental work on heat transfer.

Dr. Siegel started at Lewis in 1955 in the Nuclear Reactor Division. Prior to that he worked for two years at General Electric Company in Schenectady. There he was in the consulting office for heat transfer, and also did some

work on the nuclear reactor project for the submarine *Seawolf*.

"The nuclear reactor work at Lewis provided many interesting problems involving rapid heating in the walls of cooling channels," Dr. Siegel reflected. Another investigation was on freezing of warm water flowing over a very cold surface. This arose because of a heat exchange with very cold liquid hydrogen in the reactor system."

As the laboratory became involved in space work, Dr. Siegel started research on the effects of the space environment on heat transfer. To study the effect of low gravity, he and a coworker, C. Usiskin, designed and built the first drop tower at Lewis in 1957. "We obtained the first data and photographs of various types of boiling in reduced gravity, and studied the effect of gravity on the maximum possible boiling heat flux," said Dr. Siegel.

Because there are no coolants available in space, such as air and water as used in applications on the ground and in the atmosphere, heat transfer by thermal radiation is very important. Dr. Siegel started teaching a course at Lewis on radiation heat transfer. "A

suitable textbook was not available, so I wrote a set of course notes for the students," Dr. Siegel explained. "Eventually this grew into a textbook



Dr. Robert Siegel

coauthored with J.W. Howell, a former Lewis coworker. This graduate textbook, *Thermal Radiation Heat Transfer*, is currently in its second edition. It is used internationally and has been translated into Russian, German, and Chinese. Dr. Siegel has given on-site graduate courses in radiation heat transfer for the University of Toledo and Cleveland State University, and is also an adjunct professor of the University of Akron.

An active member of the AIAA, Dr. Siegel is an associate technical editor for the *Journal of Thermophysics and Heat Transfer*, and has served

in that capacity since the *Journal* was started five years ago. He previously served for 11 years as a technical editor of the *American Society of Mechanical Engineers Journal of Heat Transfer*.

Some of the honors that Dr. Siegel has received include the Heat Transfer Memorial Award from The American Society of Mechanical Engineers, and the NASA Exceptional Scientific Achievement Medal. He is also a Fellow of American Society of Mechanical Engineers.

Dr. Siegel and his wife, Elaine, live in Shaker Heights. Mrs. Siegel is well known on the east side of Cleveland as the head of ballroom dance instruction for the Jewish Community Centers of Cleveland, where she has been teaching for 16 years. The Siegel's are both professional dancing instructors with certificates from the Imperial Society of Dancing Teachers in London, England. "The creative challenge of dancing and learning dance choreography is fun and exciting. It is a great way to get some exercise for both the body and mind. Dancing has also enabled me to meet many wonderful people," said Dr. Siegel.

The Siegel's have two married sons and two grandchildren. Their sons both graduated from MIT and then continued through medical school into medical careers. Their older son, Stephen, is a pulmonary specialist in New York City. Their younger son, Lawrence, is an anesthesiologist and assistant professor at Stanford Medical School.

Shuttle Links With Students

Continued from page one

cal students, STS-37 pilot Kenneth Cameron, a native Cleveland, was on hand to answer students' questions. Other members of the crew included Steven Nagel, mission commander; Linda Godwin, Jerome (Jay) Apt, and Jerry Ross, mission specialists. Coincidentally, all crew members are licensed amateur radio operators.

Shuttle mission STS-37, the 39th flight of the space shuttle and the eighth flight of *Atlantis*, was highlighted by the deployment of the Gamma Ray Observatory (GRO), the second of NASA's four great space observatories, and the first American spacewalk in more than five years.

Textbook Read Around The World

When Dr. Robert Siegel of the Lewis Research Academy

started writing a set of class notes on radiation heat transfer in 1960, he never dreamed



Siegel

he would go on to write three editions of a textbook that would be translated into foreign languages and used in classrooms throughout the world. The third edition was published this fall by Taylor & Francis/Hemisphere Publishing Corporation.

"Back in the late 1950's, early 1960's when I was teaching courses here at Lewis, there were no textbooks on radiation heat transfer. So, I began writing some notes for the students," explained Siegel.

This led to a government publication and three editions coauthored by Dr. John R. Howell, former Lewis employee and now a professor at the University of Texas at Austin.

