



Chicago Council On Science & Technology

2015 – 2016 Year In Review

President's Message



Welcome to the 2015 - 2016 Chicago Council on Science and Technology annual review.

We believe science is for everyone, and our goal is to provide high-quality, engaging programming to the public on a variety of scientific topics. We feature researchers from institutions across Chicagoland, to keep you up

to date on the latest discoveries, inventions and ongoing research that affect our lives.

I would like to welcome new additions to the Board of Directors of the Chicago Council on Science and Technology: AbbVie and entrepreneur Adam Khan of AKHAN Semiconductor. I'm also pleased to announce the return of Fermi National Accelerator Laboratory back to the board of C2ST, along with the Chicago Botanic Garden. We also want to thank Horizon Pharma for their increased program sponsorship this fiscal year. I'm pleased to announce the formation of a new Auxiliary Board. You can meet our inaugural members on page six of this newsletter.

Here at C2ST we've expanded our programming to year round, with six programs taking place over the summer months. We've also diversified program venues, hosting events at MATTER, 1871, Chicago Tech Academy, Revolution

Brewing, The Plant, University of Illinois at Chicago, DePaul, Pint Chicago and a return to the Chicago Public Library, Harold Washington Center. We will continue this expansion, with upcoming events scheduled at the Shedd Aquarium, Illinois Institute of Technology's downtown Kent College of Law campus, and at the British International School of Chicago, Lincoln Park. We are pleased to expand our partner roster as well, and look forward to upcoming events with the Shedd Aquarium, The Leakey Foundation and the American Society for Biochemistry and Molecular Biology.

We are pleased to announce that our Artist in Residence (AIR), Aaron Freeman, continues on in his role here at C2ST.

Looking ahead, we hope to continue to offer engaging programming and unique events, and expand the C2ST community.

I thank you for your essential support and partnership in helping us deliver our mission, and I look forward to seeing you at an event in the near future.

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C2ST

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The Plant Chicago

On the sunniest day in June, C2ST welcomed over 75 people from across the Chicagoland area to the Back of the Yards neighborhood for an exclusive tour of The Plant. We didn't travel to a community garden or to an industrial plant, but to an innovative fusion of both.

Near 46th Street and South Bishop Street is an old 94,000 square foot former pork processing facility Bubbly Dynamics purchased and developed into a space that currently houses 16 different sustainable food producing businesses called The Plant. Their vision is to create a closed-loop system where some or all of each of the tenant businesses' waste is used as input by other businesses. A few of the businesses we explored included: Plant Chicago, Four Letter Word Coffee, Whiner Beer, and Pleasant House Bakery.

Before the tours began, The Plant's staff welcomed the participants and offered pastries and coffee in the nearby meeting room. We sat at the tables and gathered around the bar, as a green hue from the window shined inside the room. Then I asked, "What are those tubes in the windows?" Plant Chicago's executive director Jonathan Pereira replied that the transparent tubes were algae bioreactors and were placed in the window to help the plants photosynthesize, and they collect the algae to feed the fish downstairs, while purifying air inside the space. With Jonathan's response, a participant added, "Downstairs?"

Kassandra Hinrichsen, education and outreach manager at The Plant, led us through the three floor structure and gave us a peek outside. We followed her downstairs through the mushroom farm lined hallway to the sound of flowing water. The mushroom farm is where they grow rare mushrooms using recycled material from coffee bean skins to plastic bags to support its unique growing conditions. From there we walked into the aquaponics farm. Aquaponics combines aquaculture, which is raising aquatic animals, and hydroponics which is cultivating plants in water, and using the fish waste as fertilizer. The water is interlinked to each tank by tubes and is purified by clay pellets in the plant's tank.

We then walked upstairs to Pleasant House Bakery, which, to our surprise, were the people who had made the pastries we had eaten downstairs. They gave us a peek inside their mill. Across the hall was Four Letter Word Coffee who provided the rich Ethiopian coffee that complemented Pleasant House Bakery's buttery delights. As we walked from place to place, conversations about the experience began to form and take shape.

We followed Kassandra back to the main floor and walked outside to the anaerobic biodigester where all compost will eventually go, once build out is complete, to finish the closed-loop system that the entire building contributes to. This is the final step in closing the loop and treating all waste materials as a valuable commodity. We walked back inside where C2ST's Director of Programming, Chris Eppig welcomed and thanked everyone for coming to the tour and re-introduced Jonathan who then co-hosted a discussion with Ria from Four Letter Word Coffee, Wes from Pleasant House Bakery, and Ryan from Whiner Beer about how they got involved with Plant Chicago, what they produce and how they work together to work towards the closed-loop system.

With a crowd of C2ST fans and future C2ST patrons, we hoped that this experience would encourage everyone to step outside of their comfort zone and learn about the science that's literally in the back of their yards. All-in-all we were able to explore and learn from the interactive, educational, and innovative space called The Plant.

**C2ST is proud to be the source of such opportunities and to promote accessibility of information for these individuals in order to support a curious culture of learning and create a more scientifically literate Chicago.*

By Ambria Jones, C2ST 2016 Summer Intern, current student at the University of Dayton studying Environmental Biology.

Learn more about Ambria and her adventures at www.ambriajones.com



"I thought the pairing of the authoritative speaker and the charismatic facilitator was great. He obviously had read her stuff and generated insightful questions of his own."

—Audience Member

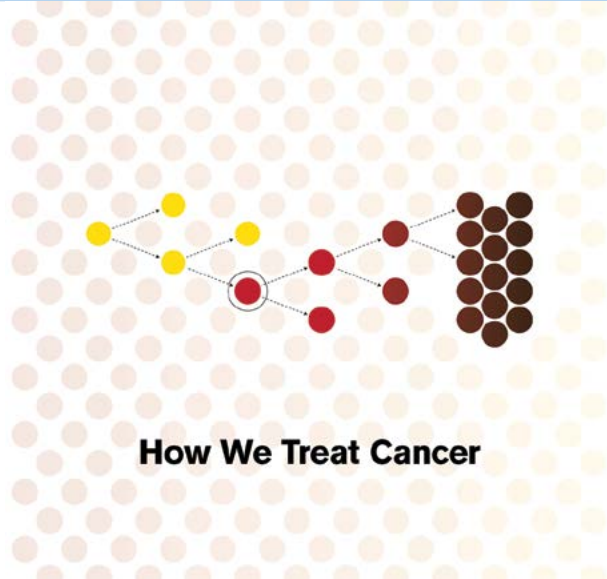
How We Treat Cancer

Cancer is the second most common cause of death in America. Despite this bleak statistic, cancer therapies have improved drastically over the past decades. Many diseases that were once an imminent death sentence can now be managed comfortably for years after diagnoses.

