



**LUNAR SAMPLES PASS INTO HANDS OF PRINCIPAL INVESTIGATORS**

Portions of lunar material returned from Tranquility Base by the Apollo 11 crew are being distributed to 142 U.S. and world scientists at MSC's Lunar Receiving Laboratory. Dr. Stuart Agrell, Cambridge University, London, England (right) is signing for samples for all of the United Kingdom principal investigators. Dr. Dan Anderson (left), LRL curator supervises the transfer along with (l-r) Russ Harmon, assistant curator; Frank Nolin, procurement and Beverly Cordell, LRL secretary.

## MSC releases samples to world's scientists

Distribution of about 18 pounds of Moon rocks and dust to 142 principal investigators from around the world began at MSC last week.

This makes up about one-third of the lunar materials returned from man's first lunar landing.

Another 15 per cent will be kept as examples of the types of material returned from Tranquility Base. The rest will be held for later scientific experiments, and a small amount may be available on temporary loan for public display.

Release of the samples was approved by the Interagency Committee on Back Contamination, set up to review NASA safeguards against contamination of Earth by alien organisms brought back from the Moon.

The investigators, 106 from the United States and 36 from eight other countries, will take portions

of the sample to their respective university, industrial and government laboratories.

However, each PI, or his representative, must personally accept his sample at the Lunar Receiving Laboratory and his plans for safeguarding the material must have been approved by MSC administrative, scientific and security officials.

The PIs plan to report the results of their analysis early next year.

Experiments by these selected scientists will include almost every type of measurement that has been made on terrestrial igneous rocks or meteorites. The principal measurements will be for:

- \* mineral content of the rocks and composition of these minerals and for the amount of water present when the rocks were formed.

- \* chemical and isotopic composition of the rocks.

- \* physical properties including microscopic fission and cosmic ray tracts that will show the Moon's radiation history.

Of the 8.2 Kilograms of lunar material being distributed, approximately 3 Kilograms will be destroyed in the course of planned experiments; the residues and remaining 5.1 Kilograms will be returned to NASA.

## Preliminary Examination Team reports findings

Preliminary examination of the rock and dust samples brought back from the Moon last July has been conducted in the Lunar Receiving Laboratory by a group of university and government scientists who make up the Preliminary Examination Team.

Last Monday, after the release of about one-third of the Moon rocks to principal investigators, the PET scientists made a report of their findings over the past 60 days.

In this report the PET said, "In spite of the limited and specific objectives of the preliminary examination, it has provided some significant results on long - recognized questions—as

well as a few surprises."

The existence of an unexplained erosion process on the lunar surface, clearly indicated in photos from Ranger, Orbiter and Surveyor, was confirmed in lab examination.

"The evidence provided by the first examination of these rocks indicates that this process is unlike any process so far observed on Earth," said the report.

The PET group also said that "the chemical composition of Tranquility Base fines and igneous rocks are unlike those of any known terrestrial rock or meteorite."

One of the most exciting observations according to the PET "is the great age of the igneous

rocks from this lunar region.

The major findings of the team were as follows:

1. The fabric and mineralogy of the rocks allow them to be divided into two genetic groups: a. fine- and medium-grained crystalline rocks of igneous origin and, b. breccias of complex origin.

2. The crystalline rocks are different from any terrestrial rock and from meteorites—shown by their modal mineralogy and their bulk chemistry.

3. Most of the rocks are rounded, indicating erosion on the lunar surface.

4. The absence of hydrated minerals suggest that there has been no surface water at Tranquility Base at any time since the rocks were exposed.

5. Evidence of shock or impact metamorphism is common.

6. All rocks display glass-lined surface pits which may be caused by impact of small particles.

7. Both fine material and breccia contain large amounts of all noble gases—almost certainly derived from solar wind.

8. The levels of organic matter observed, whether indigenous or of terrestrial origin (contamination), were extremely low.

9. The chemical analyses of 23 samples show that all rocks and fines are generally similar chemically.

10. The major and minor constituents of the samples are the same as those found in terres-

trial igneous rock and meteorites.

11. Elements that are enriched in iron meteorites were not observed, or such elements are very low in abundance.

12. Of 12 radioactive species identified, two were cosmogenic radionuclides of short half-life.

(Continued on Page 4)

## EAA offers discounts to this weekend's Rodeo

The first annual rootin' tootin' Parada del Rodeos (that's a new brand of Spanish Western) has settled in Galveston County Park for the weekend and is offering a myriad of entertainment to MSC area residents.

The festivities, sponsored by the League City Jaycees, include a Rodeo, parade, dance, Queen contest, carnival rides and midway attractions.

The last two performances of the Rodeo will be tonight and tomorrow night at 8 p.m. and MSC's Employee Activities Association is distributing special handbills which will entitle employees to a 50 cent discount on all Rodeo tickets. Regular prices are \$2 for adults and \$1.25 for children under 12.

