

ALL-EMPLOYEE MEETING, 10/10

An invitation from Laboratory Director Sam Aronson:

Please join me for an all-employee meeting on Monday, October 10, from 1:30 to 3 p.m. in Berkner Hall. During most of the meeting, we will discuss topics related to the reason we come here each day — to produce the finest science and deliver on our 10-Year Strategic Plan. I'll also talk about the budget, safety

performance and efforts we're making to keep everyone safe, and the Blueprint — both the progress and opportunities to improve.

A question-and-answer session will follow. Questions may be asked live at the aisle microphones. They can also be emailed



to jgreen@bnl.gov between now and the end of the meeting. Questions will be answered as time allows.

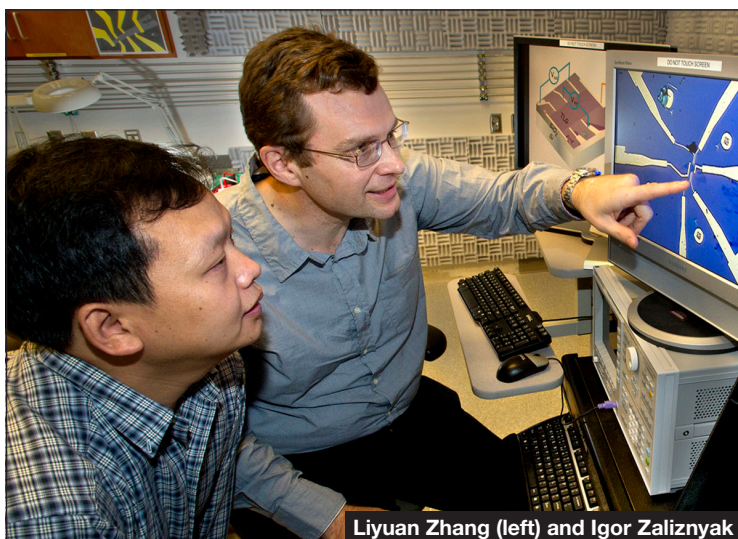
For those who cannot attend the meeting in person, a live webcast will be available at WBNL. Video from the meeting will be archived there as well.

Scientists at BNL Detect Unusual 'Quasiparticles' in Tri-Layer Graphene

Findings reveal new possibilities for manipulating charge and spin in electronic devices

By studying three layers of graphene — sheets of honeycomb-arranged carbon atoms — stacked in a particular way, scientists at BNL have discovered a "little universe" populated by a new kind of "quasiparticles" — particle-like excitations of electric charge. These new quasiparticles have mass, which depends in a very unusual way on their velocity (or energy). Unlike ordinary free electrons, which, according to Einstein's theory of relativity, become heavier when they move faster, or photon-like quasiparticles in single-layer graphene, which have zero rest mass, the newly discovered quasiparticles have mass that increases when they slow down. In fact, they become infinitely massive at rest.

"Our research shows that these very unusual quasiparticles, predicted by theory, actually exist in three-layer graphene, and that they govern properties such as how the material behaves in



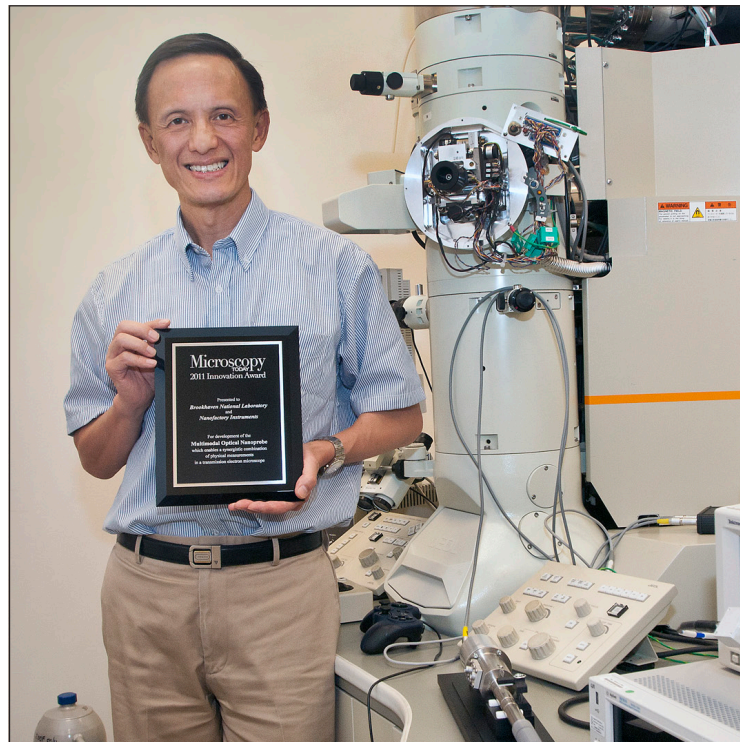
Liyuan Zhang (left) and Igor Zaliznyak

a magnetic field — a property that could be used to control graphene-based electronic devices," said BNL physicist Igor Zaliznyak, who led the research team of Liyuan Zhang, Jorge Camacho, and Maxim Khodas — at that time postdoctoral research associates at Brookhaven — and Yan Zhang,

then a graduate student from Stony Brook University.

Their work measuring properties of tri-layer graphene as a first step toward engineering new electronic devices was published online in *Nature Physics* on September 25, 2011.

See *Quasiparticles* on p. 2



Joseph Rubino D1670911

BNL & Nanofactory Instruments, AB, Win 2011 Microscopy Today Innovation Award Accepted by Team Leader Yimei Zhu

BNL and Nanofactory Instruments, AB, a Swedish company that develops and markets scanning probe microscopy instrumentation, have received the 2011 Microscopy Today Innovation Award. *Microscopy Today* is an academic journal owned by the Microscopy Society of America, an affiliate of the American Institute of Physics and the American Association for the Advancement of Science, and published by Cambridge University Press.

At the Microscopy Society of America's annual meeting in Nashville, Tennessee, August 7-11, 2011, BNL senior physi-

cist Yimei Zhu accepted the award on behalf of the Lab and Nanofactory Instruments, AB. The award consists of a plaque that commends the institutions "for the development of the Multimodal Optical Nanoprobe which enables a synergistic combination of physical measurements in a Transmission Electron Microscope."

Zhu of the Condensed Matter Physics & Materials Science Department (CMPMS) led the BNL team that worked with Nanofactory Instruments, AB, to develop the multimodal optical nanoprobe, which is...

