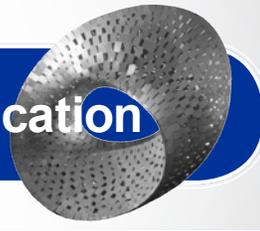


 **Fermilab Friends for Science Education**





**FERMILAB FRIENDS FOR
SCIENCE EDUCATION**

ANNUAL REPORT

2012



P.O. Box 500, MS 226
Batavia, IL 60510-5011

<http://fermilabfriends.org>

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Fermilab Friends' graphics incorporate an image of one of Robert Wilson's best known sculptures, Möbius Strip. Slicing a Möbius strip lengthwise results in two interlinked loops, an appropriate metaphor for the relationship between FFSE and the Fermilab Education Office: separate, yet tightly linked.

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Ken and Paula Spengler

TREE OF LIFE

Young-Kee Kim and Sidney Nagel

Billie Young

FROM THE FERMILAB DIRECTOR

May 16, 2013

Dear Fermilab Friends for Science Education:



*Piermaria Oddone,
Director Fermi National Accelerator Laboratory*

What a history of excellent education programs Fermilab Friends for Science Education has supported. Congratulations on your Thirtieth Anniversary. National interest and support for STEM (science, technology, engineering and mathematics) education has had its highs and lows over these thirty years, but at Fermilab there has always been a vision to share the unique expertise and resources of Fermilab with educators and students.

Without your support we could never have achieved the breadth and excellence that are the hallmarks of the Fermilab programs. It has been a model for other institutions and for our sponsoring agency, the U.S. Department of Energy. Over the last decade we have reached hundreds of thousands of students and tens of thousands of teachers—a fantastic record that benefits the nation.

As we all work toward developing the future STEM workforce and stimulating science literacy, educating teachers, students and the public will help further Fermilab's new vision:

*Fermilab is America's particle physics laboratory.
Our vision is to inspire the world and enable its scientists
to solve the mysteries of matter, energy, space and time
for the benefit of all.*

The constancy of the support of Fermilab Friends for Science Education has anchored our science education program and has permitted us to design new, creative ways to engage our youth in scientific inquiry. The support of Fermilab Friends for Science Education is now more important than ever in seeding these initiatives so that the next generation of young scientists may flourish.

Sincerely,

A handwritten signature in black ink that reads "Piermaria Oddone". The signature is written in a cursive, flowing style with a long horizontal line underneath.



FROM THE FFSE PRESIDENT

May 17, 2013

Dear Friends,

As Fermilab Friends begins 2013, we celebrate 30 years as a passionate organization.

Friends was formed in 1983, the same year that *A Nation at Risk* was released. This report, by the National Commission on Excellence in Education and submitted to the Secretary of Education, brought to national consciousness the alarming conditions and failures of public education.

That same year, Fermilab Friends embarked on a partnership of sorts. We began making connections between scientists doing cutting-edge research at Fermilab and teachers who wanted to give their students the best experiences learning science. Looking back at 2012, it is clear that we still play an important role in making those connections.

We are excited to be helping the Education Office fulfill a dream to develop a physics playground, part of the original vision for the Lederman Science Center. With funds from the Kane County Riverboat Fund, an anonymous donor and Fermilab, we have realized the first stage of the project, commemorating the Tevatron with a one-of-a-kind activity, *Run Like a Proton*. (See back page.) Funding for future phases of the playground are being explored.

This report highlights programs that are now staples for families and students: the Family Open House, the Outdoor Fair and the STEM Career Expo. Schools, teachers and families appreciate our program scholarships that cover workshop fees, field trip transportation, and family Science Adventure fees. Your support makes these programs and opportunities possible.

We continue to offer members' events, such as the Fermilab History, Art and Architecture tour presented in June 2012 by docent and annual report editor, Anne Mary Teichert. Plans are underway for an early November physics tour. Watch your e-mail for details.

We are so thankful for the continuing interest and support of our Fermilab Friends for Science Education members. We want to be an organization that involves you. If you have suggestions for contacts for funding, for membership, or for member events, please contact me.

