

the Bulletin Board

VOLUME 15, NUMBER 10

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NOVEMBER 14, 1961

ELEVENTH BROOKHAVEN LECTURE

By DR. MAURICE GOLDHABER
DIRECTOR, BNL

Title:

FUNDAMENTAL PARTICLES

Lecture Hall: 8:00 p.m., Wed., Nov. 15

A buffet supper (\$2.75) will be served at the Brookhaven Center before the lecture, beginning at 6:00 p.m. Reservations should be made at least one day in advance, by calling Extension 2302 before 5:00 p.m. or Extension 2453 in the evenings.

Refreshments will be available in the Research Staff Lobby following the lecture.

THANKSGIVING HOLIDAYS

Thursday, November 23, and Friday, November 24, will be observed as regular Laboratory holidays.

Pay Checks. Employees who are paid on a weekly basis will receive their checks on Wednesday, November 22. The checks will be available at the same places and the same hours as on Fridays. Weekly employees who will not be able to pick up their checks on Wednesday may have the checks mailed to them by leaving their life number, name and address with the Fiscal Division Cashier not later than Monday, November 19.

Time Cards. Due to the short work week, supervisors should deliver all weekly time cards to Payroll by 9:30 a.m. on Monday, November 19.

Bank Hours. The Peoples National Bank on site will be open 9:45 to 12:00 and 12:30 to 4:00 p.m. on Wednesday, November 22. On Friday, November 24, it will be open from 10:00 a.m. to 3:00 p.m.

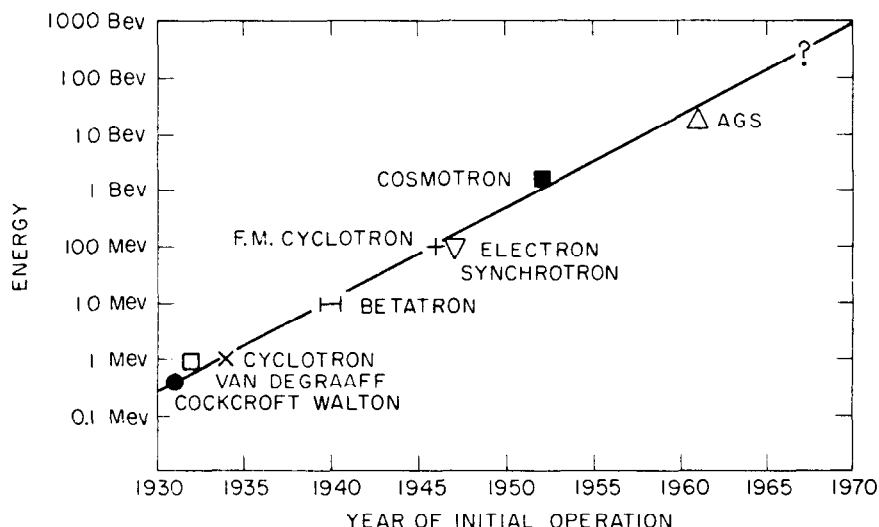
Eating Facilities. The Brookhaven Center and the Cafeteria will be closed on Thursday and Friday, November 23 and 24. The Snack Bar will be open from 9:00 a.m. to 2:00 p.m. on both of these days.

NORTH GATE TO OPEN - MONDAY -

Commencing Monday, November 20, the BNL North Gate will be opened for outgoing traffic from 5:00 to 5:30 p.m. on regular working days.

A BIGGER ATOM SMASHER?

PARTICLE ACCELERATOR DEVELOPMENT



"Now, look," said the visitor, "If you're finding smaller and smaller parts of the atom, why do you build bigger and bigger atom smashers?"

The answer to this question involves every department at Brookhaven. The atom in various stages of disrepair is the one link binding every scientific group here, from Medical to Meteorology. Some groups use broken atoms as tools; others study the broken pieces themselves to learn more about what is in the atom and what is holding it together.