See *Yimei Zhu* on p. 2

BSA Distinguished Lecture, 10/19

Physicist Nima Arkani-Hamed To Talk on 'Space Time, Quantum Mechanics and the Large Hadron Collider'

Nima Arkani-Hamed, a professor in the School of Natural Sciences at the Institute for Advanced Study in Princeton, NJ, will give a BSA Distinguished Lecture titled "Space-Time, Quantum Mechanics and the Large Had-



Nima Arkani-Hamed

ron Collider," on Wednesday, October 19, at 4 p.m. in Berkner Hall. BSA Distinguished Lectures are sponsored by Brookhaven Science Associates, the company that manages Brookhaven Lab, to present topics of general interest to the Laboratory community and the public. The lecture is free, and no preregistration is required. All visitors to the Lab age 16 and older must bring a photo ID.

Arkani-Hamed will explain that fundamental physics started in the early twentieth century with two revolutionary theories: Einstein's laws of general relativity, which explain that space and time are distorted by mass and energy; and quantum mechanics,

which explains the behavior of atoms and molecules. Physicists confirmed these theories with exquisite precision through experiments over the last three decades, but they are still searching for an all-encompassing theoretical structure

that unifies both of them.

According to Arkani-Hamed, combining these two theories shows mathematically that space-time is doomed and the existence of the universe is implausible. Physicists are attempting to understand these discrepancies and may find the answers to the challenges of fundamental physics in experiments at the world's largest and highest energy accelerator, the Large Hadron Collider (LHC) at CERN, the European Organization for Nuclear Research. In his talk, Arkani-Hamed will discuss the great theoretical physics challenges of today and what physicists expect to learn by 2020, based on their studies...

See *BSA Lecture* on p. 2



Roger Stouenburgh D1570911

From left, Bill Morse, Don Von Lintig, and John Benante, with the muon g-2 ring behind them

Physics Phoenix: Plotting the Journey of Muon g-2

"There it is — the world's most beautiful physics experiment," said physicist Chris Polly from a metal footbridge that crosses over the 14-meter blue steel ring of BNL's muon g-2 experiment, now disassembled. A haze of dust hung in the air above Polly and a handful of other physicists and engineers who have gathered together to help resurrect the \$20-million machine by transporting it hundreds of miles to Fermi National Accelerator Laboratory in Illinois.

The main component of the experiment, the largest-diam-

eter superconducting magnet in the world, has lain dormant for 10 years in a spacious hall near Brookhaven's Alternating Gradient Synchrotron (AGS). Until its last run in 2001, the muon g-2 experiment tracked the irregular spin of muons in a magnetic field. This experiment was a precise test of the validity of the Standard Model — the reigning theoretical portrayal of how three of the known four forces (gravity excluded) govern the structure and behavior of all elementary particles.

The experiment was a significant improvement upon a

similar study done at CERN in Geneva, Switzerland, which launched in 1959 to test the effects of electromagnetism on charged particles like electrons, protons, and muons.

Inside a magnetic field, muons (which are heavy, short-lived subatomic particles that result from the decay of pions created when energetic protons smash on solid targets) "look" like tiny tops spinning on an axis. The measurement taken by Brookhaven's muon g-2 experiment is of the exact angle of the axis upon which these...

See *Muon g-2* on p. 3

CALENDAR

• The BERA Store in Berkner Hall is open weekdays from 9 a.m. to 3 p.m. For more information on BERA events, contact Andrea Dehler, Ext. 3347, or Christine Carter, Ext. 2873.

— REGULARLY —

Weekdays: Free English for Speakers Of Other Languages Classes
Beginner, Intermed., Adv. classes, various times. All welcome. Learn English, make friends. See <http://www.bnl.gov/esol/schedule.asp> for schedule. Jen Lynch, Ext. 4894.

Mondays: Yogalates
Noon–1 p.m. at the Rec Hall (Bldg. 317). Registration required, Ext. 2873.

Mondays: Pilates
5:30–6:30 p.m. at the Rec Hall (Bldg. 317). Registration required, Ext. 2873.

Mon. & Thurs.: Kardio Kickboxing
\$5 per class. 12:15–1:15 p.m. in the gym (Bldg. 461). \$5 per class. Ext. 2873.

Mon., Tues., Thurs., & Fri.: Tai Chi
Noon–1 p.m., B’haven Cntr (Bldg. 30), N. Rm. Adam Rusek, Ext. 5830, rusek@bnl.gov.

Tuesdays: Hospitality Welcome Coffee
10:30 a.m.–noon at the Rec Hall (Bldg. 317). Meet over coffee. Children welcome. Ext. 2873.

Tuesdays: Knitting Class
2–4 p.m. at the Rec Hall (Bldg. 317). Learn to knit/crochet — all skill levels. Free. Ext. 2873.

Tuesdays & Wednesdays: Zumba
Tuesdays: Noon–1 p.m., in gym (Bldg. 461). Wednesdays: 5:15–6:15 p.m., at the Rec Hall (Bldg. 317). Registration required, Ext. 2873.

Tuesdays: Toastmasters
Two monthly meetings: 1st & 3rd Tuesdays, 5:30 p.m., Bldg. 463, Room 160. Guests and visitors welcome. www.bnl.gov/bera/activities/toastmasters/.

Tuesdays & Thursdays: Aerobic Fitness
5:15–6:30 p.m. in the Rec. Hall (Bldg. 317). \$5 per class, or 10 classes for \$40. Kathy Schoenig, Ext. 2818.

Tues., Wed., & Thurs.: Rec Hall Activities
5:30–9:30 p.m. in Bldg. 317. General activities, TV, ping pong, chess, games, socializing. Christine Carter, Ext. 5090.

Tuesday & Thursday: Aqua Aerobics
5:30–6:30 p.m., Pool (Bldg. 478). Registration required, Ext. 2873.

Wednesdays: Ballroom Dance
5:30, 6:30, 7:30 p.m., Brookhaven Center (Bldg. 30). Vinita Ghosh, Ext. 6226.

Wednesdays: Play Group
10 a.m.–noon at Rec Hall (Bldg. 317). Parents meet while infants/toddlers play. For events, see <http://www.meetup.com/BNL-Playgroup/>, or call Ext. 2873.

Wednesdays: Yoga
Noon–1 p.m., B’haven Center (Bldg. 30). Free. Ila Campbell, Ext. 2206, ila@bnl.gov.

Thursdays: BNL Cycletrons Club
5 p.m., Brookhaven Center. First Thurs. of month. Andy Mingino, Ext. 5786.

Thursdays: Reiki Healing Class
Noon–1 p.m., Call for location. Nicole Bernholz, Ext. 2027.

Thursdays: Postdoc Social Night
6:30 p.m. ASAP Lounge (Bldg. 462). www.bnl.gov/asap.

Thursday: Judo Class
7:30 p.m. Gym (Bldg. 461). Tom Baldwin, Ext. 4556.

Fridays: Family Swim Night
5–8 p.m. Pool (Bldg. 478). \$5/family. Ext. 2873.