Throughout his years of working at Lewis and teaching at local universities, Siegel has continued to accumulate information to update his book. "Dr. Howell and I spent years updating the first edition before publishing the second edition in 1981," said Siegel. "We kept files of research papers and articles to help supply students with the most up-to-date information."

You would think seeing your name in print twice, knowing that your book was translated into Japanese, Russian, and Chinese, and was considered one of the leading college textbooks on the subject was enough for Siegel. However, this September Drs. Siegel and Howell published a third edition

of over 1,000 pages and an accompanying solution manual.

Perhaps a driving force behind Siegel's success is his enthusiasm for the subject and his desire to pass knowledge on to future generations. "With each edition, we've added homework problems and examples that we feel will help students gain a better understanding of the subject," he said.

In addition to his textbooks, Siegel has authored 140 technical papers. He is an associate technical editor for the American Institute of Aeronautics and Astronautics' (AIAA) *Journal of Thermophysics and Heat Transfer*, a Fellow of the American Society of Mechanical Engineers (ASME) and of AIAA, received the ASME Heat Transfer Memorial Award in 1970, and was awarded the NASA Exceptional Scientific Achievement Medal in 1986.

Lewis employees receive 1995 Honor Awards

ON June 7, 1995, Leon Bibb, news anchor/reporter, WEWS News-channel 5; and Gerald Barna, Acting Deputy Director, presented plaques and medals to Lewis employees for their outstanding contributions in the civil service workforce.

Exceptional Service

Bernard J. Blaha, Propulsion Systems Division. For exceptional leadership of nozzle technology development critical to future high-speed commercial transport aircraft and for outstanding contributions to the advancement of air-breathing propulsion technology.

Maury L. Blanton, Office of Human Resources Management. For consistently providing outstanding service to the Lewis Research Center and NASA in the area of human resources management.

Paul L. Burstadt, Propulsion Systems Division. For outstanding leadership in advancing air-breathing propulsion technology for high-performance aircraft.

Pamela P. Caswell, Logistics and Technical Information Division. For consistently providing outstanding editorial services and innovative solutions to publishing problems.

Daniel Cica, Computer Services Division. In recognition of sustained exceptional service of technical excellence in the innovation and implementation of Centerwide and Agencywide customer-oriented network technology.

James E. Dockrill, Electronic and Control Systems Division. For sustained superior performance in the design and development of the Electrical Power System for Space Station *Freedom*.

Betty J. Hemphill, Facilities Engineering Division. For outstanding administrative management of construction contracts in the Facilities Engineering Division.

Albert L. Johns, Propulsion Systems Division. For exceptional leadership in developing research capabilities and techniques for high-performance aircraft.

James Kassuba, Office of Human Resources Management. For providing outstanding, creative, customer-oriented services to the employees of NASA.

Dallas Lauderdale, Jr., Facilities Engineering Division. For extraordinary service in the performance and dedication to project management skills along with outstanding efforts in guiding Small Disadvantaged Businesses through the Construction of Facilities Program at Lewis.

Barbara A. Mader, Instrumentation and Control Technology Division. For exceptional knowledge, dedication, and outstanding secretarial and administrative skills, which have contributed significantly to the efficiency and effectiveness of the Instrumentation and Control Technology Division.

Linda M. McAllister, Office of Mission Safety. In recognition of sustained superior performance in administrative and contract management support for the Lewis Research Center's Safety, Reliability, and Quality Assurance Program.

John A. Mihevic, Facilities Operations Division. For outstanding engineering leadership and dedicated service in support of the Aeronautic

Research Support Systems Computer Controls serving the major Wind Tunnel and Propulsion Test Facilities at Lewis Research Center.

Donald R. Nealen, Test Installations Division. For outstanding performance and leadership in the assembly of high-speed rotating equipment and dedication to solving the difficult problems that arose.

Raymond W. Palmer, Space Electronics Division. For pioneering research in the computer-aided design of vacuum electronics devices that has enabled high-efficiency amplifiers for planetary exploration and commercial space communications.

Carolyn K. Purvis, Power Technology Division, retired, (presently working as a Distinguished Research Associate in the User Services and Consolation Branch). For helping to raise the field of Spacecraft Environmental Interactions from a scientific curiosity to one of the most important areas of spacecraft engineering.