How big is an atom, and what does it look like? It is so small that we can't see it at all in the ordinary way, using light and our own eyes. Even microscopes don't help because the light waves we can see are thousands of times bigger than the atom. You can't see the detail of an object with a probe that is bigger than the object.

So we use probes smaller than the atom and substitute scintillation counters and cloud chambers for our eyes. The particles that serve as probes are x-rays, or electrons, or heavy parts of the atom that we can accelerate to high speeds. If they all get through without deflection, the atom we are probing is either transparent or it isn't there. If some particles get through, but others are deflected at certain angles, it is possible to figure out the shape and size of the atom by measuring the various angles at which it deflects the probes.

The present picture of the atom's size and structure is this: from hydrogen to uranium, most atoms are about the same size; you can fit **one million cubed** (1,000,000,000,000,000,000) into a cubic inch. In the outer regions of the atom, electrons are circulating. They have a negative charge exactly balanced by the positive charge of a small but massive core at the center - the nucleus. Each of the hundred elements has its own particular number of electrons per atom. Hydrogen has only one electron and uranium has 92. The number of electrons determines all the chemical properties of the atom. Since

(continued on the following page)

A Bigger Atom Smasher? (continued)

the force holding electrons to the nucleus is electromagnetic, all of the chemical binding forces are basically electromagnetic. In fact, there is only one other physical force important in everyday life – gravity. Besides these two, we know of only two other forces, and these are associated with the nucleus itself. One, extremely strong when nucleons are touching, holds them together; the other, far weaker, is responsible for the decay of radioactive particles.

By knocking the nucleus apart and examining the pieces, we have found that it is composed of two kinds of particles – one with positive electric charge (protons) and the other without any charge (neutrons). The atomic nucleus of any element contains as many protons as there are electrons in the atomic shells. All elements except hydrogen contain as many neutrons as protons and the heavier elements have even more.

Small as the atom is, the nucleus is smaller and yet is held together by vastly greater forces. If protons were used as bullets or probes, they could be accelerated in a vacuum tube with an electric potential between source and target. A potential of a few volts would give the protons enough energy to penetrate most atoms and knock electrons away from them. But to penetrate the nucleus, the protons must be drawn across several million volts. This tremendous difference between the energy required to break up an atom and the energy required to break up a nucleus is dramatic evidence of the difference between chemical reactions and nuclear reactions. The gun that can shoot particles to explore the nucleus changes from a smaller vacuum tube to a Van de Graaff or a small cyclotron.

Yet there are even deeper layers of the atom to be probed. It turns out that protons and neutrons also have internal structures. When they are struck sufficiently hard, we find other particles – apparently having something to do with holding the protons and neutrons together – coming out of them. The forces involved here are such that the bombarding particles must be accelerated across hundreds of millions of volts. To meet these voltage requirements, we have had to turn, again, from Van de Graaffs and small cyclotrons to machines such as the Cosmotron and the Alternating Gradient Synchrotron.

But even with these powerful devices, many nuclear interactions are still unknown to us, and we are not even sure we have discovered all of the particles of the nucleus. Clearly, the neutrons and protons must be hit harder still.

"Are you really going to build a bigger accelerator?", asked the visitor.

"Well," goes the classic reply, "You wouldn't build a smaller one, would you?"

½ PRICE COUPON**BROOKHAVEN NATIONAL LABORATORY NIGHT**

at the

LONG ISLAND ARENA IN COMMACK

for the

HOCKEY GAME — LONG ISLAND DUCKS vs JOHNSTOWN JETS

SUNDAY, NOVEMBER 19, 7:15 P.M.

Present this coupon at box office for purchase of one or more tickets at ½ regular price for both children and adults.

REGULAR PRICES — \$1.50 — 1.75 — 2.50 — 3.00

BERA FILM SERIES**HAMLET**

NOVEMBER 16 - LECTURE HALL - 8:30 P.M.

This Thursday, November 16, BERA is proud to present "Hamlet," Shakespeare's immortal classic. The tragedy of Hamlet, a man of thought who failed as a man of action, is magnificently brought to the screen by Sir Laurence Olivier, one of the world's great actors. This motion picture was the winner of five Academy Awards.