Yimei Zhu from p. 1

...mounted on a transmission electron microscope to measure numerous properties of a sample simultaneously, in addition to imaging.

The nanoprobe measures the optical, electrical, mechanical, and structural properties of nano-sized materials and devices that are magnified from 1,000 to 50 million times. Combining various measurement techniques in one instrument offers a new level of material characterization unavailable by sequential application of the techniques. These capabilities have been streamlined into a single package that, with minimal expense and difficulty, can be integrated into almost any electron microscopy system.

Zhu said, “The nanoprobe enables researchers to simultaneously measure a material’s structural behavior under various stimuli, including electric, optical,

New Anode Could Improve Lithium-Ion Battery Performance

By Wei-Qiang Han, Center for Functional Nanomaterials

With gasoline prices still hovering near \$4 per gallon, scientists at BNL’s Center for Functional Nanomaterials (CFN) are helping to develop electric vehicles capable of driving hundreds of miles on a single charge. A new compound of five tin atoms and one iron atom (FeSn₅) created at the CFN is another development along the road to higher capacity lithium-ion batteries for those vehicles of the future.

Compared to other types of rechargeable batteries, lithium-ion batteries weigh less, can store more electricity for longer periods of time, and can handle more cycles of use and recharging. They are used in some electric cars today, but are not yet powerful enough to compete with cars that can travel 300–400 miles on a single tank of gasoline.

Lithium-ion batteries provide energy as electricity flows from an anode to the device being powered and then back to the battery’s cathode. One way researchers compare batteries with different components is by examining theoretical capacities — how much charge a battery can store theoretically in ideal conditions, and practical capacities — how much charge a battery can store in real-world conditions that are

Quasiparticles from p. 1

Graphene has been the subject of intense research since its discovery in 2004, in particular because of the unusual behavior of its electrons, which flow freely across flat, single-layer sheets of the substance. Stacking layers changes the way electrons flow: Stacking two layers, for example, provides a “tunable” break in the energy levels the electrons can occupy, giving scientists a way to turn the current on and off. That opens the possibility of incorporating the inexpensive substance into new types of electronics.

With three layers, the situation gets more complicated, scientists have found, but also potentially more powerful.

One important variable is the way the layers are stacked. In “ABC” variants, the honeycombs in each stacked layer are offset, stepping upwards layer by layer, like a staircase. So far, ABC stack-

and mechanical ones, and to evaluate its functionality and performance. Here, *simultaneously* is the key. For example, if we want to improve the efficiency of a solar cell to harness energy for the sun, we need to shine a light on the device and measure the electric current it generates at same time, while observing the response of electronic structure and atomic arrangement at specific sites of interest. This capability is unprecedented and is a big improvement over sequentially determining these qualities.”

The nanoprobe can be used in a wide variety of experiments to help scientists understand how optical, electrical, mechanical, and structural properties of functional materials and devices are intertwined. This information is vital to making improvements in optoelectronic systems, such as fiber optic communications, laser systems, remote sensing systems, medical diagnostic systems, and



Roger Stouffer/bnl 00460711

Researchers (standing, from left) Jianming Bai, Wei-Qiang Han, Xiao-Liang Wang, and (seated) Haiyan Chen with empty battery cases that will be filled and assembled to test materials such as the new iron-tin compound.

more similar to everyday use.

Our team found that the practical capacity for anodes of FeSn₅ was 100 percent higher than the ideal capacity for anodes used in conventional lithium-ion batteries. This surpasses the highest performance lithium-ion batteries on the market today. The iron used in the new compound is also non-toxic and less expensive than the cobalt currently used in high-performance lithium-ion batteries. The main issue we encounter, however, is the small number of charge-recharge cycles that FeSn₅ can sustain before

ing appears to give rise to more interesting behaviors — such as those that are the subject of the current study.

For this study, the scientists created the tri-layer graphene at the Center for Functional Nanomaterials (CFN) at BNL, peeling it from graphite, the form of carbon found in pencil lead. They used microRaman microscopy to map the samples and identify those with three layers stacked in the ABC arrangement. Then they used the CFN’s nanolithography tools, including ion-beam milling, to shape the samples in a particular way so they could be connected to electrodes for measurements.

At the National High Magnetic Field Laboratory (NHMFL) in Tallahassee, Florida, the scientists then studied the material’s electronic properties — specifically the effect of an external magnetic field on the transport of electronic

optical information systems.

The nanoprobe is an important tool in photovoltaics research to reveal site-specific optoelectronic properties of materials and devices. In other applications, the nanoprobe can help to determine strain effects on various properties of nanostructured materials, such as quantum dots, nanowires, and graphene sheets. The nanoprobe tip can be pressed on the point of interest in a sample to investigate the local stress response and strain distribution.

BNL designed and built the laser system and holder for the nanoprobe. Also, BNL funded the construction of the device’s holder by Nanofactory Instruments, AB. In addition to Zhu, members of the BNL team included Mirko Milas and Jonathan Rameau, both postdoctoral fellows; and Matt Sfeir, an assistant scientist in the Center for Functional Nanomaterials. Brookhaven Science Associates, the company

its capacity drastically degrades.

Xiao-Liang Wang and I made the new iron-tin compound at the CFN’s material synthesis facility using preformed, nano-sized, spherical templates of tin and a conversion chemistry process. Then, we inserted the sample anode into a lithium-ion battery and tested the cell in a series of cycles.

When our tests showed that the FeSn₅ anodes could lead to a lithium-ion battery with a significantly higher practical capacity, scientists Jianming Bai, Haiyan Chen, and Trevor Tyson

charge as a function of charge carrier density, magnetic field strength, and temperature.

“Ultimately, the success of this project relied on hard work and rare experimental prowess of talented young researchers with whom we engaged in these studies, in particular, Liyuan Zhang, and Yan Zhang,” said Zaliznyak.

“These results provide experimental validation for the large body of recent theoretical work on graphene, and uncover new exciting possibilities for future studies aimed at using the exotic properties of these quasiparticles,” Zaliznyak said.

This research was funded primarily by the DOE Office of Science’s Basic Energy Science Office; work at the NHMFL was funded by the National Science Foundation and the State of Florida. For more information, go to www.bnl.gov/today/story.asp?ITEM_NO=2597.

— Karen McNulty Walsh

that manages BNL for DOE, has applied for a patent on the device. *R&D Magazine* chose the nanoprobe as one of the top 100 technological achievements of the year in 2011.

To see a video of the new nanoprobe, go to www.bnl.gov/bnlweb/pubaf/pr/PR_display.asp?prID=1327.