Dr. Francis Giles, Professor and Chief of the Division of Hematology/Oncology at Northwestern University's Feinberg School of Medicine, is optimistic about the ongoing breakthroughs in cancer research. According to Dr. Giles, how we treat cancer is on the cusp of a complete revolution. Currently, oncologists treat a cancer patient depending on what part of the body the cancer is in, often ignoring the underlying biological mechanism of the disease. An approach that is gaining traction hopes to diagnose cancer patients based on the root biological cause, on the genetics and unique biological signatures of each patient, rather than simply where the cancer is. This, Dr. Giles hopes, can increase the number of drugs that make it to late phase clinical trials and ultimately result in much more effective cancer treatment regimes.

Another reason for optimism is the ever-increasing collaboration between basic scientists—those who ask fundamental questions about the human body—and clinical researchers who apply these discoveries. Scientists ranging from physicists to molecular biologists are applying their expertise to solve outstanding problems that are enabling the discovery of new treatments.

Dr. Steve Davidsen, Vice President of Oncology Discovery at AbbVie, highlighted just how far cancer research has come over the past 20 years. There are innumerable diseases that were an almost certain death sentence mere decades ago, and are now entirely treatable. Dr. Davidsen oversees research that is poised to become the next generation in cancer treatments: the field of immunotherapy. His team of researchers is developing drugs that attempt to train the body to recognize and kill cancer cells. This is in contrast to the traditional approach of treating patients with a cocktail of toxic drugs that cannot tell the difference between healthy and diseased tissue.



Immunotherapy had its beginnings at the end of the 19th century when William Coley, an American surgeon, would treat cancer patients with bacteria. After over 100 years of research into the immune system and cancer, scientists are finally able to develop targeted strategies using this approach. One such therapy being developed at AbbVie attaches specific receptors to T-cells, important components of the immune system, that train them to stick to cancer cells and attack them, using the body's innate defense mechanisms against the disease.

While the attitude of both speakers was one of uplifting optimism for the future of cancer research and treatment, it remains that almost every single person will be affected by cancer in some way throughout their life, with upwards of half a million people dying each year from the disease. With the breakneck pace of current research, we can be hopeful that the coming decades will give rise to many more ground breaking and lifesaving treatments.

By Janet McMillan, C2ST volunteer and graduate student in chemistry at Northwestern University

“Excellent program! You could not have had a more interesting panel!”

—Audience Member

Learning How the Gut Microbiota Influences Health

Dr. Kristina Martinez gave a wonderful talk as part of our C2ST Speakeasy series on the bacteria that live in our gut and how they might affect us. **C2ST caught up with her afterwards for some follow-up questions.**

C2ST: What do you think was the most important takeaway message from your talk?

Dr. Kristina Martinez: I would say the concept that what we eat—our diet on a daily basis—has a profound impact on the abundance and the type of bacteria we are harboring in our gut, and these microbes directly influence our metabolism and our propensity to gain weight on certain diets.

C2ST: There is this association between health and certain profiles of gut bacteria. The direction of influence is presumed to be that the gut microbiota influences health, as opposed to the other way around. How do we know that this is correct?

KM: That's a really good question, and remains an area of focus—the chicken or the egg question. Is the gut microbiota affecting us, or are we affecting it? I think it definitely appears to go both ways. I think that there is interaction between the microbes affecting the homeostasis and vice versa. One way we can study this is by using the germ-free mice. Using these mice lacking their own microorganisms, you can transfer microbial communities under certain homeostatic pressures—i.e. following high fat feeding or under disease states—and the recipient mouse will often mimic the phenotype of the donor mouse. This is one indication that the microbes are influenced by the host (shaped by the donor) and can subsequently influence the host (in this case the recipient mouse).

C2ST: Last month we had a speaker who was talking about drug addiction, and she speculated that the gut microbiota might be involved in addiction somehow that we have yet to discover. There have been other connections made between the gut microbiota and other psychological conditions. I wonder if you could comment on how good the evidence is for this link between the mind and the gut, and if you have any idea how that might work.

KM: I think most evidence relating the gut microbiota to the brain is very new, and there will likely be a lot more work to come in regards to Alzheimer's and autism. There is actually a post-doc in our lab here [at UChicago] who studies the relationship between the gut microbiota and the circadian rhythm, the sleep-wake cycles. There is definitely a strong connection here, at least from animal studies that have been done, that show the bacteria in the gut influence brain gene expression that regulates sleep-wake cycles as well as metabolism. I think overall this research that is coming out between microbiota and behavior is very new and there is a lot more to be learned in this area than is currently understood based on the current literature. As far as an actual mechanism for linking the two, I think one thing that is really big in the field is the study of metabolomics or wide-scale profiling of metabolites. The byproducts of the bacterial metabolism, small molecules, are thought to circulate the blood stream—some can even cross the blood-brain barrier having a direct impact on the brain. So that is one way in which this connection is being investigated.

C2ST: There appears to be mounting evidence for the utility of fecal microbiota transplant (FMT), particularly in the treatment of *Clostridium difficile* infection. It is my understanding that this hasn't yet gained mainstream traction among physicians. Why do you think this hasn't been used more widely?

KM: As you can imagine, there are certainly a lot of concerns in performing FMT based on the donor. The largest challenge is creating standards for treatment—when do you treat, how much do you give, how often do you give it? The process is very involved in terms of screening the donors to make sure they don't have any type of disease or virus that could be transferred to the recipient. As a result, some FMT donors are family or friends, people who the recipient knows and trusts. Regardless of these challenges, FMT is one of the most effective treatments for antibiotic-resistant *C. diff* and is becoming increasingly popular, at least with some physicians.

C2ST: Given what we know about the gut microbiota so far, is there any way that we can use that information to improve our health or well-being in ways aside from FMT, or has research not progressed that far yet?

KM: I think better understanding intestinal bacteria in general and how we can target specific types and improve their growth through the use of prebiotics, will allow us to find ways to help promote a healthier microbiota without having to go to extreme measures such as FMT. But I think that FMT is probably necessary for some conditions, such as *C. diff* infection or colitis, for instance, but for general well-being and health, I think the use of pre- and probiotics could provide a safe way for the general public to improve overall health and metabolism.