Series tickets will be on sale for \$7.00 at the Lecture Hall at show time. The 10-series tickets are valid for any 10 performances up until two years from date of purchase. Single admission is \$1.00.

**SILK-SCREEN PRINTING
LECTURE-DEMONSTRATION**

The Art of Silk-Screen Printing
A Lecture-Demonstration
by DR. R.C. ANDERSON

Wednesday, November 29, 1961
8:30 - 10:00 p.m.

DON'T PUT WATER IN LAB VEHICLES

All Laboratory vehicles have been winterized with a permanent type anti-freeze. When on site, do not add water. Bring the car to the BNL Motor Repair Shop (Bldg. 423) if additional coolant is needed. If necessary to add water when off site, please notify the Motor Repair Shop upon return.

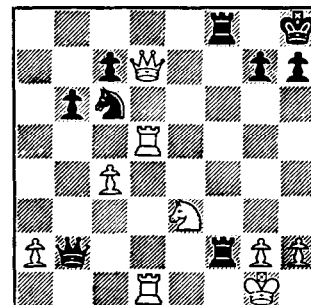
VISITORS TO BNL

On Thursday, November 16, a group of ten Fordham University graduate students in radiobiology will visit the Lab's Biology Department.

Also on Thursday, a group of nurses from St. Charles Hospital in Port Jefferson will tour the Medical Center.

CHESS PROBLEM

In this week's problem, it is Black's move and win. Three moves should do it. Answer elsewhere in this week's BULLETIN BOARD.





BERA BOWLING

BOWLING BOARD MEETS

The BNL Executive Bowling Board met on November 9. Highlights of decisions reached were:

1. Individuals are not considered eligible bowlers until the entry fee is paid.
2. A Special Event will be held during the week of December 11, with bowling shirts awarded to the winning team. League secretaries will furnish detailed information.
3. A Mixed Doubles Tournament is planned for February 3, 1962, with details to be announced at a later date.
4. League schedules were firmed up. League secretaries will distribute complete schedules to their team captains.

RED LEAGUE

The H.P. Ins worked the Cosmos over by taking all 4 points. Beckwith's 185/512 didn't hurt at all. Hoyle went 179/486 for the Cosmos in vain.

The Ah So's were very sociable to the H.P. Outs by splitting the loot in half. Brockbanks' 179/473 was high for the Ah So's. For the H.P. Outs, Meinhold rolled a 172 and Caldwell a 156.

The Downunders are planning to change their team name to Up-Overs as they keep plunging ahead with the great help of Carsten, who rolled 197/535 against the Mecas. The latter's high men were Thornhill, 179, and Roberts, 160/469.

The Bacteria Boys will be without light and heat for a while on account of embarrassing the Utilities top bananas to the tune of 3 points. Eagle Eye Berech shot a dandy 204/570. Varela and Iarocci of the Utilities rolled 173/465 and 161/464.

BLUE LEAGUE

The Sleepers took all 4 points from the Bubble Boys. For the winners, Streeter rolled a 208/526.

The Bubble Finks were done in by the Techs, 3-1. Larsen came up with a 214/530 for the Techs.

The Splitters skinned the Skins 4-0, in spite of Borzi's 206. For the Splitters, Sick bowled a 181/504.

The Alleygators took the Needlers, 3-1. For the latter, Majeski had a 180. The Alleygators' Stalmashuk came up with a 193/507.

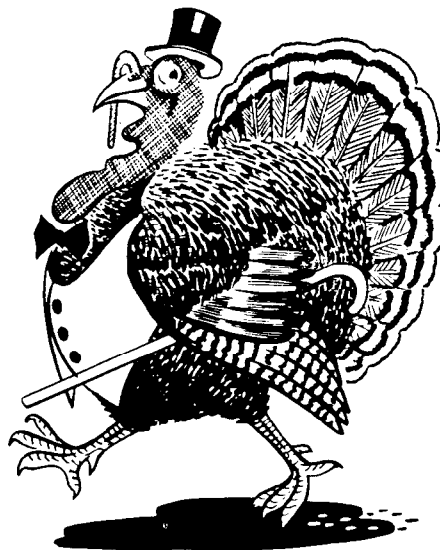
The Leftovers defeated the Nuclides by taking 3 out of 4 points. For the winners, Ruege rolled a 202/524; Kukacka rolled a 178 for the losers.