— Diane Greenberg

AdoptaPlatoon Mum Sale, 10/13

Please mark your calendar for Thursday, October 13, to go to Berkner parking lot, 11 a.m.–1 p.m., when the Brookhaven Veterans Association’s AdoptaPlatoon team will sell mums (that’s chrysanthus to the Brits!), raising funds for sending care packages to troops abroad. Bldg. 400 lobby is the fallback site in case of rain. Thank you for your support.

used x-ray diffraction at the National Synchrotron Light Source to document the new material’s crystal structure. Then, scientists Meigan Aronson, Mikhail Feygenson, Wei Ku, and Chia-Hui Lin used a magnetometer and other tools to measure the material’s magnetic properties. The findings showed that the compound might also be useful in magnetic storage devices such as hard drives for computers.

This is very exciting work, but FeSn₅ is not ready for commercial use. Our next steps are to study other aspects including its charge-recharge cycle limitations, because FeSn₅ is one of a number of reported materials with high capacity. Real solutions will combine high capacity with high cycle life.

The work at BNL was supported by the DOE Office of Science (Basic Energy Sciences) as well as its Office of Energy Efficiency and Renewable Energy, and Vehicle Technologies programs. Funding was also provided through BNL’s Laboratory Directed Research & Development program, which promotes innovative and exploratory research. Scientists who collaborated on this research represent several other institutions, including the New Jersey Institute of Technology, Stony Brook University, the University of Tennessee, and Oak Ridge National Laboratory.

BSA Lecture from p. 1

...at the LHC about the fundamental nature of the universe.

Nima Arkani-Hamed, a theoretical physicist, earned a B.Sc. in physics and mathematics from the University of Toronto in 1993 and a Ph.D. in physics from the University of California, Berkeley, in 1997. He did postgraduate work at the Stanford Linear Accelerator Center before joining the Berkeley faculty in 1999. In 2001, he joined Harvard University as a professor of physics, before moving to his current position at the Institute for Advanced Study in 2008.

A member of the American Academy of Arts and Sciences, Arkani-Hamed was awarded the Gribov Medal of the European Physical Society in 2003 and the Raymond and Beverly Sackler Prize awarded by Tel Aviv University in 2008. He delivered the Messenger Lectures at Cornell University in 2010.

— Diane Greenberg

LIANS Dinner Meeting, 10/20

With talk by BNL’s Musolino

At the next dinner meeting of the Long Island Chapter of the American Nuclear Society (LIANS), on Thursday, October 20, Stephen Musolino of BNL’s Nonproliferation & National Security Department, will talk on “The DOE Response to the Radioactive Releases from the Fukushima Nuclear Power Plant.”

The meeting will be held at Brickhouse Brewery & Restaurant, 67 W. Main St., Patchogue, (631) 447-2337. Complimentary appetizers/cash bar will start at 6 p.m., dinner at 7 p.m., and Musolino’s talk at 8 p.m. The cost is \$25/person, which has been in part defrayed by LIANS. To reserve, leave a message with Arnie Aronson, Ext. 2606, by Tuesday, October 18.



The gang's all here — or almost. This 1995 photograph shows many members of the muon g-2 team gathered around the world's largest superconducting magnet, which was built at BNL's Alternating Gradient Synchrotron for the E821 experiment.

Muon g-2 from p. 1
...subatomic dreidels tilt and whirl, which differs slightly from the Standard Model and is often referred to as the “anomalous magnetic moment” of the muon.
By the time the experiment reached the end of its run in 2001, researchers at BNL with collaborators at 11 other institutions had measured what an article in *symmetry breaking*, a joint publication of Fermilab and SLAC National Accelerator Laboratory, described as “a tantalizing discrepancy” between theory and experiment.

The precision of the measurement taken at Brookhaven could point to the existence of new physics beyond the Standard Model, of as-yet-undiscovered particles associated with muons, or of an invisible substructure to muons themselves, which are currently thought to be elementary particles.
“Muon g-2 at Brookhaven confirmed a significant deviation from the existing theory,” said Polly, who is project manager of the Fermilab endeavor. “Now, muon g-2 needs more data and confirmation from a higher precision experiment, which we’ll be able to build on top of the existing accelerator complex at Fermilab. This complex is uniquely equipped to reduce some of the statistical limitations of the Brookhaven experiment.”

Ten years after it ceased taking data at Brookhaven, muon g-2 is scheduled to embark on a cross-country journey from the woods of Long Island to the plains near Chicago, where scientists at Fermilab will refill its storage ring with muons created at Fermilab’s Antiproton Source. Along the way, many components of the experiment, including its high-precision detector, will go through improvements at Brookhaven Lab, Boston University, Fermilab, and Cornell University, among other institutions.
“Muon g-2 at Fermilab will be a pretty straightforward move — they’ll build upon the infrastructure and design already established at BNL,” said



Got the Coil on a String!
In April 1992, as the Bulletin reported, the world's largest superconducting coil “on a string” was hanging not from a finger but from a massive crane outside Bldg. 919. Three coils had been constructed inside the building. The third and largest coil was pulled on special heavy-duty tracks past a removable wall to the outdoors, attached to the crane, then lowered into its final position on the foundation that held the two previously completed inner coils within the building. Work then continued to ready the experiment for the storage ring’s commissioning scheduled for December 1993.

Bill Morse of BNL’s Physics Department, resident spokesperson for muon g-2 at BNL. “This collaboration is a great example of how our national labs unite together to improve and build upon the things they specialize in. Muon g-2 needs to take a lot more data, and Fermilab can provide a beam of muons that can produce events four times more frequently than we can at Brookhaven.”
Morse elaborated, “If we tried to create that kind of intense beam here using the AGS, we’d end up with a pile-up of muons inside the ring — which is kind of like the subatomic version of the worst traffic jam on the Long Island Expressway. At Fermilab, however, they can

boost the number of muon cycles injected and create events in a more balanced way, so that there’s never any ‘rush hour’ inside the ring.”
Polly worked on muon g-2 as a graduate student in the 90s and returned to BNL this summer to begin the process of disassembling the experiment so that the collaboration could begin research and development for the upgrade. The meeting between BNL and Fermilab physicists and engineers this summer was the first time the teams came together to survey the facility in person and hammer out some of the technical challenges of the project.
Many of the scientists and engineers present to look over

the semi-vacant experimental ring were part of Brookhaven’s muon g-2 project when it was first built. While researchers from both labs walked the perimeter discussing how to reconstruct the machine (all the while taking pictures with their smart phones for visual backup), they recounted the trials of trying to build each component of the unique superconducting coil.
“The magnet we built here at BNL is a work of art of engineering,” said Morse. “Its three superconducting coils are huge, yet they create a magnetic field that we can measure to within a fraction of a part per million.”
Because they needed such a precise magnetic field to measure muon spin and get meaningful results, the magnetic coil built 20 years ago at Brookhaven was constructed as one solid piece, which creates certain challenges for the Fermilab team.
“While the 650-ton muon storage ring can be taken apart and shipped via trucks to Illinois,” said Polly, “the monolithic 14-meter diameter cryostats with superconducting coils inside are a little harder to move down the highway, which you’d have to shut down completely — and on some of the roads leading out of Brookhaven, you’d be taking out power lines trying to get the ring through.”
The plan right now includes picking up the coil from Brookhaven using a Sikorsky S64 airframe (the kind of heavy-duty helicopter that can lift an army tank), placing it onto a barge for transport through the Saint Lawrence Seaway and down through the Great Lakes to the shores of Chicago, where another airframe helicopter will ferry it home to Fermilab.
The new muon g-2 experiment passed a DOE peer review last year and researchers expect the first of five stages of approval from the DOE to come early in 2012. If all goes to plan, the next incarnation of muon g-2 will start taking data within five years. — Emily Ruppel

