



Lewis Research Center
Cleveland, Ohio

February 27, 1981

Public Services chief boasts wide experience

The new chief of the Public Services Office, Dr. R. Lynn Bondurant Jr., comes to Lewis from Michigan where he was curriculum coordinator and principal of Coldwater Junior High School.

His other jobs have included such places as the National Aeronautics and Space Museum of the Smithsonian Institution, and Goddard Space Center.

While waiting for summer to bring his family here from Coldwater, Bondurant is driving home on the weekends. Despite the inconvenience, he believes the situation is a positive one, since it allows him to devote extra time to learning his duties at Lewis.

"I have several challenges," Bondurant commented, "learning all my responsibilities and carrying them out both at Lewis and in the surrounding area."

Public Services is in charge of the Visitor Information Center, the Speaker's Bureau, the



**DR. R. LYNN
BONDURANT**

Space Mobile Program, Film Distribution, Career Awareness and the Summer Senior High School Apprenticeship Research Program (SHARP) to name a few.

Bondurant received his B.A. degree in biology and natural sciences at Park College, then went on to get his master in zoology from Indiana University. He later obtained a Ph.D. in curriculum and secondary education from Michigan State University.

He and his wife Kay have two children, Julia, 13; and Kenny, 18.

Lewis on the road

Community Involvement: it came

They came in vans full of NASA effects—print materials, exhibits, even a spacesuit—five aerospace teacher/specialists.

They came in NASA 5—the Lewis Gulfstream—in succession until some two dozen overall from the lab's research division had assembled.

They were the presenters for one of the Center's best Community Involvement Programs of all time, Sept. 26-Oct. 2, at Coon Rapids, a bustling, 172-square-mile suburb of Minneapolis-St. Paul, Minn.

The lure? The third largest school district of the state, boasting 34,000 students and 1800 teachers. The goal? Updating these science-hungry learners with the facts and figures of the nation's space and aeronautics programs, and the particulars as they apply to Lewis Research Center.

"It felt like we talked with all 34,000 of them by the time it was over," recalled Lynn Bondurant, Educational Services Office chief, who served as coordinator for the program and another that followed immediately in a

suburb across town, Burnsville.

"In reality, more than 30,000 made up the classes we addressed and tutored at Coon Rapids, together with the 1800 teachers.

On top of this, the display of some 30 separate NASA exhibits set up in the city's leading shopping mall to give the public a sampling of the length and breadth of NASA work, drew some 20,000 visitors a day."

One mall onlooker put it this way: "You'd have to go all the way to Washington to see all the things they have here."

The two Lewis aerospace education specialists, who serve the six-state territory assigned to the Center, were, for this special occasion, augmented by counterparts from Johnson and Headquarters to make up the core team. On hand were John Hartsfield and Ralph Winrich, the two Lewis reps, and Rodney Collins, Robert Neal and Norm Poff.

The five spoke to as many as five classes a day, with the students scattered among three senior highs, five junior highs, one middle school and



From left, Jerry Kennard, William Waters, Paul Antczak and Annie Easley look out as their plane descends for landing at Anoka, Minnesota airport.

25—repeat 25—elementary schools.

That's where the honor roll of volunteer Lewis researchers and specialists fleshing out the teaching staff came in. Their "curricula": aerospace spinoffs, energy,

careers, biomedicine, photography, aeronautics research, communications and extraterrestrial life.

Lewis presenters for Coon Rapids: Cliff Brooks, Del Zatroch, Wojciech Rostafinski, William Waters,

Jarman Kennard, Robert Graham, Charles Moon (aptly chosen indeed), Loretta Shaw, Annie Easley and Ron Kiessling. Lecturers for Burnsville: Frank DeAngelo, Russell Keller, Susan

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Burnsville Highlights

- 200,000 persons viewed the NASA displays.
- Junior high schools built a 1/10th scale model of the Shuttle especially for the occasion.
- Presentations made to 12,000 students and 700 teachers. Largest banquet turnout in history greeted lead speaker Dan Brandenstein.
- Covering Coon Rapids and Burnsville, Lewis speakers alone gave 97 presentations to 17,665 persons.



Aerospace lecturer Ralph Winrich tells students how astronauts dress for space.



Former astronaut Ron Evans answers a reporter's question.



Former astronaut Ron Evans was featured speaker at a banquet celebrating Space Week in Coon Rapids.



Young and old alike were fascinated by the Moon rock.

Photos by Cliff Brooks

with clout to Coon Rapids

Continued from page 4

Johnson, David Herb, James Diedrich, plus again Waters and Kiessling.

The Lewis Coon Rapids contingent was assigned to "host" families of the suburb who provided lodging and meals, and lots of opportunity for "small talk." The "host" family idea was a first for a NASA community involvement program anywhere. Commented a school official: "We tried to match them with persons of similar professional interest."

One Coon Rapids highlight was a visit from former astronaut Ron Evans, who spoke at a banquet in his honor sponsored by the community and presided at a press conference that covered the gamut from "How do your children react to news of your going to the Moon?" (Answer: "They said Dad's going to the Moon today") to "Explain the difference between U.S. and Russian spacecraft today." Students participated in the press conference, by the way.

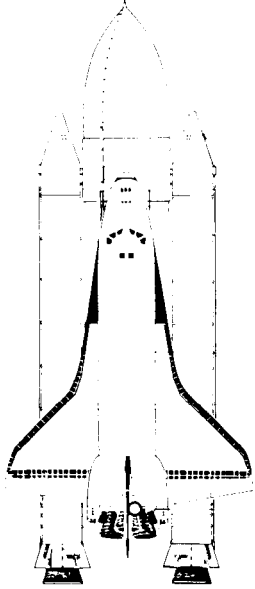
Evans flew on Apollo 17 in December of 1972 with illustrious astronaut names from the past, Harrison Schmitt and Eugene Cernan. Evans piloted the Command Module.

The beehive of activity at Anoka-Hennepin School District (official Coon Rapids

designation) hardly went unnoticed by Minneapolis-St. Paul media. Bondurant, who worked ten months putting the program together with Coon Rapids officials, spent sizeable portions of the first three days appearing on television and doing print media interviews.

Were the two week-long activities worth all the time and effort? "Well, we've already set the date and place for the next one in Cincinnati," said Bondurant. "But a better way to answer is to say the cooperation on the part of school officials was at all times unstinting and enthusiastic."

"And, don't forget," he smiled, "there are now at least 30,000 Minnesota youngsters in one town alone who'd give their eyeteeth to go into space."



Aerospace lecturer John Hartsfield explains aerodynamics of Shuttle.



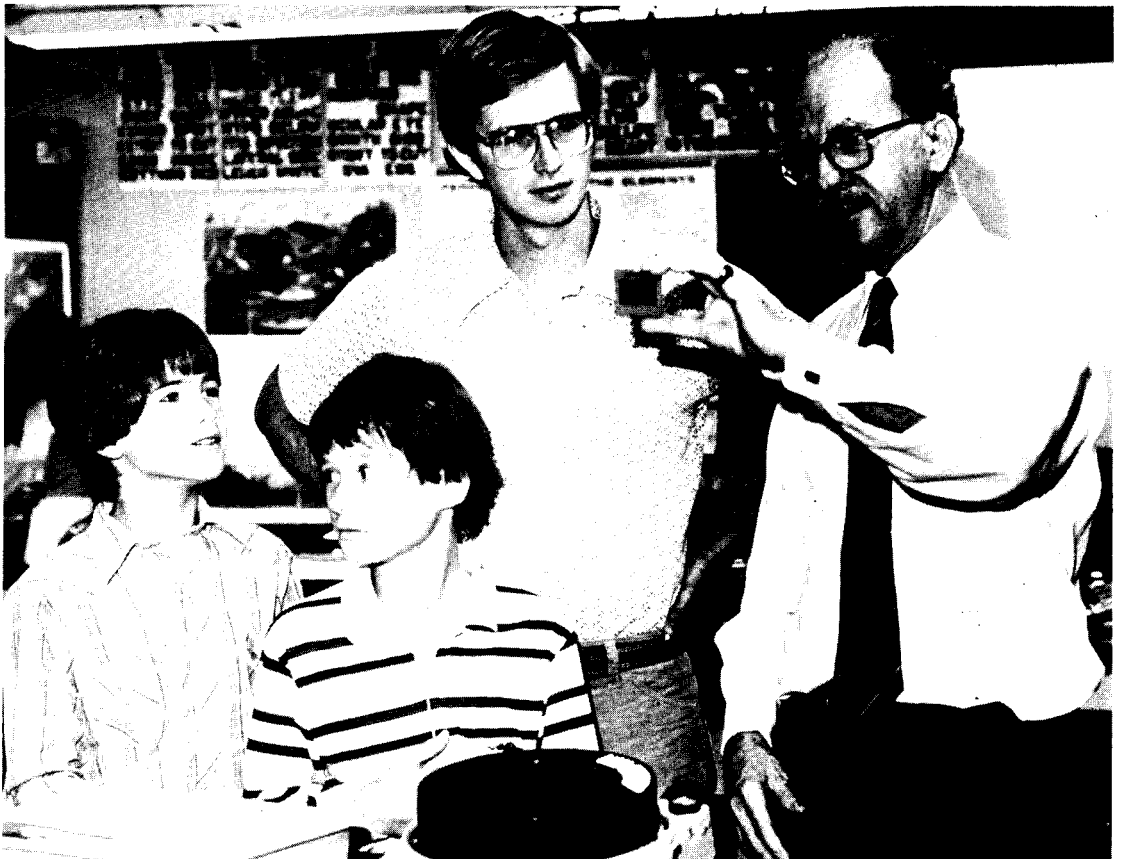
Part of the Lewis contingent are (from left) William Riecke, Leonard Cobb, Annie Easley, William Waters, Robert W. Graham, Loretta Shaw, Del Zatroch, Ronald Kiessling, Lynn Bondurant, Charles Moon, Jerry Kennard, Cliff Brooks and Paul Antczak.



Annie Easley (left) answers a student's question.



Loretta Shaw (third from left) explains types of career opportunities at NASA.



Lewis Bert Rostafinski lectures on life beyond Earth to Coon Rapids students.



CASE '51 MEETS CASE '83 FOR LEWIS TOUR - Warner Stewart (left), Director of Lewis' Engineering and Technical Services and a 1951 grad of Case Institute of Technology, discusses Center research programs with Dr. Eric Baer, current Dean of Engineering at Case, and Lynn Bondurant, Jr., head of Lewis' Educational Services Office. Several dozen Case alumni participated in the recent tour of Lewis' facilities.

Paul Farace photo

Lewis News: March 11, 1983

Teachers attend Lewis summer school

Lewis Research Center is summer school to 20 area science teachers who are participating in a two-week workshop June 13-24 entitled "The Sky as Your Classroom."

The teachers-turned-students are not sweating in classrooms. Instead they are being given the opportunity to actually fly in a four-seat Cessna 172 Skyhawk, build and launch their own model rockets, release weather balloons and visit local Federal Aviation Administration and Weather Bureau facilities.

In addition, the teachers are touring Lewis research site, as part of the summer workshop sponsored by Baldwin-Wallace College.

"The workshop offers teachers an opportunity to gain expertise in updated aerospace concepts that they can apply directly to teaching in the classroom," says Dr. R. Lynn Bondurant, chief of Lewis' Educational Services Office, who is coordinator for the program.



MARDI GRAS ROYALTY - Space Technology Director Henry O. Slone and wife, Maxine, sit atop the pageant's vibrant garden float, as king and queen of the Mardi Gras parade staged at Lewis' annual picnic. Photo scrapbook on page 3.

Don Huebler photo

Volunteer program highlights new VIC initiatives

The Lewis Visitor Information Center is inaugurating a novel volunteer program that will enable it to diversify educational programs and services.

"In addition, the Educational Services Office is transferring some responsibilities to the Visitor Center and to the corps of volunteers to come for the sake of greater efficiency and to make maximum use of the talents of the VIC staff," said ESO Chief Lynn Bondurant.

Heart of the changes is establishment of a volunteer group to help perform tasks assigned to the VIC staffers. Accordingly, they will

be able to devote more time to new aerospace education initiatives.

Among these new education initiatives, VIC Manager Richard Athey lists operation of a telelecture program, development of educational materials, and establishment of regional Teacher Resource Centers in the six-state area of Lewis responsibility.

The telelecture program, organized by VIC Educational Resources Coordinator Diane Steadly, will enable students in schools throughout the six-state region to obtain live audio lectures from volunteer Lewis researchers. This will produce a

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VIC seeks volunteers

Continued from page 1

considerable saving in staff travel time, especially for remote areas, as well as uniquely supplement classroom blackboards.

The opening of Lewis' first regional Teacher Resource Center last month at Oakland University, Rochester, Mich. is the pilot for a planned program that will -- over the next few years -- generate between 30 and 50 such centers over the six-state area, according to Bondurant. The first satellite center in the Detroit area will make NASA slides, videotapes, films and other materials available to about 85,000 teachers.

As part of the reorganization, VIC scheduling coordinator Pat Hannan

will now be responsible for recruiting employees for the Lewis Speakers Bureau. She encourages Lewis staffers to contact her (PAX 3233) for details.

Likewise, Aerospace Education Specialist Lindy Perkes is seeking scientists, engineers and other employees and retirees to volunteer as lecturers and aides for presentations in the VIC. For employees, it would be after hours or weekends.

Lewis employees may get NASA publications directly from VIC Mail and Publications Coordinator Klara Boscay, Bldg. 7, Room 210. Since quantities are limited, an order form must be filled out each time.

Regional resource center opened

The first of many planned Regional Teacher Resource Rooms was recently opened at Oakland University, near Detroit, as a joint venture with Lewis to serve educators in presenting aerospace lessons to students.

The regional information and resource center will be followed by up to 50 similar centers throughout the six state region served by Lewis' Educational Services Office.

Known officially as the Aviation and Space Center, the new facility at Oakland will serve as a resource base for educators principally in the Detroit area for NASA films, slides and printed materials on the country's aerospace ventures.

Instructional materials available include lesson plans and activities, educational literature, photo slides, film strips and video and audio tapes. Educators using the resource bank pay only for copying costs and provide their own blank film or video and audio cassettes.

According to David Housel, director of the new resource center at the university, "Our teacher aids cover all aspects of aerospace activity, including exploration, astronomy, aeronautics, ecology, meteorology and communications. And they serve all grade levels, kindergarten through college."

Lewis set up the first such facility in the Midwest seven years ago in the

Visitor Information Center.

Lynn Bondurant, head of Lewis' Educational Services Office, said, "Our intention at that point was to serve school needs in a six-state area of the Midwest with good educational materials about space. Demand grew rapidly."

Bondurant added that the Lewis-based facility currently processes some 30,000 items per year for area and regional teachers.

"For the Aviation and Space Center at Oakland University, we furnished their starting inventory of materials and they provided local service to educators and continue to work with us in coordinated programs," said Bondurant.

"In years to come, we hope to have up to 50 such facilities strategically located to service the half million teachers in Indiana, Illinois, Minnesota, Ohio, Wisconsin and Michigan."

NASA SOFTBALL STANDINGS

DIVISION A

FORCE	12-2	.857
COLONELS	12-3	.800
J-MEN	9-5	.643
TROJANS	8-5	.615
BANDITS	6-5	.545
R.M.S.	6-10	.375
KaBAND	0-15	.000

DIVISION B

JETS	10-4	.714
ROCKETS	9-7	.563
ACES	8-7	.533
TAINOS	8-7	.533
EXPRESS	4-11	.267
MOTLEY CREW	2-13	.133

NASA meets the Queen City



It rivaled a well-planned military operation in both the scale of its preparation and in its strategic planning. Like a military operation it required plenty of advance scouting of the objective, split-second timing and unfaltering assistance from behind the scenes support teams. Unlike a military action, however, this operation was carried out by teams of NASA education specialists and employees whose objectives was not enemy territory but the warm hospitality of Cincinnati. Their mission: stage the largest NASA Community Involvement Program ever attempted.

The great success of their mission is to be found both in the numbers of students and educators who participated in two weeks of lectures and special programs and in the friendships established between NASA and Ohio's Queen City. More than 2,300 Greater Cincinnati teachers and 100,000 students were left with a better understanding of their space agency and what it means to them.