STEM (science, technology, engineering and mathematics) education has become as prominent today as *A Nation at Risk* may have been in 1983. It is a continuing challenge to connect teachers and students with scientists and engineers, but Fermilab Friends provides an important support system to the Fermilab Education Office in their efforts to do just that. Teachers, students and families more than ever look forward to learning about STEM with the scientists and engineers of Fermilab. You play a big role in this effort.

Thank you for your support.



*Susan M. Dahl,
President Fermilab Friends for Science Education*

A handwritten signature in blue ink that reads "Susan Marie Dahl". The signature is written in a cursive style and is contained within a white rectangular box.



PROGRAMS IN 2012

SCHOLARSHIP RECIPIENTS

Every year FFSE provides scholarships to teachers who wish to attend workshops at Fermilab. Joanie Novack, a 5th grade teacher from Littlejohn Elementary School in DeKalb, attended the Phriendly Physics workshop this past summer and sent the following comment about her experience:

“The Phriendly Physics workshop was one of the best pro-

fessional development opportunities I have ever attended for science. The information and activities were all related to what I teach. I have been able to use several of the engaging experiments to supplement my (poor) science curriculum. The kids have really enjoyed the projects a lot and have learned from them.”

BOARD CHANGES IN 2012

The past year saw a number of changes to the FFSE board:

Norman Ramsey, an honorary director of Friends since its creation, passed away on November 4, 2011. Dr. Ramsey was a Nobel laureate in physics in 1989 and one of the key figures in the founding and evolution of Fermilab. The Fermilab auditorium is named after him.

Bruce Chrisman, an *ex-officio* board member of FFSE for many years and chief operating officer of Fermilab, retired in October of 2012 after a 42-year career at the lab. (See appreciation below.)

Recently, the FFSE board welcomed **Jack Anderson**, Fermilab’s new chief operating officer, as an *ex-officio* member. Anderson comes to Fermilab after serving as director of the Office of Integrated Performance Management at Oak Ridge National Laboratory. In the past he held several key management positions at Princeton Plasma Physics Laboratory.

In July, the FFSE board welcomed **Gregory R. Meeder** of the legal firm Holland and Knight as *pro bono* general counsel to the board. Greg’s experience with Fermilab in construction law and government contracts, among other fields, and his firm’s expertise in the not-for-profit sector have already proven to be a great asset.

Bruce Chrisman: In Appreciation

Bruce Chrisman, an *ex-officio* board member of FFSE for many years and Chief Operating Officer of Fermilab, retired in October of 2012 after a 42-year career at the lab.

Bruce’s history predisposed him to an interest in science education: he calls himself a “Sputnik scientist,” part of the generation that benefited from federal investment in science education in the 60s after the USSR launched the Sputnik satellite.

He graduated with a Ph.D. in physics and began his career at Fermilab, working in computing. He moved on to Yale University and was there when the influential 1983 report “A Nation at Risk” was released. His acquaintance with Bart Giamatti—then president of Yale and a member of the committee that produced the study—increased his interest in science education.

Upon returning to Fermilab a few years later, Bruce involved himself in educational issues as a board member of Glen Ellyn School District 41.

In the early 90s, when Leon Lederman made his push for

science education at Fermilab, Bruce was ready to contribute.

He knew Stanka Jovanovic and Marge Bardeen, founders of Friends, and so with his interest in education and his role at the lab, he was a natural fit for the FFSE board.

As COO of Fermilab, Bruce has seen the respect which the DOE has for Fermilab’s education program.

He says it is considered one of the best, and probably *the* best educational program in the DOE complex. Friends has certainly played a role in that achievement, he observes.

Though much is currently changing at Fermilab, Bruce is confident that in the future the lab will continue to make important contributions to science education.

In particular, he feels that education programs here play a critical role in giving students a feel for the excitement of science. His one wish, he says, is that

the DOE would contribute more money to this effort.

We wish Bruce well in his retirement and remain grateful for his service to FFSE and science education through the years!



Bruce Chrisman with Stanka Jovanovic and Marge Bardeen at Stanka’s retirement party in May of 1996.

PROGRAMS IN 2012

FERMILAB FAMILY OPEN HOUSE

The Fermilab Family Open House, Fermilab's "party for children who bring an adult with them to learn about the world of physics," was a success again in 2012. Held in April rather than February due to renovations in the Wilson Hall atrium, the event still drew more than 1,500 people.

