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February 2014

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Quote of the Month: "Facts are the air of scientists. Without them you can never fly." - Linus Pauling."

A WORD FROM THE:

Administration

Accelerator Div.

ES&F Div.

Acc. R&D Div.

Operations

▶ Arrivals/Departures

 Safety Stats

NOTE FROM OUR CHAIR: Thomas Roser



At the end of February the Electron Ion Collider Advisory Committee (EICAC) met at BNL to hear presentations on the science case for a future Electron Ion Collider (EIC) and on the plans for building such a collider either at BNL or JLab in Virginia. The EICAC is an international committee advising the directors of these two labs. For this meeting the main question was: what do we need to do to make the best possible case for an EIC during the upcoming Nuclear Physics Long Range Planning process.

Over the last few months a team from C-AD and Physics have put together a design study for an EIC at BNL, eRHIC. The design, of course, uses the polarized proton and heavy ion beams of one of the two RHIC rings and then adds a 21.2 GeV high intensity electron accelerator. The electron accelerator consists of an 1.32 GeV linear accelerator and two beam transport rings located inside the RHIC tunnel. The electrons will pass through the linear accelerator up to 16 times to reach 21.2 GeV energy. This design can reach very high collision rates, is very cost effective, mainly by using the existing RHIC facilities, and can cover the full science case of an EIC without needing major future upgrades. This last point was also highlighted by the Advisory Committee as critical for a successful proposal for this future collider.

VIEW [CONFERENCE PROJECTIONS FOR 2014](#): **DUE ASAP**

DID YOU KNOW??

Lets Celebrate Bob Lockey - 50 years service – February 1, 2014!

Check out who received an employee Service Award this year! 2014 Collider-Accelerator Dept. employees who received a [Service Awards](#). Last yeas Service Awards are listed [here](#). 2012 Service Awards are listed [here](#).

Windows XP - End of Life - As all of you have heard, Windows XP will not be supported by Microsoft after April 14, 2014.. [read more](#) from Nick Franco

EVENTS/SEMINARS...



Check out the [BNL Calendar](#) for upcoming events & Seminars or the [Upcoming Conferences & Workshops](#) page for workshops and Conferences happening at BNL.

March 11 - (Bldg. 510 - LSR | 3:30) Physics Colloquium, "The Evolution of the LHC Experiments Toward the High Luminosity LHC;" Presented by Francesco Lanni, BNL

Philadelphia Flower show! - *Alyssa Lamberti* nicely gave us some of her personal photos from the Philadelphia Flower show that BERA advertises every year.. These pictures are amazing and a must see! See pictures of the Botanical Gardens [here](#).



UNITED WAY - C-AD

C-AD Bake Sale raised \$536

C-AD Pizza/Star Trek Lunch raised \$259

[\(See pictures of the Pizza party here\)](#)

Your contributions are very much appreciated!

WHAT'S GOING ON IN OUR NEIGHBORHOOD?

Interested in Cycling? No Cycling Events at this time

Interested in Running or Walking? Check out the [lirunning March Calendar](#) for the following events: May the road rise up to meet ye 5k (Patchogue); Smithtown Rotary Run 5k & 1 mile fun run; Kings Park 15k; LIRRC Jack Dowling 5k (Eisenhower Park) & more..

March 11 - (Patchogue | 7pm) [PubScience](#) "PubSci is a science café presented by the Brookhaven National Laboratory Stakeholder Relations Office"

March 13 - (Berkner Hall B | 6:30pm) Community Advisory Council Meeting

March 14 - (Berkner Hall | 12:30) United Way Fundraiser - Treasure Chest Event Drawing and Star Trek

March 18 - (Bldg 400 | 12pm) Tax Overview Workshop for Visiting Foreign Nationals

March 18 - (Bldg 5110 - LSR | 3:30) Physics Colloquium "Topological Materials at the Nanoscale" presented by: John Tranquada

March 20 - (Brookhaven Center | 8:30am) BWIS Career Day

March 25, April 1 & April 8 - (Bldg 510 - LSR | 3:30) Physics Colloquium "TBA"

IN OTHER NEWS...