Up to \$5000 in prizes is being offered to the 200 cowboys and girls entered in the bareback and saddle bronc riding, calf roping,

steer wrestling, bull riding and cowgirl's barrel racing.

The Rodeo parade is scheduled to begin Saturday, September 20, at 11 a.m. in front of Clear Creek High School. From there it will proceed down Main Street, through the business section, to Highway 3, then north to the Galveston County Park.

Along with the dignitaries, marching groups and bands, the parade will include Rodeo Queen contestants and representatives from the Horseless Carriage Club and the Clear Lake Sports Car Club.

The dance will be held in the Park pavillion after Saturday night's Rodeo events. The carnival and sideshows will be open through Sunday afternoon.

Questions concerning Rodeo discounts should be directed to EAA representatives or to Shirley Brown, X4141.

## Three industries given contracts for Saturn V nuclear stage

Three aerospace industries have received space agency contracts totaling almost \$1,370,000 to study design concepts and development requirements for a nuclear rocket stage which could replace the current third stage of the Saturn V launch vehicle.

The new stage would be used for advanced missions in the late 1970's and 1980 period, and serve as a workhorse for Earth orbital and planetary applications.

The three 10-month contracts went to McDonnell Douglas,

\$570,828; North American Rockwell, \$511,734; and Lockheed Aircraft, \$287,000.

Payload concepts and their development requirements for potential flight test and early operational applications will also be considered.

The proposed nuclear stage would use the NERVA (Nuclear Engine for Rocket Vehicle Application) now being developed jointly by NASA and the Atomic Energy Commission.

## Lockheed gets support contract for fifth year

MSC has awarded a one-year contract extension to Lockheed Electronics Company, Division of Lockheed Aircraft Corporation for general electronic, instrumentation and engineering support services at the Center.

The cost-plus-award-fee contract represents the fifth year of an approved five-year program initially awarded to Lockheed Electronics.

The one-year extension is valued at about \$14.6 million and brings the total estimated value of the contract since September 1965, to about \$61 million.

Services to be performed under the contract include operational support in the areas of space and electronic systems, information systems, guidance and control, Earth resources, space physics, mapping sciences and lunar and Earth sciences.

The contract provides operational support of facilities in the Engineering and Development and the Science and Applications Directorate.

## Credit Union straight talk

Did you know that . . .

\* your Credit Union shares on deposit have increased more than 59% since January—from \$940,806 to \$1,497,912.

\* membership has increased more than 15%.

\* payroll deductions are being used by 642 Civil Service employees for more than \$26,000 each payday.

\* your Credit Union redeems Savings Bonds for members at no cost.

\* free notary service is available for members.

\* Traveler's Checks and money orders are sold to members.

\* you can deposit by the 10th and earn from the first.

\* your Credit Union now pays dividends semi-annually — currently at 5½%.

If you are missing out on some of these benefits, visit the Credit Union staff in building 11.

They are waiting to serve you each work day from 10 a.m. to 2:30 p.m. and from 10 a.m. to 4:30 p.m. on Payday Monday and Tuesday. They are also open from 5 to 6 p.m. each Wednesday (Family Day).

As a special service the Credit Union maintains reference books on used-car prices, outboard motor and boat prices, and house trailer prices. Other publications, such as *Consumers' Report* and *Changing Times*, are available in the CU lobby.



**GRASSHOPPERS TAKE THIRD VOLLEYBALL CHAMPIONSHIP**

For the third year in a row, the Employee Activities Association's Volleyball Tournament was won by the Grasshoppers. Team members are: Jack Williams, Wayne Young, Gid Weber, T. Bruce, Dave Dyer, Tom Gibson, Tom Keeton and Ray Southers. Not pictured are: Ken Westerfield and Dick Thorson.



**RUNNER-UP SLOT GOES TO LUKERS**

The Lukers are: Li J. Corcoran, Ray Longmire, Tom Krenek, Dennis Doherty, Ed Marzono, John Waters and Lee Heinz. Not pictured are: John Lottinville and Herb Tiedemann.



**THE ASSOCIATION CAPTURES THIRD PLACE**

Members of the Association are: Ed Surcek, Gene Ricks, Larry Hurtley, Phil Shannahan, Wesley Ratcliff, Bob Becker, Al DuPont and Richard Kruse.

# ROUNDUP

NASA MANNED SPACECRAFT CENTER HOUSTON, TEXAS

The **Roundup** is an official publication of the National Aeronautics and Space Administration Manned Spacecraft Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for MSC employees.

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# Your Job in Focus

## Regulations limit use of franked envelopes

The Civil Service Commission has advised Federal agencies that Federal employees have been using agency postage-paid envelopes for mailing applications to Commission offices.