Presentations included numerous hands-on activity stations, scientist-led talks and tours, Ask-a-Scientist sessions, and hourly cryogenics shows by Mr. Freeze, (Fermilab engineer Jerry Zimmerman).

For a second year, area high school physics students hosted activities that



Hamilton High School students demonstrate the Bernoulli effect to visitors at the open house.

they themselves designed and built for the event. This year's contributing high schools were Carl Sandburg High School (Orland Park), Cristo Rey Jesuit High School (Chicago), Hamilton High School (Hamilton), Naperville Central High School, and Northside College Preparatory (Chicago).

Responses from children and parents were uniformly enthusiastic. Said one parent, "We brought one child interested in science and left with a family in love with science!"

As always, the Family Open House was free of charge and made possible by an anonymous donor to FFSE.

STEM CAREER EXPO

The fifth STEM Career Expo brought more than 500 students and parents to Fermilab on April 11. The event gave them the opportunity to speak with more than 70 professionals in nearly 30 technical fields and to learn about educational and career paths.

The annual event draws high school students at all levels, including younger ones, whose career exploration is just beginning, and older ones who are already considering college options.

Students and parents once again found the event helpful and inspiring. Said a Batavia High School sophomore, "Keep this expo going for years to come. It is quite beneficial to the youth in exploring these careers." A Somonauk High School

sophomore commented, "Great opportunity—completely open [sic] up many new job opportunities and ideas for my future."



A Downers Grove High School junior concurred: "Excellent! I don't know why I didn't go last year!"

A parent's remarks underscored the ongoing influence of the event: "This is our 2nd year here and my oldest was more focused about what she

wanted to explore. I think you offer a lot and do a fabulous job. We will be here again next year, I am sure."

The annual event is free and presented under the sponsorship of FFSE, Batavia High School, Geneva Community High School, Northern Kane County Region EFE 110, and Valley Education for Employment System (VALEES).

FAMILY OUTDOOR FAIR

June 10, a sunny Sunday, brought about 450 visitors to the Lederman Science Center for the annual Fermilab Family Outdoor Fair. An array of activities aimed at children from first through seventh grades covered the grounds around the LSC.

Children dug through decaying logs for insects, made animal tracks, touched rabbit pelts and hawk feathers, discovered fossils in rocks and compared their stature to that of a bison.

Others learned about the yearly course of the sun at the sun dial, or actually saw sunspots through a telescope, a new activity offered courtesy of the Naperville Astronomical Society.

The aim of the event was to spread the idea that science can be done wherever there is curiosity and that anyone can learn about nature without elaborate equipment.

As in former years, the event was free and sponsored by FFSE.



CONGRATULATIONS TO HONOREES!

DIRECTOR'S AWARD

FFSE's Director's Award annually honors the more than 200 members of the Fermilab community who contribute their time and talents to Fermilab's education programs.

The Director's Award of \$1,000 is made possible by an anonymous donor and recognizes one volunteer whose contributions are exceptional, even among the many outstanding volunteer supporters of Fermilab's K-12 education programs.

This year's nominees were **Todd Johnson** (AD), **Terry Kiper** (PPD), **Jim Zagel** (AD), and **Jerry Zimmerman** (PPD). Each received a certificate of appreciation at the Volunteer Reception on October 25.

Don Lincoln, a physicist on CMS and DZero, received the 2012 Director's Award. Don says that his inspiration comes from his background. As a child, growing up in a blue-collar environment where few had an education beyond high school, he relied on books by scientists like George Gamow and Carl Sagan to answer his questions about the universe. He has now written

three books himself, along with numerous magazine articles and blog posts aimed at educating and inspiring the public. He has also worked with Fermilab's Visual Media Services to develop a number of videos that are big hits on Fermilab's YouTube channel.

His certificate notes, "Fermi National Accelerator Laboratory recognizes the exceptional and numerous contributions of Don Lincoln to our K-12 education programs.

"Outstanding among his contributions is his time talking with student groups that visit Fermilab. Don always learns about a group before meeting them, and is excellent at finding the right level for any group.

"He has contributed to our classroom presentation program and to public events such as Ask-a-Scientist, as well as developing videos for the public.

"His dedication to communicating particle physics and his generosity with his time enhance the Laboratory's reputation in both education and science research."