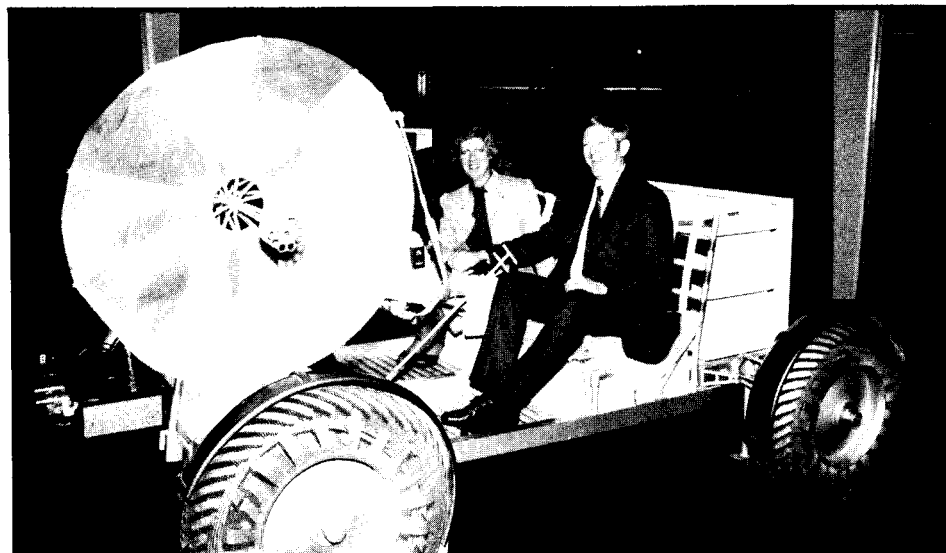
Included in the CIP were Spacemobile visits to local schools, teacher inservice programs, an astronaut visit, NASA exhibits at a shopping mall and meetings with Cincinnati educators to establish lasting professional relationships.

Lewis was responsible for the Cincinnati CIP, although Lewis lecturers were joined by colleagues from Headquarters, Goddard, Kennedy, Marshall, Johnson, Langley and NSTL.

The Cincinnati CIP was co-sponsored by the Princeton City School District with exhibit support from the Tri-County Mall.

Photos: **A.** Banner welcomes NASA contingent to Princeton Schools. **B.** Stofan interviewed by Cincinnati newsman. **C.** William Ford, a Lewis Computer Services branch chief, addresses a class. **D.** ESO Chief Lynn Bondurant (left), Dr. Gerald A. Soffen, (director of NASA's Life Sciences Division), Director Andy Stofan, NASA External Affairs Deputy Administrator Patrick Templeton and Princeton City School Superintendent Richard Denoyer preside over the kickoff press conference. **E.** Angelo Casaburri of JSC talks to science teachers. **F.** Lewis staffer Judy Budd (left) and Lynn Bondurant inspect the Apollo lunar rover, part of the Tri-County Mall exhibit.

Bill Richardson photos



E.

F.

Teachers enjoy "Sky As Your Classroom" workshop

A conference with a NASA astronaut, an opportunity to study the stars, and an opportunity to build and launch their own model rockets.

These are a few of the highlights experienced by some 40 Northeast Ohio science teachers who attended a just-concluding two-week workshop at Lewis.

During the hour-long astronaut conference, Westlake native Col. Robert F. Overmyer discussed his duties as pilot for the STS-5 flight in November 1982, and upcoming duties as commander for Shuttle mission 51-

B, set for November this year.

The "Sky As Your Classroom" workshop is annually hosted by Lewis for elementary and secondary school teachers and sponsored by Baldwin-Wallace College. It is a credit course designed to sharpen and update the teachers' knowledge of flight in the atmosphere and beyond, thereby emphasizing science, math and engineering skills.

"The workshop provides teachers with a unique opportunity for interaction with the research staff as they participate with the NASA

organization for the two weeks," said Dr. R. Lynn Bondurant, Chief of the Educational Services Office. He is overall director for the workshop.

This year some 30 of the teachers enrolled were from North Royalton and Midview school districts, both of which, since May of this year, have been participating in a "partnership for educational excellence" program with the Lewis Center. Goal of the partnership program is to enhance career-oriented teaching in science, math and engineering.

During an evening "Star Party" the

teachers used telescopes to identify planets, stars and constellations, while principles of rocketry were brought down to earth as they designed, built and launched their own rockets.

Other workshop highlights included an opportunity for teachers to become certified to use lunar samples in the classroom, a demonstration of space artwork, a launch of helium-filled balloons to study wind currents and an egg drop to demonstrate packaging of experiments for flight in space. □

NASANational Aeronautics and
Space Administration

Lewis Research Center

Volume 21 Issue 24 November 30, 1984

Lewis News

Administrator Beggs presents awards: *Nine Center staffers get highest medals*

At a mid-November Lewis Honor Awards Ceremony, nine Center staffers were recognized for excellence in leadership, science, engineering and service, with another award presented for the best technical paper of 1984.

In addition, twelve 40-year and one 45-year service pin recipients were honored.

NASA Administrator James M. Beggs, together with Lewis Director Andy Stofan, presented six employees with NASA's Exceptional Service Medal.

Bernard J. Hamrock, senior scientist, Materials Div., earned NASA's Scientific Achievement Medal "For outstanding contributions to the understanding of the lubricated behavior of mechanical devices which have been essential to the development of new advanced systems in NASA aerospace programs."

The Exceptional Engineering Achievement Medal was awarded to two employees:

- Henry W. Brandhorst Jr., Acting Chief, Power Technology Div., "In recognition of outstanding qualities of technical and creative leadership to the advancement of photovoltaics and their application to meeting space power and terrestrial energy needs worldwide."

- Marvin S. Hirschberg, Chief, Fatigue & Fracture Branch, "For pioneering technical contributions in high-temperature fatigue behavior of materials that have provided the foundation for aircraft and space propulsion durability analysis."

The six Center staffers awarded NASA's Exceptional Service Medal were:

**R. Lynn Bondurant, Jr.****Robert E. English****Henry W. Brandhorst, Jr.****Marvin H. Hirschberg****Bernard J. Hamrock****Raphael J. Koch****Edward F. Miller****George Mandel****Andrew B. Szuhai**

- R. Lynn Bondurant Jr., Chief, Educational Services Offices "For outstanding initiative and service that have made the Lewis Research Center a recognized leader in creative, dynamic cooperation with the educational community with strong positive impact on science education in primary and secondary schools."

- Robert E. English, Lewis' Distinguished Research Associate, "In recognition of many significant contributions to the NASA space power program."

- Raphael J. Koch, Chief, Plum Brook Management Office, "For effective management of the Plum Brook Station which has protected NASA's investment, insured the public safety and enhanced the reputation of the agency within the Greater Sandusky Community." Koch also received a 40-year service pin.

- George Mandel, Chief, Technical Information Services Div., "For management of the publications support team at the Center which has contributed to Lewis' productivity and enhanced its reputation for timely and

effective presentations of significant research and development data."

- Edward F. Miller, Office Head, Space Communications Div., "For continued excellence and expertise in providing technical consultation to and participation with the U.S. delegation to World Administrative Radio Conferences."

- Andrew B. Szuhai, Chief, Facilities Operations & Maintenance Div., "For contributions to the NACA/NASA through outstanding leadership as Chief of Facilities & Operations Maintenance Div."

The Lewis Distinguished Paper Award for 1984 went to Anatole P. Kurkov, aerospace engineer, Space Propulsion Technology Div., for his paper "Formulation of the Blade-Flutter Spectral Analyses in Stationary Reference Frame."

Other Lewis' 40-year service pin recipients included:

- John L. Allen, Advanced Planning & Analysis Office
- Gerald W. Englert, Internal Fluid Mechanics Div.
- Thomas F. Gelder, Altitude Wind Tunnel Project Office
- Uwe H. von Glahn, Special Projects Office
- Arthur L. Laufman, Technical Information Services Div.
- Roger W. Luidens, Advanced Planning & Analysis Office
- Keith A. Raymond, Fabrication Support Div.
- John Toma, Power Technology Div.
- Arthur M. Trout, retiree, Aerothermodynamics & Fuels Div.
- Warren J. Whitney, Internal Fluid Mechanics Div. □

Taking on lead role: *Lewis expands Teacher Resource Rooms nationwide*

The Teacher Resource Room (TRR), a concept for making aerospace teaching materials available to teachers, was pioneered by Lewis, and is now being expanded nationwide.

Recently the Center's Educational Services Office, headed by Lynn Bondurant, received an initial \$220,000 from NASA headquarters to develop and establish TRRs at NASA field Centers across the country.

Plans are underway to establish such facilities at Ames, Goddard, Johnson, Kennedy, Langley, Marshall and National Space Technology Laboratories. The startup funding will provide video recording and viewing equipment, slide storage cabinets and personal computers for each TRR.

In addition, equipment for Lewis' own Teacher Resource Room will be updated.

Dating back to the late '70s, the Lewis TRR has been providing an easily accessible source of aerospace educational materials for organized review and selection by teachers in Indiana, Illinois, Michigan, Minnesota, Ohio and Wisconsin. The TRR has served more than 10,000 teachers in this six-state area where 23 percent of the nation's schools are located.

Monthly through Lewis' TRR, some 300 to 400 teachers are provided with NASA resource materials for use in classroom and other educational or

instructional applications. Print, audio-visual and videotaped programs cover such curriculum areas as life sciences, physical science, astronomy, energy, Earth resources, environment and mathematics. Lesson plans are also available to integrate the material into a readily used classroom package.

In the last year, Lewis' Educational Services Office has undertaken a program to locate Regional Teacher Resource Rooms at selected cooperating institutions in the Lewis six-state area.

In January Lewis helped open and dedicate a new TRR (the fourth regional unit) at the University of Wisconsin-Lacrosse to serve some 25,000 educators in Western Wisconsin, Southeast Minnesota and Northeast Iowa. And within the next six months, three more TRRs are planned to be opened in Indiana and Illinois.

Coordinator for the regional TRRs is Judy Olson, who works closely with the Visitor Information Center's Judy Buttler and Diane Steadley.

"With the expanded effort now underway, resource rooms will have a great impact on students and teachers who were previously unreachable," said Bondurant. "And it is our hope that within the next five years we will perhaps be able to set up an additional 200 resource rooms across the country." □



Teacher Resource Rooms such as this one in the Center's Visitor Information Center will be established at NASA Centers across the country under Lewis leadership.

Lewis Newslines

SHUTTLE LAUNCH VIEWERS—12 Lewis Quality Circle program honorees will be at Kennedy Space Center for the launch of the 51-F Challenger which (as this issue went to press) is slated for March 3. Payload for the 51-F includes NASA's Tracking & Data Relay Satellite-B and Telesat Canada's Anik C-1 comstat. In addition to getting a bird's-eye-view of the launch, the following honorees—chosen by their Quality Circle program peers—will meet the mission team and tour KSC facilities: Bruce Brosky, John Carpenter, Carolyn Clapper, Bob Flower, Mary Lou Herrmann, Tom Lapka, Wayne LaFey, George Mazaris, June Mischnick, Henry Smith, Quieto Thomas and Del Wolfe.

STOFAN ENGINEER WEEK SPEAKER—From Feb. 17 to 23 Lewis

Learning at Lewis:

Teacher in Space Finalist Foerster Flying High

It doesn't take long in talking with Robert S. Foerster to catch the excitement and determination which undoubtedly contributed to the Lafayette, Indiana teacher being selected as one of the country's 10 finalists in NASA's continuing Teacher in Space Project.

Assigned to Lewis' Educational Services Office (his choice) last September for one year, the 35-year-old sixth grade teacher has been doing something outside the classroom his own students have been doing inside for 13 years under his tutelage—learning.

"Being involved in the Teacher in Space program and coming here to Lewis has been the highlight of my life," says Foerster. "I knew the project would be exciting and rewarding, but the actual experience has been more than I expected. I have learned so much that will make me not only a better teacher but also a more resourceful and productive person."

"To me, NASA has always been kind of magical. And coming here and also seeing the other centers has only reinforced that feeling," Bob relates. "I have found a lot of dedicated, talented people throughout NASA who demonstrate an inspiring team-spirit approach to their work."

In addition to learning more about NASA Lewis technology, writing a number of Teacher in Space related articles and helping to develop lesson plans, Foerster has been traveling across the country, speaking on the average of three to four times monthly.

"Both before and after the Challenger tragedy, people have demonstrated their enthusiasm in hearing what we have to say and also expressing their support for the program. It has been very encouraging," Foerster comments. "I believe we are providing a way for 'ordinary' people to vicariously participate in the adventure of space."

Foerster, who welcomes the opportunity to be a space traveler, was present for the fatal Challenger launch and knew that, as a finalist, there was at least a 10 percent chance that he might have been on board that day. "But having known Christa McAuliffe and the other crew members, I know they would want all of us to continue our dedicated effort and vision which serve as pathways to the dreams of our students' future."

According to Foerster, today's students ask more questions than their parents about the future because they see it as *their* future. "Their attitude seems to be: 'If you dare to dream, you can do it.' So what may be a dream for us is reality for them."

Foerster also notes that the students of today are surprisingly sophisticated in their knowledge of the connection between space-age achievements and benefits to humankind.

"Recently I read in one of the national publications about a 13-year-old boy with a pacemaker who wanted to thank NASA for helping to develop the technology which has given him new life. Now that's quite a connection for a young person to make, but it is indicative of the awareness you see among today's youth."

As a teacher of math, science and computers, Bob is active in helping to develop an electronic computer bulletin board that will help keep teachers up to date on space and science information. He also has been a contributing "lecturer" on an electronic forum that, via computer, allows participants to respond to presented materials.

Earlier this year, Foerster attended an event that he describes as a once-in-a-lifetime thrill. At a Purdue University homecoming, he was invited to participate in ceremonies honoring 16 astro-

nauts—12 current and 4 former—who, like himself, are all former Purdue graduates (only the Naval Academy has more). "It was a real thrill to stand there on the same podium with people like Neal Armstrong."

Bob says he joined the Teacher in Space Project for three reasons: "Personally, because since childhood when I first viewed Alan Shepard's pioneer flight into space over the T.V. in the classroom, I have been fascinated with the news and advancements in space; professionally, because I would enjoy the challenge of applying what I would learn in space to the classroom for the benefit of students; patriotically, because I

see the program not only as a way to serve my country but also as a means to create a positive movement that could pull people constructively and productively together."

Foerster holds a B.A. and a Masters of Sciences degree and an Administrator's License from Purdue. He also has taken computer coursework at the University and is a computer consultant and in-service trainer for the National Diffusion Network with the U.S. Department of Education.

Bob, the father of two school-age children, hopes the Teacher in Space vision he shares with students will help "provide the means in which those destined

students will achieve the discoveries of the future." And, he believes the teaching process holds the key to that realization: "Equally as challenging is training students to use their skills and reasoning to help shape that future rather than be passive inhabitants."

Currently, teacher/learner Foerster is awaiting news on whether he and the other Teacher in Space finalists will be able to spend yet another year with the project beginning this fall. "There's so much more that can and should be done through the program. I hope we have the additional opportunity to learn from the program and further our goals." □



Showing that they're glad to be in step with the Teacher in Space Project are (l to r) finalist Bob Foerster; Pamela Bacon, NASA Headquarters Project Coordinator; Project participant Barbara Morgan; and R. Lynn Bondurant, Jr., Head of the Lewis Educational Services Office.

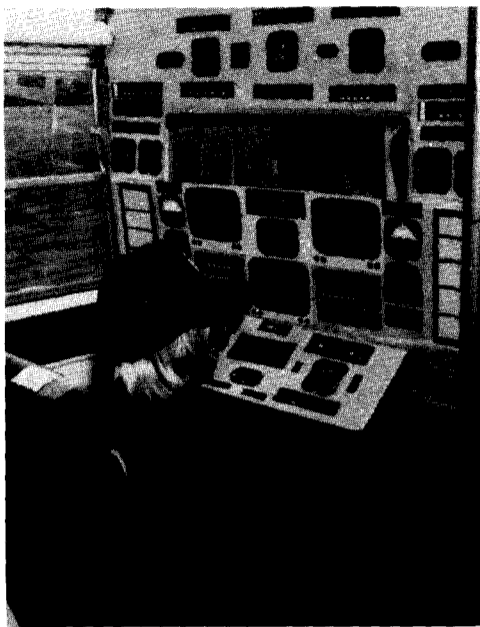
Laura Bagnell, Photo Lab

MISSION SUCCESS !

Simulated shuttle flight is no child's play



Astrotot flight crew . . .



. . . pilot at controls . . .



. . . blastoff of shuttle . . .

Leading to successful blastoffs at 0930 and 1000 hours on May 30, 18 brave astronauts boarded two specially equipped shuttle craft and embarked on unprecedented space flights that left both participants and observers starry-eyed. The mission: to explore uncharted territories in the "Partnerships in Education" program sponsored by the Center's Educational Services Office.

"This is absolutely the most fascinating thing I've experienced in my 30 years of education," said L. Jack Thomas, superintendent of North Royalton schools.