C2ST: Is there anything you didn't get to talk about during your talk that you want to mention?

KM: Well one thing I didn't mention is the link between the gut microbiota and the circadian rhythm. I think it's a fascinating topic and also related to metabolism. A paper came out just last year by my colleague, Dr. Vanessa Leone, published in *Cell, Host, & Microbe*. I would highly recommend taking a look at that article. She found that the bacteria in the gut have their own circadian behavior apart from the host.

*This transcript has been edited for both length and clarity.
Interview by Chris Eppig, Ph.D., C2ST Director of Programs*

"The lecturer was engaging and able to explain science in layman's terms."

—Audience Member

Thank You To Our Speakers

Fall 2015 Speakers

Weslyne Ashton, Ph.D., Assistant Professor of Environmental Management and Sustainability, Illinois Institute of Technology.

Mary Bauer, Head Brewer of Lagunitas Brewery, Chicago.

Jeremy Carr, Writer/Director

Claire Carre, Writer/Director

Jocelyn Carter, Ph.D., Associate Professor of Clinical Psychology, Director of Clinical Training, DePaul University.

Bala Chaudhary, Ph.D., Assistant Professor of Environmental Science, Loyola University.

MK Czerwiek, RN, MA, Artist in Residence, Feinberg School of Medicine.

Stuart Firestein, Ph.D., Chair, Department of Biological Sciences and Professor of Neuroscience, Columbia University.

Aaron Freeman, C2ST Artist in Residence.

Shannon Heffernan, Reporter and Producer, WBEZ Chicago

Adam Khan, Founder and CEO, Akhan Semiconductor.

Bobby Kasthuri, Ph.D., Neuroscience Researcher, Argonne National Laboratory, Assistant Professor of Neurobiology, University of Chicago.

Tom Macek, Senior, PharmD., Ph.D., Senior Scientific Director of Global Clinical Science Department, Takeda Development Center Americas.

Pete Makovicky, Ph.D., Associate Curator of Paleontology and Chair of the Department of Geology, Field Museum; Lecturer, Committee on Evolutionary Biology, University of Chicago.

Kristina Martinez, Ph.D., Post-Doctoral Fellow, University of Chicago.

John Maunsell, Ph.D., Alfred D Lasker Professor of Neurobiology and Director of the Grossman Institute for Neuroscience, Quantitative Biology and Human Behavior, University of Chicago.

Rabiah Mayas, Ph.D., Director of Science and Integrated Strategies in the Center for Advancement of Science Education, Museum of Science and Industry.

T. Celeste Napier, Ph.D., Professor of Pharmacology and Psychiatry, and Director for the Center for Compulsive Behavior and Addiction, Rush University.

Jack C. Newell, Writer/Director

Ken A. Paller, Ph.D., Director of the Cognitive Neuroscience Program, Northwestern University

Norm Peterson, Director of Government Relations, Argonne National Laboratory.

Tejas Shastry, Ph.D., Co-founder and CEO, AMPY.

Debra Shore, Commissioner of the Metropolitan Water Reclamation District of Greater Chicago.

Matthew Spenko, Ph.D., Associate Professor of Mechanical, Materials, and Aerospace, Illinois Institute of Technology.

Paula Skye Tallman, Ph.D., Biological Anthropologist, Science Action Center, Field Museum.

Kapila Vigas, Director of EnterpriseWorks Chicago, University of Chicago.

Miles Wernick, Ph.D., Motorola Endowed Chair Professor of Electrical and Computer Engineering, Director of the Medical Imaging Research Center, and Professor of Biomedical Engineering at the Illinois Institute of Technology (IIT).

Spring 2016 Speakers

Robert C. Armstrong, Ph.D., Director of the MIT Energy Initiative (MITEI) and the Chevron Professor of Chemical Engineering at MIT.

Seth B. Darling, Ph.D., Scientist, NST & Fellow, Institute for Molecular Engineering, Argonne National Laboratory

Steve Davidsen, Ph.D., Vice President, Oncology Discovery at AbbVie Biopharmaceuticals.

Lise Eliot, Ph.D., Associate Professor of Neuroscience at the Chicago Medical School of Rosalind Franklin University

Aaron Freeman, C2ST Artist in Residence

Francis J. Giles, M.D., Chief of hematology/oncology in the department of Medicine and Johanna Dobe Professor of hematology/oncology at Northwestern University's Feinberg School of Medicine, Deputy Director of the NCI-designated Robert H. Lurie Comprehensive Cancer Center of Northwestern University, and Director of the Developmental Therapeutics Institute of the Lurie Cancer Center.

William S. Higgins, NASA Solar System Ambassador, Radiation Safety Physicist, Fermilab.

Christopher Holden, M.D., Visiting Assistant Professor of Clinical Psychiatry and Director of Addiction Services, University of Illinois College of Medicine; Medical Director of the Substance Abuse Residential Rehabilitation Treatment Program at the Jesse Brown VA

Amy Lasek, Ph.D., Assistant Professor in the Departments of Psychiatry and Anatomy and Cell Biology, University of Illinois at Chicago.

Tom Macek, PharmD., Ph.D., Senior Scientific Director, Global Clinical Sciences Department, Takeda Development Center Americas.

T. Celeste Napier, Ph.D., Professor in the departments of Pharmacology and Psychiatry, and Director for the Center for Compulsive Behavior and Addiction, Rush University.

Lesley de Souza, Ph.D., Researcher, University of Illinois Urbana-Champaign.

Ritoban Basu Thakur, Ph.D., Fellow, Kavli Institute for Cosmological Physics (KICP), at the University of Chicago.

Kuei Yuan Tseng, M.D., Associate Professor in the Department of Cellular and Molecular Pharmacology, Chicago Medical School, Rosalind Franklin University.

Maria Velissariou, Ph.D., Vice President for Global Grains, Dairy and Convergence Platforms in R&D, PepsiCo.

Eric Weber, Leader of Technology Demonstration Projects, Plant Chicago.

Matthew Weimer, Graduate Student in Chemistry at IIT. Martin and Mary Kilpatrick Fellow in Chemistry.

The Myth of Brain Sex



Men are from Mars and women are from Venus! You may have first heard this expression years ago, or more recently as the title of the pop psychology book by John Gray.