The submission of an application by an individual is considered to be a personal matter, not official Government business, and is subject to payment of postage by the applicant.

The use of postage-paid envelopes for personal matters is a violation of postal regulations.

## Quality increases for quality performance

Under the provisions of the Federal Salary Reform Act of 1962, Class Act (GS) employees are eligible to be considered for special within-grade increases in recognition of high-quality performance.

In fiscal year 1969, a total of 1,270 NASA employees received quality increases. This included 149 MSC employees.

An additional 352 MSC employees were given cash awards for sustained superior performance.

## Nix on financial conflicts of interest

NASA regulations prescribing Standards of Conduct for Federal Employees outlines certain prohibitions against acts affecting a personal financial interest.

Employees should be aware of these prohibitions, particularly when participating in the following matters:

a. Negotiation and administration of contracts including selection or approval of contractors.

b. Technical monitoring or direction of work under a contract.

c. Participation on source boards or committees.

d. Project monitoring.

Questions concerning these prohibitions or conditions under which they can be waived may be directed to Glen Brace, X6216.

## UT game films to be shown

University of Texas football game films will be shown free again this season for all interested MSC employees and contractor personnel.

The films will be presented by the Clear Lake Texas Exes Club at 5:30 p.m. in the NASA Holiday Inn every Wednesday after a game.

Film dates are as follows: Sept. 24, California; Oct. 1, Texas Tech; Oct. 8, Navy; Oct. 15, Oklahoma Univ.; Oct. 29, Rice; Nov. 5, SMU; Nov. 12, Baylor; Nov. 19, TCU; Dec. 3, A&M; and Dec. 10, Arkansas.

## Organ Club sponsors lessons

Do you have an organ that you can't play? Would you buy an organ if someone in your family could play it?

The MSC Organ Club invites employees, contractors and their families to attend their first meeting on October 1 at 5:15 p.m. in building 2, room 316-A.

Instruction in popular organ will be offered to beginning, intermediate or advanced students.

For further information contact LaVerne Hansen, X5421.

### Employee Activities Association Final Slow Pitch Standings

The Animals won the Post-Season Tournament to become League Champions and the LEC Judges took second place.

Monday Division		Tuesday Division	
METS	8-0-1	Raiders	9-0
LEC - NADS	7-3	Ball Busters	7-2
Boeing	7-4	SMD	6-3
Bandits	6-4	Mac-Douglas	5-4
ILC	5-4	GRPB	5-4
Coyotes	5-4	Hustlers	5-4
Peanut Shells	4-4-1	F-Troop	3-6
CAD	4-5	Rats	2-7
Turkeys	1-8	BRN	2-7
LEC M/O	0-9	LEC Jokers	1-8

Wednesday Division		Thursday Division	
Packers	8-1	LEC Judges	8-1
LRD	8-2	Animals	8-2
Philco Ford	7-3	Association	7-3
GE Aces	5-4	TRW	5-4
Charlie Browns	5-4	Old Timers	5-4
LEC Bandits	4-5	LEC Mod Squad	4-5
LINK	3-6	Gnats	3-6
Dynalectron	3-6	Blazers	3-6
LEC Indians	2-7	Redd Flashes	1-8
Cal Techs	1-8	Piranhas	1-8

### Final Fast Pitch Standings

The Lone Stars won the League Championship by defeating TRW in the playoffs, two games to none.

Division I		Division II	
TRW	7-3	Lone Stars	9-1
IOFC	5-5	Lockheed	6-2-2
Rebels	4-6	STC	4-4-2
Link	3-7	Boeing	1-7-2

## Local Chorus begins practice for Christmas

The Bay Area Chorus is beginning early this year to rehearse for its annual Christmas Concert to be held in the MSC auditorium.

Altos, Sopranos, Basses and especially Tenors are needed to fill the ranks and round out the sound of the Yuletide songfest.

Herbert Tiedemann of the Photo Technology Lab is the Chorus' president.

There are already quite a few good MSC people in the Chorus, said Tiedemann, "and I know that there are more out there somewhere!"

Practice sessions are held every Sunday night from 8 to 10 p.m. in the Clear Lake City Recreation Center and newcomers will be welcome.

## THE ASTRONUTS filched from TRW's gordon a. south



## Secretaries Association offers skills courses

The Clear Lake City Chapter of the National Secretaries Association is offering secretarial study courses each Thursday evening through February 26.

The classes are held from 6:30 to 8:30 p.m. in the First State Bank of Clear Lake City, 1055 Bay Area Boulevard, Clear Lake.

Courses include: Secretarial Procedures, Secretarial Accounting, Shorthand Speedbuilding, English Usage and Letter Writing, Business Administration, Human Relations, Business Law, and Stocks and Bonds.

All lectures are free of charge and are conducted by an expert on each particular topic.