The four-hour, 60-mile simulated space shuttle mission was part of a NASA Lewis-sponsored space science awareness program conducted with Midview (Southern Lorain County) and North Royalton School (Cuyahoga County) districts involving some 600 elementary students.

The simulated launch, first conceptualized by Educational Services Chief Lynn Bondurant, Jr., was an outgrowth of the two-week "The Sky Is Your

Classroom" workshop which Lewis sponsored last summer for 15 Belden and Royal View Elementary teachers.

And before the much-awaited blastoff, two months of flight preparations were conducted. From the 249 third-, fourth- and fifth-graders who applied for the simulated flight, 36 astronauts (18 as alternates) were chosen by teacher-directed selection committees to train for a variety of simulated mission roles: commander, pilot, photographer, communicator, medical team member, scientist, meteorologist, engineer, biologist, geologist and aerial technician.

The selected 18 "astrotots," emerging in crisp white fitted paper uniforms, boarded two repainted and outfitted buses-turned-shuttles—Fantasy I and USS Belden-Midview Starship—each carrying a payload that included communications gear, computer, maps and metal detector.

In addition to collecting rock, soil, vegetation and water samples along their 35-mph trek on Routes 82 Royalton Rd. and 303 Richfield Rd., the crews con-

ducted pupil-designed experiments. For example, one Belden flight experiment involved balancing a glass of water while walking in a straight line to test water reaction to movement as well as crew coordination.

Mission control operations were handled by MARS (Military Affiliated Radio Systems). Four MARS representatives conducted workshops to familiarize assigned students with the set up and dismantling of mission control and operational procedures. On launch day, four students per communication group worked as recorder, page, radio operator and P.A. announcer, each rotating in half-hour shifts. The communications teams were in direct contact with the shuttles and relayed messages of mission progress to students and guests.

When the shuttles reached the village green (city offices) at North Royalton, student aerial technicians, using a homemade robotic arm, released several helium balloon "satellites." And at the rendezvous (Whipp's Ledges, Hickley Park) and the landing (Royal View

School) sites, three types of kites, each differing in size and shape, were tested.

Following successful completion of their simulated shuttle flights, recorded by a dozen area news photographers and by a NASA video team for the making of a documentary, the astronauts were checked out by a mission medical team and received a post-flight NASA debriefing.

Then an enthusiastic throng of students, guests and supporters cheered the victorious astrotots with a red-carpet welcome and a confetti-tossing parade and celebration. Pupils gave speeches and heard tape-recorded congratulations from Defense Secretary Caspar Weinberger and astronaut Sally Ride.

"I really think, in today's educational system, kids are not given an opportunity to dream enough," said Lynn Bondurant. "In doing this, I think the kids are painting a memory they'll remember for the rest of their lives. And as far as I know, this is a first in the United States." □

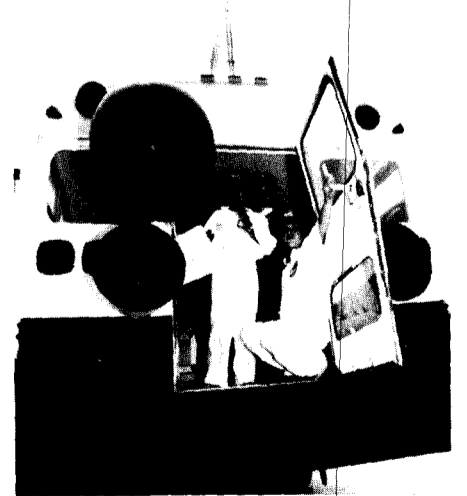
Photos by Don Huebler



. . . taking soil samples . . .



. . . hero's welcome . . .



. . . satellite deployment.

Lewis Speakers Give Public A Window To World Of NASA

By Jim Francescangeli

In today's electronic world, when we talk about communicating we often think of computers, satellites, and other advanced systems. Despite the many benefits of such systems, the face-to-face presentation remains a very effective and influential means of sharing information.

The in-person presentation is the key to the success of the Lewis Speakers Bureau in sharing aerospace-related information with the public and helping tell the NASA story.

The Speakers Bureau Program is an activity of the VIC, managed by the Bionetics Corp., under the supervision of the Educational Services Office. An effort almost as old as Lewis itself, the Speakers Bureau has grown in response to the public's demand to hear more about Lewis research and technology programs. Today, the bureau has nearly 60 members who by September had given some 280 presentations to a total audience of 32,000 people.

Each day, the VIC receives requests for presentations on a broad range of Lewis-related topics from all kinds of clubs, societies, associations, and religious groups throughout Ohio, Illinois, Indiana, Michigan, Minnesota, and Wisconsin. For special requests, speakers will occasionally travel outside this six-state region. One speaker went as

far as Alaska, at the request of the "Ninety-Nines" women pilot organization.

"Our speakers come from all disciplines—engineers, secretaries, branch chiefs, contractors and retirees," explains Pat Hannan, bureau coordinator. "Basically, they are people willing to share with the public what they have learned from their work here."

For the most part, speakers are matched with incoming requests based on their availability and "areas of expertise," from aeronautics and space exploration to educational topics and careers.

"Our program is tailored to accommodate both our requesters and our speakers," explains Hannan. "Speakers can be kept as busy as they wish. Some enjoy speaking five days a week, while others prefer one or two programs a month."

Speakers are assisted in obtaining the information and materials they need to prepare their presentations. They may also use thousands of slides stored in the Teacher Resource Room, as well as a variety of films and demonstration "props" used in VIC educational programs.

Recently, 33 active speakers received specially designed pins for their significant contributions to the Speakers Bureau Program. Top speakers honored for having made a high number of presentations were: Frank DeAngelo and Dave Herb, with 50 presentations



From January to September, Speakers Bureau volunteers gave 280 presentations to a total audience of more than 32,000. Some of the Speakers Bureau volunteers are shown above.

Back row: (left to right) Pat Hannan, Bert Rostafinski, Bill Mason, Steve Riddlebaugh, Bob Zurawski, Bill Klein, Dave McKissock, Roger Luidens, Jerry Kennard, Bob Friedman, and Bill Wildenhein.

Front row: (left to right) Ben Rodriguez, Craig Williams, Vincent Lalli, Ron Schertler, Anne Jones, Ron Sepesi, Del Zatroch, Judith Olson, Bob Graham, George Repas, Loretta Shaw, Jim Diedrich, Frank DeAngelo, Marc Millis, Jim Francescangeli, and R. Lynn Bondurant.

Speakers not shown: Harrison Allen, Cosmo Baraona, Earl Bloam, Jim Blue, Jim Burnett, Jane Cochran, Bill Crell, Annie Easley, Doris Forror, Hiren Ghose, Dave Herb, Tim Hogan, Sue Johnson, Al Juhasz, Ron Kiessling, Tom Kirkland, Marge Lehky, Todd Peterson, Bill Richardson, Jim Rogers, Kurt Sacksteder, Cathy Schuld, George Scott, Harlan Simon, Jesse Strickland, June Szucs, Sandy Walters, Bill Waters, and Jane Warner.

each; Jessie Strickland with 47; Bill Crell and Sandy Walters with 46 each; and Ron Kiessling with 45.

But it's not just the number of presentations that's impressive—it's the audience response, too. One person wrote: "It was surprising to learn about the many research and technology programs Lewis is involved in, and to realize how many things we

take for granted that were developed through the space program."

Speakers list their own rewards from participating: using creative skills to prepare presentations for diverse audiences; keeping abreast of Center activities, especially those outside one's area of work; and knowing that they're helping people more fully appreciate how Lewis pro-

grams benefit humankind.

"The Speakers Bureau is the Lewis personality which interacts very well with the public," says R. Lynn Bondurant, Jr., chief, Educational Services Office.

Membership in the Speakers Bureau Program is open to Lewis employees, contractors, and retirees. For more information, contact Pat Hannan (3-2003).

Eight 'Shuttles' Scheduled To Orbit Lewis April 8

Between 11:15 and 11:45 a.m. on Wednesday, dozens of pint-sized astronauts aboard eight special "Space Shuttles" are scheduled to "orbit" Lewis then dock in "berthing ports" set up in the Hangar apron. With names such as Cosmic Connection, Galaxy I City Kids, Lunar Limo, and Victory 2, the "Space Shuttles" are creatively converted school buses "launched" from nine Cleveland area elementary schools earlier in the day.

The Shuttles are part of a unique and imaginative program designed by Lewis' Educational Services Office to bring alive the study of science, math, and space-related topics. The April 8 mission will mark the culmination of months of planning and activities involving more than 5,000 students.

Simulating All Mission Activities

"The students are participating in every aspect of a Shuttle mission, including crew selection and training, countdown, liftoff, conducting onboard experiments, and debriefing after landing," according to Dr. R. Lynn Bondurant, chief, Educational Services Office.

The students have designed uniforms and crew patches, studied launch and landing techniques, planned experiments, established mission control rooms

at their "Space Centers," prepared flight plans, and developed press kits. On the night before the liftoff, each crew will have a sleepover and enjoy a preflight breakfast together.

Students are also converting their schools into "planets" to be explored by a Shuttle crew from one of the other participating schools.

The astronauts will use onboard computers loaned from Radio Shack to monitor their flight plans and will use two-way radios furnished by amateur radio operators, including members of the Lewis Amateur Radio Club to communicate with the other Shuttle crews and their mission control rooms.

The nine schools participating in the simulated launch include: Parknoll Elementary in Berea; Pine Elementary in North Olmsted; Lowell Academy in Lorain; Helen Muraski Elementary in Strongsville; and Fullerton, Alfred A. Benesch, Daniel E. Morgan, Walton, and Iowa Maple Schools in Cleveland.

A similar launch was conducted two years ago with two elementary schools in Grafton and North Royalton. The students were so enthusiastic that the Educational Services Office decided to conduct a second launch on a larger scale.

Planning began last fall with an all-day orientation for partici-

pating teachers. Other supporting activities organized by the Educational Services Office have included a training session on using the onboard computers and a preflight orientation for the schools' Shuttle crews by NASA astronaut David Walker who piloted STS-51-A.

Postflight Celebration

After "liftoffs" from each school between 9 a.m. and 10:30 a.m. Wednesday morning, the "Shuttles" will rendezvous at Lewis, meet members of the other crews, and exchange mementos. Each Shuttle will then visit another "planet" (a partner school) as designated in its flight plan, and return to its home "planet" later that afternoon. During the flights, the crews will conduct a variety of experiments.

A postflight celebration will begin at 7:30 p.m. Wednesday evening in Woodling Gym at Cleveland State University. Lewis employees are welcome to attend.

Congratulatory messages from local mayors, congressmen, and other officials will be read and the students will perform songs, dances, and skits.

The celebration will also include remarks from each of the young Shuttle commanders, Acting Director Dr. John Klineberg, Executive Director of the Young



PRE-LAUNCH PREPARATIONS: As part of the preparations for the Simulated Shuttle Launch on April 8, "astronauts" at Helen Muraski Elementary School in Strongsville are fitted with uniforms. The school is one of nine Cleveland-area elementary schools participating in the simulated launch, which was designed by Lewis' Educational Services Office to promote student interest in science, math, and space-related topics. The eight Shuttles are scheduled to rendezvous at Lewis Wednesday morning between 11:15 and 11:45 a.m.

Astronaut Foundation Wendell Butler, and State Superintendent of Instruction Dr. Franklin Walter.

Videotaped highlights of the schools' Shuttle missions will be shown as well as videotaped messages from astronaut David Walker and teacher-astronaut Barbara Morgan.

"Getting young people to dream about the future, to learn about the world of work, and to realize what can be achieved through teamwork are some of the goals of this launch," says Dr. Bondurant. He notes that the

program is also designed to keep children interested in the space program until the real Shuttle returns to flight.

"One of the greatest benefits," says Dr. Bondurant, "is the tremendous amount of support we are receiving from many parents, local businesses, and community leaders."

The launch is also attracting national media interest. A film crew from Cable Network News visited one of the schools last week to film some of the preparations.

Lewis Newsmakers

ASME Heat Transfer Division Awards Lewis Manager



Dr. Robert Graham, chief, Technology Assessment Office, received the 50th anniversary Award of the Heat Transfer Division, given by the American Society of Mechanical Engineers (ASME) at the Division conference July 26.

Dr. Graham was selected to receive the award because of his contributions to the heat transfer field and his service to the Division.

The award was presented at the ASME 1988 Awards Banquet held in Houston, TX last month.

Lewis Manager To Receive 1988 Arthur C. Clarke Award



Dr. R. Lynn Bondurant, chief of Educational Services, has been selected to receive the 1988 Arthur C. Clarke Award for Space Education. The award, which recognizes contributions in education toward the peaceful uses of outer space, will be presented to Dr. Bondurant in ceremonies in Houston, TX, on August 27.

The Arthur C. Clarke Award for Space Education was created in 1983, and is administered annually by the Students for the Ex-

ploration and Development of Space, the world's largest international pro-space organization for college and high school students.

Education Team Shares Ideas With Area Officials



A Lewis Education Task Team met with area officials to exchange ideas about improving science and technology education in the Greater Cleveland area. Seated, left to right: Jim Biaglow; Dave Steigman; Marcia Fudge, director of the Cuyahoga County Budget Commission; Lynn Bondurant, chief of the Office of Educational Programs; Leroy McCreary; Bill Crell; Carol Gallatin, Rocketdyne; J. Timothy McCormack, Cuyahoga County auditor; Louise Hunt; Andrew Fedynsky, of Rep. Mary Rose Oakar's office; and Joe Nervi. Standing, left to right: Fred Povinelli, director of Administration and Computer Services, and Dr. John Klineberg, Center director.

Kids Learn About Space Science Through The Eyes of A Dummy

By Cynthia Hill

For three weeks in May, Lewis hosted a national celebrity. He is a smiling eight-year-old dummy—literally, that is. Elwood, the four-foot, 12-pound goodwill ambassador toured the Lewis Lab at the request of the 22 students of Doug Hand's Fifth/Sixth grade class from Thomas Elementary School, Rock Falls, Illinois.

Elwood may be stuffed with fluff, but the children's dreams that accompany Elwood on his travels are not. In the last eight years, Elwood has logged more than 40,000 miles as a representative for his Thomas School classmates who write politicians and celebrities for invitations.

dreams for seeing Elwood in space. One student wrote, "I know NASA is busy. But lots of people dream of going places. And Elwood makes dreams come true." Another wrote, "He doesn't just get his picture taken (with people), he also learns about stuff ..."

One youngster asked Bondurant: "... Elwood and me want to know how does the space shuttle go up and not fall down?" Another asked, hopefully, "Is Elwood going to be able to be the first dummy in space? ... If a kid could go to space, how far would you send him and where?"

Art Pordash, Educational Programs, coordinated Elwood's visit. During his Lewis

"Elwood and me want to know how does the space shuttle go up and not fall down?"

The children send Elwood to the people and places they can only dream about from Rock Falls. "I remind the kids that if they're going to dream, dream big!" says Hand, Elwood's owner and creator. This year alone, Elwood has been to the Academy Awards presentation (in tuxedo) and the Easter Egg Roll at the White House with the Bushes.

The children recently wrote to Dr. Lynn Bondurant, chief of the Office of Educational Programs at Lewis, about their

adventure, Elwood toured the Visitor Center, the Zero Gravity Facility, and posed for a picture on the wing of the T 34 trainer. After spending a lot of time in meetings with Bondurant, Elwood was heard to complain, "Math and science sure are fun but forget about those meetings!"

Each time Elwood returns from one of his cross-country field trips, "it's like Christmas morning," said Hand, describing 22 wide-eyed children crowding around the UPS box



Before leaving Lewis, Elwood stopped to take a look at his visit on videotape.

that Elwood travels in.

Elwood arrived back at Thomas School last week with fascinating information about Lewis Research Center, including a videotape of his visit, photographs, books for the classroom, and a packet of NASA brochures and information for each student. The Educational Programs Office hoped Elwood would send back the message that math and science are subjects that will play an important part in

the children's future. The class was very excited, according to Hand.

Eight years ago, Hand jokingly complained to a friend that he needed another boy for his classroom of 21 girls and 8 boys. Elwood (named for Elwood P. Dowd, the main character in the play "Harvey") showed up in a student desk the next week.

This year, Hand had a special request for the technical "adult" world of space science

to come down to the kids' eye-view. Who better than a smart dummy like Elwood could make such a dream come true.

"Doug Hand's creation of Elwood has shown us another example of using imagination to reap all the benefits possible in education," said Bondurant.

With the opportunity Lewis supplied for Elwood, the kids foster stronger beliefs in themselves and the possibility that their dreams really can come true, said Hand.