During C2ST's lecture and conversation, *The Myth of Brain Sex*, Dr. Lise Eliot, author and Associate Professor of Neuroscience at the Chicago Medical School of Rosalind Franklin University, and Aaron Freeman, comedian, science journalist and current Artist In Residence for C2ST, address whether or not there really are differences between the brains of men and women, and how they may come about.

With each new development in science comes a new method by which to explain sex differences. First it was blood flow, then brain scans and anatomy, and now genetics. While it may be fun to take a quiz for brain gender, "it's a whole different story when these alleged hard-wired differences infuse our classrooms, infuse the military, infuse anywhere where we are trying to make advances," says Eliot.

Seeing a resurgence in single-sex education, segregating boys and girls, backed up by claims that "research solidly indicates that boys and girls learn differently," Eliot wanted to know if the data really supported this.

Certain differences between males and females, such as an average of 5 inches difference in height, are very statistically significant. Psychological differences, for instance the ability to recognize facial emotion, however, are not statistically significant.

Researcher Dr. Janet Hyde found that nearly all of the sex differences studied in the last 50 years show modest behavioral differences. Meta-analysis is a golden standard of scientific research, as it takes every single study on a topic and extracts the average finding. Her research went a step further, performing a meta-analysis of 124 meta-analyses. One sex difference that was significant is differences in throwing accuracy.

Only thinking about these "hard-wired" differences, or lack thereof, ignores the drastic differences in how boys and girls are treated growing up, and in their adult lives. As Eliot says, we need to think about how these differences come about.

"We need to think about how one's experience as a boy or girl is altering this very intensive brain development early in life," says Eliot. Even something like vision, which we consider to be simpler than something like language learning, depends on experience. Experiments done before today's ethical guidelines were in place showed that in animals raised with their left eye sewed shut, the part of the brain usually devoted to the left eye is used for other senses.

Eliot explains that while there are some early chromosomal and hormonal differences, sex differences are drastically shaped by experiences. Growing up as a boy or a girl is an entirely different experience. We can take these differences and amplify them, as our gender-coded environment really does. Or we can take the opportunity, through education, as Eliot suggests we should, to cross-train our boys and girls, before they are faced with our highly gender-coded society.

When we look at the anatomy of the brain, there are some differences, but they are much more subtle than the popular perception. Men's brains may be 10 percent larger on average than a woman's, but this is also true for other organs such as the heart, kidney or liver. Once this overall difference is accounted for, there are very few differences in our brains. Sex accounts for less than one percent of the variation of the size of various brain structures, so sex has an effect, but only at the population level.

So while there might be slight differences in the biology of our babies based on gender, the stronger forces at work are upbringing, culture and socialization.

Julia Turan, triturated, pipetted, imaged, and analyzed, during her undergrad years studying neurobiology. Since then, she has shifted into the world of science communications, hoping to promote a language of science legible to all. Julia is currently completing an MSc in Science Communication and Public Engagement at the University of Edinburgh. Follow her @JuliaTuran

"I thought all the speakers did a good job presenting the material at a level that could be easily understood by people outside their field."

—Audience Member

Science In The City 2016

The Chicago Council on Science and Technology would like to extend our many thanks to those who provided us with funding, their time, and in-kind donations that ensured the success of Science in the City 2016.

We are grateful for the support from each and every one of our contributors. We were able to raise over \$43,000 which will be used to fund our 28 projected programs for the 2016-2017 fiscal year.

Sponsorship

AbbVie	Global Peace & Development Charitable Trust	Magellan Corporation	Jennifer Siegenthaler & Philip Cable
Argonne National Laboratory	Horizon Pharma, Inc.	Alan Schriesheim & Kay Torshen	UI Labs

Table Purchase

AKHAN Semiconductor	Barnes & Thornburg, LLP	IIT College of Science	Northern Illinois University
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Donations

Dawn Miller	Jon Miller	Museum of Science and Industry
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In-Kind Donations

Adler Planetarium	Eli's Cheesecake	Lagunitas Brewing Co.	The Ritz-Carlton Hotel Chicago
Auditorium Theatre of Roosevelt University	Lise Eliot, Ph.D.	Lincoln Park Zoo	Rosalind Franklin University of Medicine and Science
Nick Bostrom, Ph.D.	The Field Museum of Natural History	Lyric Opera of Chicago	Science, Naturally!
Cards Against Humanity	Stuart Firestein, Ph.D.	Magellan Corporation	The Second City
Shreaya Chakroborty	Lance Grande, Ph.D.	Alice O. Martin, Ph.D. and J.D.	Sarah Shirk
Chicago International Film Festival	Natalie Greco	Robert Martin, Ph.D.	Tasting deVine Cellars
Chicago Symphony Orchestra	Goose Island Beer Co. Clybourn	The Morton Arboretum	The Theatre School at DePaul University
Cooper's Hawk Winery and Restaurants	John G. Shedd Aquarium	Morton's, The Steakhouse - Northbrook	TimeLine Theatre Company
Donna Denson	Bennetta Kelly	Museum of Science and Industry	Lucianne Walkowicz, Ph.D.
DePaul University STEM Center	KOVAL Distillery	The Particle Zoo	Wines for Humanity
	Roland Kulla	Plant Chicago	

On May 5, 2016 Chicago Council on Science and Technology hosted its sixth annual gala, Science in the City, at UI Labs on Goose Island in Chicago.

UI Labs, similar to C2ST, serves as a consortium in the city of Chicago, bringing together diverse stakeholders. Tours of DMDII, the Digital Manufacturing and Design Innovation Institute, which is a federally-funded research and development organization within UI Labs, were offered to C2ST gala attendees during the pre-dinner reception in the lobby. The reception included a craft cocktail and whisky tasting by local distillery KOVAL.

The evening was hosted by Cristal Thomas, vice president for community health engagement, University of Chicago Medicine, and senior advisor to the vice president for civic engagement at the university. Thomas formerly served as deputy governor of Illinois.

The 150 attendees celebrated the local science community, and helped Chicago Council on Science and Technology honor the recipient of the "Advancing the Public Understanding of Science & Technology Award" winner, Dr. Lucianne Walkowicz. C2ST created this award in 2012 to honor individuals who share in the passion and mission

of the organization—to increase the awareness of the great R&D taking place in our region. Dr. Walkowicz, an astronomer at the Adler Planetarium in Chicago, studies stellar magnetic activity and how stars influence a planet's suitability as a host for alien life. She is a 2012 TED Senior Fellow, a 2011 National Academy of Sciences Kavli Fellow, and has been internationally recognized for her advocacy for conservation of dark night skies. This year, she was named to Crain's '40 Under 40' list. Walkowicz spends half her time speaking with the public and helping create exciting new ways to engage people with scientific discovery.