PINK LEAGUE

The short-circuited Contacts dropped 3 to the Nightingales. Top birds were M. Heine with 142-135-140/417, and L. Hill, who unsplit the 5-10 in a game that ended with 155.

The Allthumbs and the Dipions broke even. Shining for the Dipions were J. Reidl's high game of 173/417, and a 154 game rolled by R. Svendsen.

(Continued on Page 4)



BERA'S THANKSGIVING DANCE

**FRIDAY,
NOVEMBER 17, 1961**

Follow the leader! That wise bird is heading for the first big spectacular in BNL's official fall social season -- the BERA Thanksgiving Dance this Friday, November 17.

Music did you say? Yes, we have music that's tops. Herman Stenzler's Band, after finishing an extended engagement at the Hotel Taft Lounge, will furnish the evening's entertainment. We're sure when you've heard this band, you'll want it back at the Lab again and again.

Costs for this party of parties are \$1.50 each for employee and escort, and \$2.00 each for guests. Prices include free pretzels, chips and ice. Beer, soda, coffee, and hot dogs will be available at a small fee. These items will be served to you by BNL's most courteous bartenders! If desired, bring your own liquor.

Along with our door prize and booby prize, the dance will feature a Twist contest.

MUSIC - 9:00 p.m. - 2:00 a.m. at the GYMNASIUM

LADIES VOLLEYBALL - EXERCISES

Because you have shown an interest in both volleyball and exercising in the Gym, Wednesday evenings at 7:00 p.m. have been set aside in the schedule for you. The first night's activities will be November 22. Bring your gym clothes and gym shoes. Lockers, soap and showers are available. Equipment will be on hand for volleyball, basketball, table tennis, badminton and exercising.

ATTENTION SKIERS AND WOULD-BE SKIERS!

The first meeting of the Brookhaven Ski Club will be held Monday, November 20, at 8:00 p.m. in the Recreation Hall. A Swiss film, "Speeding Skis," will be shown and plans for the coming season discussed. For further information call Ext. 2532.

DISCOUNT TICKETS

Discount tickets are currently available at the Personnel Office, 58 Brookhaven Avenue, for "My Fair Lady" (New York City). Also, there are tickets for the New York Rangers and New York Knickerbockers 1961-62 games.

BASKETBALL LEAGUE

League action will start next Tuesday, November 21, in the Gymnasium, since six teams are entered for the 1961-62 title. Three games will be featured each Tuesday over a 15-week season. Spectators welcome!

First Week's Schedule

6:15 - Biology vs. Chuckers
7:25 - Metallurgy vs. Old Timers
8:35 - Phoubars vs. Untouchables

FISHING CONTEST

Nick Sowiak won the October prize for his 42½-pound cod taken at Montauk. Nick is in the lead with his 733-point fish for one trophy - The all-around fisherman has not been boated yet. Remember, a total of points for each type of fish is used, so three 250-point fish will beat out Nick's 733 points.

This month, John Koehler boated a beautiful striped bass of 41½ pounds to give his 60 points. The fish was caught by trolling at Montauk using a white jig and pork rind.

Be sure to keep the applications coming. Work on either the all around fisherman trophy or go out for cod.

SOLUTION TO CHESS PROBLEM

WHITE	BLACK
1	1 R x P Check
2 K-R1	2 R x P Check
3 K-N1	3 Q-B7 Mate

Or if White answers by
 2 N x R then: 2 Q-B7 Check
 3 K-R1 3 Q - B8 Check, etc.

BERA BOWLING—Cont'd

The Twinkletoes tripped over the Question Marks 3 times. Hitting the mark were I. Detmer with 171/419 and L. Bartos with 157-163/435.