Lewis News

Education Holds The Key To Our Future

NASA Administrator Richard H. Truly recently announced objectives for one of the most important missions that NASA must undertake in the years to come. That mission calls on centers throughout the Agency to promote aerospace educational programs and activities from elementary through undergraduate school.

"NASA's educational strategy, in order to achieve this goal, is comprised of three elements designed to *capture* student interest in science, mathematics, and technology at an early age; *channel* more students into science, engineering, and technology career paths; and to *enhance* the knowledge, skills, and experiences of pre-college teachers, college university faculty, and other educators," said Truly.

Responding to that call, Lewis Research Center's Office of Educational Programs has outlined its objectives in meeting that goal:

1. To enhance the knowledge, skills, and experience of educators.
2. To provide programs which inspire general student interest and participation in science, technology, and related careers.
3. To substantially increase the number of minorities, women, and handicapped in Center educational programs.
4. To form additional partnerships with other government agencies, private industry, foundations, and other organizations to coordinate educational efforts.
5. To provide for organizational maintenance and development of the Office.

Dr. R. Lynn Bondurant, Jr., chief of the Office of Educational Programs, is proud of the strides Lewis has made in educational programs and excited about the commitment that

But Lewis won't rest on its laurels, says Dr. Bondurant, who heads the Office that was reorganized in February, 1990. Dr. Bondurant and his staff are presently evaluating the Office's current programs and generating ideas that will help make educational programs at Lewis more effective and efficient.

The Office of Educational Programs is made up of two branches: Student Services Branch and Educational Services Branch, which have responsibility in reaching Lewis' six-state service area—Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. The Office is also involved in private sector initiatives which include accessing educational programs, reviewing state curriculum, and coordinating an advisory board of professionals outside of Lewis.

The Educational Service Branch is responsible for a variety of programs that reach out to educators.

This branch has conducted numerous On-Center Programs that have helped teachers gain a better understanding of our nation's space program, and provided teachers with creative ways of getting students interested in math and science. Off-Center programs, such as conferences, have also proven successful in informing and motivating educators. According to Dr. Bondurant, if Lewis continues to keep "plugged into the right conferences and conventions, then we can expect to touch 30,000 teachers face-to-face in the course of one year."

The Teacher Resource Center at Lewis and Regional Teachers Resource Centers placed throughout Lewis' six states provide teachers access to NASA materials. Future plans call for the resource centers to serve as sites for in-service

quality teaching materials.

In order to translate educational programs into practical ways of understanding math and science issues of the future, the Social Studies/Technology Education area will explore technological issues such as the Space Exploration Initiative.

its hearts" to the students and teachers both on- and off-site. He attributes much of this philosophy to Center Director Larry Ross who stresses the importance of getting educators and young people involved in programs at Lewis.

"Young people are Lewis' fu-

has worked diligently in the past and will continue in the future to provide a variety of student intern programs at Lewis, said Dr. Bondurant. Again, this involves participation by the entire Lab. In addition to opening students' eyes to the abundant opportunities math and science



Dr. R. Lynn Bondurant, chief of the Office of Educational Programs, says all of Lewis has made a difference in educating teachers and students.

The most important aspect of the Educational Services Branch, said Dr. Bondurant, is that contact be maintained as effectively as possible with instructors throughout the six-state service area.

Curt Olson, an Aerospace and Electronics Technology instructor at Sauk Rapids High School in Sauk Rapids, MI., is proof that Lewis' careful attention to teachers is working. Over the past two years Olson has worked closely with the Office of Educational Services in developing a simulated space environment program for his high school.

"Dr. Bondurant and the entire Lab at Lewis have donated their talents and time in helping me to develop this important program," said Olson during a recent visit to Lewis.

Dr. Bondurant feels one of the major reasons for Lewis' success in educating teachers and students is that the entire Center "lends a hand and opens

ture," said Ross in a conversation with the *Lewis News* when he was named director in July.

To reach and cultivate today's young people is perhaps an even harder goal than reaching educators, said Dr. Bondurant. That is why the Student Services Branch, which works with elementary/secondary programs, student interns, and partnerships plays such an important role in the future of our nation's space program.

"Education, especially in science and math, is in a crisis mode in the United States, and NASA has a very exciting program that can capture the hearts and minds of our youngsters," said Frederick P. Povinelli, director of the Administration and Computer Services Directorate which oversees the Office of Educational Programs. "We need to reach elementary school children at an earlier age and focus our attention on involving all segments of our society."

The Student Services Branch

careers can provide, Lewis is building a data base of young people who will eventually grow into informed and enthusiastic adults who can work and succeed at Lewis.

Partnerships between Lewis and the schools are also providing a valuable service. The East Technical High School Partnership Program, for example, develops strong student/mentor relationships. Lewis personnel act as mentors and role models for students who might not normally be exposed to NASA if it were not for this program.

More attention is also being paid to developing NASA materials for visually and hearing impaired students.

"To me, space provides us with a horizon that you can see over," said Dr. Bondurant. "It permits you to vividly use your imagination and in so doing solve many problems that we face here on earth. The future can either just happen or we can prepare for it."

NASA's future depends on capturing, channeling, and enhancing the knowledge of our nation's teachers and students.

NASA has pledged in making education a top priority.

"Lewis has led the way in developing and conducting educational programs for both students and educators," said Dr. Bondurant. "We are educational leaders in the pure sense—in what we do, what we have accomplished, and the people we serve."

opportunities as well.

For teachers who do not have access to one of the resource centers, there is NASA's Central Operation of Resources For Education (CORE) located at the Lorain County Vocational School in Lorain, OH. Lewis is NASA's technical monitor for the facility which provides teachers across the country with



Lewis News

Plans Are Underway For 50th Anniversary

Fiftieth anniversaries don't come along everyday—or every year for that matter. So it's no surprise that the Center is working vigorously on ways of ensuring that its golden anniversary does not go unnoticed.

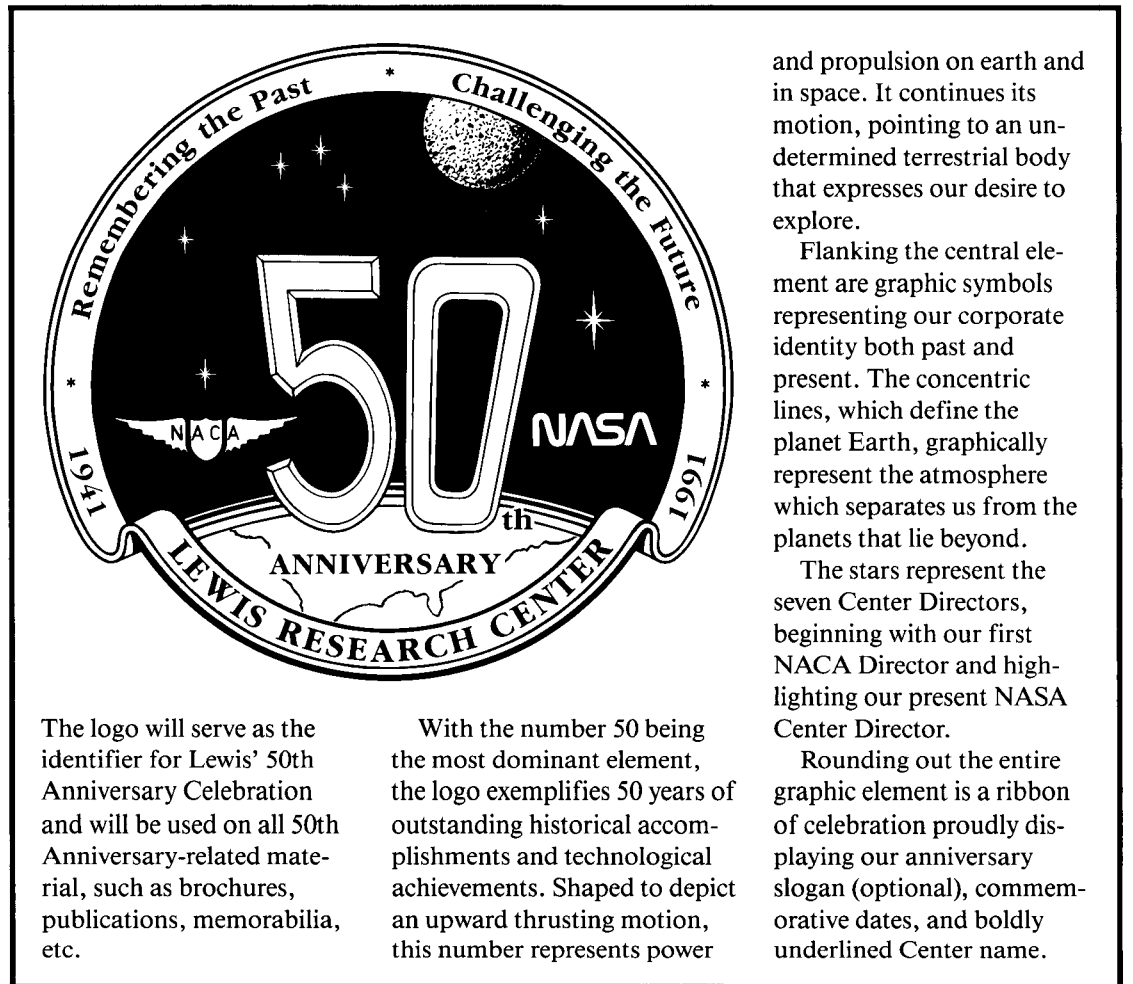
Denny Sender, Technical Information Services Division and project manager for Lewis' anniversary celebration, has a demanding job ahead of him but it's one that he is approaching most enthusiastically. "This is a great opportunity for Lewis to review its past accomplishments and look ahead to the future," said Sender during a recent interview with the *Lewis News*. "It's also a chance for us to open up our Center to the public and show them what Lewis is all about."

According to Frederick Pov-

inelli, director of the Administration and Computer Services Directorate, Sender is an ideal candidate to lead the festivities. "Denny has acquired a broad understanding of the Center in his more than 25 years here," said Povinelli. "His recent tour at NASA Headquarters under the Professional Development Program further demonstrated his ability to work across organizational lines. Planning and executing the events to celebrate our 50th anniversary is well suited to Denny's talents and something in which he is keenly interested."

To help Sender commemorate the milestone, the 50th Anniversary Planning Committee was formed in March. The committee includes: Bill Brown, Peggy Duchoslay,

Continued on page three



The logo will serve as the identifier for Lewis' 50th Anniversary Celebration and will be used on all 50th Anniversary-related material, such as brochures, publications, memorabilia, etc.

With the number 50 being the most dominant element, the logo exemplifies 50 years of outstanding historical accomplishments and technological achievements. Shaped to depict an upward thrusting motion, this number represents power

and propulsion on earth and in space. It continues its motion, pointing to an undetermined terrestrial body that expresses our desire to explore.

Flanking the central element are graphic symbols representing our corporate identity both past and present. The concentric lines, which define the planet Earth, graphically represent the atmosphere which separates us from the planets that lie beyond.

The stars represent the seven Center Directors, beginning with our first NACA Director and highlighting our present NASA Center Director.

Rounding out the entire graphic element is a ribbon of celebration proudly displaying our anniversary slogan (optional), commemorative dates, and boldly underlined Center name.

Education Is Key To Fire Awareness Week

Working on the principle that an ounce of prevention is worth a pound of cure, the Plant Services and Fire Protection Branch sponsored a Fire Awareness Week Oct. 8-12.

"We wanted to educate the employees, as well as their spouses and the community, in the area of fire prevention," said Fire Chief Robert Allen. "We want the public to know that we are here and that we have expertise to share."

The week was held in conjunction with other fire awareness programs nationwide. October is normally chosen as the time for fire prevention week because the environment is drying out at the same time the weather is cooling down. People are starting to use their fireplaces and space heaters. All of these combine to increase the risk of fire.

More than 500 people took advantage of the demonstrations and other activities offered during the week. Lewis employees, contractors, exchange personnel, and their families were not the only ones to attend. Visitors included employees of other federal agencies in the area, the Lewis Little Folks, and groups from the Visitor Center.

The Lewis Little Folks and the other children presented a special challenge to the fire fighters. The sight of a fire fighter in full fire gear and protruding face mask frightened many of the children and caused a lot of crying. Allen feels that the time spent allowing them to adjust during Fire

Awareness Week was well worth the effort.

"Traditionally, children look at fire fighters as monsters. When you're in full gear, they'll shy away and not come to you," Allen said. "We wanted them to know that in the event their house catches on fire, here is what they're going to see crawling on the floor coming in to save them."

A follow-up visit to the Little Folks Center gave fire fighters a chance to spend even more time with the kids.

During the course of the week, more than 100 people signed up for classes in CPR, care for the choking, and use of the fire extinguisher. The classes are part of an on-going, year-round program. Individuals and groups can take the classes.

"Because of the variety of expertise that we all have, we tailor courses to fit individual needs in different areas," said Allen.

Allen is already thinking about ways to improve Fire Awareness Week next year. He hopes to branch out and involve other organizations in the area who work with fire prevention such as the Industrial Commission of Ohio and the City of Cleveland fire officials. He also plans a bigger promotion push to encourage people to attend.

"We need to do a better job of promoting, from top management down, to show that it is really important that employees are aware and support fire prevention," he said.

Midwest Space Development Conference Held

Space Enthusiasts Join Together

The 1990 6th Annual Midwest Space Development Conference (MSDC) was held on October 19-21 in Westlake. Lewis was in the forefront with Center Director Larry Ross as the keynote banquet speaker who presented Lewis' role in the space program of the 1990s.

Dr. R. Lynn Bondurant, chief, Office of Educational Programs, was the luncheon speaker with a motivational message titled "Asking for the Moon." Other Center participation included: Joe Nieberding as moderator of the Space Exploration Initiative Panel, with Dr. Larry Diehl, Dr. Henry Brandhorst, and Frank Spurlock as participants.

Other area participation included Dave Kircher of Fairview High School with a presentation on "Fairview Park Space Week." A space station

panel discussion included George Hallinan, vice president and program manager of the Electronic Power System for the Rocketdyne Division of Rockwell International and, from the Cleveland Rocketdyne Office, John Juhasz and "Rick" Custer, and Steve DeBrock of Lockheed. Carol Gallatin of Rocketdyne was MSDC coordinator, and Annette Wood of Allied Signal was conference chairperson.

Space enthusiasts enjoyed a tour of Lewis, programs of model rocket building, and several presentations including: Hubble Telescope for the Classroom Teachers, How to Start a Space R & D Company, Fairfax Space Camp, Computerizing the Space Frontier, shuttle, and world space activities with Daniel J. Gauthier on "Red Stars/New Stars in Or-

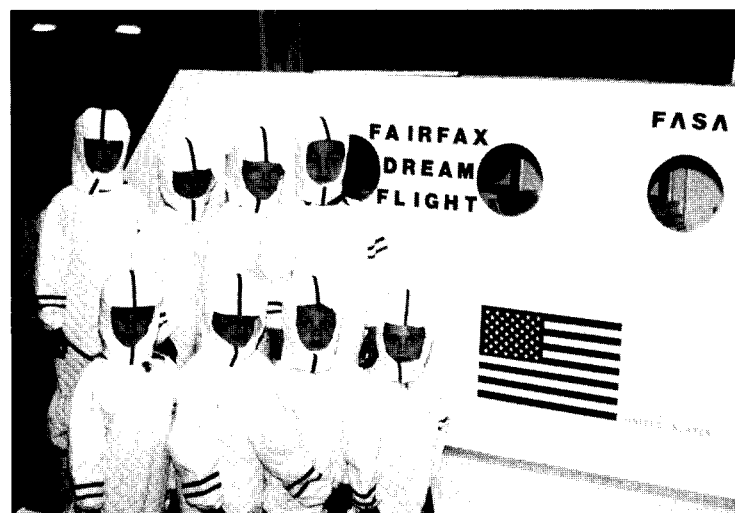
bit: Soviet & Chinese Emerging International Programs?"

Honored guest Congresswoman Mary Rose Oakar received a tribute from MSDC in recognition of outstanding support on behalf of the American Space Program, and specifically Lewis Research Center.

Many educational stars were present at the conference as well, but brightest by far was the Fairfax School simulated shuttle "Dream Flight," which was a manned flight vehicle with an astronaut crew from Fairfax School in Mentor. The students simulated a moon-based mission, but the most important mission of the day was transporting Lewis Commander Larry Ross to the MSDC Conference. As Commander Ross left the transport, he congratulated the Fairfax Aeronautics & Space Administration (FASA) on a job well done and told them to "carry on." This was an event not to be forgotten by the FASA astronauts of today and, soon to be, astronauts of tomorrow.