CALENDAR

October: Healthfest Month

To register for events and for more information see <http://intranet.bnl.gov/healthfest/>.

— WEEK OF 10/10 —

Monday, 10/10

***All-Employee Meeting**
1:30-3 p.m. Lab Director Sam Aronson invites all employees to discuss the 10-Year Strategic Plan, the Blueprint, and safety. All are welcome. See p.1.

Wednesday, 10/12
Healthfest 2-Mile Site Walk
Noon-1 p.m. Register, you will be sent a map. See link above.

Table Tennis Doubles
5 p.m. Rec Hall, Bldg. 317. Pre-register with Michael McGuigan, mcguigan@bnl.gov

Thursday, 10/13
***Adopt-a-Platoon Sale of Mums**
11 a.m.-1 p.m. Berkner Hall parking lot. The Brookhaven Veterans Association’s Adopt-a-Platoon team will sell mums to raise funds to send packages to troops abroad. Bldg. 400 lobby in case of rain.

Ballroom Dance Demo, Mini-Class
11:30 a.m. - 1:30 p.m. Dance Club members present & teach dances at all levels of skill. All welcome.

Friday, 10/14
Healthfest & Biathlon 5-km. Runs
Noon. Start at Biology, Bldg. 463.

— WEEK OF 10/17 —

Monday, 10/17

Healthfest Fair
11 a.m.-1:30 p.m. Berkner Hall lobby. Health screenings, exhibits, raffles. All are welcome.

Wednesday, 10/19
BSA Distinguished Lecture
4 p.m. Berkner Hall. Physicist Nima Arkani-Hamed to talk on “Space-Time, Quantum Mechanics and the Large Hadron Collider.” All are welcome. Visitors to the Lab of 16 and older must carry a photo ID.

Arrivals & Departures

— Arrivals —

Chin-Hao Chen	Physics
Yu-Chen (Karen) Chen..Phot. Scis	
Damien Forthomme.....	Chemistry
Yu Maezawa.....	Physics
Xiangbo Meng	Chemistry
Rashmi Sinha.....	HR/OMC
Vladimir Skokov.....	Physics

— Departures —

Thomas Alfstad.. Sust/En/Technols	
John Barry	C-AD
Guillaume Beuf	Physics
Ralph Brown	Physics
Rama Calaga	C-AD
Elisabeth Caparelli.....	Medical
Hai-Dee Lee	Medical
Joseph Indusi	NNS
Jinfeng Liao	Physics
Qiong Liu.....	Medical
Ryoichi Miyamoto.....	C-AD
Marie Thomas.....	Chemistry
Bernadette Whelan.....	Medical
Oliver Witzel.....	Physics

Please remember to donate cans to the BNL Food Drive. Food is urgently needed.

TIAA-CREF One-on-One Retirement Counseling

A TIAA-CREF consultant will visit BNL on October 19, November 2, November 17, November 28, December 8, December 14, and December 21 to answer employees’ questions about their financial matters.

The consultant will help you: understand the importance of protecting your assets against inflation, find the right allocation mix, learn about TIAA-CREF retirement income flexibility, and compare lifetime income vs. cash withdrawal options. For an appointment, call 1-800-732-8353 or go online at www.tiaa-cref.org/bnl and select “set up a meeting.”

Wanted: BNL Art & Crafts for Fall Show, 11/21-23

BNL artists, photographers, sculptors, and crafters — your most beautiful work is needed for the BNL Art Society’s upcoming Art and Crafts Show sponsored by the BNL Art Society, the BNL Photography Club, and the BNL Crafts Club at Berkner Hall, Monday-Wednesday, November 21-23, 11:45 a.m.-1:30 p.m. An opening reception with refreshments will be held on Monday, November 21, 5-6:30 p.m. BNL employees, retirees, facility users, guests of BNL, and family members 15 years and older, may all contribute up to three pieces, to be shown as space permits. Exhibits for the show must be delivered to Room C, Berkner Hall, 2-4 p.m. on Friday, November 18, and collected on Wednesday, November 23, 1:30-3 p.m. A reliable friend may deliver and/or collect the work being exhibited.

To be included in the catalog, send your name, phone number, your exhibit’s title (if there is a title), the type of work (photograph, painting, wood/metal sculpture, needlework, etc.), and a short description (medium, material, size, etc.) to Liz Seubert or Joe Gettler, Bldg. 400C, or email the information to lseubert@bnl.gov or jgettler@bnl.gov by Monday, November 14.



Peter Pohlot

Peter Pohlot of the Environmental Protection Division and Mina Talai of the Modernization Project Office saw opportunities to improve safety for their fellow employees here at the Lab, and they took action. Each one identified a specific problem, came up with a creative and effective solution, and proposed it to the Safety Solutions (S2) Program and Lab leadership. The ideas were approved and have been implemented. Check out the videos made about these projects at <http://intranet.bnl.gov/safety/videos/>.

Safety makes science possible at Brookhaven National Laboratory

<http://intranet.bnl.gov/safety>

Talai and her colleagues saw the multiple levels in Berkner as an impediment to people who have trouble navigating stairs. The solution? An American with Disabilities Act-compliant ramp. The ramp lets people in wheelchairs get to all three levels of Berkner. Now the building is ADA compliant and safer for all.

Pohlot saw that Lab staff,

who often work late into the night, had to go from their buildings to their cars in the dark — a potentially dangerous situation. So he suggested installing solar-powered LED lights, which were less expensive than regular street lights connected to the electrical grid. Now BNL's night owls have a well-lit path outside their buildings.



Mina Talai

These good ideas make the Lab's work environment safer.

The BNL S2 Program is designed to seek out health and safety improvements and corrective actions derived from employee suggestions. The program helps demonstrate Brookhaven's commitment to make safe operations an integral part of the BNL operating philosophy.