GREEN LEAGUE

The first round has been completed with the Fire Department and the Electrons tied for first place (16-12). In second place are the Old

Timers III (15½-12½); and tied for third are the Old Timers I and II (15-13). Fourth, fifth and sixth slots are occupied by the Black Birds (12½-15½), the Reefers (12-15), and the Gnats (10-18).

High games for last Monday night were: Van Norman, 205/510; Wilson, 210; Horwath, 208; Garafola, 199; Frei, 220/525; Holmquist, 180/514; Lucas, 199/515; and Texiera, 223/535.

CLASSIFIED ADS**FOR SALE**

MODEL A FORD - 1931 conv. deluxe roadster complete with rumble seat & distinction. Very gd. cond. Ideal for restoration hobby or 2nd car. Best offer over \$450. Ext. 2102 or HA 7-6066.

1957 CHEVROLET CORVETTE - Black & silver, 37,000 mi. std. trans, r&h, all new w/w tires. Very gd. cond. Ext. 464 or SH 4-3959.

1955 CHEVROLET - V-8, r&h, w/w tires, '56 Chev. engine, clean. \$500. Atherton, Ext. 2152.

1950 CHEVROLET - Std. trans., r&h, gd. running cond. \$49.95. Ext. 733.

1951 DODGE - R&h, engine overhauled 12,000 mi. ago. Gd. local transp. \$70. Big-gins, Ext. 2212 or MO 1-6754.

1955 OLDS - 4-dr. hardtop, exc. cond. Uphol. like new, guaranteed mechanically. \$550. (With new tires, \$650). Bill, MO 9-9885.

HOUSE - 7 rm. split, dead-end st. in Huntington. Full ½ acre with trees. Liv. rm. with firepl., dining rm., rec. rm., patio, laundry rm., basemt., 3 bedrms., 2½ baths, garage, all appliances, oil hot water heat, storms & screens, extras. Ext. 2102 or HA 7-6066.

HOUSE - Ranch, for sale or rent. Lg. liv. rm., 2 bedrms., blue stone firepl., gas fired to hot air heat, carpeting thruout. ½ acre. Rent. \$95 mo.; selling price: \$15,000. Ext. 440 or HA 2-1367.

HOUSE - Ranch, N. Patchogue. Lg. mod. kitchen, 4 bedrms., lg. landscaped plot. Low taxes; upkeep. Nr. Schools, shopping. \$12,500. GR 5-0168 after 6:00.

HOUSE - California Ranch, Bayport, GI Mortgage. Basemt. with playrm., 3 bedrms., oil heat, full storms & screens, mod. kitchen, oak flrs., landscaped corner plot. \$15,300. Betty, Ext. 574.

STEREO TAPE RECORDER - 1960 Ekotape, orig. \$250, now only \$100. Also 12 rolls of prerecorded tape. Atherton, Ext. 2152.

PURITRON UNIT - Ext. 395.

2 SNOW TIRES, recaps used 4 months, size 640x15, 2 for \$15. Dee, Ext. 301-37

"GOLD HILL CHAIR" - Teak and leather stool. Made in Denmark. Replica of oldest existing piece of furniture in Scandinavia (a.1300B.C.) New in originl box \$25. Fischer, Ext. 618

KITCHEN SET - 5-piece maple, gd. cond., \$15. Also, infant's 2-piece corduroy suit, worn 3 times, \$5 (½ orig. price). Stelzel, Ext. 2254 or SH 4-3120.

WINE PRESS - Sturdy, ex. cond., plus 12 gal. stone crock. \$10. Larry, PA 7-5535.

GAS STOVE - 30 in., gd. cond. Miller, Ext. 301 or SH 4-9085.

PORTABLE TV - Airline, used very little, \$50. Also, 8 in. Craftsman's hvy. duty elect. hand saw with case. \$40. Ext. 612.

SIMMONS HIDE-A-BED - Full-size, Beautyrest mattress, gd. cond. Jim, Ext. 782 or JU 1-1224 after 6:00.