The instruction is not limited to members of the National Secretaries Association, but will be open to all secretaries and stenographers in the area who wish to improve their skills.

The courses follow outlines provided by the Institute for Certifying Secretaries and are designed to increase the secretary's office skills, administrative functions and professional development.

For further information, call Helen Weseman, 488-2244 or Reva Bartlett, 488-0119.

## Credit Union invites families

Beginning Wednesday, October 1, the Credit Union in building 11 will remain open for regular business transactions from 5 to 6 p.m. each Wednesday in addition to its present hours.

This is to allow increased family participation in Credit Union activities.

## Roundup Swap-Shop

(Deadline for Swap-Shop classified ad is the Friday preceding Roundup publication date. Ads received after the deadline will be run in the next following issue. Ads are limited to MSC civil service employees and assigned military personnel. Maximum length is 15 words, including name, office code and home telephone number. Send ads in writing to Roundup Editor. AP3. Ads will not be repeated unless requested.)

### REAL ESTATE

Twin Lakes, Texas, double lot, 140' X 172', private bass fishing & swimming resort, \$1600, W. Remini, 591-4119.  
 Bay 3-2-2 for rent, brick, central air, 2 blocks to elem school, pier & boat launch, \$188, 471-4539.  
 West Galveston Island beach house for sale or rent, all electric, gulf view, 1 block to water, D. Green, 932-3486.  
 Houston, 2-1-1 frame house, air, fenced, schools nearby, assume 6% loan, 649-1697 after 5.  
 Tiki Island waterfront lot w/boat slip, ready to build on, Morris, 482-7775.  
 Swan Lagoon 4-2-2, den, formal living & dining, fireplace, fenced, air, lease \$250, 2515 Dauphin, 488-2546.  
 El Lago 4-2-2, colonial, formal living & dining, wooded, 6%, definitely selling, Zarcero, 877-4096.  
 Windemere, near Rice, 3-2-2, 1 1/2 story, equity, 5 3/4%, \$111/mo, trees, desirable stable neighborhood, needs repairs, R. Juday, 487-3946.  
 Seabrook, Miramar, equity, 6 1/4%, 4-2-2, formal living, den, carpeted, central A/H, 474-3708.  
 Alameda Mall area 3-2-2, brick, central air, built-ins, formal living & dining, 6% FHA, equity, 944-1141.  
 Bayou Vista, 2-bdr, equity, assume notes at 7%, Baker, 935-3912.

### AUTOS

69 Mercury Montego, 10,000 mi, power, air, like brand new, D. Briggs, 946-5849.  
 68 gold GTO, automatic, air, AM/FM stereo, \$2850, S. Spaeth, 944-3170 after 5.  
 68 VW sunroof sedan, red w/black vinyl interior, radio, \$1550, J. Sutton, 932-3979.  
 64 Belair, 4-dr, V-8, standard, air, radio, 48,000 mi, owner, \$850, 488-4058.  
 61 Falcon, standard, air, radio, 2 new tires, new battery, good cond, \$295, C. Hammack, 877-1657.  
 66 Ford wagon, power, air, excellent, Blue Book retail, R. Hymer, 649-0416.  
 59 Plymouth Tudor, 6-cyl, standard, L-head engine, \$75, J. Puccio, 483-6267.  
 68 red Ford truck, short wheel base, 6-cyl, \$1500, D. Merrell, 966-2612.  
 68 Chevelle, standard, 6-cyl, 4-dr sedan, R/H, still in warranty, \$1765, C. Presswood, 479-1159 after 5:30.  
 69 Toyota Corona, 2200 mi, in warranty, 591-3905, P. Sturtevant.  
 62 Buick Special convertible, V-8, \$295, J. Hammack, 877-1657.  
 66 Simca, 4-dr, excellent cond, black w/red interior, 43,000 mi, \$495, A. Van Gilder, 643-9119 after 5.  
 68 Volvo 144S, 18,000 mi, AM/FM, air, A. England, 474-3707.  
 64 VW sedan, sunroof, low mileage, 591-2710.  
 66 Toyota Corona, radio 25 mpg, excel-