Heroes of the Higgs (A movie) BY DENNIS OVERBYE The documentary *Particle Fever*² tracks the ultimately successful search at CERN for a linchpin of modern theories about the universe. [Read more..](#)

The National Science Foundation has just announced the winners of its 2013 International Science & Engineering Visualization Challenge..... [See the winners here](#)

Viewpoint: Encouraging Signs on the Path to Fusion~ [Read about it.](#) Last August, the National Ignition Facility at Lawrence Livermore National Lab reported a major milestone on the path toward laser-powered inertial fusion. Now, a paper describing the experiments has been published. Steven Rose of Imperial College explain's the paper's significance.

DAY AT THE VINEYARDS...

Macari Vineyard - [MATTITUCK] March 8 - Ray Anderson Band; March 29 - Barrel Tasting & food tasting with the frisky oysterer

Duckwalk North - [SOUTHOLD] No Events Posted

Duckwalk South - [WATER MILL] March 8 - Live Music; March 22 St. Patrick's Day Dinner

For the Kids Ringling Bros & Barnum & Bailey: Legends (March 5-10); Disney Junior Live! (April 3&4) @ [The Nassau Coliseum](#).

Stony Brook Events:

Running Scared, Running Free: Escape to the Promised Land - Until March 14 (10am-12pm-) Long Island's history comes alive with an interactive theatrical performance based on oral history. Experience this live, on-stage drama about the links between the Underground Railroad, secret codes hidden in quilts and the strength of the human spirit in the struggle for freedom.

An Evening with Psychic Jim Fargiano - March 20 (7-10pm) Join us for an evening of inspiration and amazing connections when renowned medium and psychic Jim Fargiano shares his gift and helps you understand the connection you can have with your loved ones on the other side. The cost for this three hour program is \$50 per person, and also includes wine and a chocolate dipping fountain, signature truffle tray and chocolate dipped fruit platter from ChocolateWorks, coming to Stony Brook Village in March. Space is limited, so reserve early to avoid disappointment.

Long Islands got Talent! - April 4 (6:30-8:30pm) The Ward Melville Heritage Organization's Youth Corps is proud to once again present its annual musical talent show. Registration is now underway for vocalists and instrumentalists aged 10-17 to have a chance to share their music at a preliminary round performance on Friday, April 4th.

Nassau Coliseum -

Upcoming shows: Demi Lovato, Miley Cysrus & Sonu Nigam

Spring Craft Beer Festival - March 22



Home Hot tub & Landscape Show

APRIL 4-6

Castello di Borghese Vineyard & Winery - [CUTCHOGUE] ** Vineyard Tours & Wine Tastings Every Thursday & Sunday @1pm & FREE Jazz Every Saturday (2-4) with Marguerite Volonts**

Jamesport Vineyards - Feb 8th-Mar 16th: [Live on the Vine](#) (Acts and times TBA)

Martha Clara Vineyards - [RIVERHEAD] - **Live Music every weekend**
March 8 - Double Play; 8 Winter Cellar Experience; 9 - The Brothers Caldon; 14 - Bangers & Mash Concert; 15 Firefly Acoustic Duo; 16 - The Jukebox Explosion; 21 - The Groove Gumbo Collective; 22 - Jon & Anthony's Acoustic Jam; 22 - Winter Cellar Experience; 23 - Ed Travers; 29 - 2 man Acoustical Jam; 30 - Henry Haid & Only in America Band; APRIL 5 - Wedding Expo; 6 - Double Play; 12 - Joe Taylor

Palmer Vineyards - [RIVERHEAD] APRIL 6 - Paint & Sip

Pindar Vineyards - [PECONIC] - No Events Posted

Baiting Hollow Farm Vineyard - [CALVERTON] *Music every Sat & Sun from (2-6)*

Paumanok Vineyards - [AQUEBOGUE] No Events Posted
August 5-15, 2014 - Paumanok Mediterranean Wine Cruise

Check out Erik Forsyth's Travel's:



[HTTP://WWW.YACHTFIONA.COM](http://www.yachtfiona.com)

NOTE FROM OUR ADMINISTRATION: Kerry Mirabella

Project Management:



Ideas can be brilliantly challenging. RHIC and all of its various upgrades are the result of someone/some team having an idea, and daydreaming about “what if”. When an idea transitions from the possible to the probable C-AD starts discussions with a funding agency to gauge interest, timing, and funding possibilities. Once we receive a cautious thumbs-up, the real work begins, and C-AD Project Management gets involved.