George S. Sarvay, Propulsion and Fluids Systems Division. For outstanding engineering and leadership contributions to the support of the aeronautics, launch vehicle, terrestrial energy, and space technology programs at the Center.

John W. Schaefer, Aeropropulsion Facilities and Experiments Division. For outstanding leadership in establishing, refining, and implementing management procedures and methods for the effective maintenance and operation of the Aeronautics Directorate test facilities.

Wendell White, Test Installations Division. For outstanding service to his customers, managers, and peers through exceptional leadership in a variety of disciplines at Lewis Research Center.

Stephen P. Wnuk, Facilities Planning Office. For extraordinary initiative and leadership in the management of the Lewis Facilities Utilization Program.

Lois M. Wolfe, Space Flight Systems Directorate. For sustained exceptional performance in support of the management and administration of the Space Flight Systems Directorate.

Exceptional Achievement

Richard DeLombard, Space Experiments Division. For outstanding contributions in the development of microgravity measurement and analysis capabilities at the Lewis Research Center.

Julian M. Earls, Office of the Director. In recognition of the innovative programs established with Small Disadvantaged Businesses and Historically Black Colleges and Universities.

Chunill Hah, Internal Fluid Mechanics Division. For the development of a flexible turbomachinery code which has been applied to a wide variety of industry applications, including pumps, compressors, and turbines.

Sandra L. Hardy, Engineering Support Division. For exceptional contract administration service to the Lewis Research Center through the administration of the Scientific, Engineering, Technical and Related Services (SETAR) contract.

Christopher M. Kennedy, Logistics and Technical Information Division. For outstanding leadership and exceptional achievement in provid-

ing creative improvements and high-quality logistics and technical information services to Lewis Research Center.

Rodney M. Knight, ACTS Project Office. For outstanding achievements in management, organization, and leadership in the Advanced Communications Technology Satellite Project.

Dzu K. Le, Electronic and Control Systems Division. In recognition of initiating, advocating, and performing the development and application of the wavelet transform technology for use in the analyses of expendable launch vehicle dynamics.

Jesus M. Lopez, Fabrication Support Division. For extraordinary effort in the development and subsequent operation and implementation of the Numerical Controlled Programming Support Area of the Machining Branch.

Ronald W. Sepesi, Procurement Division. For dedicated support that has significantly contributed to successful NASA Space Station Redesign activity.

Richard K. Shaltens, Power Technology Division. For outstanding efforts and accomplishments in managing the 2-kWe Solar Dynamic Ground Test Demonstration Project.

Laszlo F. Zala, Facilities Operations Division. For outstanding engineering leadership and dedicated service in support of the Internal Operations and Protective Services Group serving the critical needs of the Lewis Research Center.

Exceptional Engineering Achievement

Roberto J. Acosta, ACTS Project Office. For outstanding achievements in the development of the revolutionary antenna system for the Advanced Communications Technology Satellite (ACTS), which is dramatically improving the capabilities for commercial communications.

Steven A. Hippensteele, Internal Fluid Mechanics Division. For exceptional engineering achievement in pioneering the development and application of liquid crystal thermography to turbine engine heat-transfer research.

Exceptional Scientific Achievement

James L. Smialek, Materials Division. For outstanding contributions and technical leadership in understanding the high temperature environmental durability of advanced aeropropulsion materials.

Outstanding Leadership

R. Lynn Bondurant, Jr., External Programs Directorate. For exceptional leadership in creating educational programs that have significantly impacted the educational community while enhancing the visibility and prestige of the NASA Lewis Research Center.

William J. Masica, Space Experiments Division. For outstanding leadership in advocating and implementing Lewis Research Center programs in microgravity sciences, in-space technology, and renewable energy and conservation.

Leroy G. Sidorak, Test Installations Division. For exceptional service in support of labor/management cooperation at the Lewis Research Center.

Presidential Rank Awards

Meritorious Executive—*John J. Nieberding*, *James R. Ramler*, and *Joseph A. Yuska*. For sustained superior accomplishments in management of programs of the United States Government and for noteworthy achievement of quality and efficiency in the public service.

Distinguished Executive—*Ronald L. Thomas*. For sustained extraordinary accomplishment in management of programs of the United States Government and for leadership exemplifying the highest standards of service to the public, reflecting credit on the career civil service.