lent second or work car, \$825, J. Rutherford, 487-1671.  
 66 LeMans coupe, gold w/beige vinyl top, excellent cond, owner, 488-3136.  
 66 Mustang 289, automatic, air, AM/FM, discs, power steering, other extras, A. Glines, \$1485, 944-9491, 5 to 7 pm.  
 62 Corvair Monza interior & exterior body parts, hub caps, tinted glass, 471-4448.  
 63 Mercury Monterey, showroom cond, automatic, power, good tires, 390 engine, \$600, J. Kochner, 488-2390.  
 61 Sunbeam Alpine, excellent cond, new top & tires, mechanically sound, \$550, J. Kochner, 488-2390.  
 65 Tempest, custom, V-8, air, power steering, very clean, \$850, J. Cunningham, 488-1390.  
 63 Chevy pickup, 1/2 ton, LWB, stepside (narrow bed), deluxe heater, good cond, \$585, J. Finlayson, 591-3446.  
 64 TR-4, excellent cond, L. DeWolf, 946-3117, after 5.  
 65 MGB, yellow, good cond, convertible top, tonneau, wire wheels, radio, \$900, J. Kempf, 932-5440.  
 67 Impala SS, air, radio, 4-speed, good tires, good cond, B. Morgan, 658-5601 or 658-4545 after 5.  
 68 Corvette coupe, 4-speed, air, power steering, positraction, low mileage, owner, Samonski, 877-4795.  
 66 LeSabre, automatic, air, new tires, new brake linings, good cond, A. Bond, 877-4103.  
 68 Triumph Spitfire convertible, dark blue, black upholstery, low mileage, 488-2777 after 5.

### BOATS

17' fiberglass ib-ob, deep-vee, trailer, \$1850, 471-4539.  
 21' Thunderbird Formula, 155 hp, OMC 1/O, cabin, head, excellent cond, used less than 50 hrs, \$4850, S. Roost, 877-2867.  
 69 19' Thunderbird Comanche deluxe, less than 20 hours on 160 M. Cruiser, R. Burt, 591-2117.  
 15' fiberglass boat, 40 hp Johnson, trailer w/spare tire, retractable top, various accessories, \$800, P. Clyatt, 944-3725.  
 26' Chris Craft cabin cruiser, sleeps 4, head & galley, new engine & paint, 649-3389.  
 15' Boston whaler-type boat, 18 hp Evinrude, canopy, trailer, all accessories, used 5 times, \$950, 474-2473.  
 64 18 hp Johnson ob motor, excellent cond, \$180, W. West, 932-4311.  
 Sailfish, very good cond, \$300, J. Lee, 591-3539 after 5.  
 15' sailboat, GC-15, sloop, new this year, complete rig, \$980, save over \$500, G. Minor, 877-3028.  
 23' fiberglass boat, 68 model, 1/O, 210 OMC, radio, depth finder, tandem trailer, \$5500, 488-1137.

### BIKES AND MOTORCYCLES

Three AMF 20" bicycles, boy's or girl's, \$15 each, H. Kavanaugh, 534-4854.  
 Boy's 24" Schwinn bike, \$15, C. Thompson, 932-3653.  
 Schwinn bicycle-built-for-two, \$30, Linscomb, 877-6387.  
 Honda Scrambler 90, CL-90, new tires, excellent cond, \$225, B. Reina, 488-1326.  
 65 Honda CB-160, \$200, 591-2395.  
 Woman's 26" racing bike, good cond, M. Krisberg, 944-4319 evenings.  
 68 Harley-Davidson Sprint, 250 cc, excellent cond, used only 5 mos, 591-3798 after 6.

### HOME FURNISHINGS

Patio accessories: indoor-outdoor carpet, 6' X 6', \$10; green sun screen, 6' X 6', \$2.50 black ceramic pot, 14" X 14", \$6, all items 4 mos old, 483-2341.  
 Baby crib w/mattress, good cond, \$25, A. Rochford, 649-5768.  
 36" Magic Chef gas range, white, light & timer, excellent cond, \$45, A. Peck, X3809.  
 Baby crib & springs, without mattress, good cond, \$10, B. Jones, 487-2958.  
 RCA Whirlpool portable dishwasher, excellent cond, white, \$75, F. Delaney, 488-1752.  
 Fruitwood king-sized headboard, new cond, \$50, 591-3187.  
 Boy's maple bunk or trundle beds including two good mattresses, \$60, P. White, 877-3153.  
 Oval 9' X 6' braided rug in browns & beiges, \$15, P. White, 877-3153.  
 Westinghouse refrigerator, 2-dr, good cond, \$25, J. Thompson, 471-2646.  
 Danish-Modern coffee table by Lane, plate glass top, good cond, \$20, D. Grissom, 932-4206.  
 Maple end table, 1 drawer & shelf, \$15 or best offer, W. Weppner, 944-6130.  
 Hardwick gas range, \$65; 1480 BTU Coldspot A/C, \$100; 1 hp, Wards A/C, \$30; D. Campbell, X6208.  
 Antique player piano, will play regular way, reworked, good cond, \$400, Tash, 534-3414.  
 Ranch style couch, makes into bed, good cond, \$35, G. Richeson, 482-1064.  
 Two living room chairs, \$80, 944-8241.