Bob Van Wormer and I provide the Project Management support at C-AD, and occasionally at Physics as well. A project, by definition, has a defined beginning and end date for particular scope to be delivered. RHIC itself was originally a project, but once completed it became a program. Project Management is the process of planning, organizing, motivating and controlling resources (time, people and dollars) to accomplish the proposed scope within the dollars and end date provided.

Our efforts begin with scope definition and setting up a WBS (Work Breakdown Structure) to organize the estimating and scheduling efforts and provide a framework for eventual budgets and charge numbers. Bob is our Master Scheduler, developing the tasks/timeframes/resources with each subsystem estimator. Depending on the size of the project, I create various DOE documents (Execution Plans, Risk and Milestone lists, etc.) that document how C-AD plans to run the project. Once an estimate/proposal is funded Bob and I begin assessing progress and providing status to DOE during telecons and onsite reviews until project completion.

Recent new projects at C-AD include:

BLIP Raster project, a ~\$5M upgrade to BLIP being funded by the Office of Nuclear Physics (ONP), which will increase isotope yield and sharply reduce target fatigue/replacement by rotating beam pulses in 2 circles with different radii.

ATF-II is a High Energy Physics (HEP) funded effort to relocate the Accelerator Test Facility from its current home in building 820 to a spacious area in building 912, allowing for additional beam lines. We (the ATF-II team) presented our case last October at a competitive proposal review (Fermi and SLAC were the other contenders) and received word in February that BNL would be funded. The price tag for ATF-II is also ~\$5M, but comes with additional operating funds from HEP and ~\$2M in Program Development funds from BSA to add a 100 TW laser.

Next up:

New proposal efforts for Low Energy RHIC electron Cooling (LEReC) will begin in April, with an early estimated cost of ~\$10M. During an upcoming Technical, Cost, Schedule and Management (TCSM) review with ONP July 9-11 2014 the LEReC team will present the case for this 3+ year effort as the proof of principle for eRHIC.

NOTE FROM OUR ACCELERATOR DIVISION: Wolfram Fischer



As of this writing the low-energy part of the RHIC Run-14 is coming to a successful end. This year the cool-down from about 80K to 4K happened in a record time of only 3 days. The following setup from cool-down to physics took only 9 days, and was as short as planned despite the fact that beam work this year started later due to 56 MHz SRF installation. The RHIC Machine Specialists Travis Shrey, Greg Marr and Vincent Schoefer led the setup effort, before handing over to Christoph Montag, the RHIC Run Coordinator for the low energy part. For this run a lattice was used that is suitable for operation with electron cooling, the largest upgrade project over the next few years. We plan to run a with cooling in 2018 and 2019.

The new 56 MHz SRF cavity cryo and rf installations continue, and with a damper inserted the cavity does not affect the beam. Progress is also being made in the electron lens commissioning. The team around Roberto Than, Don Bruno, and Theo Samms cooled and powered the superconducting solenoids, and Xiaofeng Gu could transport the first electron beams through both lenses.

NOTE FROM OUR EXPERIMENTAL SUPPORT & FACILITIES DIVISION: Phil Pile



We continue to deliver low energy gold beams at center of mass energy of 15 GeV to STAR and PHENIX with a target date of completion on Tuesday March 11. After this we will switch to the high energy gold-gold run at 200 GeV where STAR and PHENIX will utilize the vertex detector systems to study heavy quark production.

BLIP has been running well with good beam condition for RbCL irradiation and Sr-82 medical isotope production. In the pipeline are a special 3-week exposure for LARP target studies at 200 MeV starting March 18th and an additional short (1-day) Thorium foil irradiation study at 180 MeV in support of the Ac-225 R&D effort in collaboration with ORNL and LANL

We are preparing for the coming runs for National Reconnaissance Office NRO and NSRL experiments. The NRO run is scheduled for Tuesday March 25th through Saturday March 28. The NASA sponsored NSRL will follow starting March 31st and run through June. These are the second runs this fiscal year for both entities as NSRL experiments began on 7 October and ran through 15 November followed by a one week run in support of the (NRO).

NOTE FROM OPERATIONS: Paul Sampson



The Low Energy setup for RHIC was quickly established early last month and Physics has been running since February 15th. High energy running will begin mid-month and continue for ~15 weeks. Prior to beam work in RHIC, setup of for both the low and high-energy running was completed. Major goals including setup of both RHIC ramps, RF conditioning, and DX training were all successfully completed. During the switch to High Energy, the final steps of installation for high level and commissioning and setup of low RF will be completed.