MSDC is a non-profit educational organization incorporated in the state of Ohio. MSDC holds its conferences in the midwest as a regional forum on space-related topics.

—By Carol B. Gallatin
MSDC Education Coordinator



Aspiring astronauts and students of Fairfax School in Mentor take part in the annual conference by simulating a moon-based mission.

Lewis And WVIZ-TV Join To Reach For The Stars

Lewis and WVIZ-TV 25 have joined talents to create an innovative educational television series for teachers called "Touching Tomorrow." The live, four-part series presents a "down-to-Earth" view of the sun and the moon through

demonstrations, activities, and techniques aimed at sparking student interest in math and science.

The partnership between Lewis and WVIZ-TV was born when Betty Cope, general manager of WVIZ-TV 25,

came to Lewis to talk with Dr. R. Lynn Bondurant, chief, Office of Educational Programs, after hearing him speak on a local radio program. Together, they envisioned pairing young people's natural fascination for space with television's ability to excite, promote, and enhance viewers' skills, according to Dr. Bondurant. "We are proud to share purpose and resources with NASA Lewis Research Center," said Cope.

The series was created by Dr. Bondurant, who hosts each program with Gail Bossert Klink, one of Ohio's two Teacher-In-Space finalists and the Aerospace Education Specialist for Newark City School.

A teacher advisory panel with representatives from four school systems and the Diocese of Cleveland provided feedback during the development of the series.

Center Director Larry Ross feels that it is NASA's duty to work with educators to motivate students to explore their surroundings through the study of math, science, and technology. "Our future lies in the hands of these young students. 'Touching Tomorrow' is another way of reaching out," he told a group of educators and Cleveland city officials during a kick-off

celebration at the Visitor Center on April 9.

The first two programs, "The Sun: Part I and II" were aired April 11 and 18 for teachers in 118 school systems and more than 200 private schools in Northern Ohio. "The Moon: Part I and II" will air May 9 and 16.

One of the unique features of the series is its interactive format, which allows teachers to call in with their questions throughout each program.

Questions can also be called into guest speakers, such as Apollo Program Astronaut John Young.

"The future of our planet depends on our relationship with the Earth. We want to help young people tune in to their environment and get excited enough about what they observe to ask questions," said Dr. Bondurant. "A fascination with space today may lead to career or life-long interest in math or science tomorrow."

Science Fair Winner



A black and white photograph showing a young woman, Stephanie Gwiazdowski, on the right, looking down at something in her hands. To her left, an older woman, Rhonda Pope, is looking on. They are in a science fair setting with various displays and equipment visible in the background.

Stephanie Gwiazdowski (right), East Technical High School junior, took first place in the school's recent science fair. Gwiazdowski's project, "Electroplating Various Selected Materials", won first place overall and first place in the chemistry category. She is among five students from East Tech High School who have applied to participate in Lewis' Sharp internship program this summer. There were ten employees who served as science fair mentors. Rhonda Pope (left), East Tech job counselor, looks on.

Photo by Quentin Schwinn

Share "The Peoples Of Cleveland" ALERT Colloquium on May 15

A lively and inspirational look at Cleveland's ethnic heritage, "The Peoples of Cleveland: Building Community" is a 50-minute musical dramatization that depicts the actual stories of immigrants who left their homelands and came to Cleveland to seek their fortune and cultivate their dreams through hard work, their faiths, and the richness of their diverse cultures.

Slides of some of Cleveland's familiar faces and neighborhoods, home to these newcomers, frame the talented cast of 13. The immigrants' stories, simply told with a suggestion of costume and movement, create a powerful experience that has been appreciated by all ages and cultures.

The ALERT Colloquium will begin at 2 p.m. in the DEB Auditorium, May 15. Seating will be on a first-come, first-serve basis, with closed-circuit TV coverage available in the DEB Cafeteria. Special ALERT buses will follow the regular Center shuttle buses, beginning at 1:30 p.m. The Colloquium is sponsored by the ALERT Activity Group of the Lewis Awareness Committee.

Remembering The Past...

Months Of Celebration Come To A Close

Throughout the past ten months, beginning on January 23, 1991, with the 50th anniversary of our 1941 groundbreaking, Lewis has been getting in touch with its roots and

remembering the past while challenging the future. On October 25, 1991, the Lewis community sent out its good wishes, thoughts, and dreams to future Lewis employees, many not yet

born, during the closing ceremony and sealing of mementos in a time capsule.

"Nothing is more tangible in respect to our future than these wonderful young people who have come to celebrate with us," said Center Director Larry Ross in regard to students from across a five-county area who participated in the ceremony on that cloudy autumn day.

Leon Bibb, WKYC, TV 3 news anchor, a well-respected communicator with a genuine interest in aerospace, served as the master of ceremonies,

while students from various schools strengthened our "future" ties between Lewis and area schools by planting an Ohio buckeye tree as a living remembrance of the 50th anniversary.

The photographs on these pages tell a portion of the story of the Closing Ceremony. From the involvement of Lewis employees in form of song, poem, and essay contributions, to the artistic presentations of our invited guests, this ceremony launched our promise of discovery and challenge that awaits all in the year 2041.



Members of Boy Scout Troop #215, Berea, under the direction of Scoutmaster Dennis P. Stocker, Microgravity Combustion Branch, performed the Presentation of Colors.

"The time capsule is a proud symbol of the legacy provided by the people of the NASA Lewis Research Center over the first 50 years in the history of Lewis—a legacy of creative technological advances of worldwide impact in both aeronautics and space, paving the way for the next half century and beyond."

—Center Director Larry Ross



WKYC, TV 3 news anchor Leon D. Bibb (standing), served as the master of ceremonies for the event, which was sponsored by the Office of Educational Programs. Seated, left to right, are: Dr. R. Lynn Bondurant, chief, Educational Programs Office; Janet Storti, branch chief, Educational Services Office; Jo Ann Charleston, branch chief, Student Programs Office; John Hairston, director, External Programs Directorate; and Larry Ross, Center director.

Spirit Of Man

Mankind lifted eyes to the sky,
Saw the sun and the birds fly.

The moon showed a beguiling face,
Stars glowed like twinkling lace.

Some were compelled to understand,
Reach out and soar above the land.

They joined their efforts to share,
To build on dreams of space and air.

They extended the time of flight,
Created large planes with engines of might.

Then endeavored to find a solution,
For the resulting noise pollution.

Advances lifted aircraft high,
Above the turbulence in the sky.

Today's planes no longer crawl,
Speed and range has made our world small.

Research and development has resulted,
In fast safe flight to be exalted.

Another challenge leads through the sky,
Into the blackness of space near by.

Mushrooming flames on rockets grew,
Man and vehicles into orbit flew.

He looked down upon the Earth,
In wonderment at his place of birth.

Now unlocking the frontier of space,
There a living habitat striving to place.

Mankind reached out in expanding rings,
Seeking the unlimited knowledge the universe brings.

The spirit that within abides,
Forward into the future guides.

By William F. Schwarckopf



William F. Schwarckopf, Advanced Design Fabrication, was the winner in the Poem category with his piece titled, "Spirit of Man". He is pictured here with Center Director Larry Ross.



Students from Collinwood High School, Cleveland, performed an oral presentation of Lewis' past.



Collinwood High School Cheerleaders gave pep to the celebration.



Recognizing Lewis' "present", students from Anton Grdina Primary School, Cleveland, recited the ABC's of NASA.



A crowd of more than 1,000 gathered in front of the Administration Building on Oct. 25, 1991, to bring a close to the time capsule and the ten-month celebration of our Center's "Past, Present, and Future." Members of Collinwood High School's choir and band enhanced the presentation.

November 22, 1991

Challenging The Future...

Lewis Anthem

Never a nation to wait,
The pioneer blood courses still,
Never a challenge too great
To meet with excitement and
skill,

Always a nation to dream
Of frontiers still left to
explore—
No matter how high the goals
seem
We dare to achieve them, and
more.

Chorus:

In aeronautics and space
The nation can trace
Reality born from the way
A vision was shared
By workers who cared:
The people of NASA.

Remember the past and stand tall;
All we've accomplished is clear.
Be ready to answer the call
To challenge the future frontier.

The moon and Mars and beyond
Await minds unwilling to rest
And beckon to those with the bond
Of achieving no less than their best.

Chorus

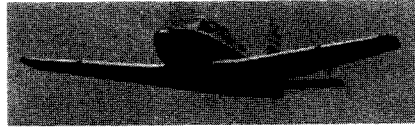
The will of a country to lead
Required its brightest and best.
At Lewis, this call we did heed;
For fifty years we would not rest.

To meet all our goals we will strive,
As long as the nation requires.
Lewis stands ready to drive
With a will and determined desires.

Chorus



Maria A. Kuczumski, Engine Sensor Technology Branch, won in the song category for the "Lewis Anthem". She is pictured here with Center Director Larry Ross.



Earle O. Boyer, Aircraft Operations Branch, performed a flyover in Lewis' T-47. The plane is used in a variety of student programs.



Celebrating the partnerships formed with area schools over the years, student representatives participated in the planting of an Ohio buckeye tree. The tree planting signifies the living bond between Lewis and the schools. Soil from area schools was mixed with Lewis' soil to nourish the symbol that will stand tall in 2041 when the Center celebrates another 50 years.



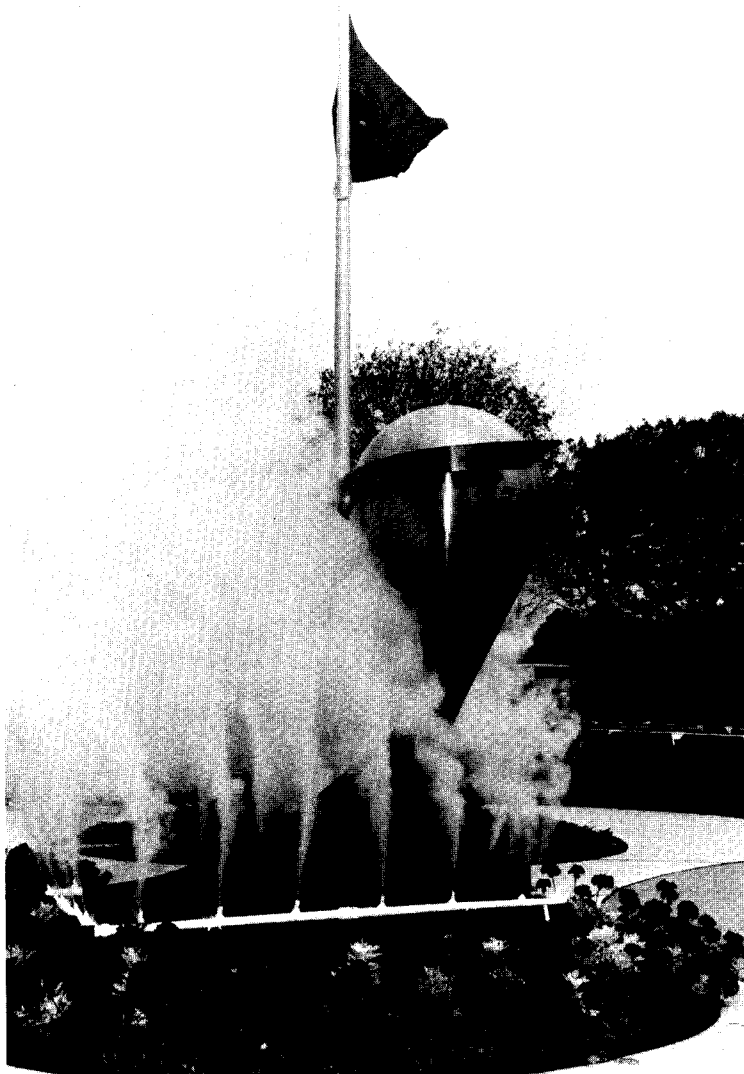
Director of External Programs John Hairston presented certificates to the winners of the 50th Anniversary Art Contest. Accepting a certificate is Sylvia Hathaway of McKinley Elementary School.

"A spirit of discovery, teamwork, and dedication was exhibited by those of us so fortunate to be here during Lewis' 50th anniversary.—Dr. R. Lynn Bondurant, chief of Educational Programs



Students from Roehm Middle School, Berea, presented a lively presentation of what they think the future might hold in store for Lewis in the year 2041.

Photos by Photo Lab



Lewis time capsule/sculpture, containing 58 mementos from the past and present, was sealed in a nitrogen mist on Oct. 25, 1991. The capsule will be opened on Oct. 25, 2041. Onlookers asked silently—"What will the future hold?"

Lewis In The Year 2041

by June C. Bahan-Szucs

As you open our NASA Lewis Research Center Time Capsule in the year 2041, we from the year 1991 greet you.

We also envy you—the pace of advances in civilization in the last 50 years of our lives has been astounding. We have advanced from a propeller-driven airplane to outer space vehicles that have allowed us to walk on the Moon and investigate the planets.

We, here at Lewis Research Center in Cleveland, Ohio, U.S.A., can only imagine what a progressive, exciting and technologically sound universe composes your world of 2041.

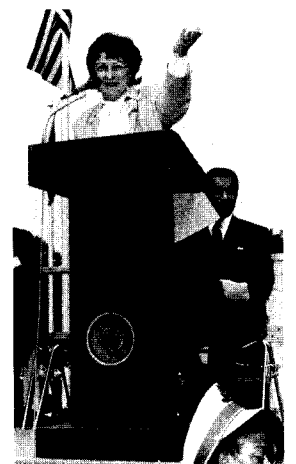
The National Aeronautics and Space Administration (NASA), with its forerunner—the National Advisory Committee for Aeronautics (NACA)—has always had a commitment to excellence. We have conducted research and development, invented technology and science procedures never before dreamed of, quieted the sound of airplane engines, lifted space shuttles off their launch pads, walked in space, improved life conditions here on Earth, developed power sources, improved world communications, and enhanced the medical sciences with unique and effective research tools.

And undergirding all these scientific wonders, NASA has maintained a firm belief that our employees and staff members are OUR MOST IMPORTANT HUMAN RESOURCE.

We were asked to tell you what we plan to do next—after this Time Capsule is closed and sealed on October 25, 1991. Well, our friends in the future—we shall keep doing what we do best—both to improve our world of 1991—and also to make your world in 2041 a better place for you to live and work.

MAY YOUR NEXT 50 YEARS BE AS SUCCESSFUL FOR ALL OF YOU IN THE YEAR 2041 AS OUR LAST FIVE DECADES HAVE BEEN FOR US.

GOOD LUCK AND GREAT BLESSINGS UPON ALL OF YOU!



June Bahan-Szucs, Procurement, won in the Essay category for her piece titled "Lewis in the Year 2041".

A simple, cost-effective program

OEP Can Reach Out And Touch Someone

A telephone call is often referred to as "the next best thing to being there." This may sound like an advertisement for the telephone company, but it's not. For students across the county who aren't able to visit Lewis firsthand, communicating via telephone is proving to be an effective way of learning about NASA and the civil space program.

Telereach, a program initiated in 1990 through Lewis' Office of Educational Programs (OEP), brings schools and Lewis together using the telephone as the medium. Telereach is not a telelecture but more related to an electronic field trip to Lewis. "The program is as simple as our office placing a call to the schools, who communicate back to us on a speaker phone," explained Anita Solarz, coordinator of the program. "Once the lines of communication are in place, Dr. Lynn Bondurant, chief of the Office of Educational Programs, gets on the line and provides an update on what's happening at NASA,

recognizes students or teachers, participates in simulations, and answers students' questions."

According to Solarz, the program was initiated to track and maintain contact with teachers who participate in the NASA Educational Workshop for Elementary School Teachers (NEWEST). "Telereach enables the OEP to maintain meaningful contact with the Lewis NEWEST participants," explained Solarz. Because of the variety of topics and project possibilities related to space, Solarz said the Telereach program offers great flexibility. "Teachers can tailor the program to a specific school activity or topic," she explained.

The Creekside Elementary School, Aurora, CO, for example, invited Dr. Bondurant to speak to the school as a kickoff for their International Space Year Project. "It was absolutely tremendous," said Lisette Clemons (NEWEST '90). "You (Dr. Bondurant) said all the right things and really impressed the staff. It was the perfect be-

ginning to our International Space Year Project."

Patricia Platel, St. John The Evangelist School, Schenectady, NY, had the distinct honor of being the first NEWEST teacher (NEWEST '89) to take advantage of the Telereach program. "The program went great," said Platel. "Hearing about the possibilities space has to offer, as told by Dr. Bondurant, made the kids feel connected with NASA Lewis. The kids were excited that NASA would take the time to talk with them."