### SPORTS EQUIPMENT

Various calibres military rifles, some sporterized, some original w/matching serial numbers, L. Kaigler, 877-4731.  
 Twelve gauge Remington automatic, 3" mag, 471-4539.  
 10' X 12' high-wall cabin tent, heavy-duty sewn-in floor, large screen windows, \$35, T. Sampsel, 471-0172.  
 69 Monitor Travel Trailer, 19' 10", self-contained, Duo-therm, sleeps 6, B. Smith, 877-1111.  
 68 mobile home, 12' X 50', 2 bdr, air,

central heat, excellent cond, L. Perkins, 658-4528 after 5 or 658-4724.  
**CAMERAS AND STEREOS**  
 Twin lens Rolleiflex, Zeiss Planar F. 2.8, 80mm lens, \$150, J. Pavlosky, 643-7145.  
 16mm Keystone roll movie camera, F. 2.5, 1" Wollensak lens, 7 speeds case, \$30, J. Pavlosky, 643-7145.  
 2 Allied stereo 12" speakers, walnut cabinets, \$70 each, S. Spaeth, 944-3170 after 5.  
 Epiphone Enson amplifier, like new, reverb, tremolo, the works, \$350 new, \$275 now, D. Peterson, 488-4176.  
 VOX Super-Beatle Piggyback amplifier model V1141, replacement cost \$1523, good cond, \$695, J. Weber, 944-3256.  
 Voice of Music stereo w/matching speaker, mechanism needs repair, \$25, Baker, 935-3912.  
 Technicolor Movie Club membership, equipment: Super-8 camera, projector, lights, screen, film, processing, \$550 new, sacrifice \$400, 645-1001.

### MISCELLANEOUS

Rare registered Manx kittens—the tailless cats—personality plus, 925-3312.  
 Custom made-to-order doll clothes (including Barbie) and stuffed animals, L. Williams, 643-9128 after 6.  
 Custom Kraft electric guitar w/case & Alamo amplifier, excellent cond, \$75, 482-7642 any time.  
 Mooney M20A, 1550 TT, 600 SMOH Genave Navcom, good paint & interior, \$5950, D. Friis, 944-5000.  
 Will fly persons on weekend for cost, F. Blankenship, 944-0750 after 5.  
 For MSC & contractors, P & K Bonanzas, IFR, 195 mph, \$17/hr wet; Cessna 172, \$9/hr; 150, \$8/hr; instructor, \$5/hr, B. Ward, 877-3187.  
 Radios: 50 Chevy, \$10; 62 Corvair, \$20, transistorized, 471-4448.  
 Electric motors, FHP, \$10 each, 471-4448.  
 Bathenette, play pen, car seat, L. Hayman, 487-0278.  
 4/10 carat diamond engagement ring, high quality, worth \$300, sell for \$150 or best offer, A. Turner, X2786.  
 Weather-proofed roof-top luggage carrier for VW sedan, \$15, B. Jones, 487-2958.  
 Underwood upright typewriter, excellent cond, \$60; beautiful mink stole, \$175, 649-2569.  
 Two-year-old registered male collie, very affectionate, needs new home w/family who cares, 482-1014.  
 All Citadel graduates in Houston area are requested to call Doug Braome, 499-4375 as soon as possible. The object is to form a local Citadel Alumni Club.  
 White, short, peau de saie wedding gown, size 10, shoulder tip veil & orange blossom crown, \$20; shoulder-length brown fall, Italian hair piece, \$10, D. Baker, 935-3912.

Station wagon luggage carrier, fully enclosed, perfect cond, used twice, L. Brubaker, 932-4253 after 6.  
 Armstrong Flute, excellent cond, \$98, C. Nelson, good for young student, X3421.  
 2 single, overhead garage doors, including traverse racks & locking mechanisms, \$75, W. Teasdale, 482-7801.  
 Men's white shoe skates, size 11 1/2, Bill, X2141.  
 Westcoaster Truckster, 12.9 hp O'Nan engine, has top, 1969 Texas license, \$175, 877-1710.  
 Automatic baby swing w/canopy, \$8; infant travel bed, adjustable legs, snap-on rockers, \$10; both in excellent cond, C. Williams, 877-2483.  
 Canon Coronet Junior 135mm F. 2.8 electric eye camera & case, \$35, M. Krisberg, 944-4319.  
 Riding mower, 24" Springfield, good operating cond, Samonski, 877-4795.  
 Removable car top carrier, fits standard or compact cars, used once, \$17, R. Stanton, 932-2982.  
 15" Chevrolet wheels, \$15, Linscomb, 877-6387.