During dinner, C2ST Artist in Residence Aaron Freeman had the crowd howling with laughter at his latest science video, "Parasitic Mind Control & Suicidal Love," a neuroscience-funfest available on our website (and Aaron Freeman's Excitable Ape! YouTube channel).

The event included a silent auction, live auction and raffle, and the evening concluded with a dessert buffet. We thank everyone who supported us, joined us at the event, and helped make Science in the City a success!

By Andrea Poet, Director of Programs and PR at C2ST

Lucianne Q&A



Learn more about Dr. Lucianne Walkowicz, an astronomer at the Adler Planetarium in Chicago. Walkowicz is C2ST's 2016 Advancing the Public's Understanding of Science and Technology Award winner.

Q: How did you become involved in C2ST?

A: I first met Andrea Poet, C2ST's Director of Programs and Public Relations, when I first came to Chicago, at a women in science panel. We got talking about a program I did in New York called Science Train, where scientists ride public transportation and talk to the people they meet about science. Andrea and I have been trying since to get Science Train going here in Chicago (with the CTA).

Q: Where did your interest in science/STEM come from?

A: I think I was always really curious when I was growing up. I was particularly interested in how things work or what would happen if I did a series of experiments to things, so I'd be hiding bread under the couch to see what would happen to it, for instance. After years of making up experiments when I was very little, I discovered that there is something that you can do for a living called science, where you get to figure out how things work, or how the world works. So it just grew out of my natural curiosity.

Q: How important is it that younger people are interested in/more involved in STEM?

A: I think that there is a lot of joy to be gained from understanding how the world around you is working, even if you are not going to be a scientist when you grow up.

I compare having a background in STEM to being in a video game where you have the real world around you, but you also have this virtual reality or augmented reality type thing happening—you can look at a tree and see all the things that are going on in the tree. You can see what it is doing or how it's growing, you can learn about how it got that way. It's having an extra layer of experience about the world around you.

Q: What is your favorite planet to study?

A: I'll give you an answer that you'll like—and its planet Earth.

All of the planets that we are discovering around other stars are pretty amazing, but a lot of things that we know or can deduce about those planets are based on things we know based on Earth. I really like to think about Earth as a Rosetta stone, the key that helps us decode what we observe in the universe as far as planetary science goes.

Q: What is the strangest thing you have ever seen?

A: I think my favorite astronomical mystery is a star called Tabby's star. It's a star that was observed by the Kepler telescope by Dr. Tabetha Boyajian. She and a group of citizen scientists observed a star whose light was changing in a way that they didn't understand. There are a lot of theories surrounding what is causing the dimming; one is that the planet could have a lot of comets around it blocking the light in an unusual way. There have also been suggestions that the cause is aliens! It's a fun science mystery because we don't know what is happening, we're just watching and waiting to figure it out.

Q: If you weren't a scientist/astronomer, what would you want to be?

A: I would do art and music full time. I am an artist and musician, but science takes up most of my time.

Q: What is your best advice for a future scientist?

A: Never be afraid to ask questions. Never be afraid to reach out.

A piece of advice I give to those in college or high school is if you think you want to work for a school, or a particular department, or if you just read a news article about some person and they sound interesting, you can ask them questions and see if they would hire you for the summer. All you have to do it ask. A lot of people are busy or don't have time to respond, so you may not hear back from everyone, but you'll hear back from somebody. Most people say no, but not everybody says no. I got a lot of work experience that way.

Q: What is your favorite exhibit at the Adler Planetarium?

A: I'll give you an exhibit, an activity, and a show. My favorite exhibit right now is our "What is a Planet" exhibit, which talks about the definition of what we call a planet, particularly around why Pluto has been called a dwarf planet until 2006 and how it got reclassified. My favorite activity at the Adler is to go to the space visualization lab. We always have scientists in there, it's a cool place to hang out and answer some things that you want to know about. I also really love our "Planet 9" show. It's a really cool and unique planetarium show about the search of this possible ninth planet in the solar system. It's unusual in a planetary show in that we present new research that we don't have all of the answers to yet. I think that's really cool, because so often scientists present research to people as a collection of facts.

In fact, science is a process, where the part where you don't have all of the answers is exciting.

**Interview conducted by Ambria Jones,
C2ST 2016 Summer Intern**

"The topic was great and I liked learning about the new evolution of therapies that are being used for cancer treatment."

—Audience Member

Meet C2ST's Inaugural Auxiliary Board Members

Chicago Council on Science and Technology added an auxiliary board to its leadership this spring. Members will include young professionals who will lend their talent and expertise to programming, development and fundraising activities. Our inaugural members include:



Shreaya Chakroborty, Ph.D., Research Assistant Professor, Department of Neuroscience, Rosalind Franklin University of Medicine and Science. Dr. Chakroborty is a neuroscientist and electrophysiologist committed to understanding the pathological mechanisms

that occur early in Alzheimer's and Parkinson's diseases, with the aim of identifying potential targets for improved and more effective therapies. She earned her Ph.D. in Neuroscience in 2011 from Rosalind Franklin University of Medicine and Science. During this time she discovered that persistent calcium signaling deviations in neurons (brain cells) in Alzheimer's disease severely disrupt memory-forming mechanisms very early in the disease process, ultimately leading to memory impairments. Her research also shows that reversing calcium signaling deviations can restore memory-forming mechanisms without altering normal processes, providing a target for future and more effective therapies to treat Alzheimer's disease. Her current research explores the therapeutic potential of a novel signaling pathway involving cyclic nucleotides in Parkinson's disease.



Sara B. Frank, Program Manager for the Center for Health Information Partnerships (CHiP) in Feinberg School of Medicine at Northwestern University, and the founder of Salient Research LLC. Sara's research and project management

focus on the ways in which technology impacts the fields of healthcare and education. Her work is informed by 14 years experience in organizations including Sheffield Hallam University, the University of Toronto and

the University Corporation for Atmospheric Research. Salient Research works with clients across K-12 and higher education, focusing on blended, online and open education.