Don Lincoln receives the Director's Award at the Volunteer Reception.

FERMILAB SCIENCE AWARD FOR HIGH SCHOOL STUDENTS

Every year FFSE underwrites an award program for outstanding science students attending high schools in DuPage and Kane Counties.

Nominated by school faculty, each winner receives a certificate and a book at their school's award ceremony.

This year's winners were:

Alex Oliva, Ivana Surjancev, Addison Trail High School; **Nathan Johnson, Michael Seibert**, Aurora Central Catholic High School; **Aaron Wear, Mark Dykstra**, Aurora Christian School; **Claire Zinser, Chris Spadafora**, Batavia High School; **Jamie Rup, Robert Stanley**, Benet Academy; **Nick Ledonne, Dan Van de Water**, Burlington Central High School; **M. Shahrugh Fahad, Maryann Muhammad**, College Preparatory School of America; **Sarah Ratliff, Jeffery Pekosh**, Community High School; **Steven Birch, Joseph Sombeck**, Downers Grove South High School; **Kyle Dirks, Joshua Scanlan**, Dundee-Crown High School; **Daniel Torres, Hernan Gonzalez**, East Aurora High School; **Bethany Oglesby, Nicholas Skawinski**, Elgin Academy; **Anthony Turco**, Fenton High School; **Christopher Warren, Ryan Wyllie**, Geneva High School; **Justin Dakota Mueller**, Glenbard East High School; **Frances Compere, Catherine Genslee**, Glenbard South High School; **Mateusz**

Kubak, Glenbard West High School; **Chris Merchantz, Shirley Yang**, Hinsdale Central High School; **Mihajlo Vujisil, Monica Makar, Kevin Hu**, Hinsdale South High School; **Peter Lu, Connie Wang**, Illinois Mathematics and Science Academy; **Kristian Seebert, Colleen Maloney**, Immaculate Conception High School; **Michael Pajor, Mark Hirsbrunner**, Lake Park High School (East Campus); **Michael Rosenberg, Lindsay Timmons**, Larkin High School; **Shreyas Vissapragada, Isabella Gau**, Metea Valley High School; **William Martinello, Brent Chiaronti**, Montini Catholic High School; **Emily Su, Matt McDonald**, Naperville Central High School; **Arnold Kelsey, Renfus Kallie**, Rosary High School; **Ritika Rastogi, Daniel Wortmann**, St. Charles East High School; **Katharine Mehan, Anna Gawlik**, St. Charles North High School; **Katherine McDonnell, Ann Koiker**, St. Francis High School; **Vikram Gurusamy**, Waubonsie Valley High School; **Nicole McArdle, Thomas Pearson**, West Aurora High School; **Kyle Christensen**, Westminster Christian High School; **Matthew Weiss, Joshua Bertsche**, Wheaton Academy; **Thomas Favale, Amy Hummel**, Wheaton North High School; **Laine E. Bruzek, Daniel J. Weeks**, Wheaton Warrenville South High School; **Dana Chamberlin, Justin Schwarz**, York Community High School.

PROGRAM SCHOLARSHIPS

Two teachers received FFSE-funded scholarships allowing them to attend workshops at Fermilab. Joanie **Novak** received a grant for the Phriendly Physics Teacher Workshop, and **Marissa Staller** received a grant for the Secondary Science Institute in Biology.

Nine families received scholarships enabling children to attend Science Adventures at Fermilab.

Recipients were: the **Albaghadadi, J. Ayala, M. Ayala, Hopewell, Jones, Koehler, Montes, Smith and Szuberla families**.

PROGRAM HIGHLIGHTS

January

More than 22,000 students in the greater Chicago area enjoyed science demonstrations at their schools as Fermilab scientists traveled to 95 classrooms through the Classroom Presentation program.

February

On February 26, Weird Science presented the 25th annual *Wonders of Science* show to a sold-out Ramsey Auditorium. Presenters Karl Craddock (Fremd H.S.), Mike Heinz (Downers Grove North H.S.) and Lee Marek (U. Illinois at Chicago) were joined by former WOS regulars Bob Lewis and Tom Redig. The show included a video tribute to the late DeWayne Lieneman, a WOS founder.

The newly revised FFSE website debuted this month.