Lewis Distinguished Publication Award

Kenneth L. Suder, *Rodrick V. Chima*, *Anthony J. Strazisar*, and *William B. Roberts*, members of the Internal Fluid Mechanics Division. In recognition of the excellence and value of their publication entitled "The Effect of Adding Roughness and Thickness to a Transonic Axial Compressor Rotor."

Steven Szabo Engineering Excellence Award

Dale C. Ferguson, *Carolyn K. Purvis*, *Michael J. Patterson*, and *David B. Snyder*, members of the Space Environment Effects Branch. For identifying and implementing the plasma contactor as an engineering solution to the problem of high-negative electrical potentials on the Space Station.

Abe Silverstein Medal

Christos C. Chamis, Structures Division. For exceptional achievement in the development and application to the Space Shuttle Main Engine of probabilistic structural analysis and design methods, which formally account for random variations inherent in structural design.

Group Achievement Awards

Cleveland Federal Executive Board Team: For outstanding service and leadership provided to the Federal, State, and local Government communities of the Greater Cleveland Area.

Supply and Transportation Improvements Team: For developing and implementing the innovative zoned delivery system at the Lewis Research Center.

Total Quality Coaches: For outstanding contributions and dedicated service in support of the Lewis Research Center's Total Quality initiative.

Forty-Year Service Awards

Joseph H. Brown, Test Installations Division; *Jean A. Chapman*, Office of University Programs; *Norman T. Grier*, Retired; *Franklin J. Kutina*, Retired; *Patricia M. O'Donnell*, Power Technology Division; *Joseph A. Shivak*, Retired; *Robert Siegel*, Lewis Research Academy; *Alex Vary*, Retired; *Joseph F. Wasserbauer*, Retired.

Forty-five Year Award

Arthur E. Sprungle, Retired

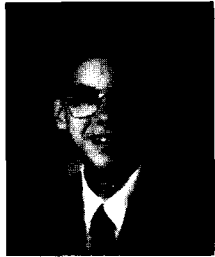
Fifty Year Service Award

Richard H. Cavicchi, Internal Fluid Mechanics Division

People

Alterovitz Wins NASA College Scholarship

Award: Ron Alterovitz, son of Dr. Samuel Alterovitz, Communications Technology Division, was recently selected to receive a NASA College Scholarship award. This year, five students were selected out of 88 applicants Agencywide.



Alterovitz

Alterovitz is the sole NASA Lewis selectee. Alterovitz was valedictorian of the Rocky River High School Class of 1997. This summer he is working as an intern in the Microgravity Science Division, and in the fall will attend CalTech to study computer science.

Siegel Selected to Receive Max Jakob

Award: Dr. Robert Siegel, Research and

1997 Combined Federal Campaign

This year's Combined Federal Campaign (CFC) will be held at NASA Lewis Sept. 15–Oct. 3. The kickoff will be held on Sept. 10. Look for further information in the next issue of the Lewis News.



Dr. Siegel

Technology Directorate, was recently selected to receive the prestigious Max Jakob Memorial Award. The award was established by the American Institute of Chemical Engineers to honor Max Jakob, a pioneer in the science of heat transfer, to commemorate his outstanding contributions as a researcher, educator, and author. The award is bestowed annually to recognize eminent achievement or distinguished service in the area of heat transfer. Siegel will receive the

award on Aug. 10 at the 1997 National Heat Transfer Conference to be held in Baltimore, MD.

Siegel is regarded internationally as an expert in the area of heat transfer, having performed analytical and experimental investigations on boiling, forced and free convection, transient thermal behavior, solidification, and radiation heat transfer. In the late 1950s, he designed and put into operation the first drop tower and used it for studies of boiling in low gravity. For this work he received the American Society of Mechanical Engineer's Heat Transfer Memorial Award in 1970 and a Space Act Award in 1993.

Performance reviews of another kind

Lewis employees exhibit artistry through dance

By S. Jenise Veris

TO a large percentage of the public outside the gates, the name NASA Lewis conjures up a stereotypical picture of a bunch of "rocket scientists"—brainy, stiff characters—working together to build spacecraft to explore the universe. However, just as most stereotypes don't hold true, this one is no exception.