Julia Haried, Co-Founder and Executive Director, MakerGirl. Julia studied business and accountancy at the University of Illinois at Urbana-Champaign and is the co-founder of MakerGirl, which is a not-for-profit that has encouraged more than 500 young girls to consider

science, technology, engineering and math (STEM) fields to study and for careers. She earned her Bachelors of Science in accounting from UIUC in May 2015, and will earn her Masters in Accounting Science in May 2016. She is currently studying to sit for the CPA exam. In September 2016, she will be employed full-time as an accountant at Deloitte in their Chicago office, in their audit practice. Her past work experiences include three years as an intern at Deloitte, interning at Condé Nast with TeenVogue in NYC, interning in the finance department at Rent the Runway in NYC, and founding MakerGirl (www.makergirl.us). Haried is an avid lover of art, reading, traveling, volunteering, playing Catan with her family, and working out. She is excited to be a catalyst for equality and diversity and for creating innovative possibilities for girls.



Shyama Majumdar, Ph.D., has over 10 years of experience in the life science industry both as a cancer research scientist as well as a consultant. Dr. Majumdar is currently working as a postdoctoral research associate at the University of Illinois at Chicago (UIC)

on prostate development and prostate cancer from the standpoint of hormone signaling in prostate stem cells and is also the current president of the postdoctoral association at UIC. She also holds the position of program coordinator at EnterpriseWorks Chicago where she manages the roadmapping process for the commercialization of

97% of program attendees enjoyed the programs.

C2ST Survey

proof of concept technologies developed at UIC. After earning her Ph.D. in Biology and MBA from University of Delaware, she worked at Harvard Medical School as a postdoc on bladder cancer. Concurrently, she also worked as a volunteer consultant for the Harvard graduate volunteer consulting group where she worked with a start-up/non-profit company.



Iredia M. Olaye, founder and chief executive officer of OlayIT™, a healthcare technology company currently located in the Chicagoland region. OlayIT™ decreases the amount spent on medical technology needs assessment and discovery by about 75%.

Through its global web-based interface, OlayIT™ strategically markets and connects healthcare technologies and manufacturers to healthcare organizations. OlayIT has partnerships with various companies in 5 states and is drastically expanding its reach. Iredia Olaye has a Master’s in Healthcare Administration (MHA) and over 10 years experience in healthcare administration, clinical practice & research. Prior to creating OlayIT, Iredia spent two years working on the executive teams of two large healthcare systems in the Midwest region of the United States, where she led the implementation of three large healthcare informatics and information technology systems. Keenly interested in preventative medicine, she also spent a significant amount of time in the city of Philadelphia collaboratively innovating health practices at a number of health organizations. As an expert in various areas of science, technology and medicine, Iredia has presented at a number of conferences

including the 2014 Philadelphia AIDS’ Education Month Summit. In October 2015 Iredia was invited to attend the Forbes Under 30 summit as a contributor and delegate. She interacted with her fellow future leaders and shared her ideas on the emerging challenges and promising solutions within the U.S. healthcare system.



Jessica Turner-Skoff, Ph.D.,

Treeologist, The Morton Arboretum. Despite starting her early academic career studying and working with animals, Dr. Turner-Skoff’s professional interest quickly became rooted in plants.

Jessica has a diverse background that focuses

on communicating science and promoting conservation with numerous stakeholders, including scientists, the general public, and not-for-profit organizations. Her dissertation research examined the conservation and sustainability of the rare, internationally important medicinal plant, American ginseng, especially how it relates to surface mining. In addition to her dissertation work, Jessica participated in a long-term research study investigating the impact of climate change on two plant species found in the tundra of northern Alaska. As The Morton Arboretum’s first ‘Treeologist,’ Jessica supports the Arboretum’s mission and vision to be the leading center of tree expertise by communicating and sharing expert knowledge. While centered in the Science and Conservation Department, she works closely with Education and Marketing to help catalyze tree advocacy by creatively making tree science, horticulture, and conservation relevant and accessible to target audiences.

C2ST Staff

Krisztina Eleki, PhD.

Executive Director

Andrea Poet

Director of Programs and PR

Chris Eppig, PhD.

Director of Programs

Jessica Weisensell

Assistant Director of Development and Administration

Anders Pollack

Visual Communication Lead

90% of program attendees said they would “probably” or “definitely” attend another C2ST program.

C2ST Survey

Thank You For Your Support

The Chicago Council on Science and Technology would like to extend our many thanks to those who provided us with funding that ensured we produced quality and engaging programming to the Chicagoland area.

The following is a list of those who made contributions in support of C2ST between July 1, 2015 and June 30, 2016 in the amount of \$10 or more. We are grateful for the support from each and every one of our loyal donors and members.

\$20,000 - \$25,000

AbbVie Chicago Community Trust	Elizabeth Morse Genius Charitable Trust Exelon Corporation	The John D. and Catherine T. MacArthur Foundation	PepsiCo, Inc. Alan Schriesheim
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\$10,000 - \$19,999

Argonne National Laboratory Magellan Corporation	Northern Illinois University Northwestern University	University of Chicago University of Illinois at Urbana-Champaign	Ralph Wanger
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\$1,001 - \$9,999

AKHAN Semiconductor John and Patricia Anderson Arch W. Shaw Foundation	Bob Arthur The Brinson Foundation Philip Cable DePaul University	Fermi Research Alliance Horizon Pharma, Inc. Illinois Tool Works Foundation John A. Cable Foundation	John and Jeanne Rowe Foundation Robert Kriss Norman Rogers
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In-Kind Donations

HDMZ	Illinois Institute of Technology	Magellan Corporation
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President's Council—\$1,000

Gastone and Linda Celesia	Kay Torshen Foundation	Alan Matthew	Kathleen Shapiro
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Leadership Council—\$250 - \$999

Shreaya Chakroborty Mary and Bruce Feay Julia Haried Mary Hendrix	Janis Morris Foundation Joseph and Bessie Feinberg Foundation Joseph Lykken	Thomas Macek Robert Rosner Sarah Shirk Jessica Turner-Skoff	Takeda Pharmaceuticals Edward Walbridge
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\$101 - \$249

Francisco Aguilar Mark Bettin	Rachel Bronson Arthur Goldman	Vickie Horn Dawn Kirschmann	Peter Wachter John C. Weisensell
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\$10 - \$100