The S2 Program is open to all BNL employees, users, and visitors. Selection of projects is made by the S2 Council, which has representation from BNL

science, operations, and support organizations. Members of the S2 Council are a good resource and sounding board in the development of proposals. The Council reviews S2 proposals and awards funding to those projects that best meet the approved criteria.

More ideas have become successful projects, which you can see in the series of videos available at <http://intranet.bnl.gov/safety/videos/>. For more information, see www.bnl.gov/esh/shsd/OHSAS/S2_homepage.asp.

— Will Safer

Classified Advertisements

Current job openings and a statement of job placement policy at BNL are available on the homepage at www.bnl.gov/HR/careers/. To apply for a position, go to www.bnl.gov and select "Search Job List." For more information, call Ext. 2882.

Motor Vehicles

03 SAAB 9-3 – 86.2K mi. looks, drives like new, loaded, lt gray, orig owner, heatd seats, leather, a/t, fwd, alarm, highest safety ratings. \$6,500 neg. Ext. 2830.
02 TOYOTA AVALON – 92K mi. silver w/ gray thr int., clean safe car, gar, new tires, single owner, no accidents, minor dents, maint records. \$8,200. Erich, 744-6423.
00 MAZDA 626 – 150K mi. a/c, a/t, p/s, p/w, p/l. Good mechanical cond, moving out of the country. \$2,200 neg. Guillaume, gbeuf@quark.phy.bnl.gov.
00 BMW 323i – 174K mi. 5 spd, 6cyl, 4 dr, blk, lthr p/s, s/roof, ABS, elec stab cntrl, trip comp, fr & head air bags, a/c, p/l, p/s, p/w, c/c, am/fm/xm/cd. \$4,900. pisarski@bnl.gov.
99 VOLVO V70R – 144K mi. exceptionally well maintd, awd, turbo. \$5,500 neg. Mark, Ext. 3970 or mwahlert@bnl.gov.
99 JEEP CHEROKEE – 123 K mi. 6 cyl, 4L, 4wd, no accid, a/t, p/w, p/l, new batt, shock absorbers, brakes, belt, pics @ www.phy.bnl.gov/~wangzhe. \$2,500 neg. Ext. 5879.
99 FORD RANGER XLT – 63K mi. 3.0L V6 eng, 4wd, a/t, ABS, bed liner/cover, trailer tow wire-harness/front tow hooks, after-market CD player. \$6,000 neg. 666-5289.
96 LINCOLN TOWNCAR – runs well, looks gd. \$1,500 neg. James, 278-5818.
95 BUICK LESABRE – 85K mi. new batt, eng mounts, struts, brakelines, water pump, a/c, new am/fm/cd/mp3 player, runs well. \$4,500 neg. Ext. 3932.
94 CADILLAC DEVILLE CONCOURS – 54K mi. mint, gar, all options, metallic red, tan top and int. \$6,600. Dominick, dsavino@bnl.gov.
BLACK & DECKER JUMP STARTER – 300 Amp instant jump starter never used, still in box, no longer need, Google: model# VEC010BD \$40/neg. Will, Ext. 7139.

Furnishings & Appliances

ANTIQUE FOLDING TABLE – mahogany, open 51"Lx29.5"H x 37"W, 18.5" w/ folded, in gen gd shape, some dings ask/\$195. Marty, 874-3478.
BUNK BED – twin loft, like new from casco kids, \$800. James, 345-0865.
COMPUTER DESK – 26.5"d x 35.5"w x 33"h, \$100, pics avail. Chris, Ext. 7365 or stelmach@bnl.gov.
DINING ROOM TABLE & CHAIRS – 36x54 birchwood top table w/18" leaf & 4 chairs, pics avail, \$50. Lynn, Ext. 5960.
DINING ROOM TABLE, CHAIRS – w/ cherry finish, 4 matching chairs, 64"L extends w 18" w/insert, excel cond, \$300. Robert, Ext. 3225, 821-9888.
KITCHEN TABLE – Small, Formica table w/wooden legs and 4 wooden chairs/\$50. Caitlin, Ext. 7432, 495-7397.
KITCHEN TABLE & CHAIRS – light Maple table w/leaf, 60"x36", 4 spindle back chairs, excel cond, \$300. 678-3299 or dgbdoug@gmail.com.
LEATHER SECTIONAL – 5 pc, med brown w/2 built in recliners, new cond, pd/\$4000, ask/\$1999. Joseph, Ext. 2567 or jsullivan@bnl.gov.

ENTERTAINMENT CTR – Raymour & Flannigan 5pc w/wall unit, pd/\$2K, ask/\$600, mahog w/lighted glass cabinets, DVD storage w/42"TV Console; 516-578-4546.
REFRIGERATOR – old but works, range hood/fan, b/o. Karl, Ext. 3116.
REFRIGERATOR & BIKE – compact re-frig/\$15, 10 spd bike/\$45, baby cart 1/set \$35, all in gd cond. 882-0840.
SIMMONS CRIB & DRESSER SET – color light wood, incl, new daybed attach, excel cond, like new, ask/\$400. 946-9673.
SOFA BED, COUCH, LOVESEAT – Jennifer Lther Q, microfiber, pd \$1,300 ask\$400,<3 yrs old. 516-578-4546.
THOMASVILLE BED – q/size, no mattress or box spring, all wood, Bridges Collection, pix avail, \$125. sabell@bnl.gov.
TWIN BED – mattress/boxspring Little Tikes Car Bed/blue, call for pics, \$150, 240-350-0174.
WASHER & DRYER – Whirlpool washer/\$75; Kenmore nat gas dryer/\$50; GE selfcleaning nat gas range/\$50, all work well w/pic up. Joseph, 585-0655.
WHIRLPOOL DRYER & WASHER – elect dryer in perf cond, washer's upper agitator does & final spin does not work/\$100/both, pic up in Stony Brook. Tsong-Lun, Ext. 2389.