TIRES & EXTRA-WIDE RIMS - 4 each, for beach car, 8.20x15 Chev. \$30. Also, Polaroid light meter, \$5; FM tuner, \$15. Ext. 464.

RME 152A VHF TUNETABLE CONVERTER - Ex. cond. One Millen Modulation Monitor, rack mount, both in operation. Howard, Ext. 2314.

GOLF CLUBS - Comp. set of 8 matched irons. Never used; mint cond. \$40. Reilly, Ext. 2520.

MINIATURE FRENCH POODLES - 9 weeks old. Reasonable. Archambeau, Ext. 301 or AT 1-7514.

FLOOR SPACE HEATER - Gas. Any reasonable offer. Ext. 565 or AT 1-9693.

PENTRON TAPE DECK & RECORDING PRE-AMP - Professional Model, Tape Deck TM-56, 2 speed with 4 pole motor. Preamp P-4 with VU meter, monitor jacks, etc. Unit seldom used. Orig. cost \$170., will sell for best offer. R. Young, Ext. 591.

MINIATURE FRENCH POODLE PUP - Male, 9 weeks old, AKC registered. EM 3-6214.

PLAYPEN - Good cond. \$6. C. Cohen, Ext. 2371.

SHOE ROLLER SKATES - Girl's white, size 3, good cond., \$7. GR 5-2629.

BRITISH ENFIELD RIFLE CAL. 303 - Good cond. \$15. Rumph, Ext. 2221.

GE CONSOLE TV - 1954, 21 inch with fine oak (blond) cabinet, needs work on vertical circuit, picture shrinks. Has new rectifiers and several new tubes. Pic. tube o.k. \$25. Warner, Ext. 425.

PORTABLE TV - RCA 17 in., almost new, incl. antenna. A bargain at \$100. Ext. 778. Y. Osawa.

SNOW TIRES - 2 brand new (used one month) Sieberling, size 7.60x15. \$35. for both. H. Sandberg, Ext. 452.

GERMAN SHEPHERD - AKC registered, male, 2 yrs. old, has all shots, perfect cond. Gentle with children and pets. Leaving Lab., must take best offer. D. Levine, PA 7-4650.

FOR RENT

DUPLEX APARTMENT - Overlooking beautiful pond. One bedroom, living rm, dining area, kitchen, bath. Heat incl. \$125. mo. furnished, \$110. mo. unfurnished. LT 9-6189.

WANTED

MALE KITTEN - Part angora, gray or orange preferred. J. Herbert, Ext. 2100.

HOME FOR BLACK MALE CAT - White diamond spot on throat; 5 mo. old, gd. mouser & personality boy. Ext. 2107.

12 GAUGE DOUBLE BARREL SHOTGUN - Will consider single barrel. Reasonable price. Dmitri, Ext. 2212.

PASSENGER - To share driving on trip south on or about Dec. 21. Beard, Ext. 2445.

SNOW PLOW - For 1961 Jeep. Hambley, Ext. 481 or HA 2-1151.

HOUSE OR APT. - To rent for 1 yr. Must be comp. furnished, with 2-3 bedrms. Pref. west of Lab and not more than 15 mi. away. Petry, Ext. 2212.

EXPERIENCED BABY SITTER - Wishes to work evening and weekends. AT 9-1865.

CAR POOLS

Two riders and driver from Bayport needed. Call Cy Fink, Ext. 346.

Two drivers to complete existing carpool from Holtsville area. Call Ext. 2180.

LOST AND FOUND

LOST - Gold signet ring with initials C.S., sentimental value. Lost on College Visitors Day. Pers. Serv. Ext. 2107.

LOST - One cylindrical metal matchbox containing Sacharine tablets. Has foreign coin attached. Reward, sentimental value. Church, Ext. 424.

FOUND - Pair of eyeglasses in brown case, and keyring with three keys. Pers. Serv. Ext. 2107.

BERA'S THANKSGIVING DANCE**FRIDAY - NOVEMBER, 17**