Telereach has continued to

***Stars are yellow.
The Hubble is exploring;
You're a great fellow,
and definitely not boring.***

***Of space you know much,
And of searching the stars,
We all have a hunch,
We'll see you on Mars.***

***We send you our praise,
In a rocket of love;
We're still in a daze,
From your phone call above.***

***With gratitude to Dr. Lynn Bondurant from
students of St. Evangelist School,
Schenectady, NY.***

grow in popularity among the NEWEST participants since 1990, said Solarz. In May and June, for example, more than

800 students and 85 educators throughout the United States have gained valuable knowledge about Lewis and space-related topics. In addition to being a cost-effective and simple program for Lewis, Telereach provides the OEP the opportunity to find out what aeronautical and space-related topics teachers and students are interested in learning about.

"I enjoy learning what today's young people are interested in," said Bondurant, whose career began in the classroom. "I always relish my moments with students. They are invigorating, and after all, do represent our nation's future."

Bear ambassadors bring back lessons from Lewis

LEWIS has hosted many visitors. Our employees have all pitched in—proudly describing the facilities and important work we do here at Lewis. Recently, through the coordination of the Office of Educational Programs (OEP) and many other areas at the Center, we extended a warm welcome to two special visitors—Neil A. Bear and John Quentin Bear—furry representatives from two schools in Indiana.

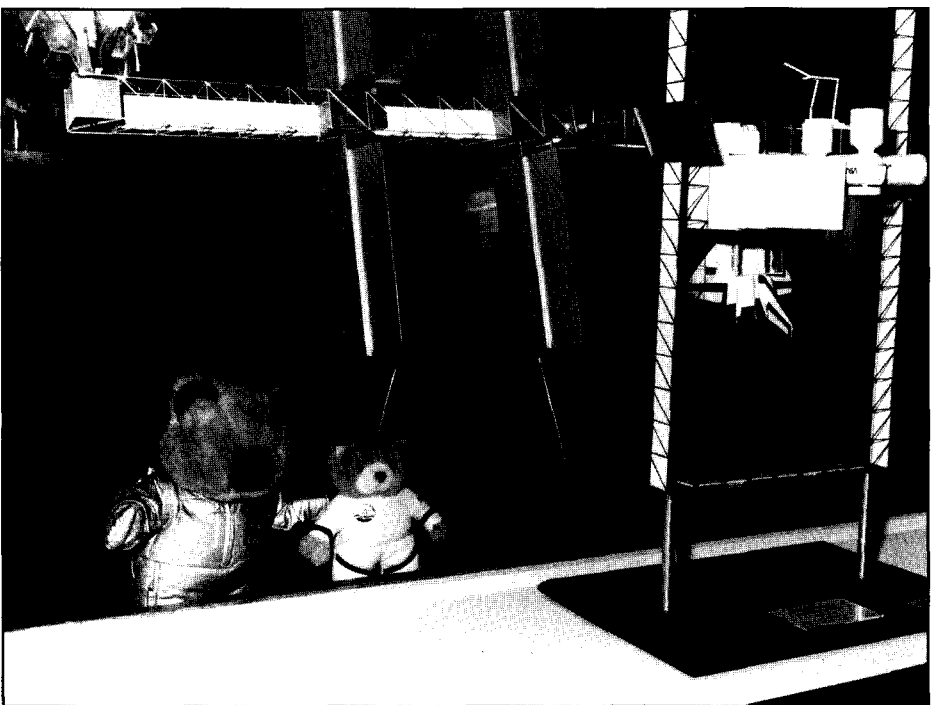
Because it is impossible for all the students of Adams Elementary School in Indianapolis and Cooks Corners Intermediate School in Valparaiso to visit Lewis, the stuffed bears were sent as representatives of those schools to learn about Lewis and take their knowledge back to the students and teachers. The bear visit was part of a follow-up experience for two educators—Ms. Bobbie Wendell (Adams Elementary School) and Penny Yelkovic (Cooks Corners Elementary School)—who participated in last summer's on-Center NASA Educational Workshop for Elementary School Teachers (NEWEST) program.

During a special tour, coordinated by OEP staffers Leonard Cobbs, NASA pilot, and Anita Solarz, NEWEST program manager, the ambassadors visited the Hangar, Power Systems

Facility, 2.2 Second Drop Tower, Icing Research Tunnel, Visitor Center, and Research Analysis Center, to name a few. Each stop included a live presentation by Lewis employees that were videotaped for the students.

According to Dr. R. Lynn Bondurant, head of the OEP, the bears' visit was an educational approach intended to stimulate student interest in math, science, and communication skills. Young students who are motivated and exposed to the sciences at the early grades have a higher probability of pursuing careers and interest in those subject areas. It is hoped that this unique approach will help motivate the young students.

"These unique visitors have created lots of interest about NASA Lewis," said Dr. Bondurant. "Their field trip on behalf of their fellow classmates enabled many students in Indiana to benefit from what NASA is doing and gain an understanding of the importance of science and math in their future. Many who might not otherwise have learned about the importance of NASA gained greatly from the bears' visit." ♦



Ambassador bears, Neil A. Bear, Adams Elementary School (left), and John Quentin Bear, Cooks Corner Intermediate School, stop by the Power Systems Facility to view the Space Station Freedom model.

November 5, 1993

Tri-C grant will focus on young students' careers

LEWIS and Cuyahoga Community College (Tri-C) are collaborating on a Science, Engineering, Mathematics, and Aerospace Academy (SEMAA) for kindergarten through 12th grade with a focus on minority and under-represented students. SEMAA's purpose is to motivate greater numbers of Cuyahoga County students to pursue careers in science, math, and related fields.

A \$250,000 grant was recently presented to Tri-C from NASA for the SEMAA during a news conference in the Stokes Communications Center of Tri-C's Unified Technologies Center (UTC). The grant is provided by the Office of Equal Opportunity at Headquarters.

Congressman Louis Stokes (D-11) and Dr.

Yvonne B. Freeman, associate administrator, Office of Equal Opportunity, participated in the special news conference. Other dignitaries included: Lewis Director Larry Ross, Director of External Programs John Hairston, Chief of the Office of Educational Programs Dr. Lynn Bondurant, and Cuyahoga Community College President Dr. Jerry S. Owens.

"National reports suggest the possibility of a shortfall of about 675,000 technical personnel in natural science and engineering at the baccalaureate level by the year 2000. A minimum of 50,000 such degrees must be earned by minorities and under-represented populations on an annual basis in order to have a major role in filling those positions. It's clear that we must increasingly rely on

these populations for our country's future science, engineering, and mathematics expertise, and SEMAA is an excellent start for achieving this goal," said Dr. Bondurant.

To meet SEMAA's objectives, middle

school summer camps and academic year programs have been implemented at Tri-C's campuses and at off-campus school sites. Along with a focus on minority and under-represented students, the program will include a strong family math/science component. ♦

Symposium addresses Small Disadvantaged Businesses

LEWIS recently hosted a two-day symposium, *Exploring Hi Tech R&D Opportunities for SDBs and LeRC.* Held Sept. 21-22 at the Holiday Inn Airport in Cleveland, the symposium was by

manager at Lewis.

Dr. Earls and Dr. Dutta headed the team of NASA officials in presenting the symposium to Cleveland. The agenda

Technical Illustrators Bring Ideas To Life

By Kathy Healey and Jim Lucic

Conveying an idea often can be difficult; especially an idea related to science and engineering. In today's high-tech business environment, eye-catching graphics are the key to effective communication.

writing and editing services, and Exhibits focuses on posters and displays of all sizes. Other Graphics groups are Statistical Drafting and Layout. Figure editing and page layout for publications, viewgraphs, and posters for conference and meeting presentations are probably the more well-known Graphic services,

and as accurately as possible is, perhaps, the technical illustrators' most important contribution at NASA Lewis.

Despite budget and workforce reductions, LTID Publishing Services has successfully maintained its customer focus and commitment to quality. The addition of state-of-the-art computer-related equipment has been key to improving efficiency.



Dr. Bruce Steinetz, senior research engineer in the Structural Dynamics Branch, has had many positive experiences working with the technical illustrators. "They've played a big role in my area of high temperature seal development and research. We're constantly developing new concepts to meet the rigors of advanced turbine and space engines. As we come up with ideas, we need help translating them into high-quality conceptual figures, which can then be used as advocacy tools — here and outside of NASA. The illustrators collaborate with us as we develop the test capability right through to the patent drawings and finished products. Their computer tools help at each step of the way through the innumerable edits that come up in a research environment. This makes the whole process as efficient as possible."

The technical illustrators in the Graphics section of the Publishing Services team, Logistics and Technical Information Division (LTID), combine specialized education, individualized expertise, and creativity to convey Lewis programs and projects in ways that are visually appealing, and scientifically and technically correct. Through the creation of clearly designed viewgraphs, intricate conceptual drawings, striking logos, and attractive brochures, the illustrators can help all Lewis employees better express themselves.

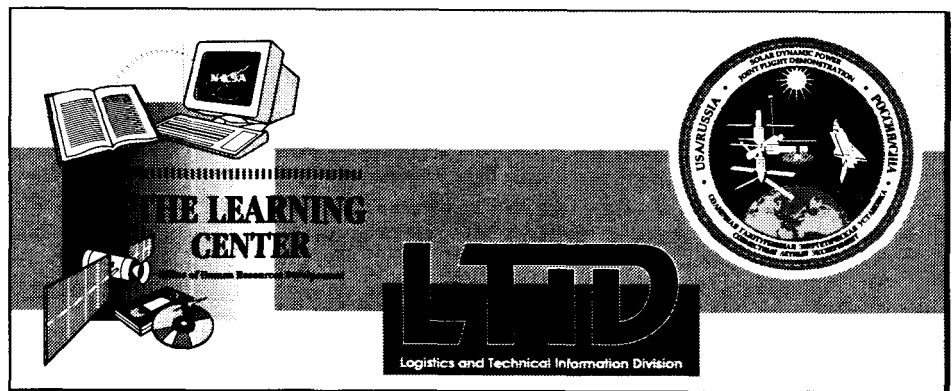
but a variety of other services are offered as well. These services include facility redesign drawing; brochure design; creation of logos; illustrations; electronic design; photo retouching; transfer of images from one medium to another with scans; design of Internet home pages; and figure renditions in GIF files to make them accessible to most computers that access the Internet.

Al Buggele, senior research operations engineer in the Aeropropulsion Facilities and Experiments Division, is another satisfied customer. "The technical illustrators have the capability to render isometric representations of new technological developments so that everyone can understand them as easily as possible, which then helps us get funding and new program initiatives. If the Graphics group was not here, the quality of my work — in terms of its ability to market new technology and the new methodologies that come along with it — would suffer severely. It takes a lot of innovation to get a point across. The artists work with me to develop, distill, refine, and conceptualize ideas.

Educated and experienced in fine arts, commercial and industrial design, illustration, and current computer drawing, scanning, and printing techniques, these artists obtain a great sense of satisfaction from their ability to help Lewis scientists and engineers present their ideas to the world in an understandable manner. The designers commented, "We view the variety of disciplines at Lewis as welcome challenges.... The people who come to us believe in their projects and programs and we get caught up in their excitement.... We help customers determine the best design for their products, and we also work to ensure that they meet NASA guidelines."

The illustrators, using both traditional and computer graphics techniques, can create pictorial rendering of complex mechanisms, facilities, or scientific phenomena from blueprints, sketches, or verbal information. They can render a diagram that will then be used to build a model, conceptualize an idea, finish a blueprint started by an engineer, or make an illustration from a photo. Helping scientists and engineers to communicate conceptually and to distill complex ideas and concepts as simply

Graphics is one of four sections of Publishing Services. The Coordination Office is the intake point for new jobs (submit materials to Building 60, Room 212 or call 433-3207). Editorial provides



It's unrealistic to expect that scientists and engineers can be experts in every phase of the development process necessary for successful marketing and advocacy. Working with the illustrators is the most efficient way to proceed. It's the way I get the most bang for the buck."

Ralph Jansen, senior research associate at Ohio Aerospace Institute (OAI), was impressed with the meticulous illustrations of detailed test rigs that were done for him. Jansen complimented not only the extremely good rendering but also the sensitive response to his timeframe restrictions.

Elaine Pappas of the Director's Office praises the technical illustrators for being able to create a polished, accurate, well-organized viewgraph from a penciled sketch or a couple of comments on the order of "this is the point we want to make." Pappas also

In celebration of Space Week and the 25th Anniversary of Apollo 11

How the Lewis Research Center contributed to the Moon race
 Speaker: Chris Pestak
 Date: July 6, 1994
 Time: 7 - 9 p.m.

Space in the Sixties
 Speaker: Frank DeAngelis
 Date: July 13, 1994
 Time: 7 - 9 p.m.

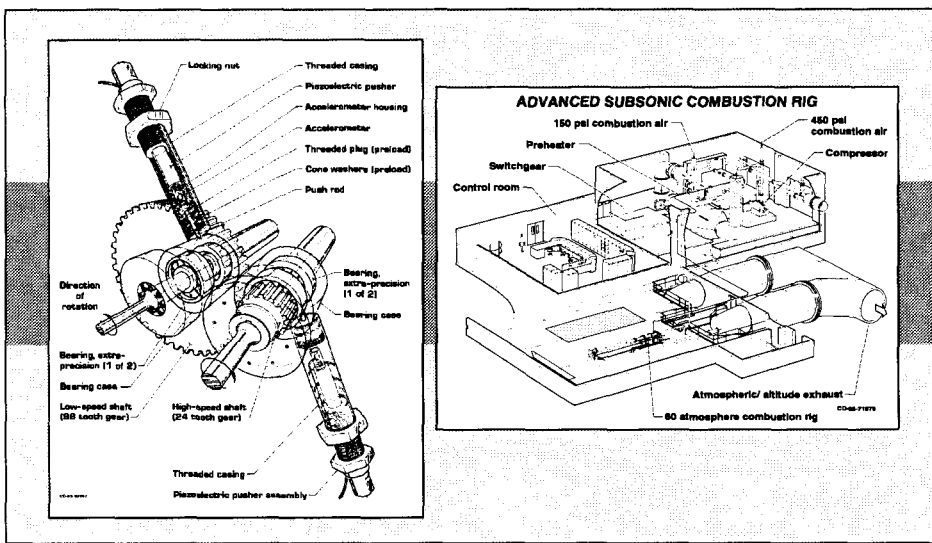
The Moon 25th Anniversary, at the past and a glimpse of the future
 Speaker: Lynn Bondurant
 Date: July 20, 1994
 Time: 7 - 9 p.m.

AP Systems will be held at Lewis Research Center Visitor Center
 2100 Brookpark Road
 Cleveland, Ohio 44135
 (216) 433-5804
 (216) 433-5800 (TDD)

If people can't understand us, we will separate ourselves from them and lose support for our programs," said Dr. R. Lynn Bondurant, Educational Programs Officer. Dr. Bondurant has received rave reviews for the illustrations prepared for

understandable to even the most uneducated among us — child or adult — by making connections to Cleveland history and locations. The star charts in the book (one for each month of 1996) map the night sky as it would appear above a person standing on the East Ninth Street pier, and are framed by an outline of the Cleveland skyline.

Dr. Bondurant was also very pleased with the design work produced for the Mobile Aerospace Education Laboratory (MAEL), which will bring aeronautics education opportunities to everyone as it travels all over the United States. Dr. Bondurant received illustrations that helped conceptualize his ideas for the graphic layout of the inside of the trailer. He also was supplied with all of the exterior designs for the trailer and the MAEL logo design that will appear on decals and will be distributed throughout the MAEL trailer's travels.