Audio, Video & Computers

CAMERAS – Minolta 35 mm X 700 camera, w/case, flash, xtra lens; Minolta 35 mm XG-7 cmra, flash attachmt. \$50/ea, photo avail. Chris, Ext. 7365, stelmach@bnl.gov.
FAST DESKTOP PC – AMD quad core, 4GB RAM, 500GB, 23" LG LCD, Fresh Windows 7 install, \$400. mwahlert@bnl.gov.
GATEWAY 555GE – 3.0GHz P4, 1GB RAM, new 250GB HD – few yrs old but runs well, Fresh Windows XP install, \$75. Mark, Ext. 3970.
INK CARTRIDGE FOR HP PRINTER – HP 57 Color, brand new, not refilled, in sealed pkg/\$15. Ed, Ext. 2041.
LCD TV – 32" Philips, 720P, 32PF7421D, USB, S-video, HDMI, component, antenna conn, like new w/remote, \$250/neg. j, Ext. 3930 or jakoncic@bnl.gov.
MACBOOK – 13", white, 2.16 GHz w/OS X (10.5.8), w/VGA & DVI adapters, neoprene case & pwr cord, excel cond, \$400/neg. 344-2209 or bourassa@bnl.gov.
MONITOR/SURGE PROTECTOR – HP 1702, 17" flat scrn mon, \$50; data shield P125 srge protctr, \$50; pics avail for both. Chris, Ext. 7365 or stelmach@bnl.gov.
PRINTER SYSTEM – HP Home Digital Photo Studio w/HP Photosmart 435 digital camera, 3.1 mp res, photosmart 7260 printer + 3 ink cartridges, \$150. 790-6431.
SUBWOOFERS – 2/Infinity Reference 860W subwoofers, 8", fully enclosed, 250W RMS ea, under 6 mos old, little use, \$100/pc or \$175/pr, neg. 201-230-2251.

Free

LAPTOP MEMORY – 1x1Gb Samsung PC3-10600 DDR3-1333MHz 204-Pin laptop mem. 2x512Mb Hynix DDR2 RAM PC2-4200 200-Pin SODIMM laptop memo. Xianbo, Ext. 5008.

Sports, Hobbies & Pets

BIKE RACK – Schwinn 4-Bike Hitch Mount, fits 1-1/4" & 2" sq hitches, like new, \$50. Gary, Ext. 7779, gstevens@bnl.gov.
BOXER PUPPIES FOR SALE – 8 wks old, male/female, fawn and brindle, vet certified, tails docked, 1st shots, dewormed, ready to go. 775-0664.
FISH TANK – 20 gal 30"x12"x12", incl cover, pump, filter, light, \$25. John, Ext. 2667.

PIANO – SPINET – Martin Bros, upright, excel cond, u-pic-up, \$500/neg. Chris, 281-0623 or elliott@bnl.gov.
SKI EQUIPMENT – size 11 Nordica boots, precision 74" skis w/marker bindings, etc, \$100. Don, 286-1396.
VIOLA FOR SALE – 16" Viola, Howard Core model, made in 2000, v/gd cond, \$1300/obo. David, Ext. 5203.

Tools, House & Garden

CHIPPER/VACUUM – Troy Bilt, 5hp, excel cond w/vac hose attachmt, additl suction scoop, chips to 1.5" branches, 10/1 leaf vol reductn, ask/\$275. Marty, 874-3478.

Miscellaneous

CHILDREN'S ITEMS – Boy sz 6 mo-2yrs, girl 12 mo-2T, \$1/ea, Botterscotch Fureal Pony excel/\$100, Vtech Pink game console, girls 12" bike, more. mmccabe@bnl.gov.
KITCHEN ITEMS – Pfaltzgraff dish set of 8, cream w/blue & green on edge, serving bowls & plates (2 of ea.) & milk/sugar. Pfaltzgraff flatware. mmccabe@bnl.gov.
MOVING SALE – bicycle, Tomtom GPS, mobile DC to AC inverter, laptop, vacuum, router, simple furn, adorable cats, etc, pics at www.phy.bnl.gov/~wangzhe. Ext. 5879.
SAT/ACT PREP BOOKS – Kaplan PSAT & SAT, 2010 ed; SAT word dictionary, Princeton Review Manual for the SAT version 4.1; all v/gd cond., orig/\$70, ask/\$35. 516-241-4598.

Happenings

CAR SHOW AT BIG DUCK RANCH – Friends of The Big Duck's classic car show, Sun, Oct 9, at Big Duck Ranch, Rt. 24, Flanders, 9-4 PM. Spectators \$5. Raffle prizes, two 50/50 drawings! Neil, 284-3737.
HELLO DOLLY PLAYBILL – Help the east end Seniors get scholarships by advertising in the Playbill of the November Production of Hello Dolly, at The Riverhead HS. Business or chip in on a dept ad. Glenn, Ext. 5036.
MUMS FOR SALE – Thur, 10/13, 11a-1p Berkner prkg lot. Proceeds go to Adopt-a-Platoon for items to ship overseas. If it rains, go to 400 Lobby. Joanne, Ext. 8481.

Lost & Found

KEYS – found, 6 keys on lanyard w/CVS, Stop n Shop cards & sm non-working flashlight, file cabinet keys? Mike, Ext. 2947.

Wanted

ADOPT-A-PLATOON – Monetary donations gratefully accepted towards mailing shipments to our platoon stationed overseas and to send goodie packages to BNL family members. Thank you. Joanne, Ext. 8481.
BNL FAMILY MEMBERS IN MILITARY – If you have a family member that has been depoyed overseas, please contact Adopt-a-Platoon so we may send them a goodie package. Joanne, Ext. 8481.
DONATIONS OF DOG/CAT FOOD – For pets of struggling families/elderly and/or Kent Animal Shelter, Collection bins are in Bldgs: 134, 400, 510 (X5864) 725, 901 and 902. Kathleen, Ext. 3161 or kratto@bnl.gov.
IRON DAY BED – antique or similar. Ext. 5090, 457-3231 or ccarter@bnl.gov.
QUEEN MASTER BEDROOM SET – preferably wood in great shape, pics would be appreciated. Susan, slattuca@bnl.gov.
RENTAL IN FLORIDA – looking to rent accommodation apt, condo, etc, on Florida's east coast for the wk of April 8-12, 2012. 375-2680 or philmar39@optonline.net.
ROOMMATE – female to share my Moriches condo-gated, furn BR, pvt bath, w/d, kit share, incs util, 15 min BNL, no smkg/pets, \$1000 + 1 mo sec. Sallie, Ext. 2746.

Two BERA Trips

Buy tickets in the BERA Store in Berkner Hall, weekdays, 9 a.m.-3 p.m. Coaches leave BNL from the Brookhaven Center. Tickets are non-refundable. Under 21s must be accompanied by a BNL employee or parent.

Do As You Please in New York City: Sat., 12/10. Drop off in the Bryant Park area. Depart BNL at 10 a.m. and leave NYC at 7 p.m. \$15 per person. Children under 2 who sit on your lap are free.

Christmas Spectacular at Radio City Music Hall: Sun., 12/11. Depart BNL at 7 a.m. and leave NYC at 3:30 p.m. 90-minute show starts at 9 a.m.; seats are 3rd Mezzanine. \$70 for adult or child (all must have a ticket): includes admission and transportation.

WHEELCHAIR – light weight. Christine, Ext. 5090, 457-3231 or ccarter@bnl.gov.