### WANTED

Driver to join existing car pool from SW Houston, 8:30 to 5 shift, S. Jacobs, 774-9924.  
 Wanted from owner: Low equity 4-2-2 Old English or Colonial, prefer Clear Lake City but will consider other areas, 932-5241 after 5:30.  
 Throw-away "junk" TV, Hi-Fi, components, etc. will pick up, J. Samouce, 488-0406.  
 Female roommate to share Bay House apartment, 2-bdr, 1 1/2 bath, 2 carpets, C. Critzos, 488-2193, 9 to 5, 591-2271, after 6.  
 Beg, borrow or rent a Steinway upright.—Does anyone want to store one in my family room? D. Waite, 591-4632.  
 Driver to join carpool from UH area, 8 to 4:30, R. Frances, X3509.  
 New or used "bolt-on" generator to fit standard 50 hp Evinrude outboard, J. Kinzler, 877-4136.  
 Ride from 7355 Belfort Apts, #46 to bldg. 2, 8:30 to 5, B. Womack, X3841.  
 Redwood table & benches or chairs, 591-3410.  
 2-story Gerbil cage, R. Erb, 877-1097.  
 To make contact with others interested in technical, winter rock climbing, R. Juday, 487-3946.  
 Will trade Big Bonus stamps for S & H Green, 488-2248.  
 Permanent ride from Concord St (Park Place area) to MSC, 8:30 to 5, L. Williams, 643-9128.

### LOST

One hubcap for 1966 Rambler Ambassador or will sell three of same, C. Canup, X4176.

# Rewards from space research just beginning

This is the second part of a two-part article on the benefits being derived from space exploration.

by Keith Elliot

"Practical applications of space research are awfully hard to pin down," says Jack Wheeler, Technology Utilization officer at MSC.

"This is because many spinoffs are still in the developmental stage, and manufacturers are reluctant to talk about them before they're on the market. We do know that many, many firms are inquiring into NASA developments with an eye towards new products and services."

NASA is glad of such inquiries. Indeed, it encourages them. And it services them, too, by such means as the publication of about 1000 briefs a year describing promising innovations.

"Many of these by themselves could become the basis of a new business enterprise or an important segment of industry," according to Technology Utilization Chief Richard L. Leshner.

A characteristic example might be the case of a California firm that put a new coaxial cable cutter-stripper on the market after an employee called a NASA *Tech Brief's* description of such a device to the attention of management.

Sales of the item, which easily and simply does a job that previously had been done by hand or crudely with a pocket knife, have been brisk from the start.

And, in a spinoff from a spinoff, a midwestern company later noticed the same *Tech Brief*, queried NASA, was told that the item was now being marketed, and purchased a supply from the California firm. By using the tool, the company reported later, labor costs in preparing coaxial cable had been reduced by 50 per cent.

NASA's Technology Utilization services are centered at NASA Headquarters in Washington, D.C., and eleven regional offices are spotted at NASA installations around the country. Publications are distributed on request to industry and public institutions.

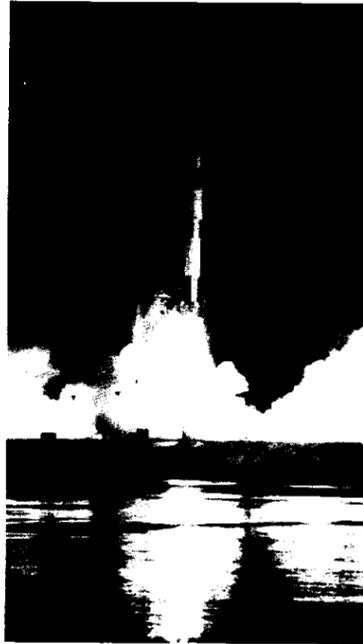
Additionally, on a client basis, regional centers can conduct computer searches of its constantly growing index of scientific and technological information coming out of space research.

The index already exceeds 400,000 publications and grows at the rate of 6000 new items a month. NASA's Regional Dissemination Centers now have several hundred clients using their computer search services.

Officials expect the centers to become self-supporting from industry fees within five years.

In a related program operated by the University of Georgia, NASA is seeking to stimulate secondary use of computer programs produced for its own use.

Many programs can be adapted to industrial jobs such as inventory control, accounting, data processing, control of automatic production flow, and structural testing.



At an average cost of \$75, more than 2000 of these programs have now been sold to companies that might have paid \$100,000 to develop them independently.

Space's biggest fallout may occur in such esoteric areas, and in the broad new field of systems management.

Aerospace management teams have learned to cope with unparalleled complexities in achieving man's greatest dream. Now they are equipped to solve some of his most pressing problems.

"These groups are capability-oriented rather than product-oriented," says John R. Moore, a vice-president of North American Rockwell Corporation.

"They are competent to design and implement large-scale systems to help overcome critical short-

ages of community facilities, critical over-crowding and congestion, critical pollution and accumulation of wastes, and critical changes in the world balance of military power."

North American's Autonetics Division is now assisting the Bonneville Power Administration, the most complex power transmission system on Earth, in setting up a new-type systems management through automation and modern data management.

Applying methods similar to those it used in North American's part of the Apollo and Saturn space programs, the management specialists have also engaged in data management contracts involving other Federal agencies, the State of California water project, and the Department of Health, Education and Welfare.