The fact is some of the area's best amateur and professional dancers/instructors are employed right here at NASA Lewis. Perhaps no couple works harder to create art on the dance floor than Edward Winsa, project manager for the International Space Station Fluids and Combustion Facility, and Susan Button, a mathematician in the Computer Services Division.

They practice 15 hours a week to compete at least 5-6 times a year at the championship level of International style of dancing (a.k.a. ballroom dancing), which includes the waltz, tango, Viennese waltz, fox-trot, and quickstep.

"For me the competition floor is a canvas, and the woman in her gorgeous rhinestone ball gown is an artist's brush of color," Winsa explained. "The man's role is to envision a diagram that literally incorporates 3,000 different movement factors put together in 3-D to cover space within a limited time as he leads his partner around the dance floor."

"I feel the emotional part is my role in the partnership," Button



NASA Lewis' Edward Winsa and Susan Button consistently compete at the championship level of International style of dance due to their training and dedication to the art.

added. "The woman must feel the music, feel the leads, and play those feelings back to the audience and the judges."

In 1996 the couple earned a second place finish in the "Over-50" age division of the North American Championships and later earned an eleventh place for all couples in the "Over-35" age division in the U.S. Championships.

After more than 30 years of dance instruction, Dr. Robert Siegel, senior technologist in the Research and Technology Directorate, and his wife, Elaine, continue to teach social ballroom dancing twice a week as well as dance two evenings a week out on their own.



She got dance fever from line dance lessons on-site, and now Deborah Jakoski is a "Honky-Tonk" division champion with partner Peter Almeroth.



NASA Lewis' Dr. Robert Siegel and wife Elaine perform the polka—one of the many dances they have perfected as certified teachers of both the International and American Social style of dancing.



NASA Lewis' Suleyman Gokoglu (far left) performs with the Turkish Folk Dance Ensemble of Northeastern Ohio for the love of dance and to share the diversity of his Turkish heritage.

They are certified teachers in both the International style and the American Social style of dancing by the Imperial Society of Teachers of Dancing in London and the U.S. Terpsichore Association in San Francisco, respectively. However, they also enjoy country/western line dancing, which they began teaching in the eighties when the movie *Urban Cowboy* first made it popular. They are presently teaching Argentine tango and salsa.

"We've never been interested in competing. We just enjoy learning, teaching, and dancing socially," Siegel said. "We do, however, attend workshops offered by professionals at the various competitions. There's creative challenge in learning and then executing the various geometric patterns of movement unique to a particular dance."

Over the years the Siegels have taught at several institutions including Cleveland State University, Tri-C/Eastern Campus; Jewish community centers; Fairmont Center for the Performing Arts in Novelty, OH; and Beachwood and Shaker Heights recreation centers.

For Deborah Jakoski, a purchasing agent from the Procurement Division currently detailed to the ISO 9000 Office, dance has become an expression of her self-confidence developed with the help of her friend and former country/western line dance instructor, Sally Harrington, who works in the Community and Media Relations Office.

"I began dancing as an exercise program to relieve emotional and physical stress and as a vehicle to improve my self-confidence and social life," Jakoski reflected. "Now I compete in two different divisions within the United Country and Western Dance Council."

In the Pro-Am division she dances with her instructor, Mike Wagner, with whom she practices different routines twice a month in Belleville, MI. In the Honky-Tonk division she and her partner, Pete Almeroth, compete against other social and recreational dancers with the emphasis on "lead and follow" rather than complicated routines or fancy choreography.

► Formerly a dancer with the Imani Dance Co., NASA Lewis' Dr. Willie Mackey is now content to be a consultant and mentor to aspiring artists. ◆

Earlier this year, Jakoski and Wagner earned second place overall out of 40 couples in their division where they performed the two-step, waltz, cha-cha, polka, East Coast swing, and West Coast swing at the UCWDC World Championships held in Nashville, TN. She and Almeroth consistently placed first or second last year including a first place finish at a nationally sponsored competition held locally at the Boot Scootin' Saloon last November, which enabled them to advance to the regional competition in Cincinnati.

Although he no longer performs with the Imani Dance Company, Dr. Willie Mackey finds great satisfaction in the role of mentor and consultant to such troupes as Dance Africa Dance that performed at the Ohio Black Expo in October 1997 and Modern Africa, an arts education group he founded and currently directs.