For Rent

SPRING HILL – priv ranch on Gulf, 70m Orlando, 45m Tampa, fly Islip dir, nr beach/tennis/park, SW architecture, 3/bdrm, 2/ba, d/r, f/p, 2gar, igp in lanai, fruit trees, review. oktane.net/HouseTour. \$400/wk. 344-5537.
CENTER MORICHES – Col home, walk to all, 4 bdrm, 2 ba, family rm, office, new kitch & heating syst, walk-in attic, full bsmt, 2 car gar, fully fenced, \$2200 neg plus utils, nonsmks only. short or long-term, avail part-furn if desired. 513-6688.
CENTER MORICHES – 3 bdrm, 2 bath, unfurn hse, cac, w/d, beach/boating rights, 10 min to Lab, util not incl, no smkg/pets, avail Dec 1. \$1,950/mo. Ext. 3116.
LAKE RONKONKOMA – 1 bdrm, no smkg/pets of any kind, all incl w/priv prkg. \$950/mo. dmcarthur@bnl.gov.
MANORVILLE – 2 bdrm, 2 bath furn Townhse, no pets, gated community, + util, 7 mos/max, 10 min to BNL, \$1,400/mo. 352-688-9136.
MASTIC – new 1 bdrm apt, full bath, fully equip new eik, new carpeting/paint, priv ent, 8 min to BNL, walk to shop, util incl, no smkg/pets, 1/mo sec. \$750/mo neg. 339-3444.
MEDFORD – 3 bdrm, 1 bath, unfurn hse, fen in backyd, pets ok, 15 min to Lab, utils not incl. \$1,800/mo. 790-0843 or ruga@bnl.gov.
MIDDLE ISLAND – 1 bdrm, l/r, full kit & bath bsmt apt, int/phone/prv ent/drwy, incl all, quiet, strictly no smkg/pet, BNL employee only, 1/mo sec, \$850/mo. Ext. 7020, 672-2451.
MILLER PLACE – 2 bdrm lg furn apt w/priv ent, 2 full bths, l/v, new eik & appls, hdwd flrs thr, incl all utils + cable+ 1 mo sec, no smkg/pets, 7 mi to BNL. \$1,300/mo neg. 598-9928.
MILLER PLACE – newly renov, spacious, 1 bdrm apt, l/r eik, full bath, priv ent/prkg on quiet cul-de-sac, 10 min to Lab, no smkg/pets, \$1,000/mo. Denise, 831-2374.

RIDGE – 1 bdr, apt, l/r, kitchenette, full bath, sep, ent/prkg, mins fr Lab, no smkg in apt, incs all. \$975/mo. Lynne, 924-0002.
RIDGE – rm for rent, v/close to Lab, new carpet/paint, utils incl plus int. \$600/mo. 917-721-2277.
ROCKY POINT – 2nd flr legal 1 bdrm apt, new full bth, huge eik, l/r, priv ent, quiet st, no smkg, access to priv beach, incl water, heat, cable TV & wireless int. \$1,025/mo. Kim, Ext. 3085.
ROCKY POINT – 1 bdrm apt w/pvt ent/ yd, eik, prkg spot on drwy, quiet neighborhood avail Nov 1, no smkg/pets, 5 min to Lab, all incl. \$1,150/mo. 516-458-3130.
ROCKY POINT – 1 bdrm lower-end unit apt, own bckyd, lg ba, eik w/side windw, lg l/v, new cac/heat, no smkg/pets, util incl water, gas, cross st from schls. \$1,000/mo neg. 593-4403.

ROCKY POINT – 2-3 bdrm, 2 bath, lg storage shed, 10 mi to BNL, 14 mi SBU, nr beach & stores, fenced backyd, incl water, cookg gas. \$1,500/mo. 525-6648.

SHIRLEY – furn apt 3 rms total, grnd flr, l/r bdrm combo, lg eik, full bath w/tub, all util incl TV/int, off-st prkg, extra bdrm/\$200, avail Dec/1. \$1,050/mo. Kathrin, kmueller@bnl.gov.

SHOREHAM – share hse w/professional, lg/furn bdrm, cable, int, no smkg/pets, 8 mi to BNL, avail now, \$675/mo. 744-3543, 578-0108/cell, gg19582003@gmail.com.

SOUND BEACH – 1st flr of the hse, 2 bdrms, kit, l/r, full bath, incl utils. \$1,500/mo. Shoko, 204-2414.

WADING RIVER – 3 bdrm, 2 1/2 ba, hse w/ jacuzzi, kit, laundry, l/r, d/r, bsemt, deck, 1 acre, SWRSD. Sec. dep., income verif., cred. chk. req. Pets ok w/pet sec. dep. Utils. not incl. \$2,900/mo. 943-9107.

WADING RIVER – 1 bdrm waterfront apt, part furn, l/r, d/r, full bath, kit, hardwd flrs, 2nd flr, priv ent, v/quiet, incl util, no smkg/pets, 1 mo sec. \$1,100/mo. 929-4886.

YAPHANK – fully furn spacious studio apt for one, hi spd int/all util incl, quiet area 5 min to BNL, no smkg/pets, avail 11/7. \$850/mo. 516-205-6712.

For Sale

SPRING HILL, FL – priv ranch on Gulf, 70m Orlando, 45m Tampa, fly Islip direct, near beach/tennis/park, SW architecture, 3/bdrm, 2/bath, d/r, f/p, 2gar, igp in lanai, fruit trees, see review.oktane.net/House-Tour. \$125,000 neg. 344-5537.
MANORVILLE – Condo/Townhse, over 55, 2 bdrm, 2.5 bath, Loft/Den, skylights, bsmt, attach gar, patio, low HOA fees, under 10 mins to Lab. \$249,900 neg. Linda, Ext. 2383.
MILLER PLACE – Ranch style, 3 bdrm hse in Scott's Beach Club, new cust kit, porceln tile flr, cherry cabnts, stainless appli, quartz counters, hdwd flrs, den, l/r, cath ceilings, \$399,900 neg. 804-8668.
RONKONKOMA – Col, 4bdrm, brand new 2.5 ba, Connetquot SD, landscaped prop, cac, 2 zone heat, extras, move in ready, nr LIE, LIRR, airport. \$395,000 neg. Kathleen, Ext. 4503, 737-6483.
WEST SAYVILLE – 3 bdrm Col w/upstairs sitting rm, 2 full ba, d/r, 2 level sunrm w/ gas heat, sunken l/r w/f/p, full bsmt, det 1.5 car gar w/loft above, walk to town. \$399,000. Kathy/Stan, 567-5966.

In Appreciation

To all my steady customers at the Starbucks kiosk in Bldg. 400: Thank you for all your business, and I hope you have a sparkling day! — Barbara
To all who remember to bring in cans for the BNL Food Drive. Thank you so much.