During access periods and Maintenance, installation upgrades and commissioning of major systems continues, with major focus on the 56MHz cavity, CeC Stochastic cooling.

Work in the AGS also continues including preparation for polarized protons and installation of e-IPMs. The Main Magnet continues to be powered by the Westinghouse MG set while diagnosis and repair of the Siemens Cyclo-converter continues.

BLIP continues to run well. A full 200MeV energy run is scheduled for March and preparations for this have been ongoing behind target changes. Maintenance for BLIP and LINAC will continue to run on a separate schedule, synchronized to these scheduled target changes.

In the pre-injectors, work on the EBIS source and progress with the laser ion source installation also continues while preparation of the Booster and R lines has begun in anticipation of the upcoming NRO and NSRL runs.

The CAD CATV system display includes daily updates including Testing, power disruptions and outages as well as important dates. This information can also be seen on the web at [RHIC Broadcast](#).

To view a list of the approved work for maintenance days or the shutdown, go the [Job Request System](#) and select the appropriate date. This link is behind the firewall and requires privileges to view.

For schedule updates see: [This Week, which can be viewed by all](#).

Note from Accelerator R&D Division: Ilan Ben-Zvi



eRHIC design:

The Electron-Ion Collider Advisory Committee, which met on Feb 28 - Mar 1 at BNL, looked over collider designs developed in BNL and Jefferson Lab, and reviewed physics reach of these machines. We presented at the Committee the eRHIC design based on Fixed Field Alternating Gradient (FFAG) recirculation passes as well as the status and plans of related R&D. Using the FFAG approach allows us to reach the electron energy as high as 21 GeV at expected reasonable cost. The Committee did not see any serious drawbacks or deficiencies in this design. The paramount importance of R&D items such as the demonstration of Gatling Gun polarized source technique and the Coherent Cooling Proof-of-Principle experiment was stressed out.

LARP Group:

A DOE Technical and Management review of the LARP was held in Fermilab during February 17-18. With committee members of various backgrounds, the review covered all the participating programs in LARP including superconducting materials and magnets, accelerator systems, beam instrumentation, personnel development, and LHC accelerator commissioning efforts. We presented the crab cavity activities in BNL, with successful testing results and active collaborations. The committee commented on the significant and important contributions to the crab cavity R&D, suggested that the US should have a leading role in the production phase. The committee supported the crab cavity program on demanding for sufficient funding, as well as provided us with pertinent recommendations.

Photocathode Group:

The Gatling gun and the Cathode preparation Tree was assembled for the first time at the system integrator Transfer Engineering in Fremont California and while under vacuum the cathodes were successfully transferred between the preparation system and their locked down position in the cathode shroud and then back again without any dropped cathodes. We successfully performed the exact operations that would be needed during phase one testing.

The actual GaAs cathodes to be used in phase 1 testing were installed into the cathode preparation Tree and after bake out the Tree assembly was transported and installed at the testing contractor in Palo Alto California.

The ATF Group:

DOE has approved the ATF Upgrade Proposal, and practical implementation of this 3-year project will commence soon. A new user facility will feature 4 experimental halls (1 presently), up to 500 MeV electron beam lines (80MeV now) and 100 TW CO₂ laser (1 TW now). This will strengthen the ATF's position at the forefront of the advanced accelerator research.

ATF activities in February included preparation of the CO₂ laser and a beamline for UCLA's nonlinear inverse Compton scattering experiment, which will run over the next 3 weeks of March.

The Muon Accelerator Group:

6-D cooling of muon beams is a critical component necessary for a Muon Collider and is now recognized as a beneficial addition to a Neutrino Factory complex.

Two approaches for the implementation of a 6-D cooling channel have been pursued within the U.S. Muon Acceleration Program (MAP). An approach featuring RF cavities filled with high-pressure hydrogen gas has been pursued by a team at FNAL while an alternative approach utilizing vacuum RF cavities immersed in high magnetic fields is being considered by a team here at BNL. This past month has featured the submission of conceptual designs for each approach. This represents a first step in a yearlong process to choose the baseline for a 6D cooling system, which can eventually be used in a Muon Collider complex.