March

Upgraded versions of two exhibits at the LSC, “Boost the Energy in the Ring” and “Shoot Particle Pinball,” made their debuts in March. Both exhibits were simplified and made more reliable.

April

The Fermilab Family Open House on April 22 drew an estimated 1,500 people. For a second year the event included a “Physics Carnival,” in which 16 physics students from four high schools designed hands-on activities and shared them with visiting students. Other offerings included Jerry Zimmerman’s cryogenics show, Michael Cooke and David Schmitz’s *FUNDamentals of Physics, Ask-a-Scientist*, make-and-take activities and tours of the linear accelerator and the muon area (formerly the Antiproton Source).

May

Retired middle school teachers Jim Cox and Barb Romack completed revisions of the activities for the B&C program in time to present them at the B&C teacher workshop in July.

Adrienne Kolb, FFSE member and Fermilab archivist, presented “The History, Art and Architecture of Fermilab” at the FFSE annual meeting.

June

The 5th annual Fermilab Family Outdoor Fair was held on June 10, a bright and sunny Sunday. An estimated 450 visitors participated in hands-on activities on the lawn surrounding the Lederman Science Center. Two new exhibits debuted this year: Jim Kalina of Roads and Grounds displayed pelts of animals found on site so that children could feel the different furs, and the Naperville Astronomical Society brought five telescopes for viewing the sun and its sunspots.

At a Friends’ “Member’s Only” event, docent Anne Mary Teichert gave a presentation about Fermilab’s first director, Robert Wilson, and led members and guests on a tour of the site to view Fermilab’s distinctive sculpture and architecture.

July

Summer teacher programs remain popular:

- *Summer Secondary Biology, Chemistry and Physics Institutes* drew 42 educators.
- The *Beauty and Charm* workshop drew 8 teachers and 2 docents.
- The *Phriendly Physics* workshop drew 8 teachers.
- The *Particles and Prairies* workshop drew 5 teachers.
- The *Prairie—Our Heartland* workshop drew 9 teachers.
- The *Insects at Work In Our World* workshop drew 8 teachers.

August

Science Adventures, informal classes for children, served 725 children in 58 sessions during the spring, summer and fall seasons. This year’s offerings included: Junior Prairie Rangers, Magnetic Magic, Hands-on Engineering, Nanotech Investigations and Nature’s Power Lab.

September

Exhibit refurbishing continued at the Lederman Science Center: A redesigned synchrotron exhibit, “Boost the Beam Energy,” was delivered for evaluation. Volunteers from the Technical Division cleaned and revamped the “Build-a-Beam” exhibit. Programmers worked on a new multi-touch table exhibit for the Detector Room. Liz Quigg completed an upgrade to the “Detector Detail” exhibit with new content enabling students to explore a CMS detector data display.

October

On October 25, Fermilab honored more than 200 employees who contributed to education office programs in 2012. The annual Volunteer Reception was sponsored by FFSE and the Education Office. Physicist Don Lincoln received the 2012 Director’s Award.

November

School field trips offered through the Lederman Science Center remain popular:

- *Particles and Prairies* and *The Prairie—Our Heartland* field trips drew 3,600 students from 40 schools in 2012.
- *Beauty and Charm* and *Phriendly Physics* field trips drew 2,350 students from 40 schools.
- *Insects at Work in Our World* drew 400 students from seven schools.

December

Outreach programs continue to reach large audiences of all ages:

- The Sunday *Ask-a-Scientist* program brought 1,521 visitors to the lab for talks and tours.
- Wednesday *Get to Know Fermilab* tours drew an additional 1,123 visitors.
- Saturday *Get to Know the Lederman Science Center* tours attracted more than 140 participants.

PERSONNEL

The success of the 2012 FFSE education programs rests with these outstanding program leaders.