"I just love to dance. It's very spiritual; in fact, it's actually my second inspiration," said Mackey, an electrical engineer in the Power & On-Board Propulsion Technology Division. "The dances of the Senegalese people inspire me most because of their historical and cultural significance. There's an interactive communication between the music and rhythm of Senegalese dance that mimics the rhythms of ancient Egyptian hieroglyphic forms."

Mackey provides housing for four individuals in the African American Museum Guest Artists Program who develop and perform programs for the African Village workshop, which he created for the museum. In February 1999, the museum will host the National Conference on Standards & Accreditation in African Dance as a result of a \$10,000 Ohio Arts Council grant proposal co-authored by Mackey and Raymond Sylla, the guest choreographer to be featured for the event.

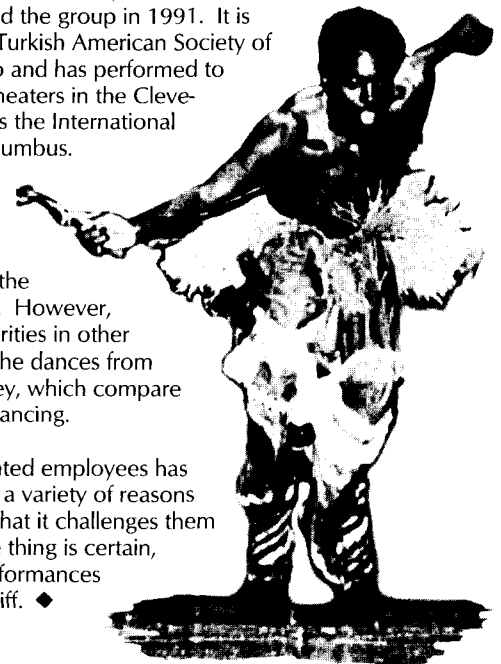
As a member of the Turkish Folk Dance Ensemble of Northeastern Ohio, Suleyman Gokoglu has found a forum to express his enjoyment of dancing while helping to correct certain stereotypes associated with his ancestry.

"Our underlying thesis is that music and dance are art forms common to all societies as a method of expressing their feelings and describing their lives," said Gokoglu, a senior research scientist in the Microgravity Science Division. "It's an indispensable tool for bringing people together for world peace and harmony."

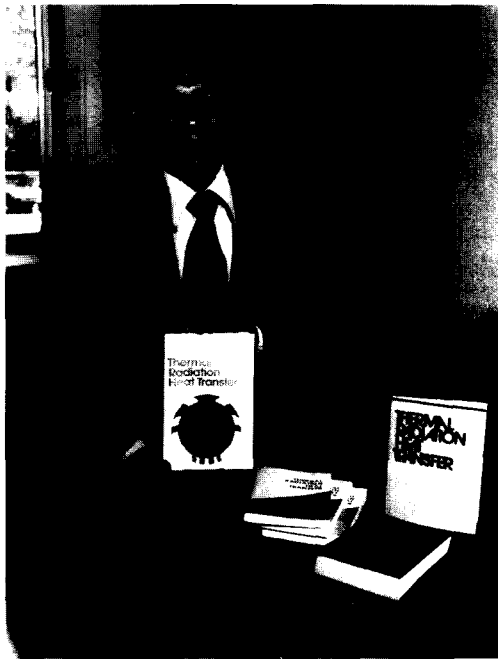
Although he never received any formal training, he was happy to be asked to join the Turkish Folk Dance Ensemble by a former NASA Lewis employee Rezzan Erten, whose husband Emru Erten founded the group in 1991. It is sponsored by the Turkish American Society of Northeastern Ohio and has performed to acclaim at major theaters in the Cleveland area as well as the International Folk Festival in Columbus.

According to Gokoglu, there is no typical Turkish dance because of the regional variations. However, you can find similarities in other countries such as the dances from southeastern Turkey, which compare to American line dancing.

Each of these talented employees has pursued dance for a variety of reasons including the fact that it challenges them intellectually. One thing is certain, however, their performances are anything but stiff. ◆



Siegel's legacy to future ex



NASA Glenn archive image

Dr. Robert Siegel poses with several versions of the textbook *Thermal Radiation Heat Transfer*, which he co-authored with J. R. Howell.