Low Energy RHIC electron Cooling:

The LEReC accelerator design based on ERL is progressing well. Simulation results show that the required beam quality for $\gamma=4.1$ can be achieved with proper chosen RF phases, voltages and initial laser beam shape. The ERL zigzag injection can be reused as is.

Two approaches to the beam transport for the ERL beam in the RHIC tunnel are being evaluated, and the actual layout in RHIC tunnel has started.

The DOE Technical Cost Schedule and Management review of LEReC is scheduled for July 9-11.

Energy Recovery Linac:

At ERL site the significant milestone has been achieved: the injection line vacuum components have been installed. Now the ERL Gun and ERL Linac are connected. In current configuration the SRF Linac can be first time used to accelerate the beam. Thanks everyone who made it happened (especially vacuum group).

Instrumentation group continues installation and connecting the beam diagnostics.

The first beam test scheduled for the April 18. (More detailed schedule is attached and can be seen at ERL wiki page:

http://www.cadops.bnl.gov/ERL/ERLWiki/images/e/e5/140228_ERL_First_Beam_Straight_Only.pdf)

During previous tests of the ERL Gun with cathode the strong multipacting problem limited us to run the Gun in CW mode operation. With our new understanding of this issue the smaller cathode radius and deeper grooves structure cathode insert has been designed. Simulation shown that this cathode insert will be multipactor-free. We plan to manufacture this insert as soon as possible and test it in ERL SRF gun.

Preparation for high power commissioning of the gun is under way. The extraction line magnets have been measured. Beam dump is getting ready to be

installed as soon as first beam test run. The Internal Accelerator Readiness Review (IRR) has been scheduled for April 3-4. The ARR will follow soon after that.

Preparations for the low power beam test are under way. The first beam from the SRF gun is expected in mid-April. A new cathode, free of multipacting, is being designed. Computer simulations show that the new cathode geometry is indeed multipacting-free. As soon as we confirm that there are no thermal or mechanical issues with the new design, an order will be placed to fabricate the cathode.

56 MHz SRF cavity for RHIC:

The cavity was installed for the RHIC run. At this point it is detuned and damped, awaiting completion of its cryogenic, RF, and motion systems.

CeC PoP:

The 112 MHz SRF gun is installed in the tunnel and we continue assembly of various components during RHIC maintenance days. The cathode cart was vacuum baked. The FPC assembly will be installed soon. Fabrication of a cryomodule for the 5-cell BNL3 cavity is in progress at Niowave. The company is making progress with the cryomodule design, which should be confirmed and approved during a Critical Design review, tentatively scheduled for May.

Budker-INP assembled the helical undulator hardware and going to install magnets and proceed with tuning.

SRF VTF:

The BNL3-1 cavity, fabricated by AES, is being prepared for its first vertical test. It is expected to begin in about one week. Vertical testing of the second BNL3 cavity (fabricated by Niowave) will follow shortly after that.

Coherent electron Cooling:

ARRIVALS: Welcome!

Gordon Corbin ~ Transferred from Superconducting Magnet Division on March 1, 2014, working with Tony Arno

Patrick Harris - Transferred from Superconducting Magnet Division on March 1, 2014, working with Nick Franco

Richard Meier - Transferred from Superconducting Magnet Division on March 1, 2014, working with Len Masi

Frank Teich- Transferred from Superconducting Magnet Division on March 1, 2014, working with Mike Mapes

Kevin Kobasiuk ~ Moved from Maintenance Support, Machine Operations Group to the FES, Waters Systems groups on March 1, 2014

DEPARTURES: Farewell, you will surely be missed..

Susheng Xin- (Access Controls) - Transferring to Photon Sciences March 10, 2014

Tyler Pontieri - (FES) - Last day March 28, 2014

Guest Notices:

Frank Schmidt - CAD Guest Last day way Feb. 16, 2014

Anton Kolmogorov- (Research Collaborator) Last day is March 24, 2014

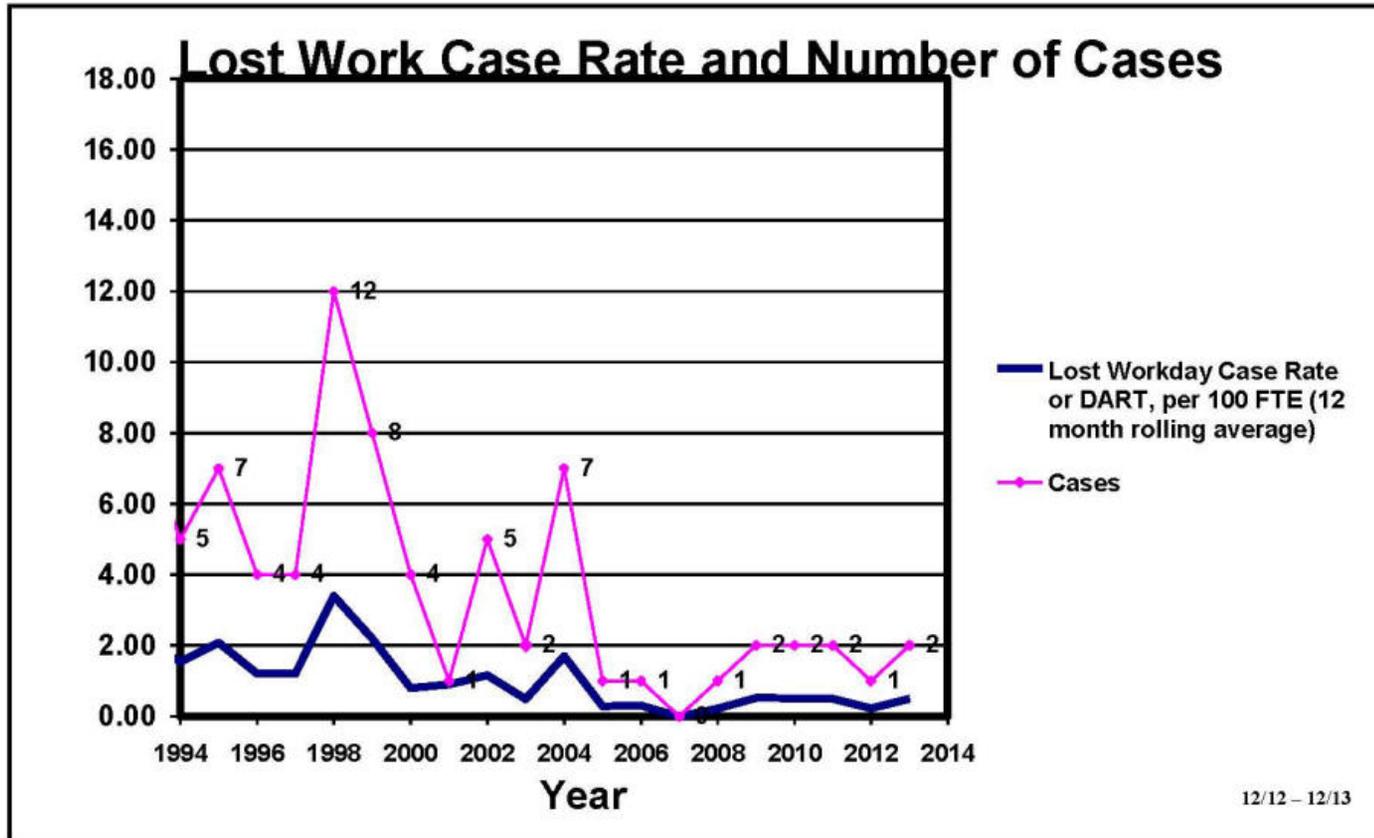
Renat Voskoboynikov - (Technical Collaborator) Last day is on March 25, 2014

Aria Soha - (Technical Collaborator) Last day is March. 29, 2014

Rossano Giachino - (Guest Scientific Associate) Last day is March 31, 2014

Nikolay Stupishin - (Research Collaborator) Last day April 1, 2014

Paul Goergen - (Guest Jr. Research Assoc.) Last day is April 30, 2014



C-AD Occupational Injury Statistics

For Year 2013 For Year* 2014

First Aid Cases	5	1
Recordable Cases	3	0
Lost Work Cases	2	1

* Calendar Year through 12/13

PHILADELPHIA FLOWER SHOW: Thank you Alyssa Lamberti for the photos

Every year we have a BERA trip to Philadelphia to see the botanical gardens and every year there is a different theme. This year was "Articulture: Alyssa and Ann Lamberti attended the trip and Alyssa came back with these amazing photos!







UNITED WAY: C-AD

Thank you to all who participated in the United Way events that Paul Sparrow was kind enough to put together, and thank you to all who assisted Paul.

Here are some pictures of the pizza party..