Deanna Andriano, Batavia High School • **Michael Bachrodt**, Fremd High School, Palatine • **Lauren Birth**, St. Peter Catholic School, Aurora • **James Browne**, Amboy High School • **SueZ Bruno**, Gates Elementary School, Aurora • **Jill Burke**, Franklin Park School District 84 • **Trudi Coutts**, Naperville Community Unit School District 203 • **James D. Cox**, teacher, retired • **Karl Craddock**, Fremd High School, Palatine • **Larry Cwik**, Seton Academy, South Holland • **Jason English**, Fremd High School, Palatine • **Todd Ernst**, Valley View School District 365U • **Amy Fehrman**, Johnson Elementary School, Warrenville • **Patricia M. Franzen**, Wild Enterprises, Metamora • **Barbara Greenberg**, teacher, retired • **Michael Heinz**, Niles West High School • **Maria Hull**, Blue Island School District 130 • **Mary Ann Janiak**, teacher, retired • **Randy Jones**, Glen Ellyn School District 41 • **Elizabeth Karnik**, Western Springs School District 101 • **Tanya Katovich**, Schaumburg High School • **Steve Keefe**, teacher, retired • **Nikki Kitzmiller**, Rotolo Middle School, Batavia • **Tom Knutson**, teacher, retired • **Robert Lewis**, Downers Grove North High School • **Paul Madsen**, Rosary High School, Aurora • **Lee R. Marek**, University of Illinois, Chicago • **Stefany Montgomery**, Geneva High School • **Jill Mueller**, West Chicago Middle School • **Radomir Niewrzol**, Glenbard North High School, Carol Stream • **Mary Sue Offut**, SciTech and Field Museum volunteer • **Glenda Peck**, Alice Gustafson Elementary School, Batavia • **Pat Pentek**, West Chicago Middle School • **Tom Redig**, Downers Grove North High School • **Barbara A. Romack**, teacher, retired • **Susan Sanders**, Glenbard School District, Glen Ellyn • **Jill Serling**, Glenbrook North High School, Carol Stream • **Marsha Stierwalt**, Alice Gustafson Elementary School, Batavia • **Patrick Swanson**, Hoffman Estates High School • **Mary Van Slyck**, Bartlett High School • **Michael Wegrzyn**, Metea Valley High School, Aurora • **Karen Weigt**, Kaneland John Stewart Elementary School, Elburn • **Wayne R. Wittenberg**, Benjamin Franklin School, Glen Ellyn • **Anna Zuccarini**, Crone Middle School, Naperville

Many Fermilab scientists give their time generously to education programs throughout the year.

Mark Adams • Michael Albrow • Maurice Ball • Leo Bellantoni • Mark Bollinger • Halley Brown • Ryan Campbell Pepin Carolan • Tom Carter • Keith Chadwick • Alex Chen • Dave Christian • Penelope Constanta • Michael Cooke • Fritz DeJongh • Brian Drendel • Luciano Elementi • Lynn Garren • Doug Glenzinski • Sten Hansen David Harding • Elvin Harms • Alan Harris • Anne Heavey • Samantha Kaushalya Hewamanage • Amber Johnson David Johnson • Young-Kee Kim • Terry Kiper • Kyle Knoepfel • Sharon Lackey • Leon Lederman • Don Lincoln • Shulamit Moed • Dennis Nicklaus • Piermaria Oddone • David Peterson • Ruth Pordes • Chris Quigg • Jen Raaf Erik Ramberg • Rob Roser • Tim Rupp • Brittany Rutherford • Jamie Santucci • Niki Saoulidou • Dave Schmitz Al Sondgeroth • Chris Stoughton • Marcia Teckenbrock • Rod Walton • Mike Weis • Jeremy Werner • Chris White • Herman White • Jim Zagel • Jerry K. Zimmerman

Education Office staff administers and supports Fermilab programs.

Marjorie G. Bardeen, Manager • **Ketevan Akhobadze**, Educational Facilities Coordinator • **Carol Angarola**, Program Administrator • **Susan M. Dahl**, Education Specialist • **LaMargo A. Gill**, Editor • **David Hoppert**, Laboratory Technician • **Maureen Hix**, Administrative Support Assistant • **Gayle Millman**, Administrative Support Assistant • **Spencer L. Pasero**, Education Program Leader • **Robert Peterson**, Education Specialist • **Elizabeth K. Quigg**, Computer Specialist • **Sue Sheehan**, Education Program Leader • **Andrea Varry**, Administrative Support Assistant

Docents facilitate student field trips and other Education Office activities and supervise the Lederman Science Center.