A native of Cleveland's eastside, Siegel earned his bachelor and master degrees at Case Institute of Technology and 2 years later a doctorate of science at the Massachusetts Institute of Technology. He arrived at NACA in 1955 when Dr. Abe Silverstein, the Lab's chief engineer, was building up a pool of academicians to pair their theoretical skills with the comparable mechanical ingenuity necessary to build new engines.

Siegel's master and doctoral theses on heat transfer, coupled with his experience in cooling nuclear reactors during a 2-year stint at General Electric, made him an ideal addition to the prominent heat transfer group where he worked on applications for aircraft nuclear propulsion. The group was composed of experts in their field, many of whom did a great deal of independent research headed by Robert Deissler, considered a giant in the field of heat transfer.

Later, Siegel became head of the Analytical Heat Transfer Section at the Lab that was recognized as the hub for basic research on the problems of radiation, convection, and conduction. His collaboration with Ephraim Sparrow and William "Red" Robbins—the "bird" group—on a proposed design for a rocket engine is remembered fondly.

BY S. JENISE VERIS

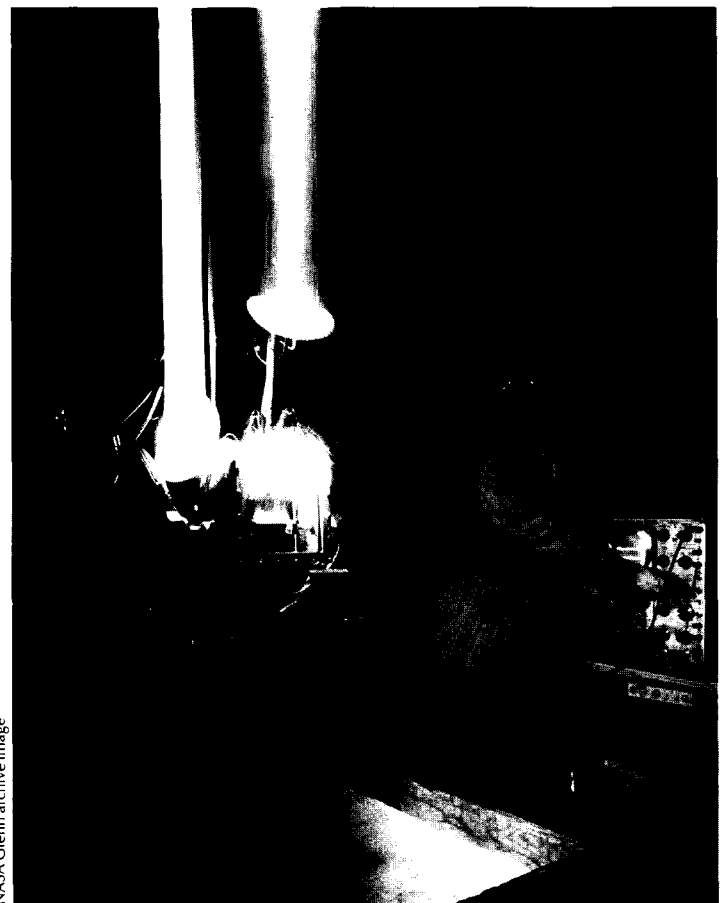
"THEIR presence at the laboratory was due in no small measure to Abe Silverstein's commitment to basic research. Like Dryden and Vannevar Bush, he believed that basic research was the nation's technical capital." (*Engines and Innovation*, p. 104)

On May 31, Dr. Robert Siegel, one of 10 senior technologists at NASA Glenn, retired after 44 years of service to NASA and its predecessor NACA. His legacy as designer of the first drop tower and co-author of the textbook *Thermal Radiation Heat Transfer*, however, will have a lasting impact on future generations of engineers as they push the boundaries of space exploration.

According to NASA Glenn's Chief Scientist Dr. Marvin Goldstein much of the fundamental science and technology that underlies the work done at the Center comes from the contributions made by senior technologists like Siegel.

"Their work requires a high level of creativity—which very few are able to attain—a great deal of personal motivation, and perhaps a bit of luck as well. This enables them to make some extraordinary breakthroughs that most people cannot even anticipate," Goldstein said. "Siegel is an example of that rare combination. He leaves behind substantial contributions resulting from his role as a researcher, teacher, and consultant. There can be no doubt that he has increased the intellectual level of the next generation workforce in the area of heat transfer, particularly radiation and boiling heat transfer."