Scientists almost universally believe that man's greatest boon from space may rest in a greater understanding of his own environment.

Dr. Robert E. Stevenson of the US Bureau of Commercial Fisheries at Galveston, for instance, is using satellite photographs of the world's oceans to pinpoint new fisheries that may ease the Earth's hunger.

Other scientists are looking to the skies to provide, via satellite scanning of the Earth, new sources of minerals and better control of water resources.

Space officials believe that unpredictably new scientific tools and concepts are likely to arise from space exploration.

Dr. Frederick Seitz, president of the National Academy of Sciences: "When future generations of mankind contemplate scientific knowledge made possible by the space program, they may well wonder what manner of man the doubters were."

Meantime, much doubt has been allayed by advances already made as an outgrowth of our starward quest.

Now conducting a comprehensive study of space's salutary side effects, the authoritative Stanford Research Institute adduces a mind-boggling list of developments in which NASA's work has played a significant part.

To name but a few: deep ocean technology, silver zinc and dry tape batteries, deep submergence vehicles, power generation systems, high-temperature ductile alloys, new welding techniques, oxidation-resistant coatings, compact batteries for hearing aids, supersonic aircraft, chemical processing and a host of others.

Clearly, there is already a massive spinoff from space and it bids to become more dizzying yet.

To quote NASA's Dr. Leshner, "I firmly believe we are seeing just the start of a coming flood of commercially valuable dividends from our investment in man's greatest adventure and his largest, most difficult undertaking."

Courtesy of Humble Oilways.

## Technology Utilization Office offers cash awards for space spinoffs

The job of recognizing and making available the fantastic spinoffs from space (see article this page) belongs to NASA's Technology Utilization Office.

This office, as its name implies, collects "useful technology"—ideas, inventions, processes and discoveries—that is the outgrowth of America's space effort, and disseminates it to the nation's industrial-professional-educational complex.

"However, the vast majority of the new technology is coming from the contractors," said Jack Wheeler, MSC's TU officer.

Wheeler believes that "in-house discoveries remain buried in somebody's drawer because our people don't know how to report them."

The following outlines the process for reporting innovations in management, science, laboratory processes, production techniques, business techniques, computer sciences, engineering, technology or systems.

1. Applicant should obtain the new handbook "Documentation Guidelines for New Technology Reporting" (NHB 2170.3) from TU office, X3809.

2. Report is received by Technology Utilization Office.

3. Each item is evaluated for

### Frank presents paper in Tokyo

M. P. Frank, flight director, Flight Control Division, along with several other top NASA management, presented a technical paper last month in Tokyo, Japan.

The Eighth International Symposium on Space Technology and Science, held August 25 through 30 at Nippon Toshi Center, heard Frank's paper entitled "Flight Control of the Apollo Lunar Landing Mission."

its novelty and usefulness (i.e. Can it be used for purposes other than the original design function?).

4. This evaluation is done by independent, non-profit research institutes under contract to NASA.

5. All significant items that pass this test are announced to the public in the form of a NASA *Tech Brief*.

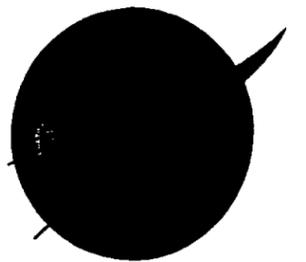
6. Those credited with selected items are eligible for TU's \$25 award.

7. If a patent is filed by the Office of Patent Council, the originator may receive a \$50 award.

8. At a later time the item may also be examined by the Invention and Contributions Board for awards from \$250 to several thousand dollars.

TU will welcome reports from MSC personnel on developments which could be valuable outside the space program.

## news from around



LTV—The nation's law enforcement agencies are reviewing a new traffic monitoring system developed by LTV Aerospace which will catch America's speeders "coming and going."

The device, which costs \$7000 a unit, is set up on the side of a road and photographs a speeding vehicle, its license plates and the driver, recording the location, time, date, posted speed limit and vehicle speed.

Citations will be delivered by mail and, reportedly, should stand up in court. Falls Church, Virginia, is currently processing a test case.

LOCKHEED—European scientists have begun using an information retrieval system developed by Lockheed Missile and Space Co. to draw on the world's largest treasury of space info.

The European Space Research Organization is working with LMSC and NASA to set up computer terminals in three of the 10 member countries—France, the Netherlands and the Federal German Republic.

### PET reports findings - -

(Continued from Page 1)

13. No evidence of biological material has been found.

14. The lunar soil at the landing site is predominantly fine-grained, granular, slightly co-

hesive and incompressible.

Its hardness increases considerably at a depth of six inches and it is similar in appearance and behavior to the soil found at the Surveyor sites.