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REVENUES AND EXPENSES

	2012 (audited)	2011 (audited)
Revenue/Contributions (\$000)		
Contributions/Foundations	\$ 37.8	\$ 59.6
Membership	17.2	15.5
Other	7.5	9.8
Total Revenue/Contributions	\$ 62.5	\$ 84.9
Expenses		
Program Services	\$ 44.3	\$ 24.8
Administrative Overhead	12.7	19.5
Total Expenses	\$ 57.0	\$ 44.4
Change in Net Assets	\$ 5.5	\$ 40.5
End of Year	\$ 142.3	\$ 136.8

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Kane County Riverboat Fund
Northern Kane County Region EFE 110
St. Charles Public Schools
School District U-46
Valley Education for Employment System



OUR NEW PHYSICS PLAYGROUND COMES TO LIFE!

The master plan for the Lederman Science Center, from its earliest days, called for a “physics playground” in front of the building. It would be a place for visitors—especially young ones—to get a visceral feeling for Fermilab science as they played.

But since the building’s completion in 1991, sufficient resources for the playground never came together.

Now at last, the playground is emerging due to a grant from the Kane County Riverboat Fund, a gift from an anonymous donor, contributions of FFSE members and, of course, Fermilab support.

The first exhibit, *Run Like a Proton*, was completed last fall and is the largest: a gravel path in the shape of the accelerator complex.

Energetic visitors assume the role of protons or antiprotons and race around the circuit that particles follow through the beamlines. Signs along the path show the “particles” how far they have progressed along their way.

The accelerator path will eventually be augmented with three companion exhibits. Two of them, “Triple Turn” and “Icarus,” will enable visitors to experience forces similar to those that particles feel as they accelerate.

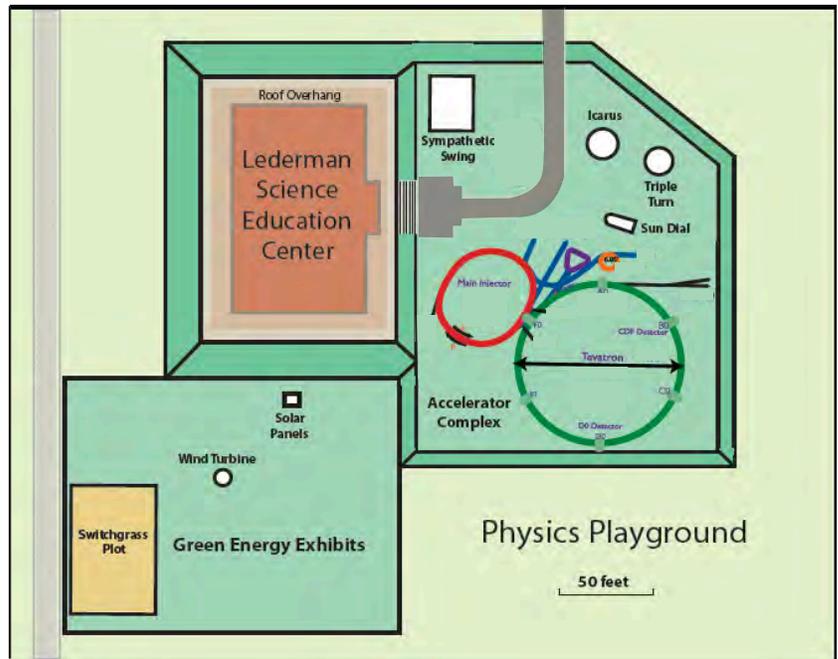
“Sympathetic Swing” will reveal how the movement of one swing gives rise to sympathetic oscillations in another—a useful analogy for that difficult task of discussing neutrino oscillations.

Ideas for the play area came courtesy of area teachers, Fermilab physicists, and Education Office staff.

The exhibits complement the LSC indoor exhibits and make connections with the themes employed there. They will be particularly appealing to those for whom kinesthetic modes of learning are most effective.

In a separate project, the Fermilab Sustainable Energy Club is installing a solar panel in an adjacent area of the LSC grounds, with future plans for a wind turbine. The Education Office plans to add a switchgrass plot to that area.

These additions to the Education Center are certain to tug young imaginations in new directions as they engage with science at Fermilab.



Rotolo Middle School students “Run Like A Proton.”



Physics playground exhibits clockwise from upper left:

- Triple Turn
- Sympathetic Swing
- Icarus

Equipment photos:
Goric Marketing Group USA, Inc. catalog