Richard Alkire	Anne Hammes	Peggy Mason	Maureen Schoenbeck
Birger Back	Brendan Hennessy	William Matson	Nancy Schreiber
Terry Bergdall	Brian Farley Hickey	Edward McCaffrey	Kathryn Schubert
Bernard Botheroyd	Kelli Hicks	Amber McNeilly	Dorie Schwartz
Graham Braun	Dan Hislop	Julia Mendez	Martin Scott
Paula Brinkman Lowe	Walter Holden	Susan Messinger	Jeffrey Sebek
Benjamin Brookes	Aaron Houska	Dawn Miller	Richard Seftor
Mary Catherin Buntin	Barry Howard	Sara Garcia Moreno	Carlo Segre
Bill Bustin	Yu-hui Huang	Nicole Mueller	Bernad Seguy
Kathy Cahill	Angela Hung	Casey Murphy	Amanda Shaffer
Andrew Calvimontes	Laura Jane Hyde	Thomas Murphy	Frank Shell
Charles Cannon	Jennifer Jaremek	Christopher Myers	Sarah Simmons
Mary Anne Cappelleri	Christopher Jereb	Katherine Naselli	Reiko Skillman
Laura Cook	Adana Johns	Adamski	Paula Slowik
George Crabtree	Tim Johns	A. Nathan	Lara Smetana
John Craib-Cox	Daniel Kaplan	Kayla Nimis	Bo Sofilj
Michelle Craig	Bennetta Kelly	Dawn M. Nothwehr	John Sowles
Julie Cross	Anna Kelner	Lynn OGrady	Ruth Sweetser
D. Derfny	Elena Kherson	Katie Opfer	Kathy Timperman
Paul Dickerson	Rob Kleps	Dan Palchak	Lisa Tutaj
James Dickert	Edward and Adrienne	Daisy Petrovich	Kristen Victory
Emily Dobrowski	Kolb	Norman Phoenix	Traci Villa
Sarah Dunifon	Matthew Koon	John Power	Elise Wachspress
George Dzuricsko	David Kraft	Paul Rattigan	Andre Walker
Ariel Ehrmann	Emily Kraft	David Reed	Patricia Ward
Mark Englert	David Krumlauf	Peggy Reins	Tyson West
Deborah Fenner	Sam Lalk	Sendhil Revuluri	Cassandra White
Ayana Field-Ridley	Laura Lange	Ben Ripani	G. Whitehead
Eric Filson	Monica Laronda	Dennis Roberson	Geoffrey A. Williamson
Ricardo Fleury	Ryan Lazarus	R.A. Rosenstein	Cory Wilson
Elizabeth Futch	Bruce Levin	Michael Rosenzweig	Nicole Woitowich
Jeffrey Garrett	Joan Lokar	Molly Rossow	Leslie Wolowitz
Ashlynn Gerth	Michael Maloney	William Rowe	Rita Wolven
Peter Gray	G. Ali Mansoori	Joelle Sacks	Alex Zabrosky
Sophie Grimes	Rush Marler	Jenny Sarna	Howard Zar
Ethel Hammer	Stuart Marsh	Jeremy Sartori	

In our 2015-2016 year, 45% of our speakers were women.