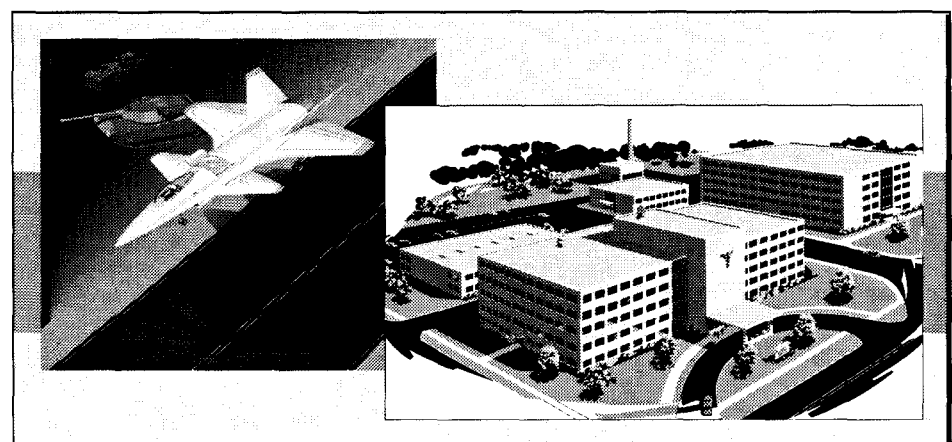


praised the quick response she gets from the Graphics people. "I have a lot of respect for all of the artists. We've never been disappointed. We've received a lot of positive feedback about the high-quality and timeliness of their work."

the book "Cleveland's History Through the Message of Starlight," which he coauthored with Cindy Hill (wife of Myron Hill, Space Experiments Division), for the celebration of Cleveland's bicentennial. The "Star Book" makes the science of astronomy

For more information or help with a project, contact Greg Patt, Cortez Graphics Manager (216) 433-5804, greg.patt@lerc.nasa.gov

As one of the world's most respected centers for aerospace research and development, Lewis has and will continue to make significant contributions to American technology. In this time of budget cuts and reductions, it is more critical than ever to document, present, exhibit, and display the valuable information we have to offer to the worldwide scientific and technical communities and to keep a positive image of Lewis in the public eye. "We have become so technical in our jargon that it's more important than ever to be able to present complex ideas in ways that many people can understand.





Lewis NEWS

Volume 33 Issue 6 July 1996

A high tech approach to learning

Mobile Aeronautics Education Lab is dedicated

By S. Jenise Veris

It has been said that *education* is the engine that drives dreams to reality. This is the concept that inspired the Mobile Aeronautics Education Laboratory (MAEL), a trailer that houses a state-of-the-art classroom utilizing the latest technologies to excite students about science and math through "hands-on/minds on" activities that model real-world challenges in aviation.

NASA Lewis, in cooperation with Cuyahoga Community College, dedicated the MAEL on May 24 before a crowd of students, teachers, and dignitaries including: Dr. Robert Whitehead, associate administrator for Aeronautics at NASA Headquarters; George Reese, acting associate administrator for Equal Opportunity Programs at NASA Headquarters; Dr. Malcom Phelps, assistant director for Programs Education Division at NASA Headquarters; Dr. Jerry Sue Owens, president of Cuyahoga Community College; Dr. Richard Boyd, superintendent for Cleveland Public Schools; and Congressional representatives Sherrod Brown, 13th District; Martin Hoke, 10th District; Steven LaTourette, 19th District; Thomas Sawyer, 14th District; and Louis Stokes, 11th District.

Visitors explored the MAEL, and (continued on page 8)



Photo by Tom Jares

Pictured left to right: Congressman Thomas Sawyer; Congressman Martin Hoke; NASA Lewis Director Donald Campbell; George Reese, acting associate administrator for Equal Opportunity Programs at NASA Headquarters; Caroline Arnold, representative for Senator John Glenn; and Dr. Robert Whitehead, associate administrator for Aeronautics at NASA Headquarters participate in the ribbon cutting ceremony for the Mobile Aeronautics Education Laboratory held May 24 at NASA Lewis.

Cosmonauts deploy Lewis managed solar array on Mir

By Kristin K. Wilson

ON May 25, cosmonauts on board the Russian Space Station Mir deployed a NASA Lewis Research Center managed U.S./Russian solar array that will increase the space station's power capability, extend its lifetime, and support Mir-based U.S. experiments.

The solar array, known as the Mir

Cooperative Solar Array (MCSA), was delivered to Mir during the second Shuttle/Mir docking mission in November 1995.

Cosmonauts Yuri Onufrienko and Yuri Usachev, with U.S. astronaut Shannon Lucid looking on from inside, hand-cranked the deployment mechanism that unstacked the new solar array, (continued on page 4)

Two hundred and seventy-five NASA Lewis employees recently received the Agency's highest honors. See pages 6 and 7.

Presented to *Lamont T. King* for innovation, technical excellence, and outstanding customer service in the support of large engineering application codes and the customers who use them.

Presented to *Vincent R. Lalli* for outstanding leadership in reliability education of aerospace personnel while establishing NASA documents and making significant contributions in the physics of failure for NASA space flight programs.

Presented to *Daniel J. Lesco* for exceptional service to NASA for his leadership of and personal contributions to Optical Instrumentation Research and Development.

Presented to *John E. Moss* for exceptional leadership, technical contributions, and personal dedication in supporting the jet engine research programs in the Propulsion Systems Laboratory.

Presented to *Joanne R. Poe* for exceptional contributions to the success of the Advanced Communications Technology Satellite (ACTS) project and creative leadership to implement continuous improvement to the management approach in the ACTS Office.

Presented to *William F. Prochazka* for outstanding support of flight research at NASA Lewis.

Presented to *Sandy A. Sorge* for exceptional knowledge, initiative, and responsiveness in providing outstanding administrative support contributing significantly to the effectiveness of the Aeropropulsion Facilities and Experiments Division and the Center.

Presented to *Robert J. Walter* for outstanding efforts and contributions in the design, fabrication, and development of research related hardware.

Presented to *Timothy J. Wickenheiser* for excellence in providing mission design support to the U.S. Space Program.

Presented to *Theresa M. Zarrelli* for sustained exceptional performance in support of the management and administration of the Power Systems Project Office at NASA Lewis.

Group Achievement Awards

New Leadership Strategy Process Consultant Team: For outstanding support and commitment to the processes that foster change at NASA Lewis.

Lewis National Transportation Safety Board (NTSB) Accident Investigation Team: For exceptional teamwork in performing NASA

Lewis' icing research in support of the NTSB's ATR-72 accident investigation.

Ceramic Analysis and Reliability Evaluation of Structures (CARES) Software Team: For advancing computational life prediction of ceramic structures to new levels of accuracy and worldwide acclaim.

Arcjet Technology Team: For an outstanding accomplishment in the development, demonstration, and transfer of electric rocket engine technology.

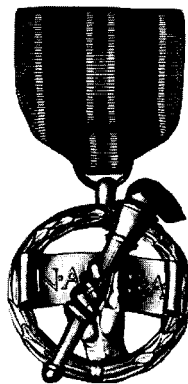
Electronic Power Laboratory Rehabilitation Project Team: For successful restoration to service of a major NASA Space Environment Chamber in the face of significant technical and implementation challenges.

Spread Across Liquids Experiment Project Team: In recognition of the dedication, skill, and teamwork demonstrated in the development, characterization, and successful missions of "Spread Across Liquids" space flight hardware.

Spacecraft Lubrication Team: For outstanding contributions in aerospace lubrication and tribology and to the continual success of America's spacecraft program.

F119 High Pressure Turbine Team: For an outstanding contribution to the solution of the F119 vibration problem by this NASA/university/industry team.

Outstanding Leadership Medal



Presented to *Henry W. Brandhorst, Jr.* for outstanding contributions in providing leadership to the power technology programs at NASA Lewis.

Presented to *Gwendolyn D. Davis* for providing outstanding leadership and contributions to the creation of a highly

productive, motivated, and empowered workforce in the Program and Policy Office.

Presented to *David A. Jacqmin* for scientific achievement in contributing to an understanding of the physics of space fluids, directly benefiting NASA's microgravity and materials processing programs.

Presented to *Eugene A. Krejsa* for outstanding engineering insight, technical ability,

and leadership in developing propeller noise reduction technology for future propulsion systems.

Presented to *Robert J. Shaw* for exceptional leadership and management of the High Speed Research (HSR) Propulsion Project Office.

Public Service Medal



Presented to *Jih-Fen Lei* for outstanding contributions to the development of high-temperature strain gages and their applications in NASA programs.

Presented to *Stephen A. Weirich, M.D.* for outstanding public service to the management and employees of NASA Lewis in providing a

high-quality, cost-conscious Occupational Health Program.

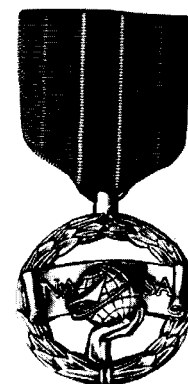
1996 Lewis Galileo Honor Awards

Lewis Galileo Resources Management Support Team: For effort, contribution, and teamwork displayed in providing resources management support for the Galileo Project at NASA Lewis.

Lewis Unfurled Galileo Main Antenna Research Team: For contributions toward developing the "antenna stuck ribs model" to free Galileo's high gain antenna.

Shuttle/Centaur Project Team: For outstanding contributions in the Galileo Program that led to the successful integration and launch of the Galileo mission to Jupiter.

Exceptional Engineering Achievement Medal



Presented to *Robert J. Boyle* for exceptional engineering achievement for his pioneering work in the field of Computational Heat Transfer for Turbomachines.

Happy 200th Birthday Cleveland!

NASA Lewis supports bicentennial activities

By S. Jenise Veris

CLEVELAND'S bicentennial was marked by a year of events celebrating the city's rich heritage as seen in its people, industry, and attractions. Demonstrating NASA Lewis' pride through outreach, employees lent their time and expertise in support of bicentennial projects.

Dr. R. Lynn Bondurant, education programs officer in the External Programs Directorate, co-chaired the Bicentennial Education Committee's "Teaching Cleveland Project" with Pat Sweet, League of Women Voters. Three years ago, Bondurant began planning the educational aspects for the bicentennial. What emerged was an educational project that looked at Cleveland's history through "slices of life" for the years 1796, 1846, 1896, 1946, and 1996. A future component of the project challenged students to imagine Cleveland in 2046.

"Teaching Cleveland has enabled me to gain an even greater respect and appreciation for Cleveland—its extensive past and its potential to be an even greater city in the future," Bondurant said. "We can dream any scenario we want to for the future and then build bridges to it. One of the ways to accomplish this task successfully, however, is to study the past."

Bondurant's commitment to the project and love of astronomy inspired the booklet *Message of Starlight*, co-authored with Cynthia Hill. The publication uses the study of monthly star charts to stimulate thought and discussion of events in Cleveland's past, present, and future featuring stars within 200 light years of Earth. Bondurant's proposal



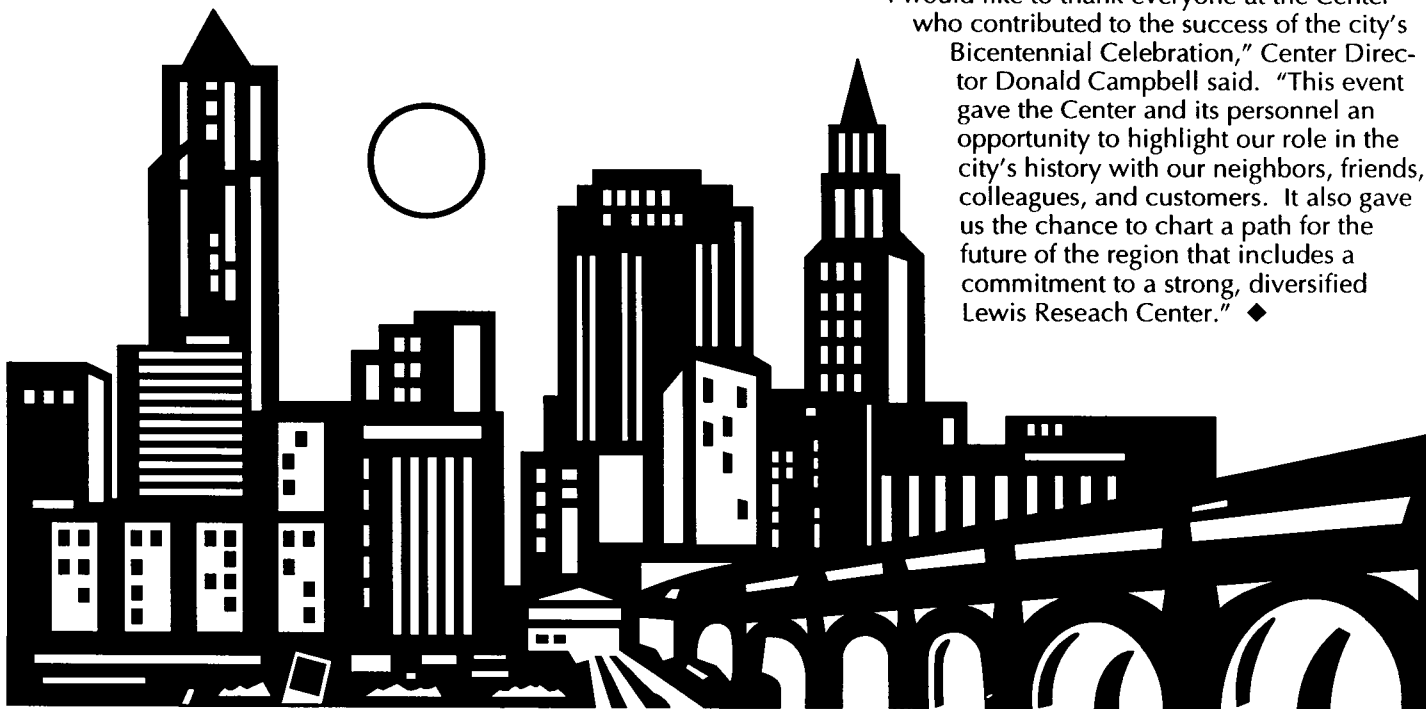
Photo by June Bahan-Scuzs

The NASA Lewis float, featuring a simulated space shuttle launch, won first place in its category in the Fox 8/American Legion/Bicentennial Parade held November 30 during the Bicentennial Homecoming Weekend. Exhibit Program Management, Inc., out of Akron, assisted in the design and construction of the float. The float was described as "a real crowd-pleaser" by many of the 200,000 Clevelanders who endured freezing temperatures to share in the excitement of the spectacle that included 200 dancing candles, 28 marching bands, 100 parading units, and 30 colorful floats.

to Dr. Eleanor Helin, a world renowned scientist who scans the skies for asteroids, landed Cleveland its own asteroid named in honor of the city's bicentennial. The city even has a bicentennial star—"Tejat" from the Gemini constellation—chosen because it is approximately 200 light years away.

Many employees, in addition to Bondurant, represented NASA Lewis through their involvement in bicentennial events. Photos on page 5 capture a few of the highlights.

"I would like to thank everyone at the Center who contributed to the success of the city's Bicentennial Celebration," Center Director Donald Campbell said. "This event gave the Center and its personnel an opportunity to highlight our role in the city's history with our neighbors, friends, colleagues, and customers. It also gave us the chance to chart a path for the future of the region that includes a commitment to a strong, diversified Lewis Research Center." ♦



Behind the Badge...

a closer look at our colleagues

Priscilla Mobley



Job/Assignment: I'm a senior chemist and team leader for the Chemical Sampling and Analysis Team in the Environmental Management Office, which is a part of the Office of Safety, Environmental, and Mission Assurance.

Years at Lewis: I first came to Lewis upon graduation from high school to work as an engineering aide under the Pre-Cooperative Engineering Program. Upon graduation from college—after a brief period of employment with private industry—I returned to Lewis in 1987 as a contractor. In 1988 I became a federal employee. So I have been at Lewis almost 11 years.

Hometown: I was born and raised in Cleveland, where my family and I recently built a new home. My husband and I love Cleveland. This is where the majority of our family reside.

Describe your family: My husband Jerry and I have been married 9-1/2 years. We have 2 beautiful children: Jerry Jr., 5 years old, and Moriah, 5 months old.

When away from Lewis: All of my time is devoted to my family and church. My husband and I both come from very large families so a lot of time is spent on family activities. I particularly enjoy roller skating, bowling, and swimming. I also tutor children, as well as adults, in math, science, and reading.

Favorite Book: I love to read and consider myself an avid reader. I enjoy reading all types of books—fiction,

nonfiction, autobiographies, etc. I particularly enjoy reading books written by African-American authors. I've read so many good books that I can't honestly say which one is my favorite. Lately, I find myself reading and concentrating more on the *Bible* and other inspirational and motivational books.

Favorite Music: I don't listen to music, as much as I used to; but I tend to enjoy R&B, jazz, and gospel music.

Favorite Movie: I love to laugh. So give me a good comedy any day, and we're in business.

What do you like best about NASA...and your job at Lewis: I particularly like NASA's overall mission. I like the independence that goes along with my job in which I get to plan and perform the work that I do. I work in a laboratory, but I also go out in the field to collect samples and provide technical support and advice to various customers on the Lab. I interact daily with a diverse group of people to provide analytical chemistry support for the Center's research programs and process systems for technical support groups. I also provide environmental laboratory support for the Center. Because of the nature of the work performed at Lewis, my job is never routine. I enjoy this because no two days are ever alike. I also enjoy serving as the chairperson for the Black Women's Advisory Group, assisting the Equal Employment Opportunity Office (EEO), and advising the Director's Leadership Team on EEO-related matters.