Dr. Robert Siegel conducts a boiling experiment on the world's first drop tower that he designed in 1957.



NASA Glenn archive image

y gives flight xploration

"I was working on heat transfer to rocket nozzles and really didn't know how to go about it," Robbins said. "Siegel was simply a genius and enormously helpful during that time."

Such genius later led him to investigate heat transfer for conditions in space and ultimately to design the world's first drop tower in 1957. The tower was a free-fall device—about 12 feet tall—that allowed him to test zero gravity for a short duration boiling experiment using a high-speed camera to film the process. A few years later he built a second tower with counterweights to conduct research at various levels of microgravity. His efforts were recognized in 1970 when he received the American Society of Mechanical Engineer's (ASME) Heat Transfer Memorial Award. In 1993 he received a NASA Space Act Award for original research work on the drop tower.

Siegel is also known for his work in radiation heat transfer because of the textbook that he co-authored in 1968 with J. R. Howell who is presently a professor in the mechanical engineering department at the University of Texas-Austin. The text originated from three NASA special publications prepared from personal research and notes for short courses in radiation heat transfer given at the Lab.

At the time, more information was needed on radiation, which was the only mechanism for cooling satellites and spacecraft. Chemical engineers were studying radiation for hot gases in furnaces and combustors, but more information was needed for space applications.

"Siegel is one of the top leaders in development of the fundamentals of radiation heat transfer for engineering applications. But putting aside his technical genius and scholarly accomplishments, Bob has been a true gentleman throughout the years I've known him," Howell said. "I certainly have enjoyed our long association—a testament to the collaboration on the book revisions we've accomplished over the years."

The book now published as a third edition has been widely used for nearly 3 decades as a graduate level college textbook, and has been translated into three other languages.

While Siegel's recognition comes largely in

the areas of radiation and low gravity heat transfer, he has done research on many other subjects such as freezing, phase change processes, transient thermal behavior, thermal behavior in semitransparent ceramics, porous media heat flow, and transient forced and free convection processes.

"We collaborated on a special project under Civil Aviation to determine the number of cooling fins necessary to enhance engine performance," said Dr. Robert Graham. "Siegel calculated the number of fins and I performed the tests to improve performance."

Siegel has been at the forefront of such research and technology and has written more than 170 journal papers and articles. He has served both ASME and American Institute of Aeronautics and Astronautics (AIAA) as a journal editor. He was an editor for the *Journal of Heat Transfer* for 11 years, and was an editor for the *Journal of Thermophysics and Heat Transfers* since its inception in 1986 until the close of 1998. He currently serves on the Honorary Editorial Advisory Boards of the *International Journal of Heat and Mass Transfer*, *International Communications in Heat and Mass Transfer*, and the *Journal of Thermophysics and Heat Transfer*.

A Fellow of the ASME and the AIAA, he has also received the NASA Exceptional Scientific Achievement Medal (1986) and the AIAA Thermophysics Award (1993). The ASME and American Institute of Chemical Engineers presented the Max Jakob Memorial Award to Siegel in 1996 in recognition of his eminence in the field of heat transfer and his distinguished service as a research worker, educator, and author.

Not the type to let grass grow under his feet,



Photo by Tom Jares

Dr. Siegel pays his respects to Dr. Abe Silverstein, his former boss and longtime friend, following the 1997 ceremony at which Silverstein was presented the prestigious Cuggenheim Medal.

Siegel currently serves on a committee for ASME, which will require him to undertake projects and attend a few meetings each year starting with the 1999 National Heat Transfer Conference to be held this month in Albuquerque, NM.

"I don't like to think of leaving the Lab as retirement, rather I'm setting a little different pace," Siegel said. "I often find now that the projects I used to save for Saturdays, like gardening, are interchanged with reviewing or finishing a paper on my computer."

When free time presents itself, Siegel said he hopes to see a few of the interesting places he has looked forward to visiting. In the meantime, he enjoys kicking up his heels several times a week with his wife and partner of 48 years, Elaine. They both share a love of ballroom dance and the joy of instructing others on the finer points of social dance—something they have done since 1974. ♦



Dr. Siegel and his wife, Elaine, share a passion for dance.

Photo courtesy of Shaker Heights JCC