C2ST Survey

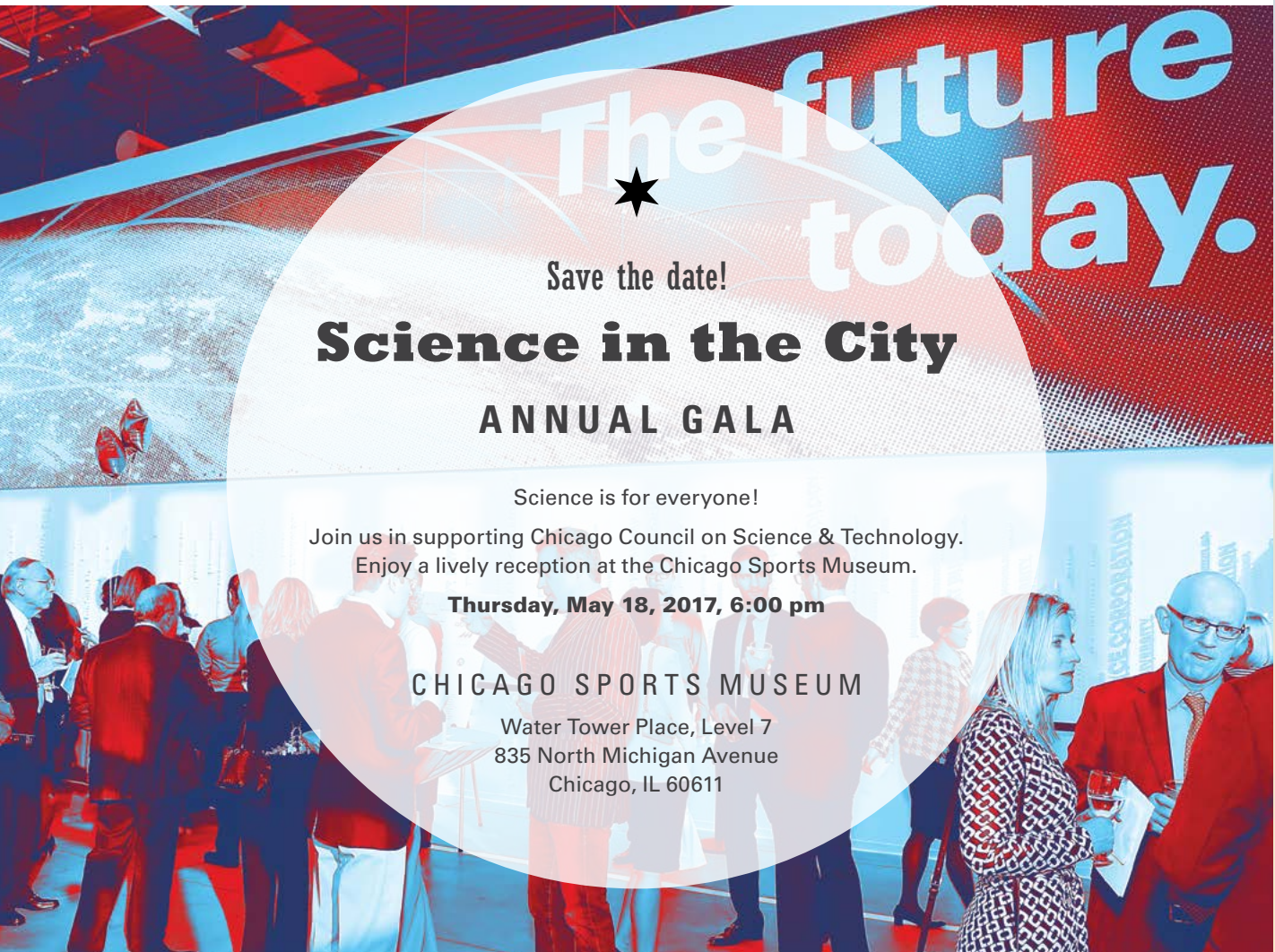
Thank You To Our Volunteers

Chicago Council on Science and Technology relies on the generosity of people who donate their time and talents to our organization. We are especially grateful to Shannon Allen, Ann Carias, Donna Denson, Sabrina Fesko, Hunter Rogers, Jenna Logsdon, Zuri McClelland, Felecia McCree Moulton, Janet McMillan, Peter Wachter and Christine Will for volunteering at multiple events during the past year. In addition to working at the events, Denson put in countless hours in the C2ST office, Fesko serves on an advisory committee, McMillan contributed to C2ST's blog and Wachter donates his photography to our group. Our volunteers donated almost 150 hours to C2ST.

We would also like to thank C2ST's two interns this year, Ruqayya Jabeen and Ambria Jones.

Finally, we would like to thank our new Auxiliary Board members (see pages ten and eleven for more information) for their time, talents and enthusiasm.

If you would like to help our organization, we welcome your support. Please contact us at info@c2st.org.



The future
today.



Save the date!

Science in the City

ANNUAL GALA

Science is for everyone!

Join us in supporting Chicago Council on Science & Technology.
Enjoy a lively reception at the Chicago Sports Museum.

Thursday, May 18, 2017, 6:00 pm

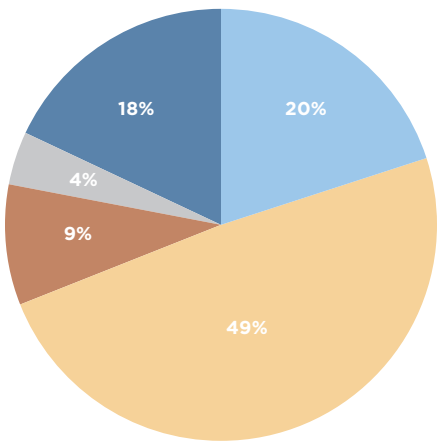
CHICAGO SPORTS MUSEUM

Water Tower Place, Level 7
835 North Michigan Avenue
Chicago, IL 60611

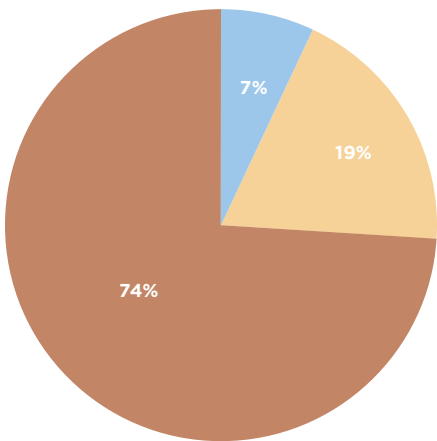
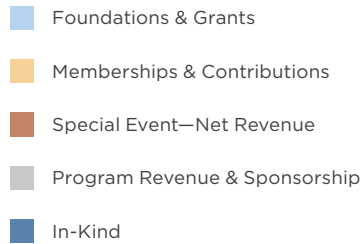
C2ST By The Numbers

The following revenue and expense charts are comprised of financial information from our fiscal year between July 1, 2015 and June 30, 2016.

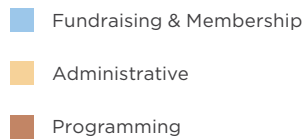
For our official financial documents please find our information on www.guidestar.org.



Revenue



Expenses



In the 2015 - 2016 fiscal year, C2ST:

- **Produced 31 programs**, consisting of 47 hours of programming
- Programs were attended by **2,130 people either in-person or through online streaming**
- Recordings of our program and highlight videos were **viewed over 22,000 times**
- **YouTube views came from 164 countries**, the top five countries: US, UK, Canada, Australia, India
- We had over **3,300 followers on Social Media**

**Join us in 2017—
in-person and online!**

Become a part of the conversation!

We want our audience and the Chicagoland community to get involved with C2ST any way they can. Please consider:

Becoming a Sponsor

You or your business will have the opportunity to sponsor a Program or Program Series of your choosing and contribute to the overall strategy and development of programs. C2ST will recognize you as a sponsor on the C2ST website, in the Annual Review, and on all printed and electronic marketing materials and ensure your seat on the President's Council.

Sponsorship ranges from \$2,500 to \$25,000+ depending upon your level of commitment. For more information on how to become a C2ST Sponsor, please contact Executive Director Krisztina Eleki, PhD., at 312-567-5830 or keleki@c2st.org.

Becoming a Patron

Join the President's Circle (\$1,000 and above) or Leadership Circle (\$250 to \$999). Since your annual gift will help us deliver our mission and goals, you will be acknowledged in our annual publication and will receive invitations to special VIP networking and 'Dine with the Speaker' events. Contact Krisztina Eleki at 312-567-5830 or keleki@c2st.org.

Becoming a Sustaining Supporter

Your sustaining gift will help us deliver quality programming and you will receive discounts where program fees apply. Please visit our website for membership information or contact Jessica Weisensell at 312-567-5835 or jweisensell@c2st.org.

Becoming a Friend

Your one-time donation will help us plan ahead and know that we have many friends who enjoy our programming.

Becoming a Volunteer

We need help at various programs and events—volunteer by contacting Jessica Weisensell at 312-567-5835 or jweisensell@c2st.org.

Matching Gifts

Many companies offer matching gift programs to encourage employees to contribute to nonprofit organizations. Most of these programs match contributions dollar for dollar, and some will even double or triple the amount of your gift! To multiply the value of your membership contribution or gift, ask your human resource or community relations department for a matching gift form. C2ST's Federal Tax Identification Number (TIN) is 20-8490697.

Donating In-Kind

Donate your talents to various projects to help with program, promotion and/or organizational development. For more information please contact Krisztina Eleki at 312-567-5830 or keleki@c2st.org.

C2ST is a 501(c)3 nonprofit organization. Contributions are tax-deductible to the extent allowable by law.



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