R. Lynn Bondurant



Job/Assignment: I work in the External Programs Directorate as the education programs officer.

Years at Lewis: I've been at Lewis since 1981.

Hometown: I grew up in Kansas City, MO, near the home of Jesse James.

Describe your family: My wife Kay and I have been married for 37 years. She is a Chapter 1 reading teacher working for Lorain city schools. We have two grown children. Our son Kenny lives in Boston and our daughter Julia lives in Detroit.

When away from Lewis: I like to take long walks, read, and stargaze. I'm also very involved in church activities.

Favorite Book: It's really hard to pick a favorite. I enjoy books by Mark Twain, Jack London, and *Walden Pond* by Henry David Thoreau. I also enjoy the *Bible*.

Favorite Music: I enjoy classical music, especially selections by Romantic period composers.

Favorite Movie: Most recently I've enjoyed *As Good As It Gets* with Jack Nicholson, *Wag the Dog* with Robert DeNiro and Dustin Hoffman, and *Titanic*. I also like the old Sherlock Holmes movies with Basil Rathbone.

What do you like best about NASA...and your job at Lewis: NASA touches the future and allows us to better understand the universe. I enjoy the opportunities I have to interface with others, especially the youth, to excite them about careers in science, engineering, and technology.

Graphic by Kelly Shankland

If you have a story idea, please call the Lewis News office at 433-5317.

Center shares vision for revitalization in Cleveland's Empowerment Zone



Robert Lawrence, the Agency's education liaison for Empowerment Zones across the country, helps a Miles Standish student get acquainted with one of the computers NASA Lewis donated to the school last year.

Educational Outreach

By S. Jenise Veris

"A key NASA goal is to enrich our nation's society and economy as we [NASA] pursue our technology mission. A NASA Partnership with the Empowerment Zones and Enterprise Communities will contribute to a better life for this and future generations," NASA Administrator Daniel Goldin said as he signed the Empowerment Zone Interagency Agreement with Cleveland Mayor Michael White, Congressman Louis Stokes, and Center Director Donald Campbell in October 1996.

NASA Lewis' contributions to the Northeast Ohio region in general and city of Cleveland in particular are well documented in an Economic Impact Survey conducted by Cleveland State University (see *Lewis News*, December 1996). The added commitment of an Agency partnership with the Empowerment Zone, however, establishes a new and focused venue for employing NASA Lewis' technical resources to boost local economic development.

The Empowerment Zone program is a core initiative in President Clinton's economic strategy to rebuild communities in America's poverty-stricken inner cities and rural heartland. It is designed to empower people and communities across the nation in developing and implementing strategic plans to create job opportunities and sustainable community development. Tax benefits and investment of Federal resources are combined with those of state and local governments, educational

institutions, and the private and nonprofit sectors to implement community-developed strategic plans for economic development. Cleveland is one of 105 cities across the nation that was accepted for the program and will share more than \$3 billion appropriated by Congress under Title XIII of the Omnibus Budget Reconciliation Act of 1993 to jump-start community revitalization. While the application process focused on the presence of multiple measures of distress (i.e., poverty rates, unemployment, crime, school drop-out rates), Cleveland has a significant number of assets. Partnerships with industry, business, academia, other public sector entities, and residents were key to the city's vision for economic revitalization. The areas designated in Cleveland's Empowerment Zone are the communities of Fairfax, Hough, Glenville, and the Midtown Corridor.

"The Agency's priorities for involvement are enhancing the educational outcomes; seeing that our technology is available for businesses that are or will be starting up in the Empowerment Zone; and offering assistance in any other way which comes under the heading of general technical assistance," said Robert Lawrence, community outreach officer in NASA Lewis' External Programs Directorate. "It's a win-win situation that allows NASA to support each community in

pursuit of their own strategic vision for change while building a constituency that understands and values NASA's mission and role in making America stronger."

Lawrence was appointed to serve as the NASA education liaison for the White House Empowerment Zone Enterprise Community initiative as a result of expertise gained while serving full time as a team leader on HUD's Interagency Task Force for Empowerment Zones. Additional work assignments performed in the Human Resources, Education, and Equal Opportunity Programs offices at NASA Headquarters while participating in the Senior Executive Service Candidate Development program made him uniquely qualified for the position.

In cities large and small, school systems make up a major part of infrastructure. Cleveland has the largest school system in Ohio, and unfortunately like many of Ohio's school systems, it has had a history of problems related to the politics of busing and failed school levies. Right now, the Cleveland school system is in a period of transition with the issue of the Mayor taking over as superintendent of schools.

According to Lawrence, NASA Lewis is part of a committee working to rebuild aspects of the system beginning with a pilot program at four of the Empowerment Zone elementary schools (Miles Standish, Giddings, Charles Orr, and Louis Pasteur) that will address hardware/software infrastructure, curriculum and tutoring, training and development of teachers, administration and policy, periodic evaluation, and security.

"You move mountains one shovel at a time, and we are taking the same approach toward education in the Empowerment Zone areas," Lawrence explained. "In the past, NASA educational programs largely benefited students who were the brightest or showed the most potential. However, many of them were drawn to more lucrative opportunities away from the area after graduation. Now we're focusing on developing more young minds beginning at the elementary level so that we have a larger pool of individuals committed to staying in the area and applying their talents locally."

Last year NASA Lewis donated 100 computers to 10 elementary schools in the Empowerment Zone as the first step in concentrating efforts on education and technological assistance at the elementary level (see *Lewis News*, June 1997). Nazzetta Robinson and David Newman, Test Installations Division, volunteered to recondition and load educational software onto the computers that will be used for practicing reading, writing, and math skills and for preparing fourth-graders for the state proficiency exam.

Several collaborative efforts with local educational institutions and nonprofit organizations demonstrate NASA Lewis' ongoing commitment as a stakeholder in the development of human resources for the revitalization of Cleveland.

The N.A.S.A. (New Approach to Self Achievement) Project is a collaborative effort on the part of NASA Lewis; the Cleveland Chapter of the National Technical Association, Inc.; Cuyahoga Community College; Woodburn Center for Cultural Studies; and Youth Opportunities Unlimited. For 6 weeks in the summer, 50 middle school students from Cleveland's inner city participate in this unique program that offers science projects, computer classes, proficiency test strategies, and a variety of enrichment activities.

NASA Lewis continues to play an integral role in SEMAA (the Science, Engineering, Mathematics, and Aerospace Academy), a program cosponsored by Cuyahoga Community College, which offers hands-on experience to supplement math and science education and excite Cleveland youth about pursuing careers in those areas. The program, managed by NASA Lewis Education Officer Dr. R. Lynn Bondurant, presently serves 2,000 area students in grades K-12. It has become a model for national educational systems and has already been replicated in Dayton, OH; Detroit, MI; and Washington, DC.

The Mobile Aeronautics Education Laboratory (MAEL) is an invaluable source of instruction to aid teachers and students in grades 9-12. The state-of-the-art lab is housed in a 53-foot trailer with 10 unique workstations designed to provide hands-on/minds-on activities modeled after real-world challenges in aviation. The MAEL is used to supplement SEMAA activities and is available for field trips and special attractions in the Cleveland area. It is also on the road 6 months out of the year to various locations at or near the other three NASA aeronautics facilities before returning to Cleveland.

A joint project between NASA Lewis and the African-American Museum is currently in developmental stages with Dr. Willie Mackey, Photovoltaics and Space Environments Branch, as the technical lead.

"We see the African-American Museum as a stand-alone point of interest and primer for more in-depth learning about various African-American scientists in history and at NASA Lewis," said Nancy Nolan-Jones, executive director of the museum. "This type of dynamic interaction will help inner city students to realize that science is alive and also a tangible career for people of color."

This month Empowerment Zone teachers will be among 48 elementary teachers selected to participate in a teachers' in-service funded by NASA Lewis to learn or enhance their ability to use the Internet and other technology tools to develop lesson plans that will improve math and science proficiency. In addition, NASA Lewis will sponsor

six high school math and science teachers to attend Fayetteville State University's week-long math institute where they will be trained to teach high level mathematics courses using graphing calculators and the Internet.

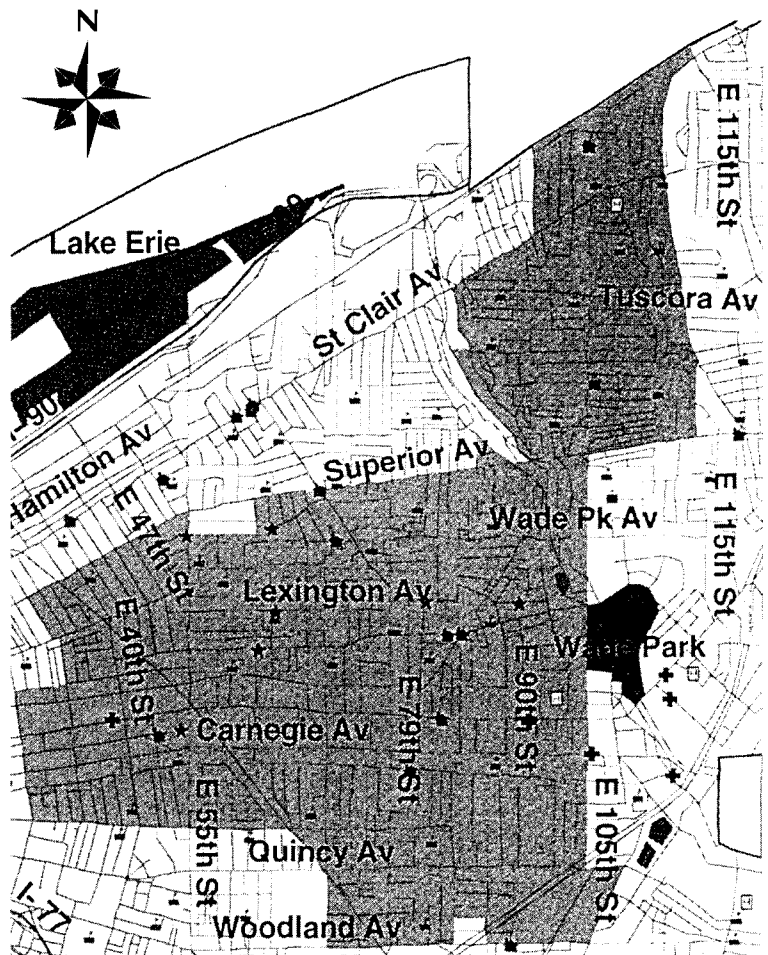
"NASA's focus on educational assistance recognizes the emphasis in our economy on building a workforce with knowledge-based skills to sustain a long-term economic advantage for the Zone," said John Hairston, co-chair of the governing board for the Empowerment Zone and director of External Programs at NASA Lewis. "It's vital to prepare our students to be able to work at NASA or in major growth industries, such as microelectronics, telecommunications, software, and designer-made materials—the 'brain power' industries."

By preparing students to meet the challenges of tomorrow, Lawrence said, we all benefit.

"The quality of life experienced by those around us determines or limits to some extent our own quality of life," Lawrence emphasized. "Without educational and technical assistance to Cleveland's poverty-stricken population to help them make a contribution to the community, all of us will experience barriers to our freedom—freedom to choose where we live, go to school, work, and seek recreation." ♦

Editor's Note: Individuals interested in volunteering technical assistance for schools in the Empowerment Zone should call Robert Lawrence at 433-2921. More information about the Empowerment Zone program is available on the Internet:

<http://www.ezec.gov/>



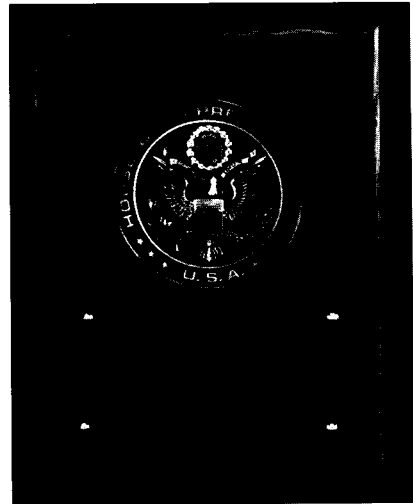
Cleveland's Empowerment Zone, which encompasses the communities of Fairfax, Hough, Glenville, and the Midtown Corridor, will receive more than \$177 million in federal aid over the next 10 years.

Congressional Award Presented

NASA Glenn's External Programs Director John Hairston and Dr. Lynn Bondurant accepted the Pioneers of Public Technology Partnerships Award on behalf of the Center Sept. 18 at the Congressional Black Caucus' (CBC) annual Decision Makers Luncheon.

Congressman Major Owens, chairman of the CBC Education Technology Think Tank, presented the award in recognition of Glenn's efforts to establish a nationwide network of Aeronautics Education Laboratories (AEL) harnessing technology that empowers communities within CBC districts.

The AEL's are primarily used as training tools to supplement educational programs designed for SEMAA (Science, Engineering, Mathematics, and Aeronautics Academy) students in grades 9-12, as well as a training laboratories for science and math educators during workshops on the integration and application of technology in the classroom.



Retiree Spotlight

Bondurant helps dreams come true

BY DOREEN B. ZUDELL

When you reach out to help someone, you never know the full impact you will have on that person," said Dr. R. Lynn Bondurant.

Bondurant, who retired from Glenn as Educational Programs Officer in 1999 with 19 years of NASA service, doesn't have to wonder about the impact he had on Mike Kersjes, a teacher in Grand Rapids, MI. In a recently released book entitled *A Smile as Big as the Moon: A Teacher, His Class and Their Unforgettable Journey*, Kersjes praises Bondurant for his help in sending the first group of special education students to Space Camp in Huntsville, AL.

Kersjes, besides being a football coach, taught special education at a Michigan high school during the 1980's. Seeing an advertisement for Space Camp, he got an idea that his students could benefit from going to the camp. However, most people weren't receptive to sending children with special needs (such as Tourette syndrome, Down syndrome, dyslexia, eating disorders, and a variety of emotional problems) to a camp designed for "bright" students. Fortunately, through faith and fortitude, Kersjes and his associate, Robin McKinney, hooked up with some people who agreed that, if given a chance, their

students could do as well as any others. One of those people was Glenn's own Bondurant.

The book chronicles Kersjes' struggle to gain permission and prepare his class to attend Space Camp. An excerpt from the book explains the pivotal role Bondurant played in the journey: "Among the many people who supported our venture, none was more vital or enthusiastic than Dr. R. Lynn Bondurant, who worked out of Lewis Research Center in Cleveland and was in charge of NASA education for the Midwest. We had been referred to him by Dr. Brown, who had assured us that Dr. Bondurant would not only provide us with the curriculum material we needed but that we would also find him to be an enormously likeable and generous man. Right on both counts."

A longtime advocate of people with disabilities, Bondurant enthusiastically embraced Kersjes' dream, and, in addition to curriculum material, began to provide guidance in the form of contacts and grant writing.

Bondurant explained that helping Kersjes was not only a personal pleasure but also part of NASA's educational philosophy to nurture and prepare young people for careers in science, technology, engineering, and mathematics. "I was fortunate to be at Lewis (Glenn) at a time when efforts to mainstream people with disabilities into society was just beginning," Bondurant said. "Also, about the time I started working with Mike, I had the first NASA film captioned for the hearing impaired by WGBH in Boston and several publications translated into Braille through the efforts of Joe Nervi, who worked with me at the time."



Dr. Bondurant

Kersjes said he values Bondurant's support then and today. "Lynn is truly my mentor—both professionally and personally. He is there to cheer me on and encourage me to persevere."

Kersjes' endeavors have moved on from teaching to developing his nonprofit organization, Space Is Special (SIS), in which Bondurant serves on the board. SIS is committed to motivating special needs and high-risk children to an interest in mathematics, science, and technology by providing "hands-on/minds-on" learning experiences. SIS has also created a unique partnership with Space Camp in Huntsville to offer programs and opportunities to special needs children.

At present Kersjes is employed by the University of California, Irvine at Marshall Space Flight Center in Huntsville, AL, to work with students, including those from Ohio, to prepare protein growth experiments to fly onboard the International Space Station.

There is more on the horizon for Kersjes and his dream—in which Bondurant will be a part. Disney is making a movie from the story that inspired his book. Moviegoers everywhere will see the story of one of Glenn's contributions that has impacted students with disabilities, and maybe even a cameo by Bondurant.

In the meantime, there is no grass growing under retiree Bondurant's feet. He continues to be involved in many educational initiatives, including the development of a human space flight course for Michigan's Virtual High School.

Said Bondurant, with a gleam in his eye, "I'm still trying to decide what I want to do when I grow up." ♦



A Cleveland, OH, student at Space Camp in Huntsville, AL.